Niigata Seiki Model No. SB-NM1025

MEASURING TOOLS BOOK

VERNIER CALIPER GVC-10 AND MICROMETER MC105-25 COMBINATION SET

INSTRUCTION MANUAL

Niigata Seiki Co., Ltd.
5-3-14, Tsukanome, Sanjo, Niigata, Japan, 955-0055
Tel. : +81-256-33-5522 Fax. : +81-256-33-5518
MAIL intl.sales@niigataseiki.co.jp
URL http://www.niigataseiki.co.jp

I396-K 1909

◎ SET INCLUDES

VERNIER CALIPERS
- ◇ Model : GVC-10
- ◇ Max Meas. Length : 100mm
- ◇ Graduations : 0.05mm
- ◇ Accuracy : ±0.05mm

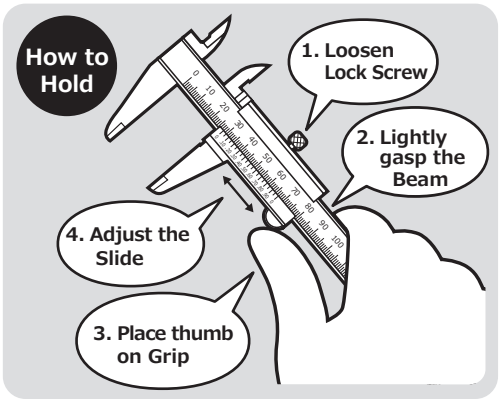
OUTSIDE MICROMETER
- ◇ Model : MC105-25
- ◇ Meas. Range : 0～25mm
- ◇ Graduations : 0.01mm
- ◇ Instrument Error : 4μm
- ◇ Accessories : Spanner

⚠SAFETY NOTES

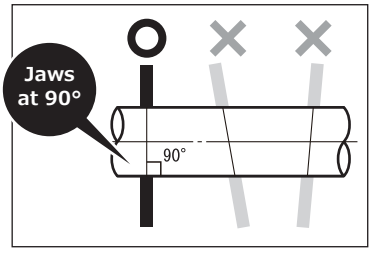
● Please read and follow these instructions. Improper use may lead to accidents, injuries, product damage, or inaccurate measurements. ● Use only for measuring. ● Handle with care - do not drop or shock, and do not place under heavy objects. ● Do not damage gauge, such as by engraving name or number on it. ● Keep away from rain, high humidity, temperature extremes, and direct sunlight during use and storage. ● Do not disassemble or modify. ● Use caution when handling Caliper - Jaw tips are sharp. ● Always make sure Lock Screw is loose before moving Caliper Slide.

How-to CALIPERS

Calipers are the most versatile measuring tool in the shop, able to measure outside dimensions, inside dimensions, depth, and step height.

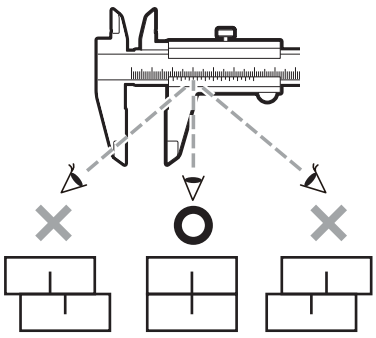


1 Positioning on Workpiece



- **For Flat Parts**
  Jaws should be perpendicular to the surface.
- **For Cylindrical Parts**
  Jaws should be at right angle to the axis of the cylinder.

2 Viewing the Scale



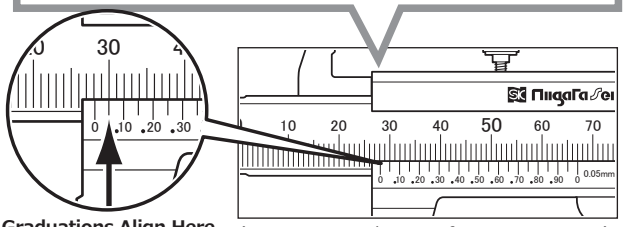
Read the Scale from directly above the Calipers.
If the Scale is viewed at an angle, the difference in height between the Main Scale and the Vernier Scale **may cause measurement error** due to parallax.

3 Reading the Scale

The measurement using both the Main Scale and the Vernier Scale. Below there are examples reading 77.00mm measurement in the first example, and 77.35mm. for the second example.

Meas. = Reading Off Main Scale + Vernier

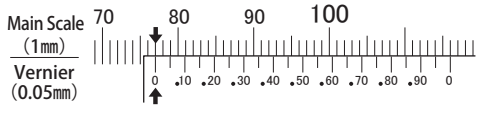
The Vernier Scale is read at the point where the Vernier graduations align with the Main Scale graduations.



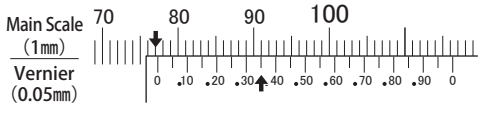
Graduations Align Here

(Measurement shown in figure is 28.05mm)

Ex. 1 Measure-ment = 77.00mm

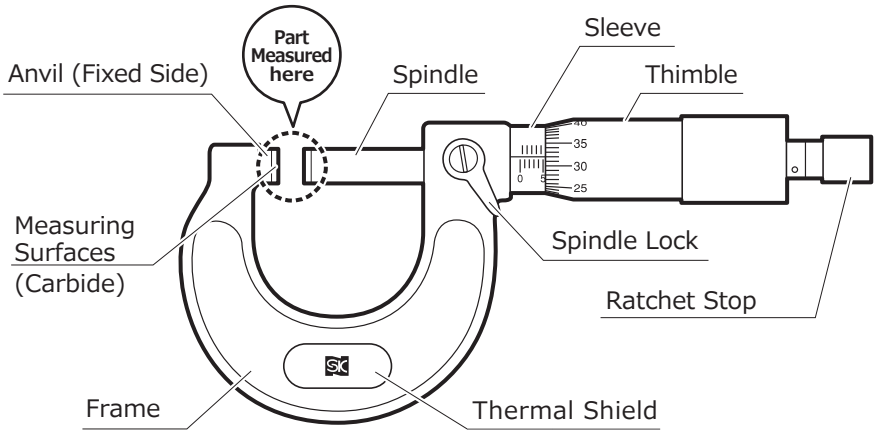


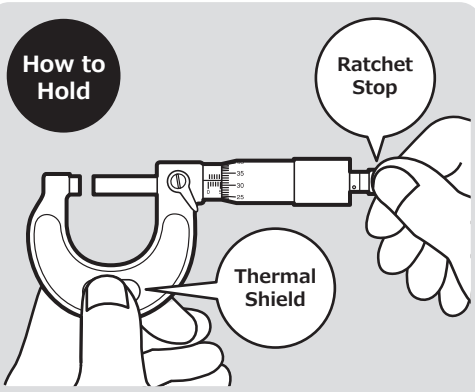
Ex. 2 Measure-ment = 77.35mm



How-to MICRO-METER

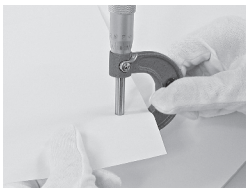
Micrometers use a threaded Spindle to measure length for more accuracy than measurements made with Calipers.





Grip the Micrometer on the Thermal Shield to prevent thermal expansion from body heat, and use the Ratchet Stop for consistent meas. force.

1 Setting the 0-Point



① Clean the Measurement Surfaces

To clean both the Anvil and Spindle measurement surfaces, place a clean sheet of paper between them and lightly close the Micrometer. Pull the paper across the surfaces to clean. Open the Micrometer to remove the paper.

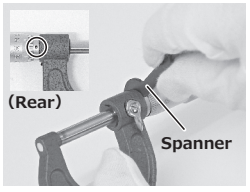
※Paper may produce dust at the edges, so do not pull all the way out, but open the Micrometer to remove.

② Close using Ratchet Stop

The amount of force used to turn the Spindle is critical. Turn the Ratchet Stop until the Measurement Surfaces touch and the ratchet clicks 1 to 3 times.

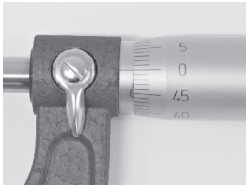
③ Set the Clamp

In the photo to the left, the 0-Point is off by about 5 μm, so it is necessary to adjust. First, tighten the Spindle Clamp using the Lever to hold the Spindle in position.



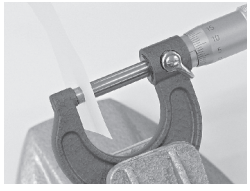
④ Insert the Spanner

To adjust the 0-Point, insert the Spanner into the hole in the sleeve and rotate. Make sure the Spanner is firmly pushed into hole, or it will slip and scratch the scale. Please use care.



⑤ Align the Scale to 0

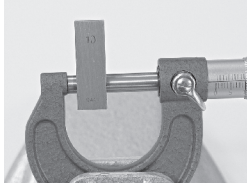
Here the Scale is aligned to read 0. Always read the Scale from directly above, reading at an angle can cause a 2 ~ 3μm reading error.



⑥ Check Accuracy (Mounting on Micrometer Stand)

Place the Micrometer into a Stand.

※ Setting the 0-Point is not sufficient to insure accurate measurements. This procedure will check for errors in the pitch of the Spindle Threads caused by wear.



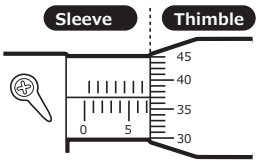
⑦ Check Accuracy (Using Block Gauge)

Place a Block Gage in the Micrometer and measure. The measurement should match the dimension on the Gauge. This will confirm the overall accuracy of the instrument.

2 Reading the Scale

●Reading Example

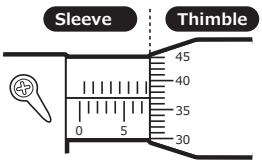
The Sleeve reading is 7.mm, and the Thimble reading adds 0.37mm, for a total measurement of 7.37mm.



Sleeve Reading : 7 .
Thimble Reading : .37

Measurement : 7 .37(mm)

The Sleeve reading is 7.5mm, and the Thimble reading adds 0.37mm, for a total measurement of 7.87mm.

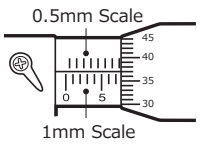


Sleeve Reading : 7 .5
Thimble Reading : .37

Measurement : 7 .87(mm)

■ On the Sleeve, the lower scale is 1mm increments, and the upper scale is also 1mm increments, but half way between, so for the two scales there is a line every 0.5mm.

■ While the Scale is very easy to read, care must be taken not to misread the last line, especially on the 0.5mm Scale, since if the line is not seen or is neglected the measurement will be off by 0.5mm.



※ You can read down to 0.01mm using the above method, but you can also read down to 0.001mm (1 μm) as shown in this diagram.

CALIBRATION

Instruments should be calibrated regularly to insure accuracy.
Wear and repeated use can affect accuracy. We recommend periodic calibration.