

Laboratory

Acumen Measurement & Calibration Services, Plot No. 14, First Floor  
R.K. Puram Colony, BHEL Road, Bahadrabad, Haridwar, Uttarakhand

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

CC-2649

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Validity

26.04.2018 o 25.04.2020

Last Amended on 06.08.2018

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*	10 mV to 200 mV 200 mV to 20 V 20 V to 1000 V	0.61 % to 0.20 % 0.20 % to 0.20 % 0.20 % to 0.20 %	Using AC/DC Multifunction Zeal Calibrator By Direct Method
2.	DC Current*	200 $\mu$ A to 2 mA 2 mA to 200 mA 200 mA to 2 A 2 A to 10 A	0.17 % to 0.37 % 0.37 % to 0.18 % 0.18 % to 0.25 % 0.25 % to 0.26 %	Using AC/DC Multifunction Zeal Calibrator By Direct Method
3.	Resistance*	1 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 100 M $\Omega$ 100 M $\Omega$ to 200 M $\Omega$	5.81 % to 0.51 % 0.51 % to 0.51 % 0.51 % to 0.99 % 0.99 % to 3.18 %	Using AC/DC Multifunction Zeal Calibrator Resistance Box
4.	AC Voltage*	<b>50 Hz</b> 10 mV to 200 mV 200 mV to 200 V 200 V to 1000 V	1.25 % to 0.35 % 0.35 % to 0.33 % 0.33 % to 0.32 %	Using AC/DC Multifunction Zeal Calibrator By Direct Method
5.	AC Current*	<b>50 Hz</b> 200 $\mu$ A to 2 mA 2 mA to 200 mA 200 mA to 2 A 2 A to 10 A	0.31 % to 0.47 % 0.47 % to 0.37 % 0.37 % to 0.21 % 0.21 % to 0.26 %	Using AC/DC Multifunction Zeal Calibrator By Direct Method
6.	Frequency*	45 Hz to 1000 Hz	0.25 %	Using AC/DC Multifunction Zeal Calibrator By Direct Method

Mithilesh Kumar  
Convenor

Avijit Das  
Program Manager

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7.	Temperature Simulation* (Temperature Indicator/Controller etc.)			
	RTD PT 100	(-) 200°C to 600°C	0.23 °C to 0.35 °C	Using Kusam - meco Calibrator By Direct Method
Thermocouple (J/K/R/T/S/E/B/N)	(-) 200 °C to 1700 °C	0.39 °C to 1.29 °C		
8.	AC High Current*	<b>50 Hz</b> 10 A to 1000 A	2.02 %	Using Zeal Calibrator With Current Coil
9.	DC High Current*	10 A to 1000 A	1.9 %	Using Zeal Calibrator With Current Coil
II.	<b>MEASURE</b>			
1.	Time-Stop Watch/ Dig. Timer* (Digital/Mechanical)	10 s to 5400 s	1.5 s to 61 s	Using Digital Timer Stop Watch By Direct Method
2.	DC High Voltage*	1 kV to 10 kV	13.47 % to 3.74 %	Using HV Probe Fluke with 4.5 DMM Fluke by Comparison Method
3.	AC High Voltage*	<b>50 Hz</b> 1 kV to 10 kV	11.2 % to 2.24 %	Using HV Probe Fluke with 4.5 DMM Fluke by Comparison Method

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<b>MECHANICAL CALIBRATION</b>				
<b>1. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>				
1.	Vernier Caliper <sup>s</sup> (Dig. / Dial) L.C.: 0.01 mm L.C.: 0.02 mm	0 to 300 mm 0 to 600 mm	10.0 $\mu$ m 12.3 $\mu$ m	Using Caliper Checker
2.	External Micrometer <sup>s</sup> L.C.: 0.001 mm L.C.: 0.01 mm	0 to 25 mm 0 to 100 mm	3.0 $\mu$ m 6.6 $\mu$ m	Using Gauge Block Set
3.	Height Gauge <sup>s</sup> (Dig./Dial) L.C.: 0.01 mm <sup>φ</sup>	0 to 600 mm	9.0 $\mu$ m	Using Caliper Checker, Surface Plate
4.	Internal Micrometer <sup>s</sup> L.C.: 0.001 mm <sup>φ</sup>	0 to 100 mm	7.2 $\mu$ m	Using Gauge Blocks With Gauge Block Accessories
5.	Plunger Type Dial Gauge <sup>s</sup> L.C.: 0.001 mm L.C.: 0.01 mm	0 to 25 mm 0 to 50 mm	2.0 $\mu$ m 6.0 $\mu$ m	Using Gauge Block With Comparator Stand
6.	Lever Type Dial Indicator <sup>s</sup> L.C.: 0.001 mm L.C.: 0.01 mm	0 to 0.2 mm 0 to 1 mm	2.0 $\mu$ m 6.0 $\mu$ m	Using Gauge Block With Comparator Stand
7.	Plain Plug Gauge <sup>s</sup>	Up to $\Phi$ 100 mm	2.6 $\mu$ m	Using Gauge Block, Plunger Dial With Comparator Stand

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8.	Cylindrical Measuring Pin <sup>§</sup>	Up to 20 mm	2.5 $\mu$ m	Using Gauge Block With Comparator Stand
9.	Setting Rod <sup>§</sup>	Up to 100 mm	5.0 $\mu$ m	Using Gauge Block With Comparator Stand
10.	Feeler Gauge <sup>§</sup>	0.03 mm to 1 mm	1.8 $\mu$ m	Using Dig. Micrometer
11.	Snap Gauge <sup>§</sup>	Up to 100 mm	2.0 $\mu$ m	Using Gauge Block
12.	Inside Dial Caliper <sup>§</sup> L.C.: 0.001 mm $\phi$	Up to 200 mm	7.0 $\mu$ m	Using Gauge Block With Gauge Block Accessories
13.	Dial Thickness Gauge <sup>§</sup> L.C.: 0.01 mm	0 to 100 mm	7.0 $\mu$ m	Using Gauge Block Set
14.	Coating Thickness Gauge <sup>§</sup>	0 to 708 $\mu$ m	4.1 $\mu$ m	Using Standard Foils
II.	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pressure Indicating Devices* (Hydraulic)	0 to 700 bar (g)	0.78 % rdg.	Using Digital Pressure Gauge By comparison method as per DKD R-6-1

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I. TEMPERATURE</b>				
1.	RTDs/ Thermocouple With or Without Indicator/Controller/ Data Logger/ Recorder, Temperature Transmitter, Liquid-in Glass Thermometer, Digital Thermometer Temperature Gauge, Liquid Baths*	40 °C to 250 °C	0.38 °C	Using 4 Wire RTD (Pt-100) Sensor With Indicator & Silicon Oil Bath "Calsys 250"
2.	Indicator of dry Block Furnace/ Muffle Furnace/ Industrial Furnace *	250 °C to 1200 °C	3.2 °C	Using S- Type Thermocouple With Temp. Indicator By Comparison Method (Single Position Only)
3.	Indicator of aging Oven, Hot Plate, Water Bath, Thermal Mapping Dry Block Furnace/ Muffle Furnace/ Industrial Furnace*	250 °C to 1200 °C	3.2 °C	Using S- Type Thermocouple With Temp. Indicator By Comparison Method (Single Position Only)
<b>II. SPECIFIC HEAT &amp; HUMIDITY</b>				
1.	Indicator of Environment Chamber,	10 % RH to 99 % RH	3.9 % RH	Using Dig. Thermo Hygrometer with Sensor By Comparison

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	Humidity Chamber, Humidity Indicating Device in Humidity Chamber *			Method (Single Position Only)
2.	Environment Chamber, Humidity Chamber, Muffle Furnaces, Freezers, Deep Freezers, Hot Air Oven, Vacuum Oven, BOD Incubator, Incubator, Centrifuge, Cold Room Chamber, Hot Room, Autoclave*	(-) 40 °C to 250 °C	1.22 °C	Using 4 Wire RTD (Pt-100) Sensor With Indicator By comparison Method (Single Position Only)

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

§ Only in Permanent Laboratory

\* Only for Site Calibration

⊕ Laboratory can also calibrate instruments/devices of coarser resolution / least count within the accredited range using same reference standard/ master equipment under the scope of accreditation.

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