



# National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



## CERTIFICATE OF ACCREDITATION

### CL-DEE

has been assessed and accredited in accordance with the standard

## ISO/IEC 17025:2005

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

Department of Energy & Environment, National Institute of Technology,  
Tiruchirappalli, Tamil Nadu

in the field of

## CALIBRATION

Certificate Number CC-2553

Issue Date 07/02/2018

Valid Until 06/02/2020

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website [www.nabl-india.org](http://www.nabl-india.org))

Signed for and on behalf of NABL

Avijit Das  
Program Director



Anil Relia  
Chief Executive Officer



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## SCOPE OF ACCREDITATION

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

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

**Certificate Number** CC-2553 **Page** 1 of 5

**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
<b><u>ELECTRO TECHNICAL CALIBRATION</u></b>				
<b>I</b>	<b>SOURCE MODE</b>			
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	<b>50Hz</b> 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
		<b>10kHz</b> 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
		<b>50kHz</b> 10mV to 100 mV	19.56uV to 78.88 uV	Using Fluke 5522A Multifunction Calibrator by Direct Method
		<b>100kHz</b> 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

Abhinav Thakur

Avijit Das  
Program Director



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4.	AC Current	<b>50Hz</b> 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
		<b>1kHz</b> 0.1mA to 1mA 1 to 10mA 10 to 100mA 100mA to 1A 1 to 10A	0.36 uAto 1.36uA 1.36uA to 7.5 uA 7.5uA to 72.51uA 72.51uA to 715.2 uA 715.2 uAto 14.16mA	Using Fluke 5522A Multifunction Calibrator by Direct Method
		<b>5 kHz</b> 10 to 100mA 100mA to 1A 1 to 10A	12.93uA to 201.8 uA 201.8 uAto 8.12mA 8.12 mA to 349.2 mA	Using Fluke 5522A Multifunction Calibrator by Direct Method
5.	DC Resistance	0 to 10 $\Omega$ 10 to 100 $\Omega$ 100 to 1k $\Omega$ 1k to 10k $\Omega$ 10 k to 100k $\Omega$ 100k to 1M $\Omega$ 1M to 100 M $\Omega$	11.61 m $\Omega$ to 12.03 m $\Omega$ 12.03 m $\Omega$ to 0.206 m $\Omega$ 0.206 m $\Omega$ to 55.7m $\Omega$ 55.7 m $\Omega$ to 0.44 $\Omega$ 0.44 $\Omega$ to 3.64 $\Omega$ 3.64 $\Omega$ to 497.7 $\Omega$ 497.7 $\Omega$ to 65.93k $\Omega$	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

Abhinav Thakur

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
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

Abhinav Thakur  
Convener

Avijit Das  
Program Director



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<b><u>MECHANICAL CALIBRATION</u></b>				
<b>I.</b>	<b>PRESSURE INDICATING DEVICES</b>			
1.	Pressure-Hydraulic <sup>s</sup> (Dial, Digital Pressure Gauges/ Indicators )	4kg/cm <sup>2</sup> to 35 kg/cm <sup>2</sup> (3.92 bar to 34.3 bar)  35kg/cm <sup>2</sup> to 700 kg/cm <sup>2</sup> 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 <sup>s</sup> (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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<b><u>THERMAL CALIBRATION</u></b>				
1.	<b>TEMPERATURE</b>			
1.	RTD's and Thermocouples <sup>§</sup>	33°C to 600°C	0.3°C	Using RTD Pt-100, Thermocouple Type S, 61/2 Digital Multimeter and Dry well (CTC-650B) by Comparison Method
2.	Thermocouples <sup>§</sup>	600°C to 1000°C 1000°C to 1200°C	1.8°C 2.8°C	Using Thermocouple Type S, 61/2 Digital Multimeter and Dry well (CTC-1200A) by Comparison Method
3.	Oven and Furnace <sup>#</sup>	30°C to 125°C	1.8°C	Using RTD Pt-100 and 61/2 Digital Multimeter by Comparison Method (Single Point Calibration)

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

<sup>§</sup> Only in Permanent Laboratory

\* Only for Site Calibration

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

<sup>o</sup> 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.

Abhinav Thakur

Avijit Das