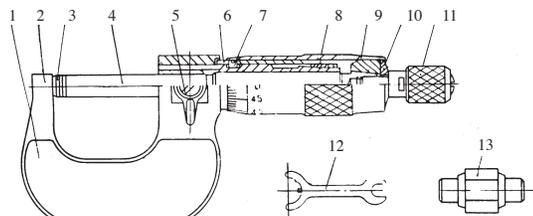


Please read through this owners manual carefully before using your new tool. Use your tool properly and only for its intended use.



Vernier Micrometer



- | | | |
|-------------------------------------|------------------|--------------------|
| 1. Heat Insulating Plate | 2. Frame | 3. Anvil |
| 4. Spindle | 5. Locking Clamp | 6. Sleeve |
| 7. Thimble | 8. Barrel | 9. Taper |
| 10. End Cap | 11. Ratchet Stop | 12. Spanner Wrench |
| 13. Standard (4KU91 and 4KU92 only) | | |

Cleaning

Wipe off oil, grease, dust and other foreign substances from all surfaces of the micrometer. Use particular care on the precision finished measuring contact faces of the spindle and the anvil.

Checking Operation

Inspection should be carried out particularly on the following points:

- (1) Check if the ratchet mechanism functions properly
- (2) Turning the ratchet stop, check if the spindle moves smoothly throughout the entire travel
- (3) Examine the measuring contact faces to be sure they are in a good condition in every respect
- (4) Check that the locking clamp works.

Checking Zero Point

The zero point setting of each micrometer has been carefully set and tested. However, it should always be checked as a routine rule to ensure the accuracy of the measurements taken. Turn the ratchet stop until the spindle touches the anvil lightly but distinctly and see if the zero point on the thimble coincides with the reference base line of the graduations on the outer sleeve.

For micrometers larger than 0-25mm (0-1") size, the zero point is checked using the standard or a gage block.

Adjusting Zero Point

If any deviation is found as the result of the above inspection, the zero point can be set correctly by the following procedure:

- (1) If the deviation is under 2 divisions on the thimble, turn the sleeve with the spanner supplied by an amount corresponding to the deviation and bring the reference base line of the sleeve to coincide with the zero point.
- (2) If the deviation is more than 2 divisions on the thimble, it is corrected by the following procedure:
 - (a) Hold the frame and the thimble and loosen the ratchet stop with the spanner.
 - (b) Disconnect the coupling of the thimble and the spindle by giving a light shock to the thimble, then turn the thimble by an amount equal to the deviation, bringing the zero point to coincide with the reference base line of the graduation on the sleeve.
 - (c) Securely holding the thimble in the corrected position, press it against the spindle and tighten the ratchet stop with the spanner coupling them together.

- (d) Having adjusted, check and confirm by repeating that the zero point has been correctly set. If any adjustment of a very small degree is required, it can be adjusted on the sleeve using the spanner wrench.

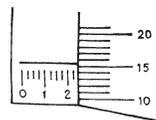
Caution

When reading the micrometer, the line of vision must be in the plane containing the graduated line to be read and the line of the spindle axis to avoid parallax. Keep correct posture to avoid parallax error.

The difference between temperatures of the micrometer and those of the work under measurement will cause errors in the measurement.

Avoid pulling out the micrometer or the work without relieving the pressure at the contact points. It may cause damage and ruin the precision finished contact faces of the tool.

Handle the instruments with care. Dropping and giving undue shocks will not only damage the contact faces but effect the combined precision.



Example for division .001"

Reading:

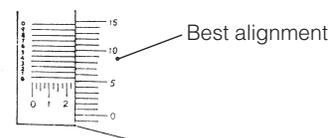
From sleeve:

$$.2 + .025 = .225"$$

From thimble: .0150"

Final readings should be:

$$.2000" + .0250" + .0150" = .2400"$$



Example for division 0.0001"

Reading:

From Sleeve:

$$.2 + .025 = .225"$$

From thimble: .0050"

From vernier of sleeve: .0004"

Final readings should be

$$.2000" + .0250" + .0050" + .0004" = .2304"$$

