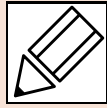


# Quick Guide to Precision Measuring Instruments



## Micrometer Heads

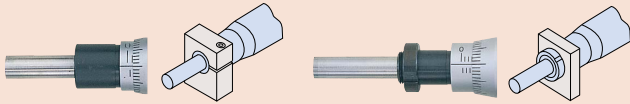
### Key Factors in Selection

Key factors in selecting a micrometer head are the measuring stroke, spindle face, stem, graduations, thimble diameter, etc.

### Stem

Plain stem

Stem locknut type



- The stem used to mount a micrometer head is classified as a "plain type" or "clamp nut type" as illustrated above. The stem diameter is manufactured to a nominal Metric or Imperial size with an h6 tolerance.
- The clamp nut stem allows fast and secure clamping of the micrometer head. The plain stem has the advantage of wider application and slight positional adjustment in the axial direction on final installation, although it does require a split-fixture clamping arrangement or adhesive fixing.
- General-purpose mounting fixtures are available as optional accessories.

### Measuring Face



Flat face



Spherical face



Anti-rotation device

- A flat measuring face is often specified where a micrometer head is used in measurement applications.
- When a micrometer head is used as a feed device, a spherical face can minimize errors due to misalignment (Figure A). Alternatively, a flat face on the spindle can bear against a sphere, such as a carbide ball (Figure B).
- A non-rotating spindle type micrometer head or one fitted with an anti-rotation device on the spindle (Figure C) can be used if a twisting action on the workpiece must be avoided.
- If a micrometer head is used as a stop, then a flat face both on the spindle and the face it contacts provides durability.

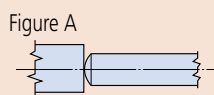


Figure A

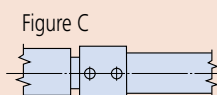


Figure C

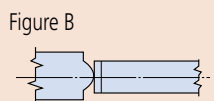
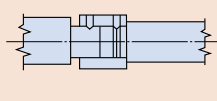


Figure B



### Non-Rotating Spindle

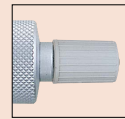
- A non-rotating spindle type head does not exert a twisting action on a workpiece, which may be an important factor in some applications.

### Spindle Thread Pitch

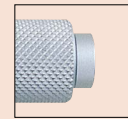
- The standard type head has 0.5 mm pitch.
- 1 mm-pitch type: quicker to set than standard type and avoids the possibility of a 0.5 mm reading error. Excellent load-bearing characteristics due to larger screw thread.
- 0.25 mm or 0.1 mm-pitch type  
This type is the best for fine-feed or fine-positioning applications.

### Constant-force Device

- A micrometer head fitted with a constant-force device (ratchet or friction thimble) is recommended for measurement applications.
- If using a micrometer head as a stop, or where saving space is a priority, a head without a ratchet is probably the best choice.



Micrometer head with constant-force device



Micrometer head without constant-force device (no ratchet)

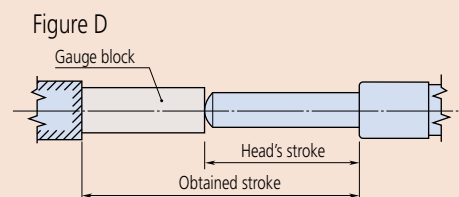
### Spindle Lock

- If a micrometer head is used as a stop, it is desirable to use a head fitted with a spindle lock so that the setting will not change even under repeated shock loading.



### Measuring Range (Stroke)

- When choosing a measuring range for a micrometer head, allow an adequate margin in consideration of the expected measurement stroke. Six stroke ranges, 5 mm to 50 mm, are available for standard micrometer heads.
- Even if the expected stroke is small, such as 2 mm to 3 mm, it will be cost effective to choose a 25 mm-stroke model as long as there is enough space for installation.
- If a long stroke of over 50 mm is required, the concurrent use of a gauge block can extend the effective measuring range. (Figure D)



- In this guide, the range (or stroke end) of the thimble is indicated by a dashed line. For stroke ends, consider the thimble as moving to the position indicated by the line when designing the jig.

### Ultra-fine Feed Applications

- Dedicated micrometer heads are available for manipulator applications, etc., which require ultra-fine feed or adjustment of spindle.