

# NATIONAL PHYSICAL LABORATORY

## METROLOGY CENTRE

**Ref: MOY/SCMI/3 SPECIFICATION OF ACCURACY**  
**(Issue 9)**  
**for**  
**AN INCLINABLE ROTATABLE TABLE**

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Type: Inclinal, rotatable table, 12 inches or 16 inches diameter.  
The scales for measuring the inclination and the rotation read directly to 0.5 minute of arc.

Made by: Optical Measuring Tools Ltd.

LIMITING VALUE OR  
MAXIMUM  
PERMISSIBLE ERROR  
(where one figure only is  
given it is applicable to  
both sizes of table)

### 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. In addition, a plate indicating the direction of setting of the angle of inclination shall be fixed to the table.
- 1.3 The scale and graticule for setting the rotation of the work-table shall be in clear focus at one setting of the eyepiece. The focus shall fall reasonably within the focusing range of the eyepiece.
- 1.4 The scale and graticule for setting the inclination of the work-table shall be in clear focus at one setting of the eyepiece. The focus shall fall reasonably within the focusing range of the eyepiece.
- 1.5 On each scale the graduation lines shall be clearly cut and free from blemishes.
- 1.6 The exterior scale for the approximate setting of the rotation of the work-table shall be in phase with the corresponding interior glass scale. ±0.3 degree.

### 2. BASE

- 2.1 The under surface of the base casting shall be reasonably free from blow holes, and it shall have an adequate bearing surface as revealed by a blueing test using a Grade A surface plate (BS 817) Not less than 20%.
- 2.2 The side abutment face, when provided, shall be satisfactorily flat and square with the base, as revealed by a blueing test against an edge of the Grade A plate known to be square with its upper surface.

		<u>LIMITING VALUE OR MAXIMUM PERMISSIBLE ERROR</u> (where one figure only is given it is applicable to both sizes of table)
2.3	The axis of inclination shall be parallel with the base	0.008 mm in 400 mm (0.0003 inch in 16 in) for 16 in table.  0.005 mm in 300 mm (0.0002 inch in 12 in) for 12 in table.
2.4	The height of the axis of inclination above the base shall be measured and recorded to the nearest 0.002 mm (0.0001 in).	
2.5	The axis of inclination shall be square with the side abutment face of the base, as measured in the horizontal plane	0.008 mm (0.0003 in) over length of abutment face for 16 in table.  0.005 mm (0.0002 in) over length of abutment face for 12 in table.
3.	<b><u>CLAMPING</u></b>	
3.1	The action of clamping the work-table shall not cause: -	
	(i) Any appreciable change in the reading of the two setting scales	maximum angular change 0.2 minute of arc.
	(ii) Any appreciable change in the height of the work-table surface above the base when the work-table is in the horizontal position	maximum change in height 0.005 mm (0.0002 in)
4.	<b><u>CENTRE PLUG</u></b>	
4.1	The centre plug shall bear an identification number.	
4.2	The working surfaces of the plug shall be hard and well finished	800 HV minimum.
4.3	The parallel portion of the plug shall be cylindrical	0.001 mm (0.000 04 in)
4.4	The parallel and tapered portions of the plug shall be concentric.	0.0025 mm (0.0001 in) FIM.
4.5	The parallel and tapered portions shall be straight.	0.001 mm (0.000 04 in)

5. **WORK-TABLE**

- |     |  |  |
|-----|--|--|
| 5.1 | The upper surface shall be flat, whether the work-table be clamped or unclamped  | 0.008 (0.0003 in)  |
| 5.2 | The upper surface shall be square to the axis of rotation  | 0.005 mm (0.0002 in) over the table diameter.  |
| 5.3 | The upper surface shall be parallel with the under surface of the base, when the inclination scale reads zero  | 0.015 mm (0.0006 in) over the diameter for 16 in table.<br><br>0.010 mm (0.0004 in) over the diameter for 12 in table. |
| 5.4 | The mean height of the upper surface above the base, immediately over the axis of inclination, shall be measured and recorded to the nearest 0.002 mm (0.0001 in).                     |  |
| 5.5 | When the work-table is in the 90 degree position its surface shall be square, in the horizontal plane, to the side abutment faces  | 0.015 (0.0006 in) over the diameter of the table.  |
| 5.6 | When the work-table is inclined through any angle in its range from 0 to 90 degrees there shall be no associated lateral movement in a direction parallel with the axis of inclination | 0.01 mm (0.0004 in) over the total range of 90 degrees.  |

6. **CENTRE PLUG SOCKET**

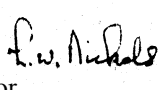
- |     |  |                            |
|-----|--|----------------------------|
| 6.1 | The centre plug shall be a good fit in the socket, and when fitted in the socket its axis shall be concentric with the axis of rotation of the table | 0.005 mm (0.000 2 in) FIM. |
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7. **SEPARATION OF AXIS**

- |     |   |                            |
|-----|---|----------------------------|
| 7.1 | The perpendicular distance between the axis of inclination and the axis of rotation shall be measured and recorded to the nearest 0.002 mm (0.0001 in). | 0.005 mm (0.000 2 in) FIM. |
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8. **ACCURACY OF SCALES**

- |      |   |                    |
|------|---|--------------------|
| 8.1  | The maximum error between any two readings on: -  |                    |
| (i)  | The scale for setting the rotation of the work-table and its associated 1 degree graticule scale, shall not exceed    | 0.3 minute of arc. |
| (ii) | The scale for setting the inclination of the work-table and its associated 1 degree graticule scale, shall not exceed | 0.2 minute of arc. |

(Signed)   
for Director

