

NATIONAL PHYSICAL LABORATORY

STANDARDS DIVISION

Ref: MOY/SCMI/46 SPECIFICATION OF ACCURACY  
(Issue 3)

for

A "MICROPTIC" CIRCULAR TABLE

Type: Projection Type Optical Rotary Table, 18-inch diameter reading direct to 0.05 minute of arc.

Made by: Optical parts: Messrs. Hilger & Watts Ltd.  
Mechanical parts: The Coventry Gauge & Tool Co. Ltd.

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 table shall be marked with an identification number, and with the maker's name or trade mark.

2. TABLE

- 2.1 The upper surface of the table shall be flat whether the table be clamped or unclamped 0.000 3 in (0.008 mm).
- 2.2 The base of the table shall be flat so as to be quite free from rock when placed on a truly flat surface.
- 2.3 The bearing area of the base shall be adequate 20% minimum.
- 2.4 The upper surface of the table shall be square to the axis of rotation 0.000 2 in. (0.005 mm) over the table diameter.
- 2.5 The upper surface of the table and the under surface of the base shall be parallel for all relative positions Maximum lack of parallelism 0.000 3 in. (0.008 mm) over the table diameter.
- 2.6 The mean height from the base to the upper surface of the table shall be measured and recorded to the nearest 0.000 1 in.
- 2.7 The distance from the side abutment faces to the axis of rotation shall be measured and recorded to the nearest 0.000 1 in.

3. CLAMPING

The action of clamping the table shall not:-

- 3.1 cause a change in the table height relative to the under surface of the base 0.000 1 in. (0.002 5 mm).

LIMITING VALUE OR  
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- 3.2 give rise to any visible movement of the scale as viewed on the projection screen.
4. **CENTRE PLUG**
- 4.1 This plug shall bear the same identification number as the Table with which it is associated.
- 4.2 The parallel and tapered surfaces of the plug shall be hard and well finished 800 HV minimum.
- 4.3 The parallel and tapered portions shall be straight 0.000 05 in. (0.001 3 mm) over the respective lengths.
- 4.4 The parallel portion shall be cylindrical 0.000 05 in. (0.001 3 mm).
- 4.5 The parallel and tapered portions shall be concentric 0.000 05 in. (0.001 3 mm).  
i.e. 0.000 1 in.  
(0.002 5 mm) FIM.
5. **TAPERED SOCKET IN TABLE**
- 5.1 The centre plug shall be a good fit in the tapered socket as revealed by a blueing test.
- 5.2 When the centre plug is fitted in the tapered socket, in any rotational position, its axis shall be concentric with the axis of rotation of the table 0.000 1 in. (0.002 5 mm)  
i.e. 0.000 2 in.  
(0.005 mm) FIM.
6. **ABUTMENTS**
- 6.1 The table abutments shall be co-planar 0.000 2 in (0.005 mm).
- 6.2 The table abutments shall be square to the base 0.000 1 in. (0.002 5 mm) over their depth.
7. **FINE SETTING**
- 7.1 The fine setting device shall operate smoothly and freely.

8. SCALES

- 8.1 The graduation lines of the main circle and those of the projector graticule and optical micrometer scale shall be cleanly cut, and free from blemishes.
- 8.2 The main circle, projector graticule and micrometer scale shall be in clear focus together on the screen.
- 8.3 The circle shall be accurately graduated and concentrically mounted; the maximum error between any two readings, including the optical micrometer scale, shall not exceed 0.15 minute of arc.

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Director



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