

# Deflection Tester

## Surface Plate with 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.

| For Safe and Proper Use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                     |                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>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.</p> <p>The symbols and their meanings are as follows.</p> <ul style="list-style-type: none"> <li>● Please read the text after fully understanding the symbols and their meanings.</li> <li>● After reading, be sure to keep this manual in a place where anyone using the product can easily refer to it at any time.</li> <li>● All of these are safety-related instructions, so please be sure to follow them.</li> </ul> |                                                                                     |                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Danger                                                                              | This indicates situations where incorrect handling could result in imminent risk of death or serious injury.                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Warning                                                                             | This indicates situations where incorrect handling could potentially result in death or serious injury.                                                                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Caution                                                                             | This indicates situations where incorrect handling may result in injury to persons or only property damage.                                                                                                                                  |
| Examples of symbols                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | The △ symbol indicates the presence of danger, warning, or caution messages, with specific precautions described within the figure.<br>(The left figure is used to indicate general danger, warning, or caution without specifying details.) |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | The ○ symbol indicates prohibited actions, with specific precautions described within or below the figure.<br>(The figure on the left is used for general prohibition notices without specifying particular actions.)                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | The ● symbol indicates mandatory actions, with specific instructions detailed within the figure.<br>(The figure on the left is used for general mandatory actions or instructions without specifying details.)                               |

# Surface Plate with Centers(Granite) Instruction Manual

## 1. Product Features

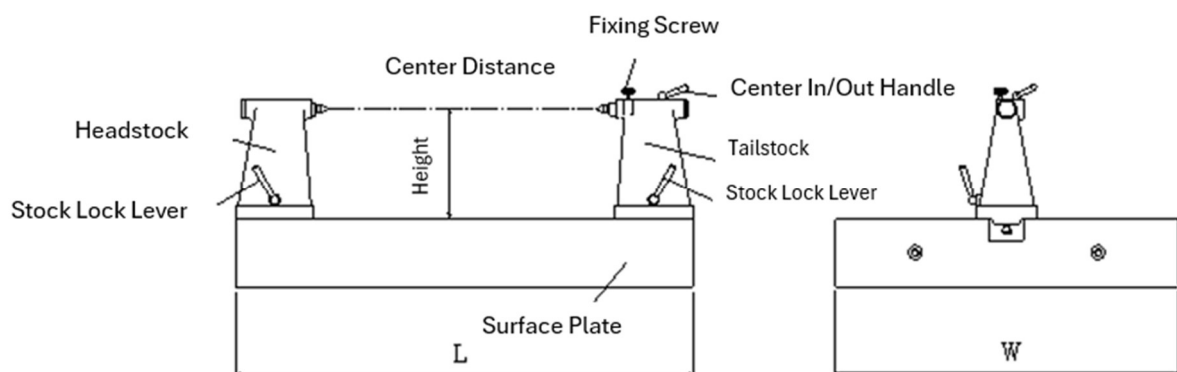
- The surface plate has flatness equivalent to JIS Grade 1.
- The stock movement section has a V-groove mechanism with a T-slot.
- The V-groove is located at the center of the surface plate width.

By removing the stock, the instrument can also be used as an inspection surface plate.

Note: The following are available as options:

- Upon request, the V-groove can be manufactured closer to the edge of the surface plate.
- A dedicated stand (made of square pipe) can also be manufactured.
- A test bar is not included. Please prepare it separately.

## 2. Names of Parts and External View



## 3. Specifications

| Code No. | Size (L×W mm) | Center Distance (mm) | Center Height (mm) | Use Center | Height Parallelism (μm) | Mass (kg) |
|----------|---------------|----------------------|--------------------|------------|-------------------------|-----------|
| SG101    | 1000×750      | 600                  | 240                | MT-2       | 5                       | 365       |
| SG102    | 1500×1000     | 1000                 | 300                | MT-3       | 8                       | 960       |
| SG103    | 2000×1000     | 1500                 |                    |            | 12                      | 1570      |

## 4. Installation of Surface Plate with 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.

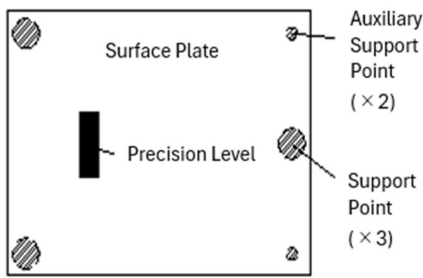


Figure a

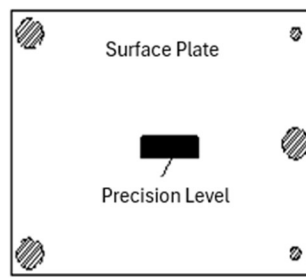
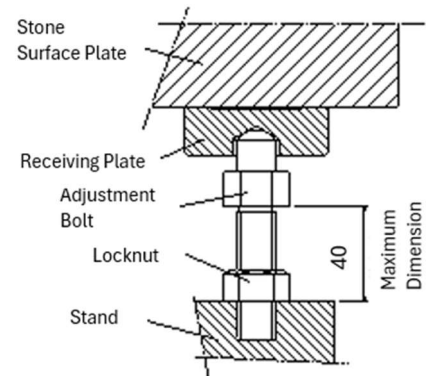


Figure b



Granite Precision Surface Plate

## 5. Instructions for Use

### Workpiece Mounting Procedure

Note: Always fix the stock when mounting the workpiece.

Note: Adjust the position of the stock so that the center of gravity is aligned with the center of the instrument. If the center of gravity is near the outside, stable measurement may not be possible and there is a risk of the instrument tipping over.

- ① Set the instrument on a stable table.
- ② Loosen the fixing screw of the tailstock, and operate the center in/out handle to confirm that the center moves smoothly. At this time, grasping the amount of center movement will make it easier to adjust the stock position.
- ③ Operate the stock fixing lever to release the lock. (At the time of shipment, the stock fixing lever is in the vertical position and unlocked.)
- ④ Adjust the position of the left and right stocks equally according to the length of the workpiece to be measured.

Note: Move the stocks carefully and little by little, as there is a risk of collision with the opposite stock.

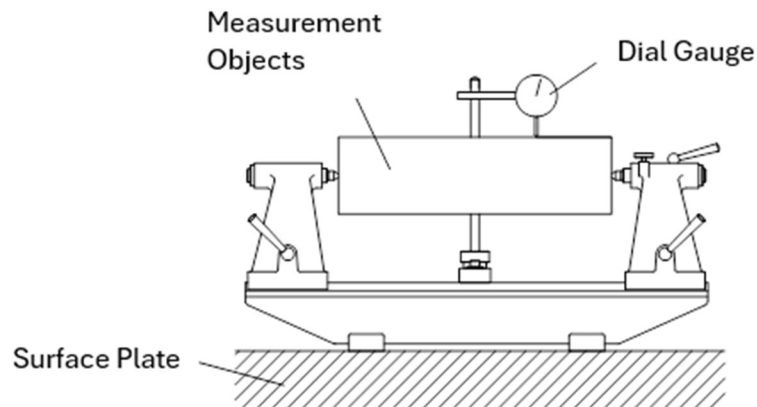
- ⑤ Operate the stock fixing lever to securely fix the stock. The stock is locked when the lever is tilted to either side.
- ⑥ Insert the left center hole of the workpiece into the headstock center.
- ⑦ While supporting the workpiece, operate the center in/out handle and hold the center in the retracted position.
- ⑧ Align the right center hole of the workpiece with the stock center, and slowly

operate the center in/out handle to insert the center into the hole.

- ⑨ After confirming that the workpiece is securely held, tighten the fixing screw.
- ⑩ After measurement, support the workpiece so that it does not fall, and slowly operate the center in/out handle to remove it. (Follow the reverse order of steps above.)

### **Measurement Method**

- ① Mount the workpiece on the instrument.
- ② Place the stand with the dial gauge on the instrument.
- ③ Lightly bring the stylus of the dial gauge into contact with the highest point of the workpiece.
- ④ Rotate the workpiece and record the needle deflection.



## **6. Adjustment Method**

### **Adjustment of the Stock Lock Lever**

- ① Loosen the stock lock lever.
- ② Move the stock so that the convex piece under the stock protrudes slightly outside the bed T-slot.
- ③ Rotate the convex piece.
- ④ Return the stock onto the bed, tighten the stock lock lever, and check its position.
- ⑤ Move the stock along the bed and make sure it moves smoothly.
- ⑥ If readjustment is required, repeat steps 1–5.

Note: If the convex piece is higher than the top surface of the T-slot, it will not fit into the slot.

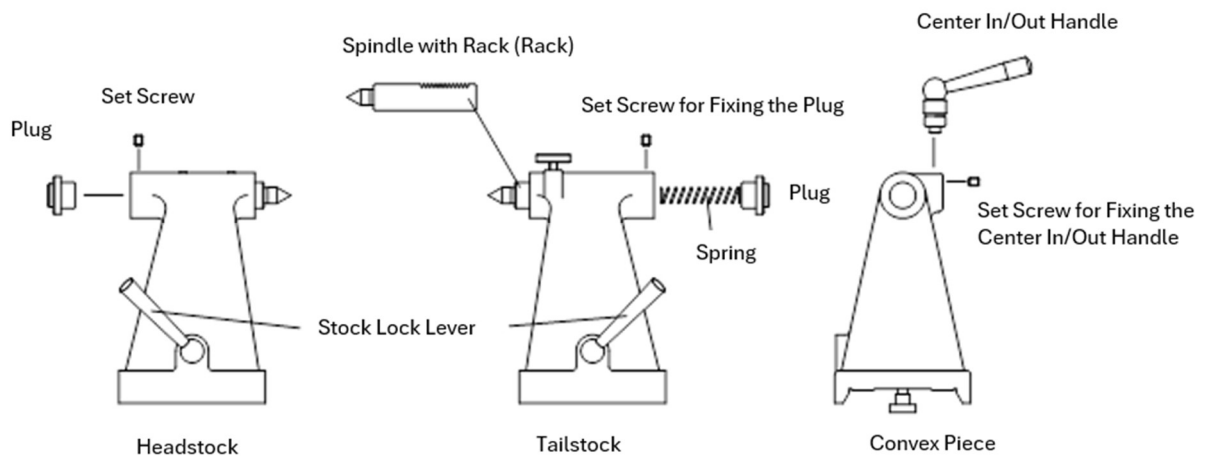
Note: The adjustment range is extremely small, so handle with care.

### **Adjustment of the Center In/Out Handle**

- ① As shown in Figure 4, loosen the set screw for fixing the plug and remove the plug.  
Since a spring is inserted, take care not to let the plug fly out.
- ② Loosen the set screw for fixing the center in/out handle, lift the handle, and remove it.
- ③ Rotate the center in/out handle to the desired position and insert it so that it meshes with the rack
- ④ Move the center in/out handle back and forth and check its position again.
- ⑤ After confirmation, install the set screw for fixing the center in/out handle.

**Caution: If overtightened, the center in/out handle will not move.**

- ⑥ Insert the spring, press in the plug, and install the set screw for fixing the plug.
- ⑦ If readjustment is required, repeat steps 1–6.



**Figure 4. Adjustment of the Convex Piece and the Center In/Out Handle**

## **7. Replacement of the Center**

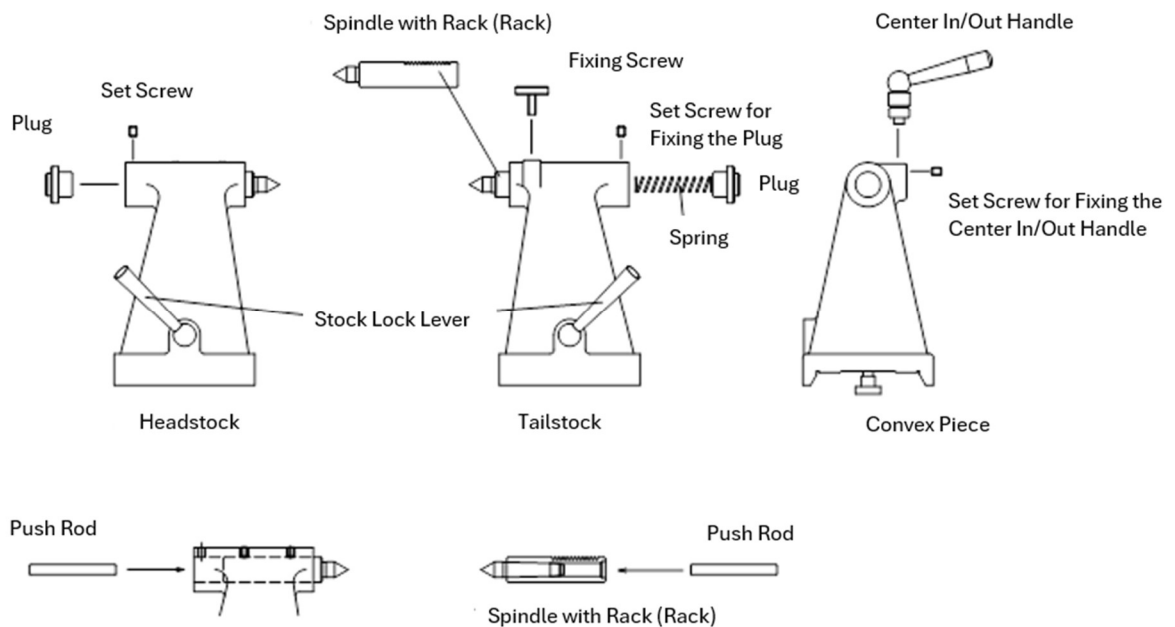
**If damage (such as chipping or wear) is found on the tip of the center, replace the center with a new one immediately.**

### **Headstock Side**

- ① Loosen the set screw and remove the plug.
- ② Prepare a push rod and insert it into the stock to remove the center.
- ③ Insert a new center.
- ④ To protect the tip of the center, place a wooden block or similar material against it and tap lightly with a plastic hammer.
- ⑤ Reattach the plug and set screw.

## Tailstock Side

- ① Remove the fixing screw.
- ② Loosen each set screw, and remove the plug and the Center In/Out Handle.  
Caution: Since a spring is inserted, take care not to let the plug fly out.
- ③ Pull out the spindle with rack .
- ④ Insert a push rod into spindle with rack and tap lightly to remove the center.
- ⑤ To protect the tip of the center, place a wooden block or similar material against it and lightly tap with a plastic hammer.
- ⑥ Insert the spindle and the Center In/Out Handle, and adjust their position.
- ⑦ Secure the spindle, insert the spring, attach the plug and set screw, and finally install the fixing screw.



## 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.  
If it is placed on an unstable surface, the accuracy of the bed surface may be affected, and there is a risk of the instrument tipping over or falling due to its weight.
- ⑥ Do not apply excessive load or impact to the bed or centers.
- △ ⑦ Before mounting the workpiece, always make sure that the stock is securely fixed.  
If the stock is not 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.

If it is moved too much at once, the stock may slip on the bed and collide with the opposite stock, causing damage to the centers.

In particular, when the distance between the centers is narrow, lightly tap the rear of the stock and adjust it slowly.

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

Note: When transporting by vehicle, insert cardboard or similar material between the two stocks and secure them firmly with string or other means to prevent movement, even if the fixing handle loosens due to vibration.

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

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

- ⑭ If there are scratches or damage, have the instrument repaired and inspected.

- 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.

- ㉓ Avoid using the surface plate repeatedly in specific areas.

Use the entire surface evenly.

## Contact Information

JIS Certified Factory



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Head Office and Factory

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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).