

Laboratory ICS Technologies, 7, M. N. Ind. Estate, W.E. Highway, Mira Road, Thane, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 1 of 9

Validity 01.02.2019 to 31.01.2021 Last Amended on -

“In view of the transition for ISO/IEC 17025:2017, the validity of this accreditation certificate will cease on 30.11.2020”

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I. SOURCE				
1.	SIMULATION TEMPERATURE^s (Indicator/Controller/Recorder)			
	Thermocouple RTD PT 100 J-Type K-Type S-Type	(-)150 °C to 800 °C 0 to 700 °C 0 to 1300 °C 0 to 1700 °C	1 °C 0.9 °C 1 °C 1 °C	Using Universal Calibrator – Masibus by Direct Method
2.	DC Voltage [#]	1 mV to 100 mV 100 mV to 10 V	3.1 % to 0.08 % 0.08 % to 0.014 %	Using Universal Calibrator – Masibus by Direct Method
3.	DC Current [#]	1 mA to 60 mA	0.81 % to 0.20 %	Using Universal Calibrator – Masibus by Direct Method
4.	DC High Current [#]	100 A to 600 A	1.6 % to 1.7 %	Using Multifunction Source with Current Coil by Direct Method
5.	AC High Current [#]	50 Hz 100 A to 900 A	1.70 % to 1.5 %	Using Multifunction Source with Current Coil by Direct Method
6.	Frequency [#]	230 VAC 45 Hz to 999 Hz	0.26 %	Using Multifunction Source with by Direct Method

Vishal Shukla
Convenor

Battal Singh
Program Manager

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 2 of 9

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
7.	Resistance [#]	1 Ω to 100 Ω 100 Ω to 100 M Ω	1.34 % to 0.12% 0.12 % to 1.48 %	Using Decade Resistance Box
8.	Capacitance [#]	@1 KHz 1 nF to 100 nF 100 nF to 1 μ F	2.93 %	Using Decade Capacitance Box by Direct Method
MEASURE				
1.	DC Voltage [#]	1mV to 100 mV 100 mV to 100 V 100 V to 1000 V	0.86 % to 0.06 % 0.06 % to 0.01 % 0.01 %	Using 6½ Digital Multimeter Make Fluke 8846A by Direct/ Comparison Method
2.	AC Voltage [#]	(50 Hz) 1 mV to 100 mV 100 mV to 100 V 100 V to 1000 V	4.26 % to 0.12 % 0.12 % to 0.17% 0.17 % to 0.45 %	Using 6½ Digital Multimeter Make Fluke 8846A With Multifunction Source by Direct/ Comparison Method
3.	AC High Voltage [#]	50 Hz 1 kV to 5 kV	7.7 % to 5.55 %	Using H.V. Probe-Fluke 80 K-40 Digital Multimeter by Direct Method by Direct Method
4.	DC Current [#]	1 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.26 % to 0.06 % 0.06 % to 0.15 % 0.15 % to 0.40%	Using 6½ Digital Multimeter Make Fluke 8846A by Direct/ Comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 3 of 9

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
5.	AC Current [#]	@ 50 Hz 1 mA to 100 mA 100 mA to 1 A 1 A to 9 A	0.45 % to 0.17 % 0.17 % to 0.23 % 0.23 % to 0.45 %	Using 6½ Digital Multimeter Make Fluke 8846A With Multifunction Source by Direct /Comparison Method
6.	Resistance [#]	1 Ω to 100 Ω 100 Ω to 100 M Ω	0.40 % to 0.04 % 0.04 % to 1.04 %	Using 6½ Digital Multimeter Make Fluke 8846A With Multifunction Source by Direct Method
7.	Frequency [#]	@1V AC 50 Hz to 999 Hz	0.02 % to 0.01 %	Using 6½ Digital Multimeter Make Fluke 8846A With Multifunction Source by Direct Method
8.	DC Capacitance [#]	1 nF to 1uF 1 uF to 1mF	5.3 5 % to 1.9 % 1.9 % to 1.82 %	Using 6½ Digital Multimeter Make Fluke 8846A by Direct Method
9.	Time (Stop Watch) / Timer [#]	10 s to 1 hr	0.75 s to 30.5 s	Using Time Interval Meter by comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 4 of 9

Validity 01.02.2019 to 31.01.2021 Last Amended on -

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (Basic Measuring Instrument Gauge etc.)			
1.	Caliper (Vernier, Dial & Electronic) ^s L.C.: : 0.02 mm	Upto 600 mm	16.9 μ m	Using Caliper Checker & Slip Gauge Set by Comparison Method
2.	Height Gauge ^s (Vernier, Dial & Electronic) L.C.: : 0.02 mm	Upto 600 mm	17.0 μ m	Using Caliper Checker by Comparison Method
3.	Depth Gauge ^s (Digital/Dial/Vernier) L.C.: : 0.02 mm	0 to 300 mm	19.8 μ m	Using Depth Micro Checker by Comparison Method
4.	External Micrometer ^s L.C.: : 0.01 mm	0 to 300 mm	13.6 μ m	Using Slip Gauge Set by Comparison Method
5.	Depth Micrometer ^s L.C.: 0.01 mm	0 to 300 mm	9.0 μ m	Using Depth Micro Checker by Direct/ Comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 5 of 9

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
6.	Micrometer Setting Standard ^s	25 mm to 275 mm	5.0 μ m	Using Slip Gauge Set & Electronic Comparator by Comparison Method
7.	Dial Gauge-Plunger ^s Type L.C.: : 0.01 mm	Upto 25 mm	5.0 μ m	Using Dial Calibration Tester by Comparison Method
8.	Dial Gauge-Lever Type L.C.: : 0.01 mm	Upto 1mm	4.5 μ m	Using Dial Calibration Tester by Comparison Method
12.	Feeler Gauge/Plastic Foils/Shims ^s	Upto 1 mm	11.8 μ m	Using Slip Gauge Set & Electronic Comparator by Comparison Method
13.	Bevel Protractor ^s L.C.: : 5 min	0-90-0 °	3.0 min	Using Angle Gauge Set by Comparison Method
14.	Degree Protractor ^s L.C.: : 1°	0-90-0°	36 Min	Using Angle Gauge Set by Comparison Method
16.	Electronic Probe with DRO ^s L.C.: : 0.001 mm	Upto 25 mm	2.9 μ m	Using Slip Gauge Set & Electronic comparator by Comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 6 of 9

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
18.	Measuring Pins ^s	0.5 to 20 mm	5.0 μ m	Using Electronic Comparator by Comparison Method
19.	Measuring Scale ^s L.C.: : 1 mm (in steps of 500 mm)	Upto 1000 mm	308 μ m $\sqrt{(L/1000)}$	Using Scale & Tape Calibrator by Comparison Method
20.	Measuring Tape ^s (in steps of 500 mm)	Up to 1000 mm >1 m to 50 m (with step of 500mm)	366.3 $\sqrt{(L/1000)}$ μ m	Using Scale & Tape Calibrator by Comparison Method
II.	PRESSURE INDICATING DEVICES			
	Pressure Hydraulic			
1.	Analog (Dial) & Digital Pressure Gauges [#]	Up to 700 bar	1.5 bar	Using Digital Pressure Calibrator with Hydraulic Pump by Comparison Method
2.	Pressure Transducer with / without Indicator [#]	Up to 700 bar	2.0 bar	Using Digital Pressure Calibrator with Hydraulic Pump by Comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 7 of 9

Validity 01.02.2019 to 31.01.2021 Last Amended on -

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III.	WEIGHTS			
1.	Mass-Weights [§] (E2 Class weights and balance of readability 0.1 mg)	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g	0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.09 mg 0.15 mg 0.15 mg 0.20 mg 0.30 mg 0.30 mg 0.30 mg 0.30 mg	Using Calibration of weights of Class M1 Accuracy and Coarser as per OIML R-111-1
	(F1 Class weights and balance of readability 1 mg)	5 kg 10 kg	0.817 mg 1.8 g	Using Calibration of weights of Class M3 Accuracy and Coarser as per OIML R-111-1
IV.	VOLUME			
1.	Glassware like pipettes, burettes, measuring cylinder volumetric flask etc. [§]	1 ml to 10 ml @27° C >10 ml to 100 ml @27° C	0.05 ml 0.08 ml	Using Weighing Balance of 220 g Capacity and 0.1mg readability and distilled water by Gravimetric method based on IS/ISO 4787

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 8 of 9

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V.	WEIGHING BALANCE			
1.	Mass Electronic Weighing balance with readability [*] d=1 mg	0 to 200 g	0.20 mg	Using E2 Class Weights, Calibration of Electronic Weighing Balance and Comparator of Class I and Coarser as per OIML R-76-1
	d=1g	0 to 10 kg	0.70 g	Using E1 Class Weights, Calibration of Electronic Weighing Balance and Comparator of Class III and Coarser as per OIML R-76-1 And OIML R 47
VI.	ACCELERATION AND SPEED			
1.	Tachometer contact Type ^s	85 rpm to 1500 rpm	2.3 rpm	Using Calibrated Tachometer in Noncontact mode and Tachometering by comparison method
	Tachometer Contact Type ^s	85 rpm to 1200 rpm	2 rpm to 13 rpm	
VII.	ACOUSTIC			
1.	Sound Level Meter ^s	1.5 dB	1.5 dB	Using Sound Calibrator by Comparison Method

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Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2948 Page 9 of 9

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<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	RTD/Thermocouples With / Without Indicator, Temp Gauge [§]	50 °C to 250 °C	1.4 °C	Using 4 Wire RTD with Indicator & Oil Bath Calibrator by Comparison Method
2.	RTD/Thermocouples With / Without Indicator, Temp Gauge [§]	250 °C to 500 °C	2.3 °C	Using S Type Thermocouple with Indicator & with Dry Block Calibrator by Comparison Method
		500 °C to 1200 °C	3.3 °C	

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

[^]Only for Site Calibration

[§]Only in Permanent Laboratory

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