

NATIONAL PHYSICAL LABORATORY

METROLOGY CENTRE

Ref: MOY/SCMI/15 SPECIFICATION OF ACCURACY
(Issue 4)

for

AN OPTICAL DIVIDING HEAD

Type: An Optical Dividing Head fitted with either a projector screen on which angular settings can be read direct to 0.2 minute, or a microscope system in which angular settings can be read direct to 1 minute and to approximately ¼ minute by estimation.

A removable centre and a setting bar are supplied for mounting in the taper socket in the head.

Made by: Coventry Gauge & Tool Co. Ltd. (Mechanical parts).
Rank Precision Industries Ltd. Metrology Division. (Optical parts).

LIMITING VALUE OR
MAXIMUM
PERMISSIBLE ERROR

1. GENERAL

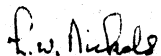
- 1.1 The general workmanship and finish shall be in keeping with a precision measuring tool of this class.
- 1.2 The head shall be marked with an identification number, and with the maker's name or trade mark.

2. MECHANICAL FEATURES

- 2.1 The base of the headstock shall be flat so as to be quite free from "rock" when placed on a truly flat surface.
- 2.2 The bearing area of the base shall be adequate 20% minimum
- 2.3 The meehanite face plate shall be hardened 450 HV minimum
- 2.4 The face-plate shall be flat 0.0025 mm (0.0001 in)
- 2.5 The face-plate shall be square with the axis of rotation of the head 0.005 mm (0.0002 in) over the diameter of the face-plate.
- 2.6 The centre point and the setting bar shall be hard 700 HV minimum
- 2.7 When the centre is fitted in any rotational position in the tapered socket of the head, its axis shall coincide with the axis of rotation of the head 0.005 mm (0.0002 in) FIM.
- 2.8 The setting bar shall be straight and uniform in diameter 0.005 mm (0.0002 in)
- 2.9 The tapered portion of the setting bar shall be concentric with the parallel portion 0.005 mm (0.0002 in) FIM

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- 2.10 When the setting bar is fitted in any rotational position in the tapered socket of the head, its axis shall coincide with the axis of rotation of the head
0.005 mm (0.0002 in) FIM near socket
- 2.11 When so mounted the axis of the setting bar, in its mean position in the vertical plane, shall be parallel with the base of the head
0.015 mm (0.0006 in) FIM 50 mm from socket.
0.008 (0.0003 in) in 150 mm
- 2.12 It shall also be parallel with the base tongues in plan view
0.008 mm (0.0003 in) in 150 mm
3. **FINE SETTING AND CLAMPING**
- 3.1 The fine setting device shall operate smoothly and freely.
- 3.2 The action of clamping the head shall not give rise to any visible movement in the optical scale.
4. **OPTICAL SYSTEM (PROJECTOR TYPE)**
- 4.1 The graduation lines of both the optical circle and micrometer scale shall be clearly cut and shall both be in focus on the screen.
- 4.2 The maximum error between any two readings, including both circle and micrometer errors, shall not exceed
± 0.3 minute
5. **OPTICAL SYSTEM (MICROSCOPE TYPE)**
- 5.1 The graduation lines of both the optical circle and microscope graticule shall be clearly cut and both shall be in focus at one setting of the eyepiece.
- 5.2 The maximum error between any two readings, including both circle and graticule errors, shall not exceed
± 0.3 minute

 (Signed)

for Director

