Fine Pitch Micrometer Heads
(0.1mm Pitch)

Bulletin No. 1854

Mitutoyo

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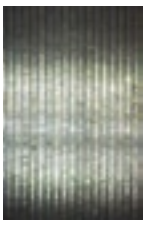
(0.1mm Pitch)

New, high-precision thread machining technology has made it possible to create a new thimble design incorporating a highly accurate screw with a pitch of 0.1mm. This is one-fifth of the conventional micrometer pitch of 0.5mm and provides a feed of just 0.1mm per thimble revolution. Since the external dimensions of these heads are compatible with conventional 0.5mm pitch heads, conventional types can be easily replaced with these new heads to provide extra-fine adjustment, or measurement resolution, when and where needed.

Screw Thread pitch = 0.5mm

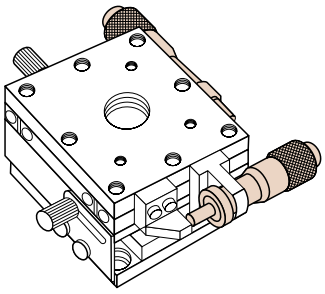


Screw Thread pitch = 0.1mm

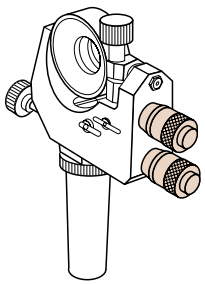
Applications

Semiconductor-wafer positioning machinery and optical component alignment units, etc.

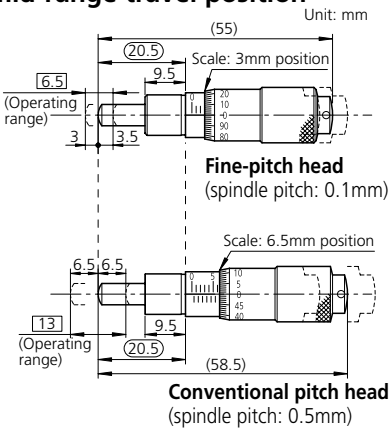
- Precision X-Y table positioning



- Precision adjustment of mirror in holder



Comparison of mounting dimensions between a standard fine-pitch head and a standard conventional pitch head at the mid-range travel position



While the fine-pitch micrometer head has a measuring range of 6.5mm, the conventional head has a larger range of 13mm. When replacing a conventional head, the fine-pitch type can use the common range in the middle of the spindle travel. The standard and compact types of fine-pitch head are completely interchangeable.

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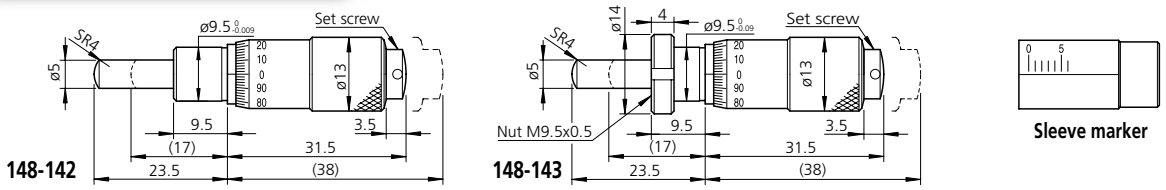
Fine Pitch (Pitch = 0.1mm)

Standard Type

Suitable for most applications

- Spindle: SKS3 H steel (hardness HRC60 or more), lapped tip
- Scale: Satin-chrome plated
- Recommended mounting thickness for locknut-type stem: 6mm



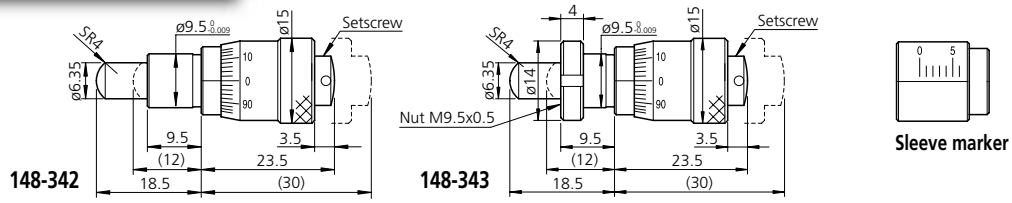
Order No.	Measuring range	Spindle pitch	Graduations	Stem type	Tip shape	Scale spec	Accuracy	Mass
148-142	0 - 6.5mm	0.1mm	0.002mm	Plain	Spherical (SR4mm)	Normal graduations	±2µm	31g
148-143				Locknut				34g

Fine Pitch (Pitch = 0.1mm)

Compact Type

Thicker and shorter thimble reduces length

- Spindle: SKS3 H steel (hardness HRC60 or more), lapped tip
- Scale: Satin-chrome plated
- Recommended mounting thickness for locknut-type stem: 6mm



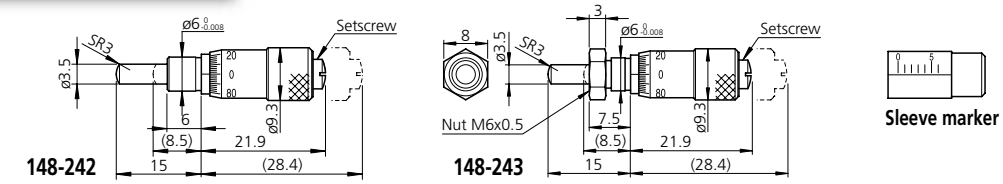
Order No.	Measuring range	Spindle pitch	Graduations	Stem type	Tip shape	Scale spec	Accuracy	Mass
148-342	0 - 6.5mm	0.1mm	0.002mm	Plain	Spherical (SR4mm)	Normal graduations	±2µm	29g
148-343				Locknut				31g

Fine Pitch (Pitch = 0.1mm)

Small, Light Type

Small diameter, space-saving design

- Spindle: SKS3 H steel (hardness HRC60 or more), lapped tip
- Scale: Satin-chrome plated
- Recommended mounting thickness for locknut-type stem: 4mm

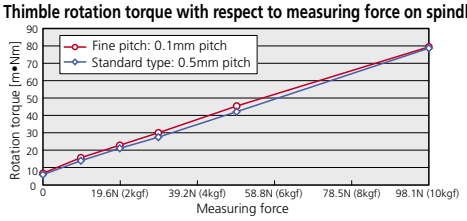


Order No.	Measuring range	Spindle pitch	Graduations	Stem type	Tip shape	Scale spec	Accuracy	Mass
148-242	0 - 6.5mm	0.1mm	0.002mm	Plain	Spherical (SR3mm)	Normal graduations	±5µm	10g
148-243				Locknut				10g

Thimble Torque versus Measuring Force

The thimble rotation torque versus measuring force is practically identical to that of the conventional type of micrometer head, therefore you can manipulate the fine-pitch head with the same degree of 'feel' as before.

Thimble rotation torque with respect to measuring force on spindle

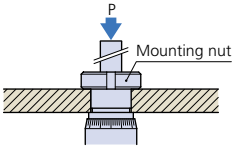


Load Bearing Capacity

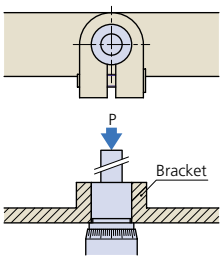
(Mitutoyo Experimental Values)

- As a general guide a fine-pitch micrometer head will meet its specified accuracy, operating against a measuring force of 20N, for at least 100,000 rotations by hand.
- The level of static load, in the axial direction, which a mounted micrometer head can withstand before damage or dislocation occurs is shown below for each mounting method. (Maintaining accuracy is not taken into account.)

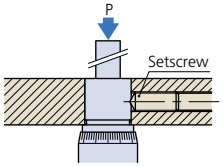
1. Nut clamp method
Damage to the head will occur at 8.6 to 9.8kN (880 to 1000kgf).



2. Slit clamp method
The head will be pushed out of the bracket at 0.69 to 0.98kN (60 to 100kgf).



3. Setscrew clamp method
Damage to the head will occur at 0.69 to 1.08kN (70 to 110kgf).



A micrometer head with a screw thread pitch of 0.25mm is also available.

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