Niigata Seiki

INSTRUCTION MANUAL | **Model No.** GHB-**

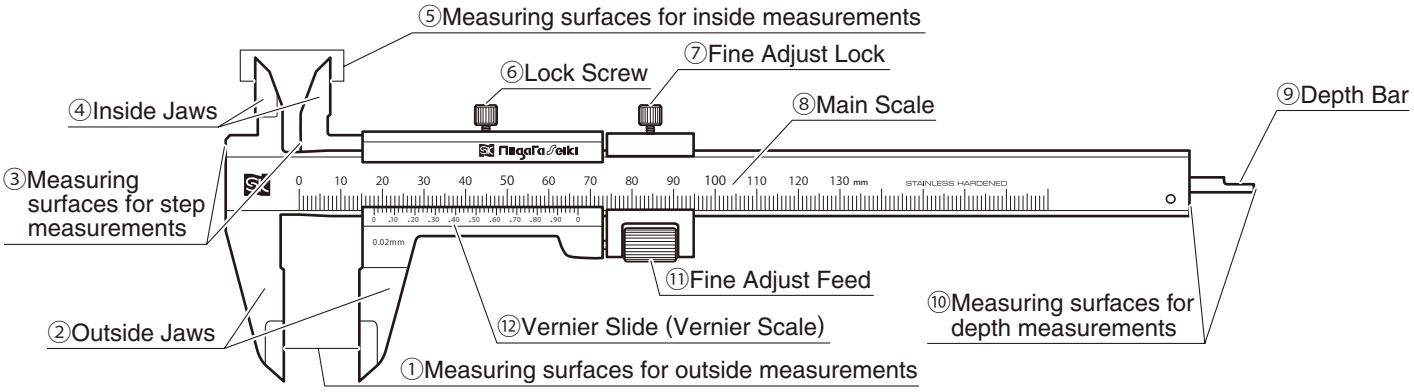
PRECISION MEASURING TOOLS

VERNIER CALIPERS WITH FINE ADJUSTMENT

Thank you for purchasing the Niigata Seiki Vernier Calipers with Fine Adjustment.
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



①Measuring Surfaces for outside measurements	Position measured object between these surfaces.
②Outside Jaws	Measures external dimensions. Move Slide to open and close.
③Measuring surfaces for step measurements	Measures the height of steps.
④Inside Jaws	Measures internal dimensions. Move Slide to open and close.
⑤Measuring surfaces for inside measurements	Position surfaces inside object to be measured.
⑥Lock Screw	Locks the Vernier Slide.

⑦Fine Adjust Lock	Tighten to use Fine Adjustment. ※ For Fine Adjustment, Loosen Lock Screw ⑥, and tighten Fine Adjust Lock ⑦. Rotate Fine Adjust Feed wheel ⑪.
⑧Main Scale	Indicates measured value in 1mm graduations.
⑨Depth Bar	Bar for measuring depth. Bar moves in and out with Vernier Slide.
⑩Measuring surfaces for depthmeasurements	Depth is measured between these two surfaces.
⑪Fine Adjust Feed	Rotate wheel for fine adjustment.
⑫Vernier Slide (Vernier Scale)	Scale for measuring with a resolution of 0.02mm. Refer to following page for usage instructions.

SAFETY PRECAUTIONS

Please Observe

To prevent injury to yourself and others, and to prevent damage to property, always follow the procedures marked with the following symbols.

⃠ 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 directions.**
- 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.

◎ **Use only in suitable environment.**
- Do not use in locations that are humid, wet, very hot, cold, or in direct sunlight.

◎ **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.

◎ **Jaw tips are sharp—Handle with care.**
- Careless handling may cause injury.

⃠ **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:

●Wipe off rust proofing and dirt from measuring surfaces and slide.
Contamination of surfaces may cause measurement error.

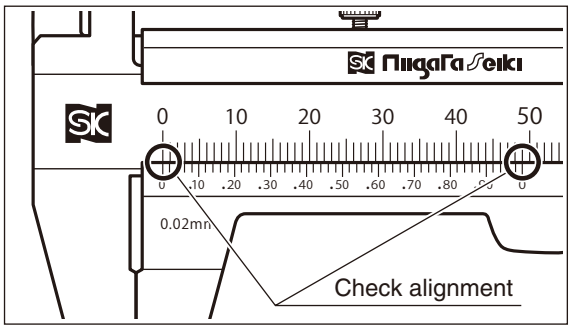
●Allow the caliper and object to be measured time to reach the same temperature.
A temperature difference between the object to be measured and the caliper may cause measurement error. Allow enough time for the temperatures to equilibrate.

●Performing an accuracy check.

①Jaw 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.)

②Confirm "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 "49" positions as shown.

③Depth Confirmation
Position caliper on a flat surface for depth measurement. Reading should be "0" as in step ② above, with the vernier scale graduations aligned at the "0" and "49" positions.

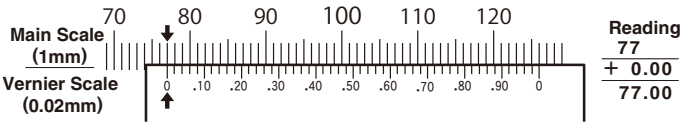


READING THE SCALE

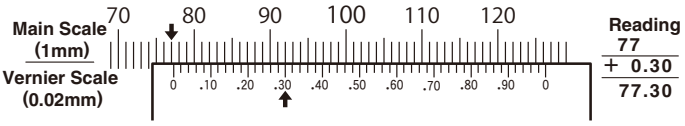
The measured value is determined by reading the main scale, and then adding the Vernier Scale reading determined by the position where the vernier and main scale graduations align.

Measured Value = Main Scale Reading + Vernier Scale Reading

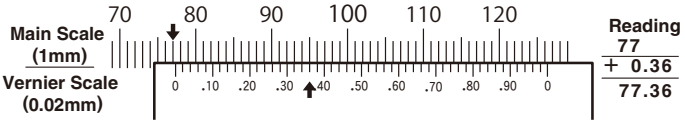
●EXAMPLE 1 **Measured Value: 77.00mm**



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



●EXAMPLE 3 **Measured Value: 77.36mm**



AFTER USE CARE • STORAGE NOTES

●Wipe slide, measuring surfaces, and exterior with a dry cloth to remove any dirt or oil.
When not in use, apply anti-corrosive treatment or keep in anti-corrosive bag.

●When not in use, keep jaws slightly open.
If stored with jaws closed, thermal expansion may create excessive forces and affect accuracy.

●Store in supplied case in a cool, dry location.
Store away from moisture or direct sunlight, and out of reach of unauthorized personnel.

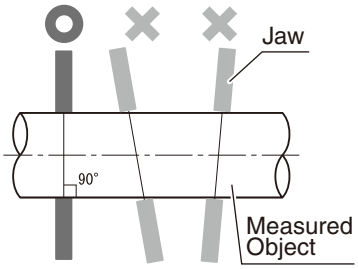
PREVENTING ERRORS

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

POSITIONING CALIPER ON OBJECT

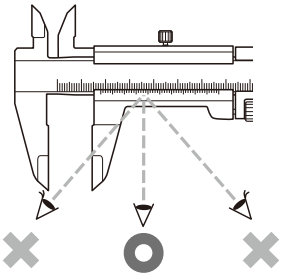
＜Flat surfaces＞
Position the caliper perpendicular to the surfaces to be measured.

＜Cylindrical surfaces＞
Position the caliper perpendicular to the axis of the cylinder.



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 (Satin finish)

Model No.	GHB-15	GHB-20	GHB-30
Measuring Range	0～130mm	0～180mm	0～280mm
Resolution	0.02mm		
Accuracy	±0.05mm		±0.08mm

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