

Laboratory **Ganathi Instruments, # NHB 8/A, KHB Colony, Hunsur Road, Hootgalli, Mysore, Karnataka**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **CC-2633** Page **1 of 8**

Validity **13.04.2018 to 12.04.2020** Last Amended on **-**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO-TECHNICAL CALIBRATION</u></b>				
<b>1.</b>	<b>SOURCE</b>			
<b>1.</b>	DC Voltage <sup>#</sup>	1 mV to 330 mV 330 mV to 10 V 10 V to 1000 V	1.34 % to 0.020 % 0.020 % to 0.015 % 0.015 % to 0.017 %	Using Multi Product Calibrator Fluke 5080A By Direct Method
<b>2.</b>	AC Voltage <sup>#</sup>	<b>45 Hz to 1 kHz</b> 1 mV to 329 mV 329 mV to 32.9 V 32.9 V to 1000 V	7.7 % to 0.39 % 0.39 % to 0.32 % 0.32 % to 0.38 %	Using Multi Product Calibrator Fluke 5080A By Direct Method
<b>3.</b>	DC Current <sup>#</sup>	100 $\mu$ A to 3.29 mA 3.29 mA to 329 mA 329 mA to 1 A 1 A to 10 A 10 A to 20 A	0.22 % to 0.12 % 0.12 % to 0.08 % 0.08 % to 0.21 % 0.21 % to 0.32 % 0.32 % to 0.70 %	Using Multi Product Calibrator Fluke 5080A by Direct Method
		20 A to 900 A	1.00 %	Using Multi Product Calibrator Fluke 5080A with Current Coil x 100 by Direct Method
<b>4.</b>	Resistance <sup>#</sup> Discrete values in steps of 1-1.9-10	1 $\Omega$ to 10 $\Omega$ 10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 10 k $\Omega$ 10 k $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 1M $\Omega$ 1 M $\Omega$ to 10 M $\Omega$ 10 M $\Omega$ to 100 M $\Omega$	1.32% to 0.18% 0.18% to 0.05% 0.05% to 0.044% 0.044% to 0.03% 0.03% to 0.046% 0.046% to 0.056% 0.056% to 0.24% 0.24% to 0.58%	Using Multiproduct Calibrator Fluke 5080A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
5.	Temperature Simulation <sup>#</sup> (Indicator/Controller)			
	Thermocouple K-Type J- Type E- Type T- Type S- Type R- Type B- Type N- Type  RTD Sensor	(-) 200 °C to 1370 °C (-) 200 °C to 1200 °C (-) 200 °C to 950 °C (-) 200 °C to 400 °C 100 °C to 1750 °C 200°C to 1760 °C 600 °C to 1800 °C (-) 200 °C to 1300 °C  (-) 200 °C to 800 °C	1.51°C 1.23°C 1.12°C 1.44°C 2.4°C 2.3°C 2.71°C 1.80°C  0.40°C	Using Temperature Calibrator by Simulation Method
II.	<b>MEASURE</b>			
1.	AC Current <sup>#</sup>	<b>45 Hz to 1 kHz</b> 10 mA to 1A 1A to 10 A	0.35 % to 0.24 % 0.24 % to 0.27 %	Using Fluke 8845A DMM By Direct Method
2.	DC Resistance <sup>#</sup>	1 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 1M $\Omega$ 1 M $\Omega$ to 10 M $\Omega$ 10 M $\Omega$ to 100 M $\Omega$	0.45% to 0.021% 0.021% to 0.047% 0.047% to 0.071% 0.071% to 0.94%	Using Fluke 8845A DMM By Direct Method
3.	Temperature Simulation <sup>#</sup>			
	Thermocouple K-Type J-Type S-Type R-Type T-Type N-Type E-Type B-Type RTD/PT-100	(-) 200°C to 1350°C (-) 200°C to 1200°C 100°C to 1750°C 200°C to 1750°C (-) 200°C to 400°C (-) 200°C to 1300°C (-) 200°C to 950°C 600°C to 1800°C (-) 200°C to 800°C	1.40°C 1.17°C 2.3°C 2.3°C 1.4°C C 1.75°C 1.05°C 3.11°C 0.4°C	Using Temperature Calibrator Fluke 724 by Simulation Method

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4.	Time Interval <sup>#</sup>	10 sec to 1 hr 1hr to 24 hr	0.13 sec to 4.73 sec 4.73 sec to 112.4 sec	Using Digital Timer By Comparison Method
5.	DC Voltage <sup>#</sup>	100 mV to 10 V 10V to 1000V	0.011% to 0.005% 0.005% to 0.007%	Using Fluke 6 1/2 DMM 8845A By Direct Method
	DC High Voltage <sup>*</sup>	0.5kV to 5 kV	2.8% to 2.0%	Using HV Probe Kusam Meco with DMM By Direct Method
6.	AC Voltage <sup>#</sup>	<b>45 Hz to 1 kHz</b> 100 mV to 10 V 10V to 750V	0.25% to 0.24% 0.24% to 0.11%	Using Fluke 6 1/2 DMM 8845A By Direct Method
	AC High Voltage <sup>*</sup>	<b>50Hz</b> 0.5kV to 28kV	8.8% to 7.9%	Using HV Probe Kusam meco with DMM By Direct Method
7.	DC Current <sup>#</sup>	100 $\mu$ A to 1A 1A to 10A	0.24% to 0.13% 0.13% to 0.21%	Using DMM Fluke 6 1/2 DMM 8845A By Direct Method

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<b><u>MECHANICAL CALIBRATION</u></b>				
<b>1. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>				
1.	Vernier Calipers <sup>s</sup> (Vernier/Dial/Digital) L.C.: 10 $\mu\text{m}^{\phi}$	0 to 300 mm 0 to 600 mm	9.3 $\mu\text{m}$ 9.9 $\mu\text{m}$	Using Caliper Checker / Gauge Blocks
2.	Height Gauge <sup>s</sup> (Vernier /Dial/Digital) L.C.: 10 $\mu\text{m}^{\phi}$	0 to 600 mm	10.7 $\mu\text{m}$	Using Caliper Checker / Gauge Blocks
3.	Depth Gauge <sup>s</sup> (Digital/ Vernier) L.C.: 10 $\mu\text{m}^{\phi}$	0 to 300 mm	6.4 $\mu\text{m}$	Using Gauge Blocks
4.	External Micrometer <sup>s</sup> (Mech/Dial/Digital) L.C.: 1 $\mu\text{m}^{\phi}$ L.C.: 10 $\mu\text{m}^{\phi}$	0 to 300 mm > 300 mm to 600 mm	2.9 $\mu\text{m}$ 7.1 $\mu\text{m}$	Using Gauge Blocks
5.	Depth Micrometer <sup>s</sup> L.C.: 10 $\mu\text{m}^{\phi}$	0 to 300 mm	5.9 $\mu\text{m}$	Using Gauge Blocks
6.	Micrometer Head <sup>s</sup> L.C.: 1 $\mu\text{m}^{\phi}$	0 to 25 mm	1.2 $\mu\text{m}$	Using Gauge Blocks
7.	Micrometer Setting Rod <sup>s</sup>	12.5 mm to 150 mm	2.3 $\mu\text{m}$	Using Electronic Comparator
8.	Plunger Dial Gauge <sup>s</sup> (Dial/Digital) L.C.: 1 $\mu\text{m}^{\phi}$ L.C.: 10 $\mu\text{m}^{\phi}$	0 to 12.7 mm 0 to 25 mm	1.5 $\mu\text{m}$ 6.0 $\mu\text{m}$	Using Electronic Dial Calibration Tester

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9.	Lever Type Dial Gauge <sup>s</sup> L.C.: 1 $\mu\text{m}^{\phi}$ L.C.: 10 $\mu\text{m}^{\phi}$	0 to 0.2 mm 0 to 2 mm	1.4 $\mu\text{m}$ 6.0 $\mu\text{m}$	Using Electronic Dial Calibration Tester
10.	Bore Gauge <sup>s</sup> (Dial/Digital) (For Transmission Only) L.C.: 1 $\mu\text{m}^{\phi}$	Up to 2mm Travel Dia. Range: 20 mm to 500 mm	2.7 $\mu\text{m}$	Using Electronic Dial Calibration Tester
11.	Thickness Gauge <sup>s</sup> (Digital/ Dial) L.C.: 1 $\mu\text{m}^{\phi}$	0 to 10mm	1.7 $\mu\text{m}$	Using Gauge Blocks
12.	Electronic Probe / LVDT <sup>s</sup> L.C.: 0.1 $\mu\text{m}^{\phi}$	0 to 10mm	0.5 $\mu\text{m}$	Using Electronic Dial Calibration Tester
13.	Snap Gauge <sup>s</sup> (Plain/Adjustable)	2 mm to 50 mm > 50 mm to 200 mm	2.4 $\mu\text{m}$ 4.6 $\mu\text{m}$	Using Gauge Blocks
14.	Plain Plug Gauge <sup>s</sup>	0 to $\emptyset$ 100 mm	1.8 $\mu\text{m}$	Using Electronic Comparator
15.	Cylindrical Measuring Pin <sup>s</sup> (Grade "1" and Coarser)	0 to $\emptyset$ 20 mm	1.0 $\mu\text{m}$	Using Electronic Comparator
16.	Cylindrical Setting Master <sup>s</sup>	0 to $\emptyset$ 100 mm	1.2 $\mu\text{m}$	Using Electronic Comparator
17.	Thread Measuring Wires (Cylinders) <sup>s</sup>	0 to $\emptyset$ 6.35 mm	0.4 $\mu\text{m}$	Using Electronic Comparator

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18.	Feeler Gauge <sup>§</sup>	0.02 mm to 1 mm	1.9 $\mu$ m	Using Digital Micrometer
19.	Width / Gap Gauge <sup>§</sup>	Up to 50 mm	2.4 $\mu$ m	Using Electronic Comparator
20.	Comparator Stand <sup>§</sup> (Flatness of Base)	Up to 200 mm x 200 mm	1.2 $\mu$ m	Using Electronic Probe
21.	Coating Thickness Foil <sup>§</sup>	0 to 1000 $\mu$ m	0.7 $\mu$ m	Using Electronic Comparator
II.	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pressure Gauge/ Pressure Transmitter <sup>#</sup>	0 to 35 bar > 35 Up to 700 bar	0.92 % rdg 1.97 % rdg	Using Digital Pressure Gauge By Comparison based on DKD R6-1
2.	Vacuum Gauge <sup>#</sup>	0 to (-) 0.8bar	3.33 % rdg	Using Digital Vacuum Gauge By Comparison based on DKD R6-1

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	RTD's, RTD with Indicators, Thermocouple, Thermocouple with Indicator, Digital Thermometer, Recorder With Sensor, Temperature-Gauge, Transmitter, Switches, Transducer <sup>#</sup>	(-) 15 °C to 110 °C 110 °C to 400 °C 400 °C to 650 °C	0.38 °C 1.05 °C 1.13 °C	Using RTD- Pt100 with Indicator, S Type ,N Type Thermocouple with Indicator along with Dry Block Calibrator By Comparison Method
2.	Digital Temperature Controllers, Indicator of Oven, Incubator, Chambers, Baths, Freezers, Autoclave *	(-) 80 °C to 400 °C	1.42 °C	Using RTD- Pt100 with Indicator, S Type, N Type Thermocouple with Indicator By Comparison Method (Single Point Location)
3.	Digital Temperature Controllers/Indicator of Furnace *	100 °C to 1000 °C 1000 °C to 1200 °C	2.81 °C 3.58 °C	Using S Type, N Type, K Type Thermocouple with Indicator By Comparison Method (Single Point Location)

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4.	Temperature/ Humidity Indicators of Humidity Chambers, Climatic Chambers *	Relative Humidity 10 % RH to 95 % RH Temperature (-) 10 °C to 60 °C	1.78 % RH 2.01 °C	Using RTD- Pt100 with Indicator, Temp & Humidity Meter By Comparison Method (Single Point Location)

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

§ Only in Permanent Laboratory

\* Only for Site Calibration

# 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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