

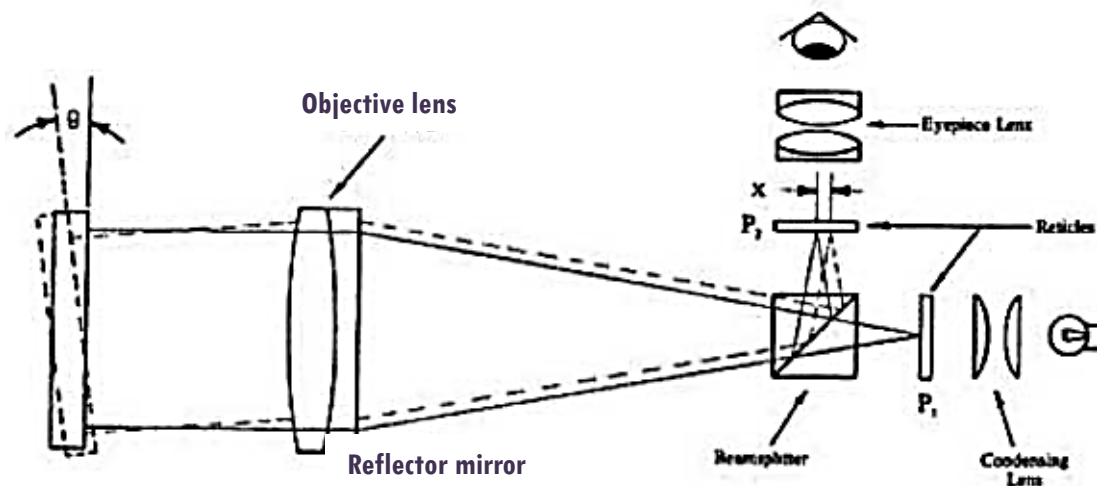


Angle Measurements

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Auto-Collimator

Auto-collimator is an optical instrument used for the measurement of small angular differences, changes or deflection, plane surface inspection etc. For small angular measurements, autocollimator provides a very sensitive and accurate approach. An autocollimator is essentially an infinity telescope and a collimator combined into one instrument.





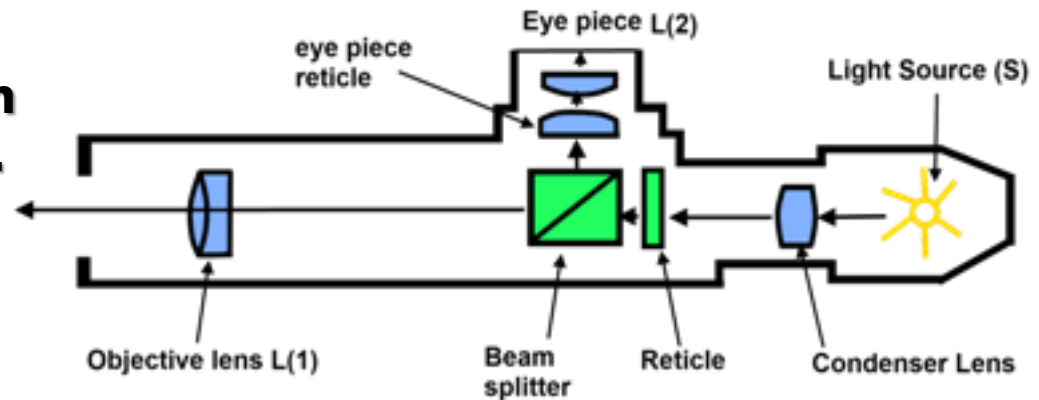
Angle Measurements

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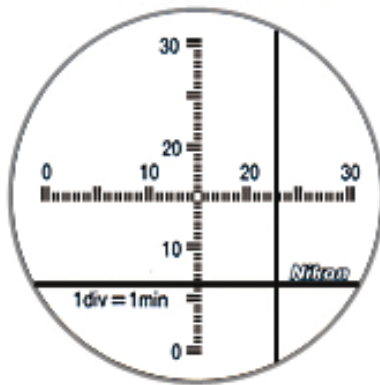
Auto-Collimator

There are three main parts in auto-collimator.

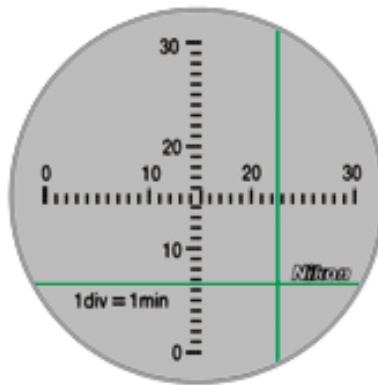
1. Micrometer microscope.
2. Lighting unit and
3. Collimating lens.



Viewfield diagram (6B)



Viewfield diagram (6D)





Angle Measurements

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Auto-Collimator

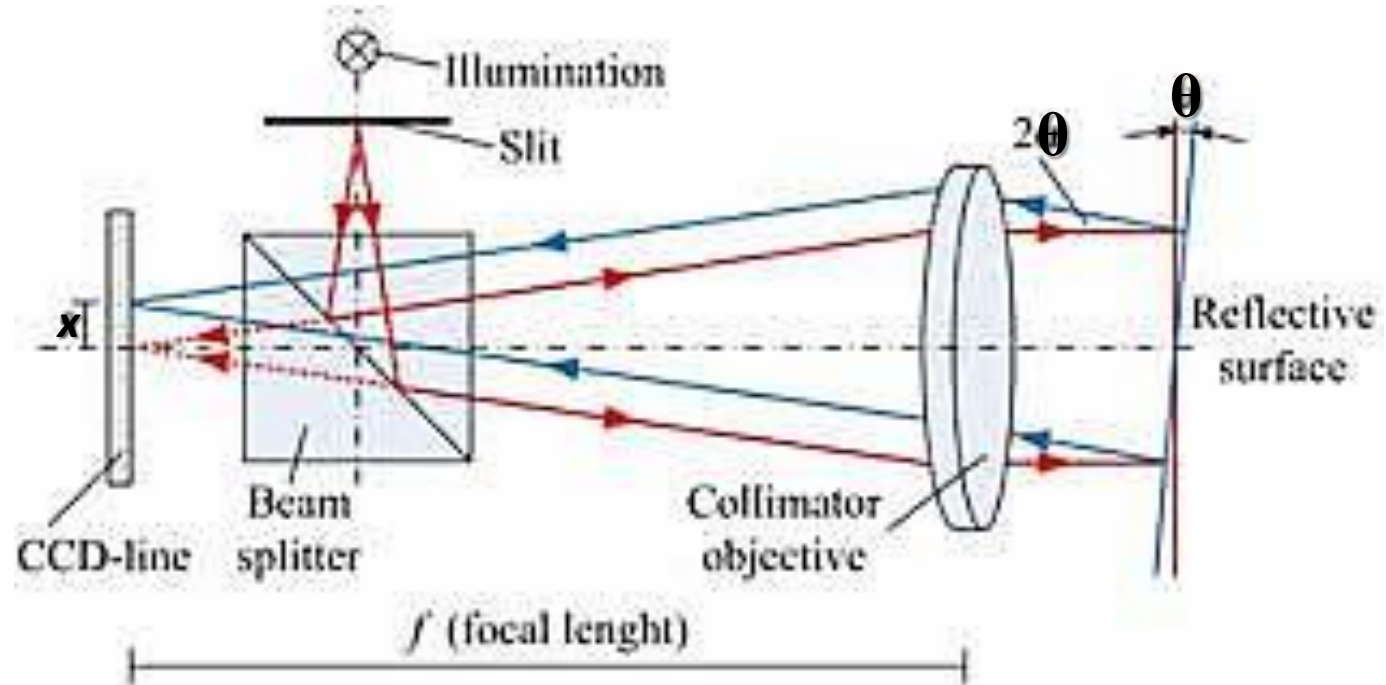
The distance of focus from the object is given

$$x = 2 \theta f$$

where

f = focal length of the lens.

θ = fitted angle of reflecting mirror.

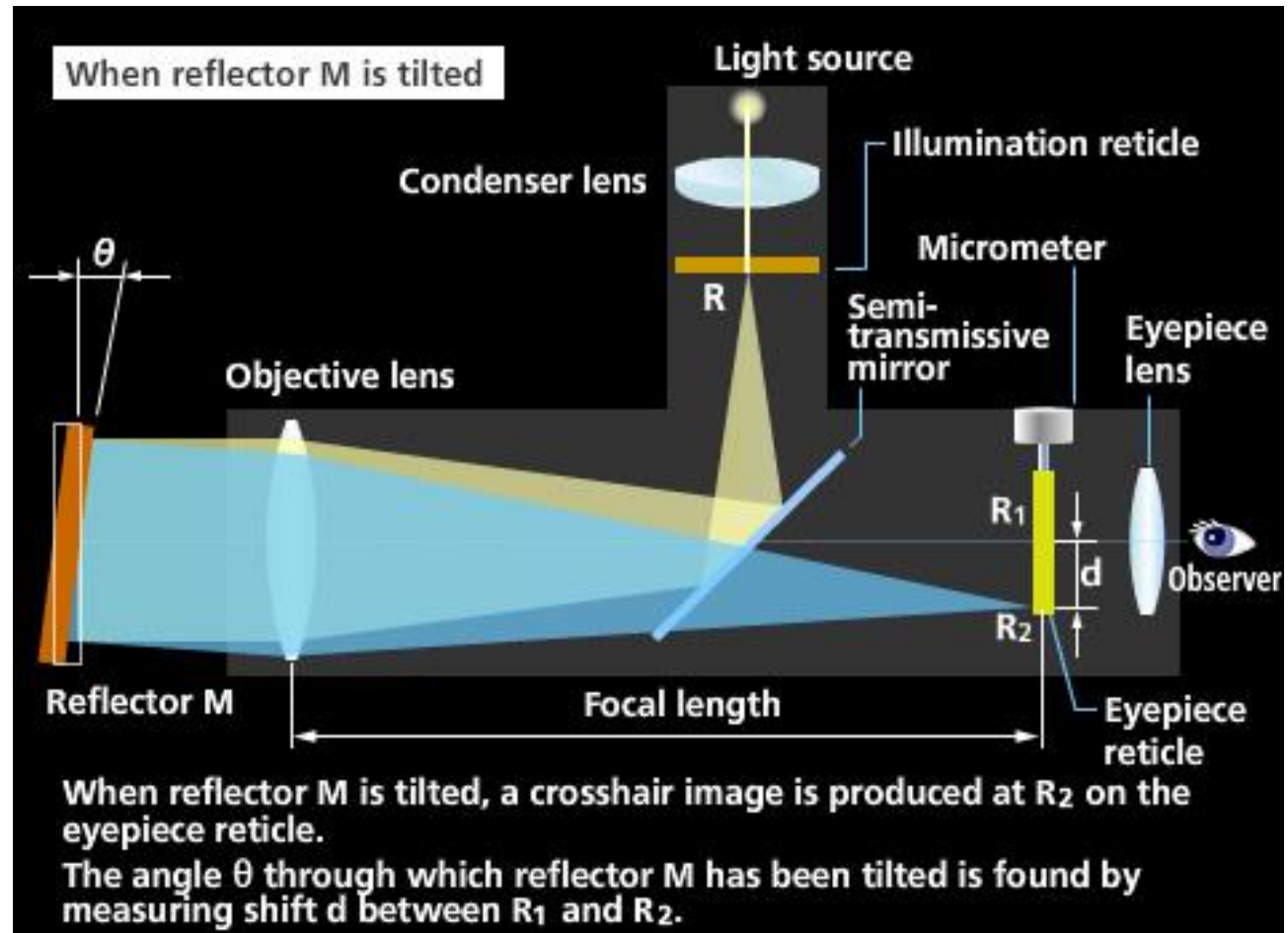




Angle Measurements

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Auto- Collimator





Angle Measurements

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Applications of Auto- Collimator

1. Measuring the difference in height of length standards.
2. Checking the flatness and straightness of surfaces.
3. Checking squareness of two surfaces.
4. Precise angular indexing in conjunction with polygons.
5. Checking alignment or parallelism.
6. Comparative measurement using master angles.
7. Measurement of small linear dimensions.
8. For machine tool adjustment testing.

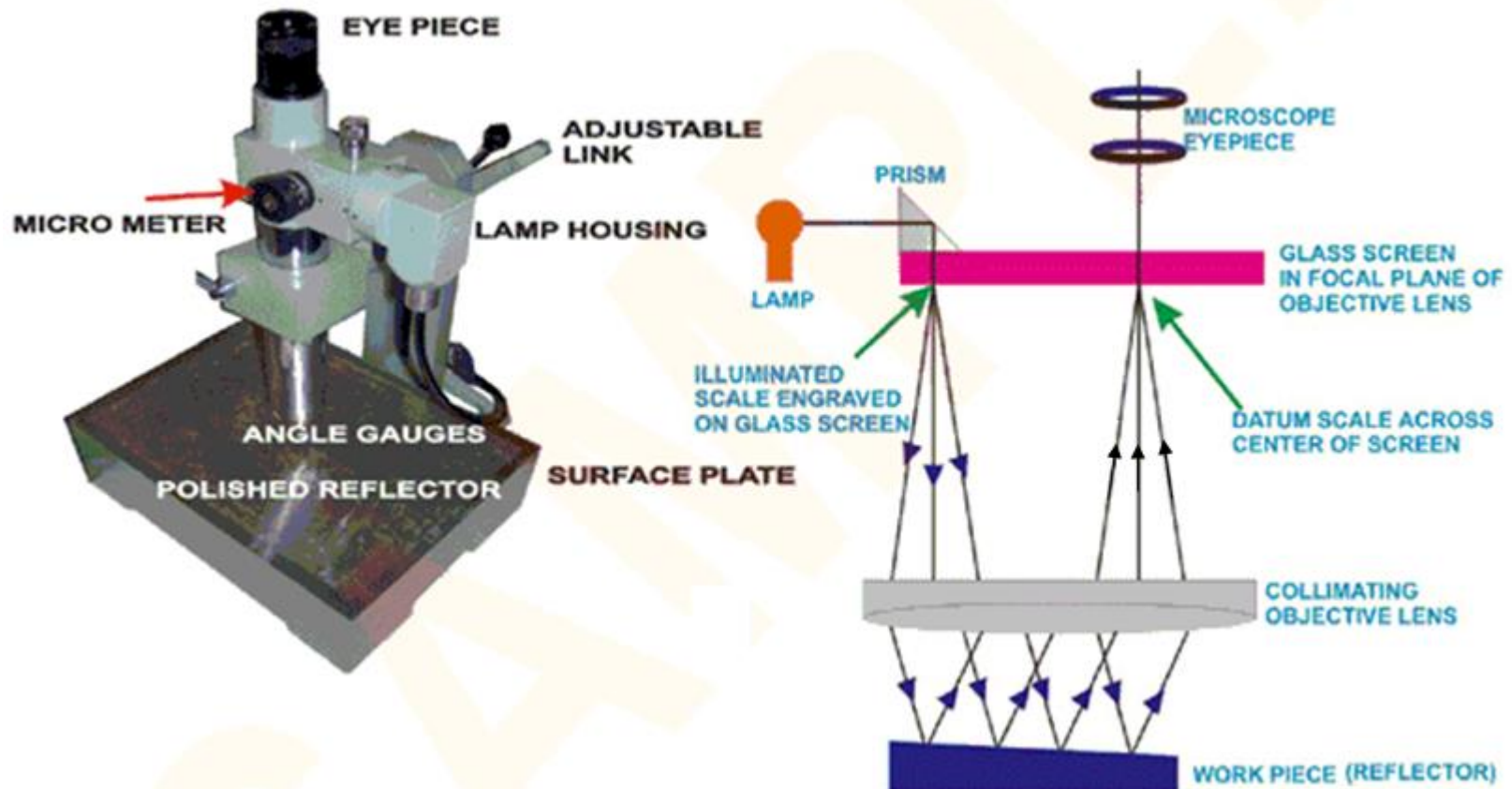




Angle Measurements

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Angle Dekkor





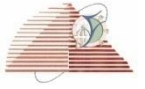
Angle Measurements

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Angle Dekkor

This is also a type of auto-collimator. There is an illuminated scale in the focal plane of the collimating lens. This illuminated scale is projected as a parallel beam by the collimating lens which after striking a reflector below the instrument is refocused by the lens in the field of view of the eyepiece. In the field of view of microscope, there is another datum scale fixed across the center of screen. The reflected image of the illuminated scale is received at right angle to the fixed scale as shown in fig. Thus the changes in angular position of the reflector in two planes are indicated by changes in the point of intersection of the two scales. One division on the scale is calibrated to read 1 minute.





Angle Measurements

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Applications of Angle Dekkor

1. Measuring angle of a component.
2. Checking the slope angle of a V-block
3. To measure the angle of cone or taper gauge





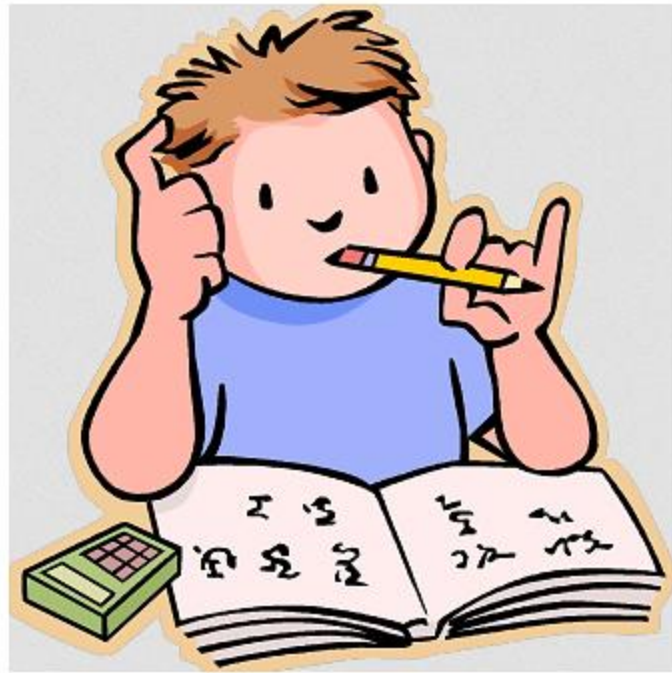


Q (2)

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1. *What are the various purpose of using limit gauges?*
2. *Explain with neat sketch the principle of dial indicator operation.*





Homework



HW (3)

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Explain how the component shown in fig. is checked for its dimensional and form accuracy. Justify the selection of instruments after considering various alternative possible. (all dimensions in mm)

