

PRECISION MEASURING TOOLS

VERNIER CALIPERS (Kaidan Scale)

Thank you for purchasing the Vernier Calipers (Kaidan Scale).

This product is a precision measurement tool with a main scale and a vernier scale to indicate the measured value.

●For safe and proper use of this product, please read this instruction manual before use and follow the procedures described.

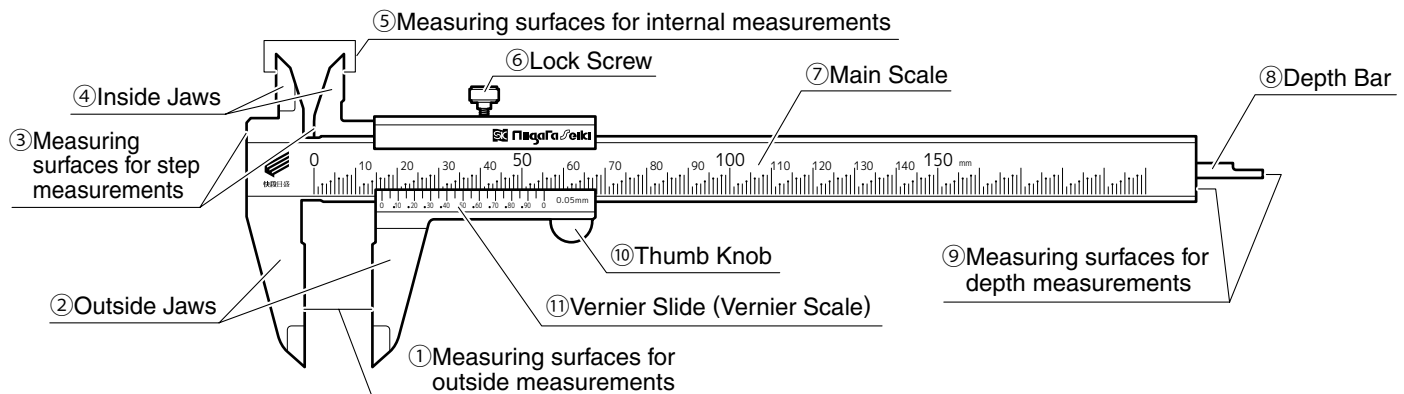
Please keep manual where it is accessible to user for future reference.

●Keep this manual with the instrument if transferred or leased to a third party.

●For inquiries about this product, please contact dealer or Niigata Seiki at the address listed on the following page.

■PART IDENTIFICATION AND FUNCTION

※Model GVC-15KDE shown.




- | | |
|--|---|
| ① Measuring Surfaces for outside measurements | Object to be measured is positioned between these surfaces. |
| ② Outside Jaws | Measures external dimensions. Move Slide to open and close. |
| ③ Measuring surfaces for step measurements | Measures the height of steps. |
| ④ Inside Jaws | Measures internal dimensions. Move Slide to open and close. |
| ⑤ Measuring surfaces for internal measurements | Position surfaces inside object to be measured. |
| ⑥ Lock Screw | Locks the Vernier Slide position. |
| ⑦ Main Scale | Indicates measured value in 1mm graduations. |
| ⑧ Depth Bar | Bar for measuring depth. Bar moves in and out with Vernier Slide. |
| ⑨ Measuring surfaces for depth measurements | Depth is measured between these two surfaces. |
| ⑩ Thumb Knob | Position thumb on knob for precise control of vernier slide. |
| ⑪ Vernier Slide (Vernier Scale) | Scale for measuring with a resolution of 0.05mm.
Refer to following page for usage instructions. |

SAFETY PRECAUTIONS

Please Observe

Always follow the proper operating procedures in order to prevent harm to yourself or others, and to prevent damage to property.

 Denotes a prohibition - You MUST NOT do

 Denotes a requirement - You MUST do



WARNING

Indicates risk of personal injury or property damage if not followed.



Read the manual and follow the instructions.

- Use of product other than as described in the manual may cause accident.



Use only for measuring.

- Use for any purpose other than measuring may damage or wear the instrument. Improper use may also cause accident.



Handle with Care.

- Do not drop or subject instrument to excessive shock. Do not place under heavy objects. Improper handling may cause damage or poor accuracy.
- Do not scratch instrument, for example by writing ID number.



Use In Proper Environment

- Please do not use instrument in rain or locations with excessive humidity. Do not use at extreme high or low temperatures. Keep out of direct sunlight.



Jaw Tips Are Sharp – Handle With Care.

- Careless handling may cause injury.



Do not move the Vernier Slide when the Lock Screw is tightened.

- Excessive force applied to Slide may cause damage or affect accuracy.



Do not disassemble or modify.

- Do not remove the vernier slide, Please do not attempt to disassemble or modify as it may cause damage or poor accuracy.

CALIBRATION

●In order to maintain instrument accuracy, it is recommended that accuracy is confirmed through calibration on a periodic basis.

Wear of measuring surfaces from repeated use may affect accuracy and periodic accuracy checks should be performed.

We provide calibration services.
Please contact agent in country of purchase to make arrangements.

PREPARATION FOR USE

Before using the caliper, follow the steps below:

- **Loosen the lock screw.**

Moving the vernier slide with the lock screw tightened may cause excessive force to the slide which will damage the caliper and affect accuracy.

- **Wipe off any dirt, or oil from measuring surfaces and slide.**

Contamination of surfaces may cause measurement error.

- **Allow the caliper and object to be measured time to reach the same temperature.**

A temperature difference between the object to be measured and the caliper may cause measurement error. Allow enough time for the temperatures to equilibrate.

- **Performing an accuracy check.**

- ① **Jaw Alignment**

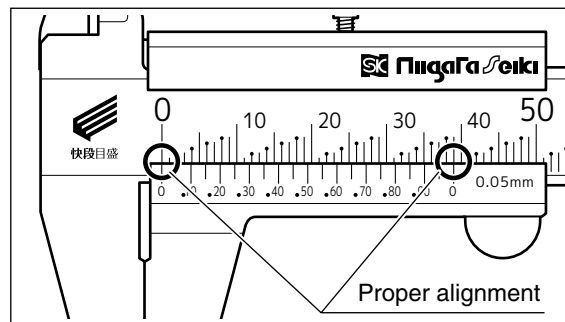
In closed position, make sure the measuring surfaces on the outside jaws align properly and there is no gap (no light should leak past.)

- ② **Confirm "0" points on scale (see diagram at right)**

With jaws closed as in step ① above, make sure the reading is zero and the vernier scale graduations align at the "0" and "39" positions as shown.

- ③ **Depth Confirmation**

Position caliper on a flat surface for depth measurement. Reading should be "0" as in step ② above, with the vernier graduations aligned at the "0" and "39" positions.

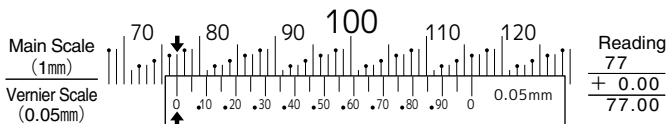


READING THE SCALE

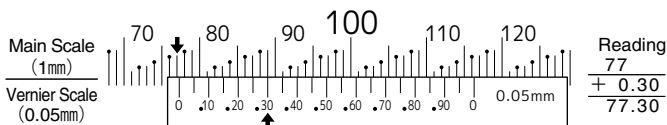
The measured value is determined by reading the main scale, and then adding the Vernier Scale reading as determined by the position where the vernier and main scale graduations align.

Measured value = Main Scale Reading + Vernier Scale Reading

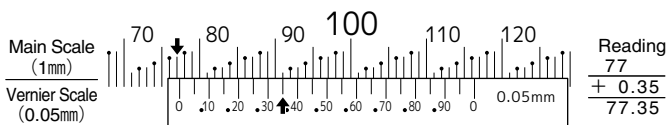
- **EXAMPLE 1 Measured Value: 77.00mm**



- **EXAMPLE 2 Measured Value: 77.30mm**



- **EXAMPLE 3 Measured Value: 77.35mm**



AFTER USE CARE, STORAGE NOTES

- **Wipe slide, measuring surfaces, and exterior with a dry cloth treated with anti-corrosive oil. When not in use, apply anti-corrosive treatment or keep in anti-corrosive bag.**

- **When not in use, keep jaws slightly open and lock screw slightly loose to prevent over tightening due to thermal expansion which may affect accuracy.**

- **Store in supplied case in a cool, dry location. Keep away from direct sunlight or wet locations and protect from use by unauthorized personnel.**

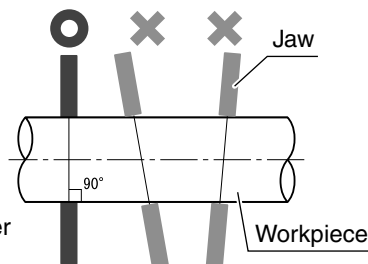
PREVENTING ERRORS

In order to prevent measurement error, please note the following.

POSITIONING CALIPER ON OBJECT

- < **Flat surfaces** >

When measuring features with flat surfaces, make sure the measuring surface of the jaws are parallel to the surfaces to be measured.

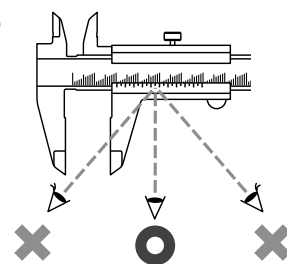


- < **Cylindrical surfaces** >

When measuring cylindrical features, make sure the caliper jaws are perpendicular to the cylinder axis as shown.

VIEWING THE SCALE

Scale should be read from directly above the calipers. Due to step in height of vernier scale relative to main scale, if viewing direction is not directly above the reading may have parallax error.



SPECIFICATIONS

- **Material : Stainless Steel**

Model No.	GVC-15KDE	GVC-20KDE	GVC-30KDE
Measuring Range	150mm	200mm	300mm
Resolution	0.05mm		
Maximum permissible error	±0.05mm		±0.08mm
Weight	140g	200g	380g

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