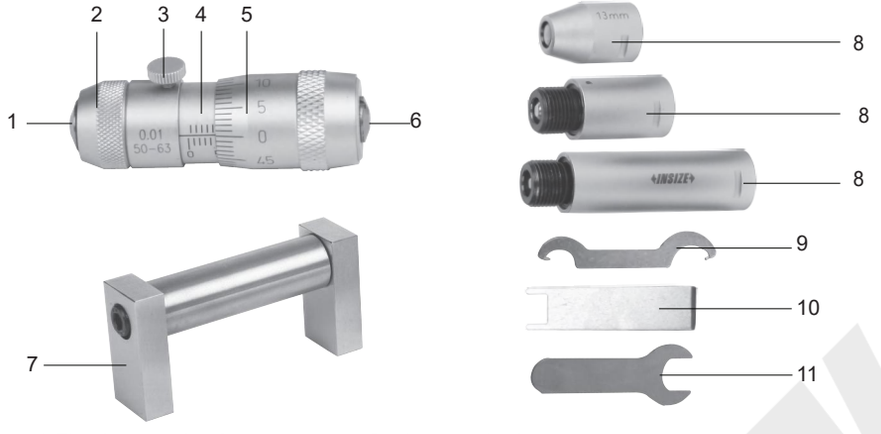
OPERATION INSTRUCTION

Tubular Inside Micrometer
Series 3222

Graduation: 0.01mm
Travel of micrometer head: 13mm
Accuracy: (3+n+L/50)μm(n is number of rods, L is maximum measuring length(mm))
Graduation: .001"
Travel of micrometer head: .5"
Accuracy: ±[.00005(3+n+L/2)]"(n is number of rods, L is maximum measuring length(inch))



1-Fixed measuring face
2-Thimble
3-Locking screw
4-Sleeve
5-Barrel
6-Moving measuring face
7-Setting standard
8-Extension rod
9-Spanner 1
10-Spanner 2 (For replacing core shaft of extension rod)
11-Spanner 3

1. Micrometer is used to measure inside size.
2. It is necessary to calibrate micrometer with setting standard before measuring. Clean the measuring faces and setting standard surface with soft cloth. Micrometer measures setting standard, rotate barrel to set its size less than setting standard. Put fixed measuring face to contact setting standard, rotate barrel slowly, meanwhile shake micrometer to find the minimum value when moving measuring face contacts setting standard. If result is equal to the normal value of setting standard, micrometer is ready to measure, otherwise, mark down the position the zero scale points, take out micrometer, rotate barrel until setting zero hole is visible(Fig.1) and zero scale points one as before. Tighten the locking screw, use spanner 1 to rotate sleeve(Fig.2) until the zero scale on sleeve points the correct scale on barrel. Loosen the locking screw, do calibration again to make sure the result is equal to the normal value of setting standard.

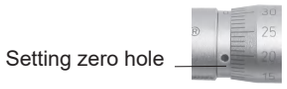


Fig.1

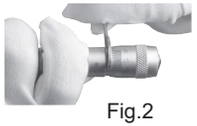


Fig.2

3. According to the measured workpiece to select extension rod, the number of extension rod is less to reduce cumulative error. The longest one connects to sleeve, the next is in turn by the length, the shortest is the last one. Install extension rod, first take down thimble(-Fig.3), extension rod connects to sleeve(Fig.4), use spanner 3 to tighten it, screw on thimble(Fig.5).

Fig.3

Fig.4

Fig.5

4. During measurement, make sure there are no cutting chips or other debris on the measuring faces and workpiece surface to effect the result. Rotate barrel to set its size less than the hole's diameter, and then put micrometer into the hole. Put fixed measuring face to contact the measured hole, rotate barrel slowly, shake micrometer gently along hole's axial and radial to find the minimum value in axial direction(Fig.6) and the maximum value in radial direction(Fig.7), tighten the locking screw, take out micrometer to get the result.

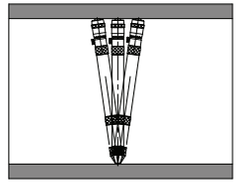


Fig.6

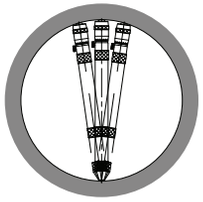
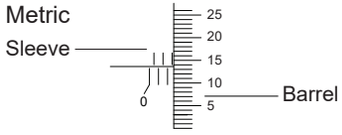
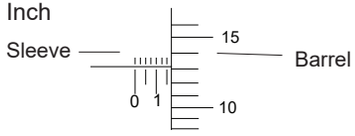


Fig.7

5. During reading, the sight is perpendicular to the scale to avoid parallax reading. The reading is the sum of a initial reading, extension rod's range, sleeve, barrel. For example, the rod's range is 25mm in metric or 1" in inch, the reading method is following.



Initial reading: 50mm
Extension rod: 25mm
Sleeve reading: 2.5mm
Barrel reading: 0.137mm(7 is estimated)
Reading: 77.637mm



Initial reading: 2"
Extension rod: 1"
Sleeve reading: 0.15"
Barrel reading: 0.0131"(1 is estimated)
Reading: 3.1631"

6. Take down extension rod, they should be oiled to prevent rust after measurement.

MN-3222-E