

Laboratory **CL-DEE, Department of Energy & Environment, National Institute of Technology, Tiruchirappalli, Tamil Nadu**

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

Certificate Number **CC-2553**

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Validity **07.02.2018 to 06.02.2020**

Last Amended on **13.04.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I	SOURCE MODE			
1.	DC Voltage	100 mV to 10V 10V to 100V 100 V to 1000V	4.33uV to 0.179mV 0.179mV to 2.93mV 2.93 mV to 23.95mV	Using Fluke 5522A Multifunction Calibrator by Direct Method
2.	AC Voltage	50Hz 10mV to 100 mV 100mV to 10V 10V to 100V 100 V to 1000V	9.07uV to 46.41uV 46.41uV to 2.61mV 2.61 mV to 26.6mV 26.6 mV to 42.76mV	Using Fluke 5522A Multifunction Calibrator by Direct Method
		10kHz 10mV to 100 mV 100mV to 10V 10V to 100V 100 V to 1000V	3.55uV to 32.51uV 32.51uV to 2.61mV 2.61mV to 26.58mV 26.58 mV to 42.76mV	Using Fluke 5522A Multifunction Calibrator by Direct Method
		50kHz 10mV to 100 mV	19.56uV to 78.88 uV	Using Fluke 5522A Multifunction Calibrator by Direct Method
		100kHz 10mV to 100 mV	6.92 uV to 65.82 uV	Using Fluke 5522A Multifunction Calibrator by Direct Method
3.	DC Current	1 to 10mA 10 to 100mA 100mA to 1A 1 to 10A	0.183uA to 1.59 uA 1.59uA to 15.22uA 15.22uA to 277.93 uA 277.93 uA to 6.56mA	Using Fluke 5522A Multifunction Calibrator by Direct Method

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Convenor

Avijit Das
Program Director

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4.	AC Current	50Hz 1 to 10mA 10 to 100mA 100mA to 1A 1 to 10A	1.35uA to 6.94 uA 6.94uA to 72.37uA 72.37uA to 715.2 uA 715.2uA to 9.67 mA	Using Fluke 5522A Multifunction Calibrator by Direct Method
		1kHz 0.1mA to 1mA 1 to 10mA 10 to 100mA 100mA to 1A 1 to 10A	0.36 uA to 1.36uA 1.36uA to 7.5 uA 7.5uA to 72.51uA 72.51uA to 715.2 uA 715.2 uA to 14.16mA	Using Fluke 5522A Multifunction Calibrator by Direct Method
		5 kHz 10 to 100mA 100mA to 1A 1 to 10A	12.93uA to 201.8 uA 201.8 uA to 8.12mA 8.12 mA to 349.2 mA	Using Fluke 5522A Multifunction Calibrator by Direct Method
5.	DC Resistance	0 to 10 Ω 10 to 100 Ω 100 to 1k Ω 1k to 10k Ω 10 k to 100k Ω 100k to 1M Ω 1M to 100 M Ω	11.61 m Ω to 12.03 m Ω 12.03 m Ω to 0.206 m Ω 0.206 m Ω to 55.7m Ω 55.7 m Ω to 0.44 Ω 0.44 Ω to 3.64 Ω 3.64 Ω to 497.7 Ω 497.7 Ω to 65.93k Ω	Using Fluke 5522A Multifunction Calibrator by Direct Method
6.	Frequency	100Hz to 10kHz 10kHz to 100kHz	9.8mHz to 29.5mHz 29.5mHz to 289mHz	Using Fluke 5522A Multifunction Calibrator by Direct Method

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7.	DC Capacitance	1nF to 100nF 100 nF to 10uF 10uF to 100uF	17.37 pF to 0.31 nF 0.31 nF to 64.65nF 64.65nF to 715nF	Using Fluke 5522A Multifunction Calibrator by Direct Method
8.	Temperature Simulation RTD J Type K Type	(-)200 to 800°C (-)200 to 1370°C (-)200 to 1200°C	0.34°C 0.66°C 0.45 °C	Using Fluke 5522A Multifunction Calibrator by Direct Method

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MECHANICAL CALIBRATION

I.	PRESSURE INDICATING DEVICES			
1.	Pressure-Hydraulic ^s (Dial, Digital Pressure Gauges/ Indicators)	4kg/cm ² to 35 kg/cm ² (3.92 bar to 34.3 bar) 35kg/cm ² to 700 kg/cm ² 34.3 bar to 686.5 bar)	0.15% rdg 0.03% rdg	Using water operated Dead Weight Tester based on DKD-R6-1
2.	Pressure-Pneumatic ^s (Dial, Digital Pressure Gauges/ Indicators)	2 bar to 20 bar 0 bar to (-)0.8 bar	0.1% rdg 0.82% rdg.	Using Digital Pressure Calibrator based on DKD-R6-1

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THERMAL CALIBRATION

1.	TEMPERATURE			
1.	RTD's and Thermocouples [§]	33°C to 600°C	0.3°C	Using RTD Pt-100, Thermocouple Type S, 6 1/2 Digital Multimeter and Dry well (CTC-650B) by Comparison Method
2.	Thermocouples [§]	600°C to 1000°C 1000°C to 1200°C	1.8°C 2.8°C	Using Thermocouple Type S, 6 1/2 Digital Multimeter and Dry well (CTC-1200A) by Comparison Method
3.	Oven and Furnace [#]	30°C to 125°C	1.8°C	Using RTD Pt-100 and 6 1/2 Digital Multimeter by Comparison Method (Single Point Calibration)

* 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.

° 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.

** Relative accuracy error has not been considered for CMC estimation.

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