



# National Accreditation Board for Testing and Calibration Laboratories

## SCOPE OF ACCREDITATION

**Laboratory Name :** INDIAN INSTITUTE OF TESTING AND CALIBRATION LAB, 195/89, RHB, PRATAP NAGAR, JAIPUR, RAJASTHAN, INDIA

**Accreditation Standard** ISO/IEC 17025:2017

**Certificate Number** CC-3544 **Page No** 1 of 31

**Validity** 11/04/2023 to 10/04/2025 **Last Amended on** 26/04/2023

| S.No               | Discipline / Group  | Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument | Calibration or Measurement Method or procedure                   | Measurement range and additional parameters where applicable(Range and Frequency) | * Calibration and Measurement Capability(CMC)(±) |
|--------------------|---|---|--|---|--|
| Permanent Facility |   |   |  |   |  |
| 1                  | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50Hz   | Using 6 ½ DMM By Direct Method                                   | 100 mA to 10 A  | 0.2 % to 0.3 %                                   |
| 2                  | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 50 Hz  | Using 6 ½ DMM By Direct Method                                   | 100 mV to 1000 V  | 0.15 % to 0.10 %                                 |
| 3                  | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)  | 1 Phase Active Power (15 to 300 V, 100mA to 20A, 0.1 PF to UPF) @ 50 Hz   | Using Multi product calibrator By Direct Method                  | 2.4 W to 9600 W   | 0.4 % to 0.3 %                                   |
| 4                  | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)  | AC Current @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 1 mA to 20 A  | 0.15 % to 0.2 %                                  |
| 5                  | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)  | AC Current @ 50 Hz  | Using Multiproduct Calibrator with Current Coil By Direct Method | 20 A to 1000 A  | 2.3 % to 1.5 %                                   |



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| 6    | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz   | Using Multiproduct Calibrator By Direct Method | 33 µA to 1 mA   | 0.56 % to 0.15 %                                 |
| 7    | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz   | Using Multiproduct Calibrator By Direct Method | 10 mV to 100 mV   | 0.41 % to 0.06 %                                 |
| 8    | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz   | Using Multiproduct Calibrator By Direct Method | 100 mV to 1000 V  | 0.06 % to 0.1 %                                  |
| 9    | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz   | Using Multiproduct Calibrator By Direct Method | 3 mV to 10 mV   | 0.87 % to 0.41 %                                 |
| 10   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Capacitance at 1 kHz   | Using Multiproduct Calibrator 5502A            | 220 pF to 100 µF  | 5.72 % to 0.63 %                                 |
| 11   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Power Factor   | Using Multiproduct Calibrator By Direct Method | 0.087 PF to 1 PF  | 0.003PF  |



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| 12   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Power Factor   | Using Multiproduct Calibrator By Direct Method        | -0.087 PF to 1.0 PF   | 0.003PF  |
| 13   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | Capacitance  | Using 6 ½ DMM By Direct Method                        | 1 nF to 100 µF  | 5.72 % to 1.73 %                                 |
| 14   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Current   | Using 6 ½ DMM By Direct Method                        | 100 mA to 10 A  | 0.1 % to 0.2 %                                   |
| 15   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Current   | Using 6 ½ DMM By Direct Method                        | 20 µA to 100 mA   | 0.25 % to 0.10 %                                 |
| 16   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Resistance (2 Wire)   | Using 6 ½ DMM By Direct Method                        | 100 Mohm to 1 Gohm  | 0.92 % to 2.3 %                                  |
| 17   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Resistance (4 Wire)   | Using Std. Resistance Direct / VI Method 6 ½ DMM, MPC | 0.1 mohm  | 0.3%   |



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| 18   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 1 mohm  | 0.2%   |
| 19   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 1 ohm   | 0.2%   |
| 20   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using 6 ½ DMM By Direct Method                       | 1 ohm to 10 ohm   | 0.35 % to 0.05 %                                 |
| 21   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 10 mohm   | 0.2%   |
| 22   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using 6 ½ DMM By Direct Method                       | 10 ohm to 100 ohm   | 0.05 % to 0.02 %                                 |
| 23   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 100 mohm  | 0.2%   |



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| 24   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4Wire/2 Wire)  | Using 6 ½ DMM By Direct Method                 | 100 ohm to 100 Mohm   | 0.02 % to 0.92 %                                 |
| 25   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage  | Using 6 ½ DMM By Direct Method                 | 1 mV to 10 mV   | 0.5%   |
| 26   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage  | Using , 6 ½ DMM By Direct Method               | 10 mV to 100 mV   | 0.05 % to 0.01 %                                 |
| 27   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage  | Using 6 ½ DMM By Direct Method                 | 100 mV to 1000 V  | 0.01%  |
| 28   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator By Direct Method | 1 A to 20 A   | 0.1 % to 0.2 %                                   |
| 29   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator By Direct Method | 190 µA to 1 A   | 0.05 % to 0.1 %                                  |



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| 30   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current  | Using Multiproduct Calibrator By Direct Method                   | 20 $\mu$ A to 190 $\mu$ A   | 0.15 % to 0.05 %                                 |
| 31   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current  | Using Multiproduct Calibrator With Current Coil By Direct Method | 20 A to 1000 A  | 1.9 % to 1.1 %                                   |
| 32   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Power (10 V to 200 V and 1 to 5A)  | Using Multiproduct Calibrator By Direct Method                   | 10 W to 1 kW  | 0.58%  |
| 33   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance   | Using Standard mega Ohm Box By Direct Method                     | 2 Mohm to 200 Gohm  | 3.5 % to 4.0 %                                   |
| 34   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 2 Wire)   | Using Multiproduct Calibrator By Direct Method                   | 1 Mohm to 10 Mohm   | 0.02 % to 0.07 %                                 |
| 35   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 2 Wire)   | Using Multiproduct Calibrator By Direct Method                   | 10 Mohm to 1000 Mohm  | 0.07 % to 1.8 %                                  |



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| 36   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Standard Resistance Box By Direct Method | 1 kohm  | 0.23%  |
| 37   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Multiproduct Calibrator By Direct Method | 1 ohm to 10 ohm   | 0.13 % to 0.03 %                                 |
| 38   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Standard Resistance Box                  | 100 ohm   | 0.23%  |
| 39   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Standard Resistance Box                  | 10 kohm   | 0.23%  |
| 40   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Standard Resistance Box Direct Method    | 10 ohm  | 0.23%  |
| 41   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Multiproduct Calibrator By Direct Method | 10 ohm to 100 ohm   | 0.03 % to 0.01 %                                 |



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| 42   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 0.1 mohm  | 0.8%   |
| 43   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 1 mohm  | 0.73%  |
| 44   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 1 ohm   | 0.23%  |
| 45   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 10 mohm   | 0.2%   |
| 46   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 100 mohm  | 0.23%  |
| 47   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4wire/ 2 Wire)   | Using Multiproduct Calibrator By Direct Method | 100 ohm to 1 Mohm   | 0.01 % to 0.02 %                                 |





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| 48   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)         | DC Voltage  | Using Multiproduct Calibrator By Direct Method | 1 mV to 10 mV   | 0.4 % to 0.04 %                                  |
| 49   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)         | DC Voltage  | Using Multiproduct Calibrator By Direct Method | 10 mV to 330 mV   | 0.04 % to 0.02 %                                 |
| 50   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)         | DC Voltage  | Using Multiproduct Calibrator By Direct Method | 330 mV to 1000 V  | 0.02 % to 0.01 %                                 |
| 51   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | J-Type Thermocouple   | Universal Calibrator MPC By Direct Method      | -100 °C to 1200 °C  | 0.3°C  |
| 52   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | RTD- Type   | Universal Calibrator/MPC By Direct Method      | -200 °C to 800 °C   | 0.29°C   |



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| 53   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) K- Type                                      | Universal Calibrator/ MPC By Direct Method     | -60 °C to 1260 °C   | 0.5 °C   |
| 54   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) N- Type                                      | Universal Calibrator/ MPC By Direct Method     | 0 °C to 1300 °C   | 0.3 °C   |
| 55   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) R- Type                                      | Universal Calibrator/MPC By Direct Method      | 150 °C to 1700 °C   | 0.7°C  |
| 56   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) S- Type                                      | Universal Calibrator/MPC By Direct Method      | 170 °C to 1700 °C   | 0.6°C  |
| 57   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)      | Time  | Using Digital Time Calibrator                  | 6 s to 86400 s  | 49.15s   |



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| 58   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency   | Using Multiproduct Calibrator By Direct Method                  | 1 kHz to 1000 kHz   | 0.001 % to 0.002 %                               |
| 59   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency   | Using Multiproduct Calibrator By Direct Method                  | 1 MHz to 2 MHz  | 0.002 % to 0.005 %                               |
| 60   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency   | Using Multiproduct Calibrator By Direct Method                  | 10 Hz to 45 Hz  | 0.01 % to 0.003 %                                |
| 61   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency   | Using Multiproduct Calibrator By Direct Method                  | 45 Hz to 1000 Hz  | 0.003 % to 0.001 %                               |
| 62   | MECHANICAL-ACCELERATION AND SPEED           | Tachometer (Contact Type)   | Tachometer Calibrator / Digital Tachometer by Comparison Method | 10 RPM to 100 RPM   | 7%   |
| 63   | MECHANICAL-ACCELERATION AND SPEED           | Tachometer (Contact Type)   | Tachometer Calibrator / Digital Tachometer by Comparison Method | 100 RPM to 6000 RPM   | 0.68%  |



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| 64   | MECHANICAL-ACCELERATION AND SPEED                             | Tachometer (Non Contact Type)   | Tachometer Calibrator/ Dig Tachometer by Comparison Method | 10 RPM to 60 RPM  | 6.7%   |
| 65   | MECHANICAL-ACCELERATION AND SPEED                             | Tachometer (Non Contact Type)   | Tachometer Calibrator/ Dig Tachometer by comparison method | 60 RPM to 90000 RPM   | 7.5 %  |
| 66   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier/Dial/Dig.) L.C.: 0.01 mm   | Using Caliper Checker by Comparison Method                 | 0 to 150 mm   | 12µm   |
| 67   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier/Dial/Dig.) L.C.: 0.01mm  | Using Caliper Checker by Comparison Method                 | 0 to 300 mm   | 12µm   |
| 68   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier/Dial/Dig.) L.C.: 0.01mm  | Using Caliper Checker by Comparison Method                 | 0 to 600 mm   | 17.44µm  |



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| 69   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Cube mould  | Using Dig. Vernier Caliper by Comparison Method     | 0 to 150 mm   | 24.45µm  |
| 70   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Depth Gauge (Dig./Dial/Vernier L.C.: 0.01mm)  | Slip Gauge Set/Caliper Checker by Comparison Method | 0 to 300 mm   | 13µm   |
| 71   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Thickness Gauge L.C.: 0.050mm  | Slip Gauge Set                                      | 0 to 10 mm  | 28.9µm   |
| 72   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dig/analogue Height gauge, L C 0.02mm   | Using Caliper Checker by Comparison Method          | 0 to 450 mm   | 13.23µm  |
| 73   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer Dig. / Mech. L.C.: 0.001mm  | Using Gauge Block Set by Comparison Method          | 25 mm to 75 mm  | 2.0µm  |



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|------|---|---|--|---|--|
| 74   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer Dig. / Mech. L.C.: 0.001mm  | Using Gauge Block Set by Comparison Method               | 0 to 25 mm  | 2.0µm  |
| 75   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Inside Micrometer   | Using Caliper Checker with attachment. Comparison Method | 0 to 300 mm   | 0.2mm  |
| 76   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Measuring Scale L.C.: 1mm/0.5mm   | Measuring Scale & Tape Calibrator by Comparison Method   | 0 to 1000 mm  | 122µm  |
| 77   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Measuring Tape/Pi Tape L.C.: 1mm and 0.1 mm   | Measuring Scale & Tape Calibrator by Comparison Method   | 0 to 30000 mm   | 122* $\sqrt{\text{length of tape in metre}}$     |
| 78   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieves   | Dig. Vernier Caliper by Comparison Method                | 4 mm to 150 mm  | 18µm   |



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|------|---|--|--|---|--|
| 79   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Ultrasonic Thickness Gauge   | Using Slip Gauge Set Comparison Method   | 1 mm to 100 mm  | 9.7µm  |
| 80   | MECHANICAL-PRESSURE INDICATING DEVICES                        | Pressure Hydraulic: Dial and Digital Pressure Gauge, Pressure Transmitters/Transducer  | Using Digital Pressure Indicator with Hydraulic Pump and 6 ½ DMM By Comparison Method based on DKD-R-6-1 | 0 to 700 bar  | 0.57bar  |
| 81   | MECHANICAL-PRESSURE INDICATING DEVICES                        | Pressure Pneumatic: Digital/Dial Pressure Gauge, Pressure/Vacuum Transmitters/Transducer   | Using Digital Pressure Calibrator and 6 ½ DMM By Comparison method based on DKD-R-6-1                    | -0.90 bar to 0  | 0.009bar   |
| 82   | THERMAL-SPECIFIC HEAT & HUMIDITY                              | Digital & Analog Thermo Hygrometer, RH Sensor with indicator, RH Transmitters/Controller /Indicator with sensor, RH Recorder/Data Logger with sensor, Dry and wet Bulb Thermometer | Using Standard RH Sensor with indicator and Temp & Humidity Generator by Comparison Method               | 10 % rh to 95 % rh @ 25 °C  | 1% rh  |



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|------|----------------------------------|--|---|---|--|
| 83   | THERMAL-SPECIFIC HEAT & HUMIDITY | Digital & Analog Thermo Hygrometer, RH Sensor with indicator, RH Transmitters/Controller /Indicator with sensor, RH Recorder/Data Logger with sensor, Dry and wet Bulb Thermometer | Using Standard temperature Sensor with indicator and Temp & Humidity Generator by Comparison Method | 5 °C to 60 °C @50 % rh  | 0.45°C   |
| 84   | THERMAL-TEMPERATURE              | RTD's, Thermocouples with or without controller/indicator, Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data logger /Recorder with sensor                      | Using RTD with Indicator, 6 ½ DMM, dry block furnace by comparison method                           | -25 °C to 200 °C  | 0.35°C   |





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|------|---------------------|--|---|---|--|
| 85   | THERMAL-TEMPERATURE | Thermocouples with or without controller/indicator, Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data logger /Recorder with sensor | Using R-Type Thermocouple With Indicator, 6 ½ DMM, Dry Block Furnace by Comparison Method | 200 °C to 650 °C  | 2.26°C   |



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|---------------|---|---|---|---|--|
| Site Facility |   |   |   |   |  |
| 1             | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 1 and 3 Phase Energy at PF ±0.5 to 1, Frequency 50Hz, Voltage 240 V, Current 1 A to 120 A                                   | Using 3ø Energy Logger By Comparison Method     | 25 Wh to 24 kWh   | 0.7%   |
| 2             | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50Hz   | Using 6 ½ DMM By Direct Method                  | 100 mA to 10 A  | 0.2 % to 0.3 %                                   |
| 3             | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50 Hz  | Using HV Probe with DMM By Direct Method        | 1 kV to 28 kV   | 5.8%   |
| 4             | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 50 Hz  | Using 6 ½ DMM By Direct Method                  | 100 mV to 1000 V  | 0.15 % to 0.10 %                                 |
| 5             | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)  | 1 Phase Active Power (15 to 300 V, 100mA to 20A, 0.1 PF to UPF) @ 50 Hz   | Using Multi product calibrator By Direct Method | 2.4 W to 9600 W   | 0.4 % to 0.3 %                                   |



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|------|--|---|--|---|--|
| 6    | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 1 mA to 20 A  | 0.15 % to 0.2 %                                  |
| 7    | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz  | Using Multiproduct Calibrator with Current Coil By Direct Method | 20 A to 1000 A  | 2.3 % to 1.5 %                                   |
| 8    | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 33 µA to 1 mA   | 0.56 % to 0.15 %                                 |
| 9    | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 10 mV to 100 mV   | 0.41 % to 0.06 %                                 |
| 10   | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 100 mV to 1000 V  | 0.06 % to 0.1 %                                  |
| 11   | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz  | Using Multiproduct Calibrator By Direct Method                   | 3 mV to 10 mV   | 0.87 % to 0.41 %                                 |



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|------|---|--|--|---|--|
| 12   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Capacitance at 1 kHz   | Using Multiproduct Calibrator 5502A            | 220 pF to 100 μF  | 5.72 % to 0.63 %                                 |
| 13   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Power Factor   | Using Multiproduct Calibrator By Direct Method | 0.087 PF to 1 PF  | 0.003PF  |
| 14   | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Power Factor   | Using Multiproduct Calibrator By Direct Method | -0.087 PF to 1.0 PF   | 0.003PF  |
| 15   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | Capacitance  | Using 6 ½ DMM By Direct Method                 | 1 nF to 100 μF  | 5.72 % to 1.73 %                                 |
| 16   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Current   | Using 6 ½ DMM By Direct Method                 | 100 mA to 10 A  | 0.1 % to 0.2 %                                   |
| 17   | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)               | DC Current   | Using 6 ½ DMM By Direct Method                 | 20 μA to 100 mA   | 0.25 % to 0.10 %                                 |



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| 18   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage   | Using HV Probe with DMM By Direct Method             | 1 kV to 30 kV   | 3.6%   |
| 19   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (2 Wire)  | Using 6 ½ DMM By Direct Method                       | 100 Mohm to 1 Gohm  | 0.92 % to 2.3 %                                  |
| 20   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM,MPC | 0.1 mohm  | 0.3%   |
| 21   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 1 mohm  | 0.2%   |
| 22   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 1 ohm   | 0.2%   |
| 23   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)  | Using 6 ½ DMM By Direct Method                       | 1 ohm to 10 ohm   | 0.35 % to 0.05 %                                 |



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| 24   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)   | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 10 mohm   | 0.2%   |
| 25   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)   | Using 6 ½ DMM By Direct Method                       | 10 ohm to 100 ohm   | 0.05 % to 0.02 %                                 |
| 26   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 Wire)   | Using Std. Resistance Direct / VI Method 6 ½ DMM/MPC | 100 mohm  | 0.2%   |
| 27   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4Wire/2 Wire)   | Using 6 ½ DMM By Direct Method                       | 100 ohm to 100 Mohm   | 0.02 % to 0.92 %                                 |
| 28   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage   | Using 6 ½ DMM By Direct Method                       | 1 mV to 10 mV   | 0.5%   |
| 29   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage   | Using , 6 ½ DMM By Direct Method                     | 10 mV to 100 mV   | 0.05 % to 0.01 %                                 |



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| 30   | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage  | Using 6 ½ DMM By Direct Method                                   | 100 mV to 1000 V  | 0.01%  |
| 31   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator By Direct Method                   | 1 A to 20 A   | 0.1 % to 0.2 %                                   |
| 32   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator By Direct Method                   | 190 µA to 1 A   | 0.05 % to 0.1 %                                  |
| 33   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator By Direct Method                   | 20 µA to 190 µA   | 0.15 % to 0.05 %                                 |
| 34   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Current  | Using Multiproduct Calibrator With Current Coil By Direct Method | 20 A to 1000 A  | 1.9 % to 1.1 %                                   |
| 35   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source)  | DC Power (10 V to 200 V and 1 to 5A)  | Using Multiproduct Calibrator By Direct Method                   | 10 W to 1 kW  | 0.58%  |



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|------|---|---|--|---|--|
| 36   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance   | Using Standard mega Ohm Box By Direct Method   | 2 Mohm to 200 Gohm  | 3.5 % to 4.0 %                                   |
| 37   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 2 Wire)   | Using Multiproduct Calibrator By Direct Method | 1 Mohm to 10 Mohm   | 0.02 % to 0.07 %                                 |
| 38   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 2 Wire)   | Using Multiproduct Calibrator By Direct Method | 10 Mohm to 1000 Mohm  | 0.07 % to 1.8 %                                  |
| 39   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Standard Resistance Box By Direct Method | 1 kohm  | 0.23%  |
| 40   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Multiproduct Calibrator By Direct Method | 1 ohm to 10 ohm   | 0.13 % to 0.03 %                                 |
| 41   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4 Wire)   | Using Standard Resistance Box                  | 100 ohm   | 0.23%  |





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|------|---|---|--|---|--|
| 42   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Standard Resistance Box                  | 10 kohm   | 0.23%  |
| 43   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Standard Resistance Box Direct Method    | 10 ohm  | 0.23%  |
| 44   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance ( 4Wire)  | Using Multiproduct Calibrator By Direct Method | 10 ohm to 100 ohm   | 0.03 % to 0.01 %                                 |
| 45   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 0.1 mohm  | 0.8%   |
| 46   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 1 mohm  | 0.73%  |
| 47   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)  | Using Standard Resistance Box                  | 1 ohm   | 0.23%  |



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| 48   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)   | Using Standard Resistance Box                  | 10 mohm   | 0.2%   |
| 49   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire)   | Using Standard Resistance Box                  | 100 mohm  | 0.23%  |
| 50   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4wire/ 2 Wire)  | Using Multiproduct Calibrator By Direct Method | 100 ohm to 1 Mohm   | 0.01 % to 0.02 %                                 |
| 51   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage   | Using Multiproduct Calibrator By Direct Method | 1 mV to 10 mV   | 0.4 % to 0.04 %                                  |
| 52   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage   | Using Multiproduct Calibrator By Direct Method | 10 mV to 330 mV   | 0.04 % to 0.02 %                                 |
| 53   | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage   | Using Multiproduct Calibrator By Direct Method | 330 mV to 1000 V  | 0.02 % to 0.01 %                                 |



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|------|---|---|--|---|--|
| 54   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | J-Type Thermocouple   | Universal Calibrator MPC By Direct Method      | -100 °C to 1200 °C  | 0.3°C  |
| 55   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | RTD- Type   | Universal Calibrator/MPC By Direct Method      | -200 °C to 800 °C   | 0.29°C   |
| 56   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) K- Type                                      | Universal Calibrator/ MPC By Direct Method     | -60 °C to 1260 °C   | 0.5 °C   |
| 57   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) N- Type                                      | Universal Calibrator/ MPC By Direct Method     | 0 °C to 1300 °C   | 0.3 °C   |
| 58   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) R- Type                                      | Universal Calibrator/MPC By Direct Method      | 150 °C to 1700 °C   | 0.7°C  |



# National Accreditation Board for Testing and Calibration Laboratories

## SCOPE OF ACCREDITATION

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| <b>Laboratory Name :</b>      | INDIAN INSTITUTE OF TESTING AND CALIBRATION LAB, 195/89, RHB, PRATAP NAGAR, JAIPUR, RAJASTHAN, INDIA |                        |            |
| <b>Accreditation Standard</b> | ISO/IEC 17025:2017   |                        |            |
| <b>Certificate Number</b>     | CC-3544  | <b>Page No</b>         | 28 of 31   |
| <b>Validity</b>               | 11/04/2023 to 10/04/2025   | <b>Last Amended on</b> | 26/04/2023 |

| S.No | Discipline / Group                                | Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument | Calibration or Measurement Method or procedure                  | Measurement range and additional parameters where applicable(Range and Frequency) | * Calibration and Measurement Capability(CMC)(±) |
|------|---|---|---|---|--|
| 59   | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Simulation (Indicator / Controller/Recorder/ Data Logger /Scanner) S- Type                                      | Universal Calibrator/MPC By Direct Method                       | 170 °C to 1700 °C   | 0.6°C  |
| 60   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)      | Frequency   | Using, 6 ½ DMM By Direct Method                                 | 45 Hz to 1000 Hz  | 0.012 % to 0.11 %                                |
| 61   | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)      | Time  | Using Digital Time Calibrator                                   | 6 s to 86400 s  | 49.15s   |
| 62   | MECHANICAL-ACCELERATION AND SPEED                 | Tachometer (Contact Type)   | Tachometer Calibrator / Digital Tachometer by Comparison Method | 10 RPM to 100 RPM   | 7%   |
| 63   | MECHANICAL-ACCELERATION AND SPEED                 | Tachometer (Contact Type)   | Tachometer Calibrator / Digital Tachometer by Comparison Method | 100 RPM to 6000 RPM   | 0.68%  |
| 64   | MECHANICAL-ACCELERATION AND SPEED                 | Tachometer (Non Contact Type)   | Tachometer Calibrator/ Dig Tachometer by Comparison Method      | 10 RPM to 60 RPM  | 6.7%   |



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| S.No | Discipline / Group  | Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument        | Calibration or Measurement Method or procedure   | Measurement range and additional parameters where applicable(Range and Frequency) | * Calibration and Measurement Capability(CMC)(±) |
|------|---|--|--|---|--|
| 65   | MECHANICAL-ACCELERATION AND SPEED                             | Tachometer (Non Contact Type)  | Tachometer Calibrator/ Dig Tachometer by comparison method   | 60 RPM to 90000 RPM   | 7.5 %  |
| 66   | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieves  | Dig. Vernier Caliper by Comparison Method  | 4 mm to 150 mm  | 18µm   |
| 67   | MECHANICAL-PRESSURE INDICATING DEVICES                        | Pressure Hydraulic: Dial and Digital Pressure Gauge, Pressure Transmitters/Transducer  | Using Digital Pressure Indicator with Hydraulic Pump and 6 ½ DMM By Comparison Method based on DKD-R-6-1 | 0 to 700 bar  | 0.57bar  |
| 68   | MECHANICAL-PRESSURE INDICATING DEVICES                        | Pressure Pneumatic: Digital/Dial Pressure Gauge, Pressure/Vacuum Transmitters/Transducer   | Using Digital Pressure Calibrator and 6 ½ DMM By Comparison method based on DKD-R-6-1                    | -0.90 bar to 0  | 0.009bar   |
| 69   | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE     | Force (Compression) Compression/Universal Testing Machine, Load Testing Machine, Spring Testing Machine, Flexural Testing Machine. | Using Class 1 Force Proving Ring Instruments And Load Cell As Per IS: 1828 (Part-I) 2022                 | 100 N to 200 kN   | 0.5%   |



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| <b>Accreditation Standard</b> | ISO/IEC 17025:2017   |                        |            |
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| S.No | Discipline / Group  | Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument    | Calibration or Measurement Method or procedure   | Measurement range and additional parameters where applicable(Range and Frequency) | * Calibration and Measurement Capability(CMC)(±) |
|------|---|--|--|---|--|
| 70   | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE | Force (Tension) Compression/Universal Testing Machine, Load Testing Machine, Spring Testing Machine, Flexural Testing Machine. | Using Class 1 Force Proving Ring Instruments And Load Cell As Per IS: 1828 (Part-I) 2022   | 100 N to 200 kN   | 0.512%   |
| 71   | MECHANICAL-WEIGHING SCALE AND BALANCE                     | Electronic Weighing Balance (Readability: 0.01 mg), Class I  | Using Standard Weights of E1 Accuracy Class as per OIML R 76-1                             | 1 mg to 200 g   | 0.1mg  |
| 72   | THERMAL-SPECIFIC HEAT & HUMIDITY                          | Humidity Indicator with Sensor of Humidity Calibrator/Generator / Chamber  | Using Standard RH Sensor with Indicator (Single Position Calibration) by Comparison Method | 10 % rh to 95 % rh @ 25 °C  | 1 % rh   |
| 73   | THERMAL-SPECIFIC HEAT & HUMIDITY                          | Temperature Indicator with Sensor of Humidity Chamber/Conditioning Chamber   | Using Standard Thermo hygrometer (Single Position Calibration) by Comparison Method        | 5 °C to 50 °C @ 50 % rh   | 0.39°C   |



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|------|---------------------|---|---|---|--|
| 74   | THERMAL-TEMPERATURE | RTD's, Thermocouples with or without controller/indicator, Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data logger /Recorder with sensor | Using RTD with Indicator, 6 ½ DMM, dry block furnace by comparison method                 | -25 °C to 200 °C  | 0.35°C   |
| 75   | THERMAL-TEMPERATURE | Thermocouples with or without controller/indicator, Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data logger /Recorder with sensor        | Using R-Type Thermocouple With Indicator, 6 ½ DMM, Dry Block Furnace by Comparison Method | 200 °C to 650 °C  | 2.26°C   |

\* CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.