

Laboratory Caretek Calibration Laboratory, Shop No. 3,4 & 5, Kaoustubh Apartment Mahalaxmi Society, Anandnagar, Sinhagad Road, Pune, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2838

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Validity 26.09.2018 to 25.09.2020

Last Amended on 01.01.2019

	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1 mV to 200 mV 200 mV to 1000 V	1.36 % to 0.18 % 0.18 % to 0.15 %	Using Multifunction Calibrator by Direct Method
2.	DC Current [#]	200 μ A to 200 mA 200 mA to 10 A	0.19 % to 0.25 % 0.25 % to 0.28 %	Using Multifunction Calibrator by Direct Method
3.	AC Voltage [#]	50Hz 10 mV to 200 mV 200 mV to 750 V	1.25 % to 0.50 % 0.50 % to 0.23 %	Using Multifunction Calibrator by Direct Method
4.	AC Current [#]	50Hz 200 μ A to 200 mA 200 mA to 10 A	0.85 % to 0.43 % 0.43 % to 0.33 %	Using Multifunction Calibrator by Direct Method
5.	Frequency [#]	45 Hz to 1kHz	1.10 % to 0.30 %	Using Multifunction Calibrator by Direct Method
6.	DC Resistance [#]	0.1 Ω to 100 Ω 100 Ω to 10 k Ω	2.29 % to 0.046 % 0.046 % to 0.045 %	Using Decade Resistance Box by Direct Method
II.	MEASURE			
1.	DC Voltage [#]	1 mV to 200 mV 200 mV to 1000 V	0.50 % to 0.05 % 0.05 %	Using 6 ½ Digit Multimeter by Direct Method
2.	DC Current [#]	1 mA to 100 mA 100 mA to 10 A	0.30 % to 0.09 % 0.10 % to 0.35 %	Using 6 ½ Digit Multimeter by Direct Method

Vishal Shukla
Convenor

Avijit Das
Program Manager

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3.	AC Voltage [#]	50Hz 10 mV to 200 mV 200 mV to 750 V	0.50 % to 0.30% 0.30 % to 0.20%	Using 6 ½ Digit Multimeter by Direct Method
4.	AC Current [#]	50 Hz 1mA to 100 mA 100 mA to 10A	2.20 % to 0.90 % 0.90 % to 1.40 %	Using 6 ½ Digital Multimeter by Direct Method
5.	Resistance [#]	0.1 Ω to 100 Ω 100 Ω to 1k Ω	0.3 % to 0.04 % 0.04 % to 1.30 %	Using 6 ½ Digital Multimeter by Direct Method
6.	Stop Watch [#]	60 sec to 3600 sec	0.5 sec to 3.5 sec	Using Digital Stop Watch by Direct Method

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Snap Gauge ^s	Up to 100 mm	2.0 μ m	Using Gauge Block Set by Comparison Method
2.	Plunger Dial Gauge ^s L.C.: 0.001 mm L.C.: 0.01 mm	0 to 1 mm 0 to 10 mm	1.2 μ m 2.9 μ m	Using Dial Calibration Tester by Comparison Method
3.	Dial Thickness Gauge ^s L.C.: 0.01 mm	0 to 10 mm	2.7 μ m	Using Gauge Block Set by Comparison Method
4.	Lever Dial Gauge ^s L.C.: 0.01 mm	0 to 0.8 mm	3.7 μ m	Using Dial Calibration Tester by Comparison Method
5.	External Micrometer ^s L.C.: 0.001 mm	0 to 150 mm	3.6 μ m	Using Gauge Block Set by Comparison Method
6.	Bore Gauge with Dial ^s (Transmission error)	0 to 1 mm	2.7 μ m	Using Dial Calibration Tester by Comparison Method
7.	Depth Gauge ^s	0 to 300 mm	12.0 μ m	Using Gauge Block Set , Long Slip, Surface Plate by Comparison Method
8.	Height Gauge ^s (Vernier / Dial / Digital)	0 to 300 mm	11.8 μ m	Using Caliper Checker & Surface Plate by Comparison Method

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9.	Depth Gauge ^s	0 to 300 mm	12.0 μ m	Using Gauge Block Set , Long Slip, Caliper Checker & Surface Plate by Comparison Method
II.	PRESSURE INDICATING DEVICES			
1.	Differential Pressure Sensor of Air Leak Tester, Digital / Analogue Pressure Gauge, Pressure Transmitter [*]	0 to 2000 Pa	1.65 Pa	Using Digital Pressure Calibrator (Fukuda) & Druck Pump by Comparison Method
III.	WEIGHING SCALE AND BALANCE			
1.	Electronic Weighing Balance [*] d $\geq$ 1 g	0 to 15 kg	4.2 g	Using F2 Class Standard Weights as per OIML R-76
IV.	UTM, TENSION CREEP AND TORSION TESTING MACHINE			
1.	Verification of Force Measuring system of UTM ' TTM & CTM [*] Compression Tension	0.2kN to 2 kN 2kN to 20 kN 10kN to 100 kN 0.2kN to 2 kN 2kN to 20 kN	0.22% 0.27% 0.43% 0.33% 0.22%	Using Class 0.5 Load Cells & 3 point Load Indicator by comparison method as per IS:1828

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<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	Thermocouples / RTD with and without Indicator, and Temperature Gauge [#]	30 °C to 400 °C	0.9 °C	Using Standard 4-wire RTD sensor with Indicator, 6 ½ DMM & Dry block Furnace by Comparison Method
2.	Thermocouples / RTD with and without Indicator [#]	400 °C to 1200 °C	2.87 °C	Using Standard R-Type Thermocouple sensor with Indicator, 6 ½ DMM & Dry block Furnace by Comparison Method
3.	Temperature Indicator of Freezer/Oven/ Furnace/Cold & Heat Chamber [#]	(-)20 °C to 400 °C	0.9 °C	Using Standard 4-wire RTD sensor with Indicator & 6 ½ DMM by Comparison Method

* 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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