

Laboratory San Techno Services, 2, Rutu Regency, Sucheta Nagar, Mumbai Naka, Nashik, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2589

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Validity 05.03.2018 to 04.03.2020

Last Amended on 09.07.2019

Sl.	Measurand or Reference Material/ Type of instrument or material to be calibrated or measured/ Quantity Measured / Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable (Range and Frequency)	Calibration and Measurement Capability (CMC) (±)
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	ALTERNATING CURRENT (<1 GHZ)			
1.	AC Current @ 50 Hz [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	10 µA to 100 µA 100 µA to 1 mA 1 mA to 10 A	1.27 % to 0.25 % 0.33 % to 0.17% 0.17 % to 0.25 %
2.	AC Current @ 50 Hz [§]	Using Multifunction Calibrator Meco 90A by Direct Method	1 mA to 200 mA 200 mA to 2 A 2 A to 10 A 10 A to 20 A	0.60 % to 0.13% 0.13 % 0.13 % to 0.18% 0.18 % to 0.13%
3.	AC High Current @ 50 Hz [§]	Using Multifunction Calibrator Meco 90A with Current Coil by Direct Method	50 A to 1000 A	1.87 %
4.	AC High Voltage @ 50 Hz [#]	Using HV Probe with DMM Fluke by Direct Method	1 kV to 10 kV	5.9 % to 7 %
5.	AC Voltage @ 50 Hz [§]	Using Multifunction Calibrator Meco 90A By Direct Method	5 mV to 200 mV 200 mV to 200 V 200 V to 1000 V	1.6 % to 0.10 % 0.10 % 0.10 %
6.	AC Voltage @ 50 Hz [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	1 mV to 100 mV 100 mV to 1000 V	4.74 % to 0.20 % 0.20 % to 0.18 %
7.	Capacitance @ 1 kHz [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	1 nF to 100 nF 100 nF to 100 µF	5.11 % to 1.74 % 1.74 % to 1.78 %

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8.	Capacitance @ 1 kHz [§]	Using Capacitance Box by Direct Method	1 nF to 100 nF 100 nF to 100 µF	1.33 % to 1.16 % 1.16 %
9.	Inductance @ 1 kHz [§]	Using Inductance Box by Direct Method	1000 µH to 1000 mH 100 µH to 1000 µH	1.17 % to 1.16 % 1.18 % to 1.17 %
II.	DIRECT CURRENT			
1.	DC Current [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	100 mA to 1 A 1 A to 10 A 10 µA to 1 mA 1 mA to 100 mA	0.065 % to 0.08 % 0.08 % to 0.19 % 0.37 % to 0.065 % 0.065 %
2.	DC Current [§]	Using Multifunction Calibrator Mecor 90A By Direct Method	10 µA to 1 mA 2 A to 10 A 200 mA to 2 A 1 mA to 200 mA	0.54 % to 0.59 % 0.14 % to 0.12 % 0.08 % to 0.14 % 0.59 % to 0.08 %
3.	DC High Current [§]	Using Multifunction Calibrator Mecor 90A with Current Coil by Direct Method	50 A to 1000 A	1.90 %
4.	DC High Voltage [#]	Using HV Probe with DMM (Fluke) by Comparison Method	1 kV to 5 kV	7.62 %
5.	DC Voltage [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	1 mV to 100 mV 100 mV to 1000 V	0.80 % to 0.013 % 0.013 % to 0.008 %

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6.	DC Voltage [§]	Using Multifunction Calibrator Meco 90A By Direct Method	200 mV to 1000 V 1 mV to 200 mV	0.06 % 4.59 % to 0.06 %
7.	Resistance [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method	100 Ω to 100 kΩ 100 kΩ to 100 MΩ 100 MΩ to 1000 MΩ 1 Ω to 100 Ω	0.005 % to 0.013 % 0.013 % to 0.95 % 0.95 % to 2.33 % 0.36 % to 0.005 %
8.	Resistance (Discrete) [§]	Using Multifunction Calibrator Meco 90A by Direct Method (Selectable Resistance)	1 MΩ, 2.4 MΩ, 5 MΩ, 10 MΩ, 24 MΩ 1 kΩ, 2.4 kΩ, 5 kΩ, 10 kΩ, 24 kΩ 50 kΩ, 100 kΩ, 240 kΩ, 500 kΩ 10 Ω, 24 Ω, 50 Ω, 100 Ω, 240 Ω, 500 Ω	0.33 % 0.25 % 0.23 % 0.46 %
III.	TEMPERATURE SIMULATION			
1.	J-Type Thermocouple [#] K-Type Thermocouple [#] RTD [#] S-Type Thermocouple [#]	Using Universal Calibrator MC 12 by Direct Method	(-) 50 °C to 1000 °C (-) 50 °C to 1200 °C (-) 100 °C to 800 °C 200 °C to 1200 °C	1.1 % 1.1 % 1.4 % 1.1 %
IV.	TIME & FREQUENCY			
1.	Frequency [§]	Using 6½ Digital Multimeter (Fluke 8846A) by Direct Method Using Universal Calibrator MC12 by Direct Method	100 Hz to 1 MHz 3 Hz to 100 Hz 1 Hz to 10000 Hz	0.013 % to 0.06 % 0.69 % to 0.03 % 0.69 % to 0.03 %

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2.	Stop Watch/Timer [#]	Using Time Interval Meter by Comparison Method	5 s to 1 hour	0.74 s to 3.62 s

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Coating Thickness Gauge [§]	Using Master Foils by comparison method	0 to 0.2 mm 0.2 mm to 1.5 mm	1.8 µm 13.0 µm
2.	Dial Calibration Tester (L.C.: 0.001 mm) [§]	Using Electronic Probe with DRO by comparison method	0 to 25 mm	1.0 µm
3.	External Micrometer - Analog / Dial / Digital (L.C.: 1 µm) [§]	Using Slip Gauge Block Set by Comparison Method as per IS 2967	0 to 100 mm 100 mm to 300 mm	1.5 µm 5.7 µm
4.	Micrometer Setting Rod [§]	Using Gauge Block Set, Long Gauge Block with Electronic Probe & Comparator Stand by Comparison method	25 mm to 300 mm	4.9 µm
5.	Plunger Dial Gauge (L.C.: 10 µm) [§]	Using Dial Calibration Tester by Comparison method as per IS 2092	0 to 10 mm	7.0 µm
6.	Surface Plate [*]	Using Spirit Level (with sensitivity 0.01 mm/m)	400 mm x 400 mm to 1600 mm x 1600 mm	$5.4 \sqrt{\{(L+W)/120\}}$ µm
7.	Bevel Protractor (L.C.: 5') [§]	Using Angle Gauge Block by comparison method	0 ° to 90 °	4'

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8.	Bore Gauge—only for the Transmission Error (L.C.: 1 µm) [§]	Using Dial Calibration Tester by Comparison method	Upto 1 mm	4.7 µm
9.	Caliper—Vernier / Dial / Digital (L.C.: 10 µm) [§]	Using Caliper Checker & External Micrometer by Comparison Method as per IS 3651	0 to 600 mm	14.0 µm
10.	Combination Set (L.C.: 1°) [§]	Using Angle Gauge Block by Comparison method	0° to 90°	37'
11.	Depth Caliper—Vernier / Dial / Digital (L.C.: 20 µm) [§]	Using Depth Micro Checker by Comparison Method as per IS 4213	0 to 300 mm	14.0 µm
12.	Depth Micrometer (L.C.: 10 µm) [§]	Using Depth Micro Checker by Comparison Method	0 to 150 mm	8.8 µm
13.	Dial Thickness Gauge (L.C.: 10 µm) [§]	Using Gauge Block Set by Comparison Method	0 to 10 mm	4.5 µm
14.	Feeler Gauge / Plastic Foil [§]	Using Gauge Block Set with Electronic Probe and Comparator stand by comparison method as per IS 3179	Upto 1.5 mm	5.4 µm
15.	Height Gauge – Vernier / Dial / Digital (L.C.: 10 µm) [§]	Using Caliper Checker & Surface Plate by comparison Method as per IS 2921	0 to 600 mm	13.0 µm

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16.	Lever Type Dial Gauge (L.C.: 1 µm) [§]	Using Dial Calibration Tester by Comparison method as per IS 11498	0 to 0.14 mm	2.5 µm
	(L.C.: 10 µm) [§]		0 to 0.8 mm	3.2 µm
17.	Pistol Caliper (L.C.: 100 µm) [§]	Using Gauge Block Set by comparison method	0 to 50 mm	66.0 µm
18.	Plain Plug Gauge [§]	Using Gauge Block, Long gauge Block, Electronic Probe & Comparator stand by comparison method as per IS 3455	Up to 300 mm	6.6 µm
19.	Plain Snap Gauge [§]	Using Gauge Block, Long gauge Block by comparison method as per IS 3455	Up to 300 mm	3.0 µm
20.	Plunger Dial Gauge (L.C.: 1 µm) [§]	Using Dial Calibration Tester by Comparison method as per IS 2092	0 to 1 mm	3.0 µm
II.	PRESSURE INDICATING DEVICES			
1.	Digital and Dial Vacuum Gauge [#]	Using Digital Vacuum Indicator and Comparator Pump by Comparison Method as per DKD R 6- 1	(-) 0.9 bar to 0 bar	0.016 bar
2.	Dial and Digital Pressure Gauge, Pressure Transmitter (Hydraulic Pressure) [#]	Using Digital Pressure Indicator & Comparator Pump by Comparison Method as per DKD R-6- 1	0 bar to 100 bar	0.1 bar
			0 bar to 700 bar	0.3 bar

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3.	Dial and Digital Pressure Gauge, Pressure Transmitter (Pneumatic Pressure) #	Using Digital Pressure Indicator & Comparator Pump by Comparison Method as per DKD R-6- 1	0 bar to 30 bar	0.032 bar

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<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	RTD, TC with & without Indicator, Temperature measuring device with probe, Temperature Gauge, Digital Thermometer [#]	Using 4 Wire RTD Sensor & 6½ Digital Multimeter with Dry Well Block by Comparison Method	50 °C to 350 °C	1.2 °C
		Using 4 Wire RTD Sensor & Digital Calibrator MC12 with Liquid Temperature Calibrator Bath by Comparison Method	(-) 15 °C to 110 °C	0.31 °C
		Using S type thermocouple & 6½ Digital Multimeter with Dry Well Block by Comparison Method	350 °C to 1200 °C	4.4 °C
2.	Temperature Indicator of Temperature Bath / Oven / Furnace (Single Position Calibration) [#]	Using 4 Wire RTD Sensor & Digital Calibrator MC12 by comparison method	(-) 15° C to 110 °C	0.4 °C
		Using S type Thermocouple & 6½ Digital Multimeter by comparison method	350 °C to 1200 °C	3.7 °C
		Using 4 Wire RTD Sensor & 6½ Digital Multimeter by comparison method	50 °C to 350 °C	1.2 °C

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3.	Thermal Chamber, Oven, Autoclave, Freeze, Furnace, Industrial Incubator*	Using RTD Sensor with Data logger by 9 channel multipoint Mapping method	10 °C to 200 °C	2.6 °C
4.	Thermal Chamber, Oven, Furnace*	Using N-Type Thermocouple with Data logger (Nine Channel Multi Position Method) by Mapping	200 °C to 1000 °C	4.7 °C

* 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.