

**Laboratory** United Calibrations Pvt. Ltd., Flat No. 2, Shyama Enclave, Indrayani Nagar, Bhosari, Pune, Maharashtra  
**Accreditation Standard** ISO/IEC 17025: 2005  
**Certificate Number** CC-2537 (in lieu of C-1306 & C-1307) **Page** 1 of 7  
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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO-TECHNICAL CALIBRATION</u></b>				
<b>1.</b>	<b>SOURCE</b>			
1.	DC Voltage <sup>#</sup>	20 mV to 200 mV 0.2 V to 20 V 20 V to 200 V 200 V to 1000 V	0.40 % to 0.19 % 0.30 % 0.19 % 0.18 %	Using Multifunction Calibrator by Direct Method
2.	DC Current <sup>#</sup>	0.2 mA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2000 mA 2 A to 10 A 50 A to 900 A	0.63 % to 0.58 % 0.59 % 0.83 % 0.27 % 0.54 % 1.25 %	Using Multifunction Calibrator and Current Coil by Direct Method
3.	AC Voltage <sup>#</sup>	<b>50 Hz</b> 20 mV to 200 mV 0.2 V to 20 V 20 V to 200 V 200 V to 900 V	2.64 % to 0.36 % 0.93 % 0.60 % 0.30 %	Using Multifunction Calibrator by Direct Method
4.	AC Current <sup>#</sup>	<b>50 Hz</b> 0.2 mA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2000 mA 2 A to 10 A 50 A to 900 A	1.11 % to 1.72 % 1.57 % 1.57 % 0.33 % 0.52 % 2.38 %	Using Multifunction Calibrator and Current Coil by Direct Method
5.	DC Resistance <sup>#</sup>	10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1000 $\Omega$ 1 K $\Omega$ to 10 K $\Omega$ 10 K $\Omega$ to 100 K $\Omega$ 100 K $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 1 G $\Omega$	0.80 % to 0.23 % 0.19 % 0.18 % 0.16 % 2.34 % 3.13 %	Using Decade Resistance Box by Direct Method

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6.	Frequency <sup>#</sup>	45 Hz to 100 Hz 100 Hz to 1 KHz	1.40 % to 0.63 % 0.63 % to 0.19 %	Using Multifunction Calibrator by Direct Method
7.	Temperature Simulation <sup>#</sup> (Temperature Indicator/ Controller)			
	K-Type (T/C) J-Type (T/C) R -Type (T/C) S -Type (T/C) RTD PT-100	30 °C to 1200 °C 30 °C to 750 °C 200 °C to 1600 °C 200 °C to 1600 °C (-) 50 °C to 400 °C	1.14 °C to 2.43 °C 1.10 °C to 1.74 °C 6.95 °C to 9.39 °C 7.03 °C to 10.54 °C 0.85 °C	Using mV/mA/RTD Calibrator by Simulation Method
<b>II.</b>	<b>MEASURE</b>			
1.	DC Voltage <sup>#</sup>	10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 950 V	0.46 % to 0.15 % 0.17 % 0.17 % 0.16 % 0.22 %	Using Digital Multimeter By Direct Method
2.	DC Current <sup>#</sup>	0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	1.42 % to 1.14 % 1.57 % 1.37 % 1.35 % 1.31 %	Using Digital Multimeter By Direct Method
3.	DC Resistance <sup>#</sup>	10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1000 $\Omega$ 1 K $\Omega$ to 10 K $\Omega$ 10 K $\Omega$ to 100 K $\Omega$ 100 K $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 30 M $\Omega$	1.08 % to 0.63 % 0.63 % 0.50 % 0.74 % 0.93 % 2.25 %	Using Digital Multimeter By Direct Method
4.	Frequency <sup>#</sup>	45 Hz to 100 Hz 100 Hz to 1 kHz	0.28 % to 0.22 % 0.22 % to 0.51 %	Using Digital Multimeter By Direct Method

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<b><u>MECHANICAL CALIBRATION</u></b>				
<b>1. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>				
1.	Calipers <sup>§</sup> (Vernier/Dial/Digital) L.C.: 10 $\mu$ m	0 to 600 mm	17 $\mu$ m	Using Caliper Checker & Slip Gauge by Comparison Method as per IS 3651
2.	Height Gauge <sup>§</sup> (Vernier/Dial/Digital) L.C.: 10 $\mu$ m	0 to 600 mm	15.2 $\mu$ m	Using Caliper Checker, Slip Gauge & Surface Plate by Comparison Method as per IS 2921
3.	Depth Gauge <sup>§</sup> (Vernier/Dial/Digital) L.C.: 10 $\mu$ m	0 to 300 mm	13 $\mu$ m	Using Slip Gauge Set, Caliper Checker & Surface Plate by Comparison Method as per IS 4213
4.	External Micrometer <sup>§</sup> L.C.: 1 $\mu$ m	Upto 100 mm >100 mm to 300 mm	1.3 $\mu$ m 8.2 $\mu$ m	Using Slip Gauge Set & Mic. Setting Rod by Comparison Method as per IS 2967
5.	Depth Micrometer <sup>§</sup> L.C.: 10 $\mu$ m	0 to 300 mm	13 $\mu$ m	Using Slip Gauge Set & Surface Plate by Comparison Method as per JIS B 7544
6.	Internal Micrometer <sup>§</sup> (Stick type) L.C.: 10 $\mu$ m	50 mm to 300 mm	9.0 $\mu$ m	Using Slip Gauge Set & Surface Plate by Comparison Method as per IS 2966

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7.	Comparator Stand <sup>§</sup> (Flatness of Working Face)	Up to 200 mm x 200 mm	3.7 $\mu$ m	Using Slip Gauge Set by Comparison Method as per IS 7599
8.	Plunger Dial / Digital Dial Gauge <sup>§</sup> L.C.: 1 $\mu$ m	Up to 25 mm	2.7 $\mu$ m	Using Dial Calibration Tester by Direct Method IS 2092
9.	Lever Dial Gauge <sup>§</sup> L.C.: 1 $\mu$ m	Up to 1 mm	2.5 $\mu$ m	Using Dial Calibration Tester by Direct Method IS 11498
10.	Bore Gauge With Dial <sup>§</sup> (For Transmission Mechanism)	Up to 1 mm	4.1 $\mu$ m	Using Dial Calibration Tester & Plunger Dial Gauge by Direct Method as per JIS B 7515
11.	Bevel Protector <sup>§</sup> L.C.: 5 Min	Up to 360°	5.8 Min of arc	Using Angle Gauge & Surface Plate by Comparison Method as per IS 4239 & IS 5812
12.	Combination Set / Angle Protector <sup>§</sup> L.C.: 1°	0 to 180°	41 min	Using Angle Gauge & Surface Plate by Comparison Method as per IS 4239 & IS 5812
13.	Angle Plate <sup>§</sup> Parallelism/Flatness Squareness	Up to 300 mm	5.5 $\mu$ m 9.9 $\mu$ m	Using Digital Dial, Surface Plate & Cylindrical Square by Direct Method as per IS 2554

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14.	Measuring Pin <sup>§</sup>	0.5 mm to 20 mm	3.6 $\mu$ m	Using Slip Gauge, Digital Dial & Comparator by Comparison Method as per IS 11103
15.	Plain Plug Gauge / Width Gauge / OD Master <sup>§</sup>	Up to 200 mm	4.1 $\mu$ m	Using Slip Gauge, Digital Dial & Comparator by Comparison Method as per IS 3455
16.	V Block <sup>§</sup> Symmetry/Parallelism Squareness	Up to 300 mm	9.6 $\mu$ m 10 $\mu$ m	Using Mandrel, Plunger Dial Gauge & Cylindrical Square by Direct Method as per IS 2949
17.	Feeler Gauge / Thickness Foils <sup>§</sup>	Up to 1 mm	2.8 $\mu$ m	Using Digital Micrometer by Comparison Method as per IS 3179
18.	Coating Thickness Gauge <sup>§</sup>	Up to 690 $\mu$ m	4.35 $\mu$ m	Using Coating Thickness Foils By Comparison Method
19.	Snap Gauge / Gap Gauge <sup>§</sup>	2 mm to 100 mm 100 mm to 200 mm	2.0 $\mu$ m 4.8 $\mu$ m	Using Slip Gauge by Comparison Method as per IS 3455
20.	Parallel Thread Plug Gauge / Wear Check Plug Gauge <sup>§</sup> (For Effective Dia.)	2 mm to 100 mm	4.9 $\mu$ m	Using FCDM, Cylindrical Setting Master & Thread Measuring Wires by Comparison Method as per IS 2334 & IS 4218

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21.	Dial Snap Gauge <sup>§</sup> L.C.: 1 $\mu$ m	Up to 200 mm	3.1 $\mu$ m	Using Slip Gauge by Comparison Method as per IS 14271
22.	Micrometer Setting Standards <sup>§</sup>	Up to 400 mm	4.4 $\mu$ m	Using Slip Gauge, Digital Dial & Comparator by Comparison Method as per IS 2967
23.	Engineers Square <sup>§</sup> Parallelism/ Straightness Perpendicularity	Up to 300 mm	5.5 $\mu$ m 9.9 $\mu$ m	Using Digital Dial, Surface Plate & Cylindrical Square by Direct Method as per IS 2103
24.	Dial Thickness Gauge/Pistol Caliper <sup>§</sup> L.C.: 10 $\mu$ m	Up to 50 mm	5.9 $\mu$ m	Using Slip gauge by Comparison Method as per IS 2092
25.	Surface Plate <sup>#</sup>	3000 mm x 3000 mm	$2.5\sqrt{\frac{L+W}{125}} \mu\text{m}$ (L & W in mm)	Using Spirit Level (L.C.:10 $\mu$ m/mtr) by Direct Method as per IS 7327 & IS 2285
26.	Bench Centre <sup>#</sup> Coaxility / Parallelism of Centre with respect to base	Up to 300 mm	9.7 $\mu$ m 31.8 $\mu$ m	Using Plain, Taper Mandrel & Plunger Dial By Comparison Method
<b>II.</b>	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pressure Gauge <sup>#</sup> (Dial/Digital)	0 to 700 bar	2.94 bar	Using Digital Pressure Indicators & Hydraulic Pump by Comparison Method as Per DKD-R-6-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
2.	Vacuum Pressure Gauge <sup>#</sup>	(-) 0.8 bar to 0 bar	0.024 bar	Using Digital Pressure Indicators & Vacuum Pump by Comparison Method as Per DKD-R-6-2

\* Measurement Capability is expressed as an uncertainty ( $\pm$ ) at a confidence probability of 95%

<sup>\$</sup>Only in Permanent Laboratory

<sup>#</sup> The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

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