

Laboratory **Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16, First Floor, Rama Vihar, Delhi**

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

Certificate Number **CC-2450** Page **1 of 7**

Validity **15.11.2017 to 14.11.2019** Last Amended on **-**

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|---|--------------------------------|---|---|---|
| <u>ELECTRO-TECHNICAL CALIBRATION</u> | | | | |
| 1. | SOURCE | | | |
| 1. | DC Voltage [#] | 1 mV to 300 mV 300 mV to 30 V 30 V to 300 V 300 V to 1000 V | 1.18 % to 0.02 % 0.02 % to 0.015 % 0.015 % to 0.015 % 0.015 % to 0.016 % | Using Multifunction Calibrator 5080A By Direct Method |
| 2. | DC Current [#] | 10 μ A to 3 mA 3 mA to 300 mA 300 mA to 1 A 1 A to 20 A | 1.24 % to 0.10 % 0.10 % to 0.07 % 0.07 % to 0.04 % 0.04 % to 0.6 % | Using Multifunction Calibrator 5080A By Direct Method |
| | DC High Current [#] | 20 A to 1000 A | 0.6 % to 0.65 % | Using Current Coil by Direct Method |
| 3. | AC Voltage [#] | 50 Hz 10 mV to 300 mV 300 mV to 30 V 30 V to 300 V 300 V to 1000 V | 1.08 % to 0.58 % 0.58 % to 0.31 % 0.31 % to 0.17 % 0.17 % to 0.18 % | Using Multifunction Calibrator 5080A By Direct Method |
| 4. | AC Current [#] | 50 Hz 30 μ A to 300 μ A 300 μ A to 300 mA 300 mA to 1 A | 3.18 % to 0.6 % 0.6 % to 0.5 % 0.5 % to 0.4 % | Using Multifunction Calibrator 5080A By Direct Method |
| | AC High Current [#] | 1 A to 20 A 20 A to 1000 A | 0.4 % to 0.73 % 0.73 % to 1.0 % | Using Current Coil By Direct Method |
| 5. | Resistance [#] | 1 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω | 1.24 % 0.64 % 0.19 % 0.12 % 0.047 % | Using Multifunction Calibrator 5080A by Direct Measurement By Direct Method |

Vishal Shukla
Convenor

Avijit Das
Program Director

Laboratory Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16,
First Floor, Rama Vihar, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2450 **Page** 2 of 7

Validity 15.11.2017 to 14.11.2019 **Last Amended on** -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|-----|--|--|--|---|
| | | 190 Ω 1 K Ω 1.9 K Ω 10 K Ω 19 K Ω 100 K Ω 190 K Ω 1 M Ω 1.9 M Ω 10 M Ω 19 M Ω 100 M Ω 190 M Ω | 0.05 % 0.031 % 0.036 % 0.031 % 0.035 % 0.047 % 0.054 % 0.047 % 0.056 % 0.12 % 0.17 % 0.59 % 1.16 % | |
| 6. | DC Power [#] | 10 V to 1000 V 0.1 A to 20 A 1 W to 20 KW | 1.13 % to 0.78 % | Using Multifunction Calibrator 5080A By Direct Method |
| 7. | AC Power [#] Cos ϕ =0.5lag unity- 0.5lead (1P 2W) | 50 Hz 15 V to 600 V 0.1 A to 20 A 1.5 W to 12 kW | 0.6 % to 1.21 % | Using Multifunction Calibrator 5080A By Direct Method |
| 8. | Power Factor [#] | 50 Hz 230 V, 5 A \pm 0.2pF to 1.0pF | 0.006 pF | Using Multifunction Calibrator 5080A By Direct Method |
| 9. | Frequency [#] | 5 V 45 Hz to 1 KHz | 0.13 % to 0.01 % | Using Multifunction Calibrator 5080A By Direct Method |
| 10. | Resistance [#] | 0.1m Ω , 1m Ω , 10m Ω , 100m Ω , 1 Ω , 10 Ω , 100 Ω , 1k Ω , 10k Ω 2M Ω , 3M Ω , 5M Ω , 10M Ω , 20M Ω , 50M Ω , | 1.5 % to 0.6 % 4.62 % to 2.54 % | Using Resistance Box By Direct Method |

Vishal Shukla
Convenor

Avijit Das
Program Director

Laboratory **Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16, First Floor, Rama Vihar, Delhi**

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

Certificate Number **CC-2450** **Page** **3 of 7**

Validity **15.11.2017 to 14.11.2019** **Last Amended on** -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (±) | Remarks |
|------------|---|---|---|--|
| | | 100MΩ, 200MΩ, 2GΩ 2GΩ, 10GΩ, 20GΩ, 50GΩ, 200GΩ | 4.7 % to 4.47 % | |
| 11. | Capacitance [#] | 1 kHz 100pf to 10μF | 1.4 % to 1.22 % | Using Standard Capacitance Box By Direct Method |
| 12. | Inductance [#] | 1 kHz 0.1 mH to 10 H | 4.25 % to 1.27 % | Using Standard Inductance Box By Direct Method |
| 13. | Temperature Simulation [#] K Type J Type B Type E Type N Type R Type S Type T Type RTD Type | 0 to 1350 °C (-) 200 °C to 1050 °C 450 °C to 1800 °C (-) 200 °C to 1000 °C 0 to 1300 °C 0 to 1750 °C 0 to 1750 °C (-) 200 °C to 390 °C (-) 200 °C to 850 °C | 0.36 °C 0.36 °C 0.73 °C 0.36 °C 0.36 °C 0.58 °C 0.59 °C 0.36 °C 0.36 °C | Using Masibus Multi Process Calibrator By Simulation |
| II. | MEASURE | | | |
| 1. | DC Voltage [#] | 1 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V | 0.43 % to 0.059 % 0.059 % to 0.014 % 0.014 % to 0.015 % 0.015 % to 0.02 % | Using Fluke 8846A 6½ DMM by Direct Method |
| 2. | AC Voltage [#] | 50 Hz 10 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V | 0.5 % to 0.11 % 0.11 % to 0.11 % 0.11 % to 0.13 % 0.13 % to 0.20 % | Using Fluke 8846A 6½ DMM by Direct Method |

Vishal Shukla
Convenor

Avijit Das
Program Director

Laboratory

Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16,
First Floor, Rama Vihar, Delhi

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

CC-2450

Page

4 of 7

Validity

15.11.2017 to 14.11.2019

Last Amended on -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|-----|--------------------------------|--|---|--|
| 3. | DC Current [#] | 10 μ A to 1 mA 1 mA to 200 mA 200 mA to 1 A 1 A to 10 A | 0.115 % to 0.067 % 0.067 % to 0.09 % 0.09 % to 0.07 % 0.07 % to 0.08 % | Using Fluke 8846A 6½ DMM by Direct Method |
| 4. | AC Current [#] | 50 Hz 50 μ A to 100 mA 100 mA to 1 A 1 A to 10 A | 0.4 % to 0.17 % 0.17 % to 0.17 % 0.17 % to 0.27 % | Using Fluke 8846A 6½ DMM by Direct Method |
| 5. | Resistance [#] | 10 Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 1000 M Ω | 0.71 % to 0.12 % 0.12 % to 0.3 % 0.6 % to 0.6 % 0.6 % to 1.4 % | Using Fluke 8846A 6½ DMM by Direct Method |
| 6. | Frequency [#] | 5 V 10 Hz to 1 MHz | 0.03 % to 0.01 % | Using Fluke 8846A 6½ DMM by Direct Method |
| 7. | Digital Timer [#] | 10 s to 60 min | 0.78 sec to 2.39 sec | Using Digital Timer by Comparison method |
| 8. | DC High Voltage [#] | 1 kV to 10 kV | 11.5 % | Using High Voltage Probe with DMM by Comparison/Direct Method |
| 9. | Capacitance [#] | 1 kHz 1 nF to 100 μ F | 0.6 % to 0.5 % | Using APLAB LCR Meter by Direct Method |
| 10. | Inductance [#] | 1 kHz 1 mH to 10 H | 0.8 % to 0.6 % | Using APLAB LCR Meter by Direct Method |

Vishal Shukla
Convenor

Avijit Das
Program Director

Laboratory Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16,
 First Floor, Rama Vihar, Delhi
Accreditation Standard ISO/IEC 17025: 2005
Certificate Number CC-2450 **Page** 5 of 7
Validity 15.11.2017 to 14.11.2019 **Last Amended on** -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|--------------------------------------|--|-----------------------------|---|---|
| <u>MECHANICAL CALIBRATION</u> | | | | |
| 1. | PRESSURE INDICATING DEVICES | | | |
| 1. | Pneumatic Pressure Pressure Gauges, Pressure Transmitters/ Transducers, Pressure Switch , Pressure Calibrator [#] | 0 to 40 Bar | 0.03 Bar | Using Digital Pressure Gauge by comparison Method as per DKD R6-1 |
| 2. | Hydraulic Pressure Pressure Gauges, Pressure Transmitters/ Transducers, Pressure Switches , Pressure Calibrator [#] | 0 to 70 Bar 0 to 700 Bar | 0.08 Bar 0.25 Bar | Using Digital Pressure Gauge by comparison Method as per DKD R6-1 |
| 3. | Vacuum Pressure Pressure Gauge, Pressure Transmitters/ Transducers, Pressure Switches Pressure Calibrator [#] | (-) 0.95 Bar to 0 Bar | 0.007 Bar | Using Digital Pressure Gauge by comparison Method as per DKD R6-1 |

Vishal Shukla
 Convenor

Avijit Das
 Program Director

Laboratory Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16,
First Floor, Rama Vihar, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2450 **Page** 6 of 7

Validity 15.11.2017 to 14.11.2019 **Last Amended on** -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|-----------------------------------|---|--|---|---|
| <u>THERMAL CALIBRATION</u> | | | | |
| 1. | TEMPERATURE | | | |
| 1. | Liquid in Glass Thermometers, Temperature Gauges [#] | (-) 30 °C to 100°C | 0.31 °C | Using PRT and Precision Scanner Using Low Temperature Bath By Comparison Calibration |
| 2. | RTD/ Thermocouples with or without Temperature Indicators, Data Logger/ Scanner, Temperature Transmitters With Sensors, Digital Thermometers [#] | (-) 30 °C to 100 °C 100 °C to 650 °C 650 °C to 1000 °C | 0.17 °C 0.65 °C 2.3 °C | Using PRT and Precision Scanner, R –Type T/C with Precision Scanner using Low Temperature Bath, Dry Calibrator, Furnace By Comparison Calibration |
| 3. | Temperature & Humidity Meter with Inbuilt/ External Sensors, Thermal Hygrometers [§] | 10 °C to 50 °C @~50 % RH 30 % RH to 90 % RH @~25 °C | 0.94 °C 2.6 % RH | Using Temperature & Humidity Meter with Sensors, Temp. / Humidity Generator Cum Chamber By Comparison Calibration |
| 4. | Temperature Indicator with Sensor of Deep Freezer, Chamber, Oven, Liquid Baths, Dry Block, Incubator, Furnace [*] | (-) 30 °C to 250 °C 250 °C to 650 °C 650 °C to 1000 °C | 0.9 °C 2.1 °C 2.3 °C | Using PRT and Precision Scanner, R-Type Thermocouple with Precision Scanner By Single Position Calibration (At Measuring Location in DUC) |

Vishal Shukla
Convenor

Avijit Das
Program Director

Laboratory Sadhana Calibration, Plot No. 5, R-Block, Gali No. 4, Kh. No. 38/16,
 First Floor, Rama Vihar, Delhi
Accreditation Standard ISO/IEC 17025: 2005
Certificate Number CC-2450 **Page** 7 of 7
Validity 15.11.2017 to 14.11.2019 **Last Amended on** -

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|-----|--|---------------------------|---|---|
| 5. | Humidity Indicator with Sensor of Environmental Chamber, Humidity Chamber* | 30 % RH to 90 % RH @~25°C | 2.2 % RH | Humidity Indicator with Sensors By Single position calibration (At measuring location in DUC) |

* 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.

Vishal Shukla
Convenor

Avijit Das
Program Director