# National Accreditation Board for Testing and Calibration Laboratories

## SCOPE OF ACCREDITATION

**Laboratory Name :** ELECTRONICS REGIONAL TEST LABORATORY(WEST), GOVERNMENT OF INDIA, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, STQC DIRECTORATE, PLOT NO. F-7&8, MIDC AREA, OPP.SEEPZ, ANDHERI(EAST), MUMBAI, MAHARASHTRA, INDIA

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

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|---|---|---|---|---|---|
| Permanent Facility | | | | | |
| 1 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 1 Phase AC Active Energy @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A, 0.1 (Lag/Lead) to UPF | Using Power Energy Standard by Direct Method | 0.03 Wh to 50 kWh | 0.2 % to 0.02 % |
| 2 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 1 Phase AC Active Power @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A, 0.1(Lag/Lead) to UPF) | Using Power Energy Standard by Direct Method | 0.03 W to 50 kW | 0.2 % to 0.02 % |
| 3 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 3 Phase Active Energy @ 40 Hz to 70 Hz) (40 V to 320 V,10 mA to 20 A, 0.1(Lag/Lead) to UPF) | Using Power Energy Calibrator by by Direct Method | 0.12 Wh to 19.2 kWh | 0.023 % to 0.21 % |
| 4 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 3 Phase Active Energy @ 40 Hz to 70 Hz, (30 V to 500 V, 10 mA to 100 A, 0.1 (Lag/Lead) to UPF) | Using Power Energy Standard by Direct Method | 0.09 Wh to 150 kWh | 0.2 % to 0.02 % |

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| 5 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 3 Phase Active Power @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A, 0.1 (Lag/Lead) to UPF) | Using Power Energy Standard by Direct Method | 0.04 W to 6.4 kW | 0.2 % to 0.027 % |
| 6 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 1 kHz to 5 kHz | Using 8½ DMM, AC Measurement Standard and Standard Resistor by V / I Method | 10 µA to 100 µA | 0.2 % to 0.05 % |
| 7 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 1 kHz to 5 kHz | Using 8½ DMM and Standard Resistor by V / I Method | 100 µA to 100 mA | 0.05 % to 0.03 % |
| 8 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 1 kHz to 5 kHz | Using 8½ DMM and Standard Resistor by V / I Method | 100 mA to 20 A | 0.03 % to 0.09 % |
| 9 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 10 Hz to 1 kHz | Using AC Measurement Standard & Std. Resistor by V / I Method) | 10 µA to 100 mA | 0.015 % to 0.025 % |

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| 10 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 10 Hz to 1 kHz | Using 8½ DMM and Standard Resistor by V / I Method | 10 A to 100 A | 0.02 % to 0.05 % |
| 11 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 10 Hz to 1 kHz | Using 8½ DMM and Standard Resistor by V / I Method | 100 mA to 10 A | 0.01 % to 0.02 % |
| 12 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 5 kHz to 10 kHz | Using AC Measurement System & AC Shunts by V / I Method | 1 mA to 2 A | 0.01 % to 0.025 % |
| 13 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 5 kHz to 10 kHz | Using AC Measurement System & AC Shunts by V / I Method | 2 A to 10 A | 0.03 % |
| 14 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50 Hz | Using CT, 8½ DMM and Standard Resistor by Comparison Method | 1 A to 3200 A | 0.2 % |

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| 15 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage @ 50 Hz | Using HV Probe with DMM by Direct Method | 1 kV to 35 kV | 0.5 % |
| 16 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage @ 50 Hz | Using HV Probe with DMM & HV Source by Comparison Method: | 1 kV to 35 kV | 0.6 % |
| 17 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage @ 50 Hz | Using HV Probe with DMM by Direct Method | 35 kV to 50 kV | 0.5 % to 1 % |
| 18 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Resistance @ 1 kHz | Using MFC, Standard Resistor & 8½ DMM by Comparison Method | 0.1 mohm to 100 mohm | 0.02 % to 0.01 % |
| 19 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Resistance @ 1 kHz | Using MFC, Standard Resistor & 8½ by Comparison Method | 1 ohm to 10 kohm | 0.004 % |

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| 20 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Resistance @ 1 kHz | Using MFC, Standard Resistor & 8½ DMM by Comparison Method | 100 mohm to 1 ohm | 0.01 % to 0.004 % |
| 21 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 Hz to 10 kHz | Using AC Measurement System by Direct Method | 1 mV to 100 mV | 0.2 % to 0.015 % |
| 22 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 Hz to 10 kHz | Using AC Measurement System by Direct Method | 10 V to 1000 V | 0.004 % to 0.009 % |
| 23 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 Hz to 10 kHz | Using AC Measurement System by Direct Method | 100 mV to 10 V | 0.015 % to 0.004 % |
| 24 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 kHz to 30 kHz | Using AC Measurement System by Direct Method | 1 mV to 100 mV | 0.16 % to 0.009 % |

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| 25 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 kHz to 30 kHz | Using AC Measurement System by Direct Method | 10 V to 1000 V | 0.005 % to 0.009 % |
| 26 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 kHz to 30 kHz | Using AC Measurement System by Direct Method | 100 mV to 10 V | 0.009 % to 0.005 % |
| 27 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 100 kHz to 1 MHz | Using AC Measurement System by Direct Method | 1 mV to 10 V | 1.4 % to 0.21 % |
| 28 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 30 kHz to 100 kHz | Using AC Measurement System by Direct Method | 1 mV to 100 mV | 0.3 % to 0.0093 % |
| 29 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 30 kHz to 100 kHz | Using AC Measurement System by Direct Method | 10 V to 200 V | 0.005 % to 0.09 % |

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| 30 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 30 kHz to 100 kHz | Using AC Measurement System by Direct Method | 100 mV to 10 V | 0.009 % to 0.005 % |
| 31 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 1 kHz | Using Video Bridge and MTS by Direct Method | 1 µF to 10 mF | 0.01 % to 0.05 % |
| 32 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 1 kHz | Using Capacitance Measuring assembly by Direct Method | 1 pF to 10 pF | 0.02 % to 0.005 % |
| 33 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 1 kHz | Using Capacitance Measuring assembly by Direct Method | 10 pF to 1000 pF | 0.005 % |
| 34 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 1 kHz | Using Capacitance Measuring assembly by Direct Method | 1000 pF to 1 µF | 0.005 % to 0.011 % |

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| 35 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 100 Hz | Using Video Bridge and MTS by Direct Method | 10 mF to 1000 mF | 0.05 % |
| 36 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | CT Phase Angle @ 50 Hz | Using CT Test Bench & Standard CT by Comparison Method | 0 min to 360 min | 3 min |
| 37 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | CT Ratio @ 50 Hz | Using CT Test Bench & Standard CT by Comparison Method | 1 A to 3200 A / 1 A or 5 A | 0.2 % |
| 38 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Inductance @ 1 kHz | Using Video Bridge & Component Analyser by Direct Method | 100 µH to 10 H | 0.052 % to 0.055 % |
| 39 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Phase Angle @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A) | Using Power Energy Standard by Direct Method | (-) 180 ° to (+) 180 ° | 0.006 ° to 0.007 ° |

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| 40 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Power Factor (Lead/Lag) @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A) | Using Power Energy Standard by Direct Method | 0.1 PF to UPF | 0.006 to 0.007 |
| 41 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | PT Phase Angle @ 50 Hz | Using PT Test Bench with Standard PT by Comparison Method | 0 min to 360 min | 3 min |
| 42 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | PT Ratio @ 50 Hz | Using PT Test Bench with Standard PT by Comparison Method | 220V/110V ,63.5V to 33kV/110V, 63.5V | 0.2 % |
| 43 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 1 Phase Active Energy @ 40 to 70 Hz (30 V to 500 V, 10 mA to 100 A, 0.1(Lead/Lag) to UPF) | Using Power Energy Calibrator by Direct Method | 0.03 Wh to 50 kWh | 0.2 % to 0.021 % |
| 44 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 1 Phase Active Power @ 40 to 70 Hz (30 V to 500V, 10 mA to 100 A, 0.1 (Lead/Lag) to UPF) | Using Power Energy Calibrator by Direct Method | 0.03 W to 50 kW | 0.2 % to 0.021 % |

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| 45 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 3 Phase Active Energy @ 40 Hz to 70 Hz (40 V to 300 V, 10 mA to 100 A, 0.1(Lead/Lag) to UPF) | Using Power Energy System by Direct Method | 0.04 Wh to 30 kWh | 0.2 % to 0.027 % |
| 46 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 3 Phase Active Power @ 40 Hz to 70 Hz (40 V to 300 V, 10 mA to 100 A, 0.1 (Lead/Lag) to UPF | Using Power Energy Calibrator by Direct Method | 0.04 W to 30 kW | 0.2 % to 0.027 % |
| 47 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 10 Hz to 1 kHz | Using MFC, AC Measurement Std & Std. Resistor by V / I Method ) | 10 µA to 100 mA | 0.01 % |
| 48 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC, AC Measurement Std & Std. Resistor by V / I Method | 10 µA to 100 µA | 0.2 % to 0.05 % |
| 49 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC, AC Measurement Std and Current shunt by V / I Method | 100 µA to 100 mA | 0.05 % to 0.03 % |

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| 50 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC & Trans-conductance Amplifier by Direct Method | 100 mA to 20 A | 0.03 % to 0.09 % |
| 51 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC CURRENT @ 10 Hz to 1 kHz | Using Trans conductance Amplifier, Std. Resistor & 8½ DMM by V / I Method | 10 A to 100 A | 0.02 % to 0.1 % |
| 52 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 10 Hz to 1 kHz | Using MFC, AC Measurement Std and Std. Resistor by V/I method | 100 mA to 10 A | 0.01 % to 0.03 % |
| 53 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 5 kHz to 10 kHz | Using MFC by Direct Method | 1 mA to 2 A | 0.01 % to 0.057 % |
| 54 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 5 kHz to 10 kHz | Using MFC by Direct Method | 2 A to 10 A | 0.03 % |
| 55 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz | Using MFC with Current coil & CT source by Direct Method | 20 A to 3200 A | 0.3 % |

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| 56 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Resistance @ 1 kHz | Using Standard Resistors by Direct Method | 0.1 mohm to 1 mohm | 0.023 % to 0.017 % |
| 57 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Resistance @ 1 kHz | Using Standard Resistors by Direct Method | 1 ohm to 10 kohm | 0.0008 % to 0.003 % |
| 58 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Resistance @ 1 kHz | Using Standard Resistors by Direct Method | 10 mohm to 100 mohm | 0.012 % to 0.008 % |
| 59 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 Hz to 10 kHz | Using MFC by Direct Method | 1 mV to 100 mV | 0.2 % to 0.015 % |
| 60 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 Hz to 10 kHz | Using MFC by Direct Method | 10 V to 1000 V | 0.004 % to 0.009 % |
| 61 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 Hz to 10 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.015 % to 0.004 % |

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| 62 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 1 mV to 100 mV | 0.16 % to 0.0092 % |
| 63 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 10 V to 1000 V | 0.005 % to 0.009 % |
| 64 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.0092 % to 0.005 % |
| 65 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 100 kHz to 1 MHz | Using MFC by Direct Method | 1 mV to 10 V | 1.3 % to 0.21 % |
| 66 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 1 mV to 100 mV | 0.3 % to 0.0093 % |
| 67 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 10 V to 200 V | 0.005 % to 0.009 % |

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| 68 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.0093 % to 0.005 % |
| 69 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using 4 Terminal std. Capacitor by Direct Method | 1 µF to 10 mF | 0.058 % |
| 70 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Std. Capacitor by Direct Method | 1 pF | 0.042 % |
| 71 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Std. Capacitors by Direct Method | 10 pF to 1000 pF | 0.002 % to 0.001 % |
| 72 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Std. Capacitor by Direct Method | 1000 pF to 1 µF | 0.001 % to 0.011 % |
| 73 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 100 Hz | Using 4 Terminal std. Capacitor by Direct Method | 10 mF to 1000 mF | 0.1 % |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 74 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Inductance @ 1 kHz | Using Std. Inductor by Direct Method | 100 µH to 10 H | 0.052 % |
| 75 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Phase Angle @ 40 to 70 Hz (30 V to 500 V, 10 mA to 100 A) | Using Power & Energy Calibrator by Direct Method | (+) 180° to (-) 180° | 0.017 ° |
| 76 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Power Factor (Lead/Lag) @ 40 Hz to 70 Hz (30 V to 500 V, 10 mA to 100 A) | Using Power Energy Calibrator by Direct Method | 0.1 PF to UPF | 0.013 |
| 77 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 1 A to 20 A | 0.002 % to 0.006 % |
| 78 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 1 nA to 100 µA | 0.003 % to 0.002 % |
| 79 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 100 µA to 1 A | 0.002 % |

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|---|---|---|---|---|---|
| 80 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 100 µA to 100 mA | 0.002 % to 0.001 % |
| 81 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 100 A to 500 A | 0.01 % to 0.04 % |
| 82 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 100 mA to 1 A | 0.001 % to 0.002 % |
| 83 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using Electrometer with Standard Resistor by V / I Method | 100 pA to 1 nA | 0.05 % to 0.003 % |
| 84 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM and Standard Resistor by V / I Method | 20 A to 100 A | 0.006 % to 0.01 % |
| 85 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage | Using HV Probe with DMM by Direct Method | 1 kV to 50 kV | 0.05 % to 0.5 % |

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|---|---|---|---|---|---|
| 86 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using DCC Bridge and Standard Resistor by Direct Method | 0.1 mohm to 100 mohm | 0.001 % |
| 87 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using 8½ DMM, MFC and Standard Resistor by Comparison Method | 1 Gohm to 1 Tohm | 0.001 % to 0.05 % |
| 88 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using 8½ DMM, MFC and Standard Resistor by comparison Method | 1 Mohm to 1 Gohm | 0.0003 % to 0.001 % |
| 89 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using DCC Bridge and Standard Resistor by Direct Method | 1 ohm to 1 Mohm | 0.0003 % |
| 90 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using DCC Bridge & Standard Resistor by Direct Method | 100 mohm to 1 ohm | 0.001 % to 0.0003 % |
| 91 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using Nano voltmeter by Direct Method | 1 mV to 100 mV | 0.007 % to 0.0005 % |

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|---|---|---|---|---|---|
| 92 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using Nano voltmeter by Direct Method | 10 µV to 1 mV | 0.015 % to 0.007 % |
| 93 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 8½ DMM, DC Ref. STD, Ref. Divider with Null Detector by Comparison Method | 100 mV to 1000 V | 0.0005 % to 0.0003 % |
| 94 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 1 A to 20 A | 0.002 % to 0.006 % |
| 95 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 10 µA to 100 µA | 0.003 % to 0.002 % |
| 96 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using DC High Current Source by Direct Method | 100 A to 500 A | 0.01 % to 0.02 % |
| 97 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC with Transconductance amplifier by Direct Method | 20 A to 100 A | 0.006 % to 0.01 % |

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|---|---|---|---|---|---|
| 98 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC with Current Coil by Direct Method | 20 A to 1000 A | 0.2 % |
| 99 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC HIgh Voltage | Using HV Source with HV Divider by Direct Method | 1 kV to 50 kV | 0.05 % to 0.5 % |
| 100 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Power (100 mV to 1000 V, 100 mA to 20 A) | Using MFC by Direct Method | 10 mW to 20 kW | 0.025 % to 0.07 % |
| 101 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor by Direct Method | 0.1 mohm to 100 mohm | 0.001 % |
| 102 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor and Decade Resistance Box by Direct Method | 1 Mohm to 10 Gohm | 0.0005 % to 0.001 % |
| 103 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor by Direct Method | 1 ohm to 1 Mohm | 0.0002 % to 0.0005 % |

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|---|---|---|---|---|---|
| 104 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor by Direct Method | 10 Gohm to 1 Tohm | 0.001 % to 0.2 % |
| 105 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistors by Direct Method | 100 mohm to 1 ohm | 0.0002 % to 0.001 % |
| 106 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 1 mV to 100 mV | 0.002 % to 0.0005 % |
| 107 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 1 V to 10 V | 0.0002 % to 0.0001 % |
| 108 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 10 µV to 1 mV | 0.005 % to 0.002 % |
| 109 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 100 mV to 1000 V | 0.0005 % to 0.0003 % |

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|---|---|---|---|---|---|
| 110 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Amplitude (Vertical Deflection factor) - 50 ohm | Using MFC by Direct Method | 1 mV to 6.5 V | 0.17 % |
| 111 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Amplitude (Vertical Deflection factor) -1 Mohm | Using MFC by Direct Method | 1 mV to 130 V | 0.17 % |
| 112 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Bandwidth | Using MFC & Signal Generator by Direct Method | 10 Hz to 3 GHz | 2 % to 5 % |
| 113 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Time Base | Using MFC by Direct Method | 2 ns to 5 s | 0.0011 % to 0.0003 % |
| 114 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure) | RF Level / Power @ 100 kHz to 3 GHz | Using RF Power Meter with sensor by Direct Method | (-) 50 dBm to 13 dBm | 0.22 dB to 0.28 dB |

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|---|---|---|---|---|---|
| 115 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure) | RF Level / Power @ 3 GHz to 18 GHz | Using RF Power Meter with sensor by Direct method | (-) 50 dBm to 13 dBm | 0.22 dB to 0.26 dB |
| 116 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source) | RF Level / Power @ 10 kHz to 3 GHz | Using Synthesized Signal Generator by Direct Method | (-) 50 dBm to 13 dBm | 0.24 dB to 0.28 dB |
| 117 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source) | RF Level / Power @ 3 GHz to 6 GHz | Using Synthesized Signal Generator by Direct Method | (-) 50 dBm to 13 dBm | 0.24 dB to 0.28 dB |
| 118 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | B - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 1800 °C | 0.04 °C |
| 119 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | C - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 2320 °C | 0.25 °C |

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|---|---|---|---|---|---|
| 120 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | E - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 270 °C to 1000 °C | 0.012 °C |
| 121 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | J - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 210 °C to 1200 °C | 0.013 °C |
| 122 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | K - Type Thermocouple | Using 8 ½ DMM by Direct Method | (-) 270 °C to 1372 °C | 0.03 °C |
| 123 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | L - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 900 °C | 0.04 °C |
| 124 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | N - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 270 °C to 1300 °C | 0.025 °C |
| 125 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | R - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 50 °C to 1768 °C | 0.035 °C |

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|---|---|---|---|---|---|
| 126 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | RTD (PT 385 - 100 ohm) | Using 8½ DMM by Direct Method | (-) 200 °C to 650 °C | 0.01 °C |
| 127 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | RTD (PT 385 - 1000 ohm) | Using 8½ DMM by Direct Method | (-) 200 °C to 650 °C | 0.01 °C |
| 128 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | S - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 50 °C to 1768 °C | 0.043 °C |
| 129 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | T - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 270 °C to 400 °C | 0.038 °C |
| 130 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | U - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 600 °C | 0.03 °C |
| 131 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | B - Type Thermocouple | Using MFC by Direct Method | 0 °C to 1820 °C | 0.07 °C |

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|---|---|---|---|---|---|
| 132 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | C - Type Thermocouple | Using MFC by Direct Method | 0 °C to 2320 °C | 0.09 °C |
| 133 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | E - Type Thermocouple | Using MFC by Direct Method | (-) 270 °C to 1000 °C | 0.11 °C |
| 134 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | J - Type Thermocouple | Using MFC by Direct Method | (-) 210 °C to 1200 °C | 0.08 °C |
| 135 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | K - Type Thermocouple | Using MFC by Direct Method | (-) 270 °C to 1372 °C | 0.06 °C |
| 136 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | L - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 900 °C | 0.02 °C |
| 137 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | N - Type Thermocouple | Using MFC by Direct Method | (-) 270 °C to 1300 °C | 0.06 °C |

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|---|---|---|---|---|---|
| 138 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | R - Type Thermocouple | Using MFC by Direct Method | (-) 50 °C to 1768 °C | 0.2 °C |
| 139 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | RTD (PT 385 - 100 ohm) | Using MFC by Direct Method | (-) 199 °C to 650 °C | 0.03 °C |
| 140 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | RTD (PT 385 - 1000 ohm) | Using MFC by Direct Method | (-) 199 °C to 650 °C | 0.03 °C |
| 141 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | S - Type Thermocouple | Using MFC by Direct Method | (-) 50 °C to 1768 °C | 0.2 °C |
| 142 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | T - Type Thermocouple | Using MFC by Direct Method | (-) 270 °C to 400 °C | 0.09 °C |
| 143 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | U - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 600 °C | 0.02 °C |

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|---|---|---|---|---|---|
| 144 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Frequency | Using Frequency Counter with Rubedium Reference by Direct Method/ | 1 mHz to 18 GHz | 2 E-10 |
| 145 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Time Interval | Using Frequency counter Rubidium Frequency counter Direct Method | 100 ms to 10000 s | 1.64 E-5 to 5 E-8 |
| 146 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Time Period | Using Frequency Counter with Rubidium Reference by Direct Method | 3.3 ns to 1000 s | 2.1 E-10 |
| 147 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency | Using Signal Generator with Rubedium Reference by Direct Method | 1 mHz to 18 GHz | 3 E - 11 |
| 148 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Time | Using Frequency Counter, Rubidium Reference with Signal Generator by Direct Method | 3.3 ns to 1000 s | 7 E - 10 |
| 149 | MECHANICAL-ACCELERATION AND SPEED | Tachometer - (Non Contact) | Using Digital Tachometer & RPM generator by Comparison Method | 1000 rpm to 99900 rpm | 0.13 % |

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|---|---|---|---|---|---|
| 150 | MECHANICAL-ACCELERATION AND SPEED | Tachometer - (Non Contact) | Using Digital Tachometer & RPM generator by Comparison Method | 50 rpm to 1000 rpm | 1.1 % |
| 151 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class I and Coarser (Readability : 0.002 mg) | Using E1 class standard weights as per OIML R 76-1 | 0 to 20 g | 0.03 mg |
| 152 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class I and Coarser (Readability : 0.01 mg) | Using E1 Class standard weights as per OIML R 76-1 | > 20 g to 200 g | 0.14 mg |
| 153 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class II and Coarser (Readability : 0.1 g) | Using E1 & E2 class standard weights as per OIML R 76-1 | > 200 g to 12 kg | 76 mg |
| 154 | MECHANICAL-WEIGHTS | Accuracy Class E2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 2 g | 0.014 mg |

# SCOPE OF ACCREDITATION

**Laboratory Name :** ELECTRONICS REGIONAL TEST LABORATORY(WEST), GOVERNMENT OF INDIA, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, STQC DIRECTORATE, PLOT NO. F-7&8, MIDC AREA, OPP.SEEPZ, ANDHERI(EAST), MUMBAI, MAHARASHTRA, INDIA

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|---|---|---|---|---|---|
| 155 | MECHANICAL-WEIGHTS | Accuracy Class E2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.01 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 200 g | 0.12 mg |
| 156 | MECHANICAL-WEIGHTS | Accuracy Class E2 and Coarser | Using E1 Class standard weights and Balance (Readability : 0.002 mg) by substitution Method based on ABBA cycle as per OIML R 111-1 | 1 g | 0.012 mg |
| 157 | MECHANICAL-WEIGHTS | Accuracy Class E2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.01 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 100 g | 0.12 mg |

# SCOPE OF ACCREDITATION

**Laboratory Name :** ELECTRONICS REGIONAL TEST LABORATORY(WEST), GOVERNMENT OF INDIA, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, STQC DIRECTORATE, PLOT NO. F-7&8, MIDC AREA, OPP.SEEPZ, ANDHERI(EAST), MUMBAI, MAHARASHTRA, INDIA

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|---|---|---|---|---|---|
| 158 | MECHANICAL-WEIGHTS | Accuracy Class E2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg & Coarser) by substitution Method based on ABBA cycles as per OIML R 111-1 | 20 g | 0.03 mg |
| 159 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg & Coarser) by substitution Method based on ABBA cycles as per OIML R 111-1 | 20 g | 0.03 mg |
| 160 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 5 g | 0.024 mg |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 161 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.01 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 50 g | 0.06 mg |
| 162 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 500 mg | 0.01 mg |
| 163 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg & Coarser) by substitution Method based on ABBA cycles as per OIML R 111-1 | 10 g | 0.03 mg |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 164 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 100 mg | 0.006 mg |
| 165 | MECHANICAL-WEIGHTS | Accuracy Class F1 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 200 mg | 0.01 mg |
| 166 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 Class standard weights and Balance (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 2 mg | 0.01 mg |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 167 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 20 mg | 0.01 mg |
| 168 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 Class standard weights and Balance (Readability : 0.002 mg) by substitution Method based on ABBA cycle as per OIML R 111-1 | 1 mg | 0.004 mg |
| 169 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 Class standard weights and Balance (Readability 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 10 mg | 0.004 mg |

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|---|---|---|---|---|---|
| 170 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 5 mg | 0.01 mg |
| 171 | MECHANICAL-WEIGHTS | Accuracy Class F2 and Coarser | Using E1 Class standard weights and Balances (Readability : 0.002 mg) by substitution Method based on ABBA cycles as per OIML R 111-1 | 50 mg | 0.01 mg |
| 172 | MECHANICAL-WEIGHTS | Accuracy Class M2 and Coarser | Using E2 Accuracy Class standard weights and Balances (Readability : 0.1 g) by substitution Method based on ABBA cycles as per OIML R 111-1 | 5 kg | 120 mg |

# SCOPE OF ACCREDITATION

**Laboratory Name :** ELECTRONICS REGIONAL TEST LABORATORY(WEST), GOVERNMENT OF INDIA, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, STQC DIRECTORATE, PLOT NO. F-7&8, MIDC AREA, OPP.SEEPZ, ANDHERI(EAST), MUMBAI, MAHARASHTRA, INDIA

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|---|---|---|---|---|---|
| 173 | MECHANICAL-WEIGHTS | Accuracy Class M2 and Coarser | Using E2 Class standard weights and Balance (Readability : 0.1 g) by substitution Method based on ABBA cycles as per OIML R 111-1 | 10 kg | 120 mg |
| 174 | MECHANICAL-WEIGHTS | Accuracy Class M3 and Coarser | Using E2 Class standard weights and Balance (Readability : 0.1 g) by substitution Method based on ABBA cycles as per OIML R 111-1 | 500 g | 120 mg |
| 175 | MECHANICAL-WEIGHTS | Accuracy Class M3 and Coarser | Using E2 Class standard weights and Balance (Readability :0.1 g) by substitution Method based on ABBA cycles as per OIML R 111-1 | 1 kg | 120 mg |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 176 | MECHANICAL-WEIGHTS | Accuracy Class M3 and Coarser | Using E2 Class standard weights and Balance (Readability :0.1 g) by substitution Method based on ABBA cycles as per OIML R 111-1 | 2 kg | 120 mg |
| 177 | THERMAL-SPECIFIC HEAT & HUMIDITY | RH & Temperature Indicator with Inbuilt or External sensors, Thermo Hygrometer | Using RH & Temperature Indicator with sensor, Chamber by Comparison Method | 20 % rh to 95 % rh @ 25 °C, 40 °C, 55 °C | 0.2 °C |
| 178 | THERMAL-SPECIFIC HEAT & HUMIDITY | RH & Temperature Indicator with Inbuilt or External sensors, Thermo Hygrometer | Using RH & Temperature Indicator with sensor, Chamber by Comparison Method | 20 % rh to 95 % rh @ 25 ºC, 40 ºC, 55 ºC | 1 % rh |
| 179 | THERMAL-TEMPERATURE | Digital Temperature indicator with sensor of Chambers, Baths (Single Position) | Using PRT with DTI by comparison method | 250 °C to 600 °C | 0.1 °C |
| 180 | THERMAL-TEMPERATURE | Digital temperature indicator with Sensor of Chambers, Freezers, Baths (Single Position) | Using PRT with DTI by comparison method | (-) 80 °C to 250 °C | 0.05 °C |
| 181 | THERMAL-TEMPERATURE | Liquid in glass thermometer | Using PRT with DTI, Oil bath by Comparison Method | (-) 80 °C to 250 °C | 0.57 °C |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 182 | THERMAL-TEMPERATURE | RTD with or without indicator, Data logger, Scanner | Using PRT with DTI and Oil bath by Comparison Method | (-) 80 °C to 250 °C | 0.07 °C |
| 183 | THERMAL-TEMPERATURE | RTD with or without indicator, Data logger, Scanner | Using PRT with DTI and Dry Block calibrator by Comparison Method | 250 °C to 600 °C | 0.16 °C |
| 184 | THERMAL-TEMPERATURE | Thermocouples with or without indicator, Data logger, Scanner | Using S type Thermocouple with DTI and Dry block furnace by Comparison Method | 300 °C to 1000 °C | 1.3 °C |
| 185 | THERMAL-TEMPERATURE | Thermocouples with or without indicator, Data loggers, Scanner | Using PRT with DTI and Dry block furnace by Comparison Method | 50 °C to 600 °C | 0.16 °C |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| Site Facility | | | | | |
| 1 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 1 Phase AC Active Energy @ 40 Hz to 70 Hz (40 V to 320 V, 10 mA to 20 A, 0.1 (lag/Lead) to UPF) | Using Power Analyzer by Direct Method | 0.04 Wh to 6.4 kWh | 0.031 % |
| 2 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 1 Phase AC Active Power @ 40 Hz to 70 Hz (40 V to 320 V, 10 mA to 20 A, 0.1(lag/Lead) to UPF) | Using Power Analyzer by Direct Method | 0.04 W to 6.4 kW | 0.03 % |
| 3 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | 3 Phase AC Active Power @ 40 Hz to 70 Hz (40 V to 320 V, 10 mA to 20 A, 0.1(Lag/Lead) to UPF) | Using Power Energy Calibrator by Direct Method | 0.04 W to 6.4 kW | 0.03 % |
| 4 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50 Hz to 1 KHz | Using 8½ DMM and Standard Resistor by V / I Method | 20 A to 100 A | 0.05 % |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 5 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50 Hz to 5 KHz | Using 8½ DMM and Standard Resistor by V / I Method | 1 A to 20 A | 0.05% to 0.08% |
| 6 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current @ 50 Hz to 5 kHz | Using 8½ DMM and Standard Resistor by V / I Method | 100 mA to 1 A | 0.04 % to 0.08 % |
| 7 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage @ 50 Hz | Using HV Probe with DMM by Direct Method | 1 kV to 5 kV | 1 % |
| 8 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage @ 50 Hz | Using HV Probe with DMM by Direct Method | 5 kV to 28 kV | 1 % to 2 % |
| 9 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Resistance @ 1 KHz | Using Precision Component Analyser by Direct Method | 1 ohm to 5 Mohm | 0.02 % to 0.1 % |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 10 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 kHz to 30 kHz | Using 8½ DMM by Direct Method | 10 mV to 100 mV | 0.07 % to 0.034 % |
| 11 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 10 kHz to 30 kHz | Using 8½ DMM by Direct Method: | 100 mV to 1000 V | 0.034 % to 0.022 % |
| 12 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 30 kHz to 100 kHz | Using 8½ DMM by Direct Method | 10 mV to 100 mV | 0.17 % to 0.08 % |
| 13 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 30 kHz to 100 kHz | Using 8½ DMM by Direct Method | 100 mV to 100 V | 0.08 % to 0.06 % |
| 14 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 50 Hz to 10 kHz | Using 8½ DMM by Direct Method | 10 mV to 100 mV | 0.03 % to 0.012 % |

# SCOPE OF ACCREDITATION

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|---|---|---|---|---|---|
| 15 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage @ 50 Hz to 10 kHz | Using 8½ DMM by Direct Method | 100 mV to 1000 V | 0.012 % to 0.01 % |
| 16 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Capacitance @ 1 kHz | Using Precision Component Analyser by Direct Method | 10 pF to 1 mF | 0.05 % to 0.2 % |
| 17 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Inductance @ 1 kHz | Using Precision Component Analyser by Direct Method | 10 µH to 10 H | 0.052 % to 0.2 % |
| 18 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Phase Angle @ 40 Hz to 70 Hz (40 V to 320 V, 5 mA to 20 A) | Using Power Energy Standard by Direct Method | (-) 180 ° to (+)180 ° | 0.028 ° |
| 19 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 1 Phase Active Energy @ 40 to 70 Hz (40 V to 320 V, 10 mA to 20 A, 0.1(Lead/Lag) to UPF) | Using Power Energy Calibrator by Direct Method | 0.04 Wh to 6.4 kWh | 0.031 % to 0.31 % |

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|---|---|---|---|---|---|
| 20 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | 1 Phase Active Power @ 40 to 70 Hz (40 V to 320 V, 10 mA to 20 A, 0.1(Lag/Lead) to UPF) | Using Power Energy Calibrator by Direct Method | 0.04 W to 6.4 kW | 0.03 % to 0.31 % |
| 21 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC by Direct Method | 1 A to 20 A | 0.7 % to 3.2 % |
| 22 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC & MTS by Direct Method | 1 mA to 10 mA | 0.22 % to 0.1 % |
| 23 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC by Direct Method | 10 mA to 100 mA | 0.1 % to 0.15 % |
| 24 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC & MTS by Direct Method | 100 µA to 1 mA | 0.45 % to 0.22 % |

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|---|---|---|---|---|---|
| 25 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 1 kHz to 5 kHz | Using MFC by Direct Method | 100 mA to 1 A | 0.15 % to 0.7 % |
| 26 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz | Using MFC with Current Coil by Direct Method | 20 A to 1000 A | 0.3 % |
| 27 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz to 1 kHz | Using MFC by Direct Method | 1 A to 10 A | 0.06 % to 0.08 % |
| 28 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz to 1 kHz | Using MFC by Direct Method | 1 mA to 10 mA | 0.12 % to 0.06 % |
| 29 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz to 1 kHz | Using MFC by Direct Method | 10 A to 20 A | 0.08 % to 0.15 % |
| 30 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz to 1 kHz | Using MFC by Direct Method | 10 mA to 1 A | 0.06 % |

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|---|---|---|---|---|---|
| 31 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz to 1 kHz | Using MFC by Direct Method | 100 µA to 1 mA | 0.23 % to 0.12 % |
| 32 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Resistance @ 1 kHz | Using Standard Resistors by Direct Method | 1 ohm to 10 kohm | 0.004 % |
| 33 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Resistance @ 1 kHz | Using Standard Resistors by Direct Method | 10 mohm to 100 mohm | 0.01 % |
| 34 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 1 mV to 10 mV | 0.7 % to 0.11 % |
| 35 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 10 mV to 100 mV | 0.11 % to 0.036 % |
| 36 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 10 V to 100 V | 0.03 % to 0.036 % |

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|---|---|---|---|---|---|
| 37 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 10 kHz to 30 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.036 % to 0.03 % |
| 38 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 100 kHz to 500 kHz | Using MFC by Direct Method | 1 mV to 10 V | 5.8 % to 0.25 % |
| 39 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 1 mV to 10 mV | 1.5 % to 0.5 % |
| 40 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 10 mV to 100 mV | 0.5 % to 0.083 % |
| 41 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 10 V to 100 V | 0.041 % to 0.25 % |
| 42 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 30 kHz to 100 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.083 % to 0.041 % |

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|---|---|---|---|---|---|
| 43 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz to 10 kHz | Using MFC by Direct Method | 1 mV to 10 mV | 0.62 % to 0.075 % |
| 44 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz to 10 kHz | Using MFC by Direct Method | 10 mV to 100 mV | 0.075 % to 0.025 % |
| 45 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz to 10 kHz | Using MFC by Direct Method | 10 V to 1000 V | 0.021 % to 0.031 % |
| 46 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz to 10 kHz | Using MFC by Direct Method | 100 mV to 10 V | 0.025 % to 0.021 % |
| 47 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using 4 Terminal std. Capacitor by Direct Method | 1 µF to 10 mF | 0.02 % to 0.1 % |
| 48 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Std. Capacitor by Direct Method | 1 pF | 0.04 % |

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|---|---|---|---|---|---|
| 49 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Std. Capacitor by Direct Method | 10 pF to 1 µF | 0.02 % |
| 50 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 100 Hz | Using 4 Terminal std. Capacitor by Direct Method | 10 mF to 1000 mF | 0.1 % |
| 51 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Inductance @ 1 kHz | Using Std. Inductor by Direct Method | 100 µH to 10 H | 0.052 % |
| 52 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Phase Angle/ @ 40 Hz to 70 Hz (40 V to 320 V, 5 mA to 100 A) | Using Power & Energy Calibrator by Direct Method | (-) 180° to (+) 180° | 0.028 ° |
| 53 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM by Direct Method | 10 mA to 100 mA | 0.003 % to 0.004 % |
| 54 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM by Direct Method | 100 µA to 10 mA | 0.003 % |

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|---|---|---|---|---|---|
| 55 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 8½ DMM by Direct Method | 100 mA to 1 A | 0.004 % to 0.012 % |
| 56 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage | Using HV Probe with DMM by Direct Method | 1 kV to 50 kV | 0.2 % to 1% |
| 57 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage | Using HV Probe with DMM by Direct Method | 5 kV to 40 kV | 0.2 % to 1 % |
| 58 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using High Resistance Meter by Direct Method | 1 Gohm to 100 Gohm | 0.012 % to 0.04 % |
| 59 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using 8½ DMM by Direct Method | 1 ohm to 10 ohm | 0.0075 % to 0.001 % |
| 60 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using 8½ DMM by Direct Method | 10 ohm to 100 Mohm | 0.001 % to 0.002 % |

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|---|---|---|---|---|---|
| 61 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using High Resistance Meter by Direct Method | 100 Gohm to 1 Tohm | 0.04 % to 0.25 % |
| 62 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using 8½ DMM by Direct Method | 100 Mohm to 1 Gohm | 0.002 % to 0.012 % |
| 63 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Resistance (4 wire) | Using Micro ohm meter by Direct Method | 100 mohm to 1 ohm | 0.01 % to 0.0075 % |
| 64 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 8½ DMM by Direct Method | 1 mV to 10 mV | 0.007 % to 0.0055 % |
| 65 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 8½ DMM by Direct Method | 10 mV to 100 mV | 0.0055 % to 0.0008 % |
| 66 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 8½ DMM by Direct Method | 100 mV to 1000 V | 0.0008 % to 0.0012 % |

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|---|---|---|---|---|---|
| 67 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 1 A to 20 A | 0.025 % to 0.11 % |
| 68 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 1 mA to 100 mA | 0.017 % to 0.013 % |
| 69 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 100 µA<br>to 1 mA | 0.04 % to 0.017 % |
| 70 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC by Direct Method | 100 mA to 1 A | 0.013 % to 0.025 % |
| 71 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using MFC with Current Coil by Direct Method | 20 A to 1000 A | 0.3 % |
| 72 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Power (1 V to 1000 V & 100 mA to 20 A) | Using MFC by Direct Method | 10 mW to 20 kW | 0.025 % to 0.07 % |

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|---|---|---|---|---|---|
| 73 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Decade Resistance Box by Direct Method | 1 Gohm to 1 Tohm | 0.05 % to 0.4 % |
| 74 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor by Direct Method | 1 mohm to 10 kohm | 0.001 % |
| 75 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Decade Resistance Box by Direct Method | 1 Mohm to 10 Mohm | 0.001 % to 0.005 % |
| 76 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Standard Resistor and Decade Resistance Box by Direct Method | 10 kohm to 1 Mohm | 0.001 % |
| 77 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance (4 wire) | Using Decade Resistance Box by Direct Method | 10 Mohm to 1 Gohm | 0.005 % to 0.05 % |
| 78 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 1 mV to 100 mV | 0.1 % to 0.003 % |

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|---|---|---|---|---|---|
| 79 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using MFC by Direct Method | 100 mV to 1000 V | 0.003 % to 0.002 % |
| 80 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Amplitude (Vertical Deflection Factor) - 50 ohm | Using MFC by Direct Method | 1 mV to 6.5 V | 0.46 % |
| 81 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Amplitude (Vertical Deflection Factor) -1 Mohm | Using MFC by Direct Method | 1 mV to 130 V | 1 % |
| 82 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Bandwidth | Using Signal Generator & MFC by Direct Method | 10 Hz to 3 GHz | 3 % to 5 % |
| 83 | ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Source) | Oscilloscope - Time Base | Using MFC by Direct Method | 2 ns to 5 s | 0.0011 % to 0.0003 % |

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|---|---|---|---|---|---|
| 84 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure) | RF Level / Power @ 100 kHz to 3 GHz | Using RF Power Meter with sensor by Direct Method | (-) 50 dBm to 13 dBm | 0.22 dB to 0.26 dB |
| 85 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure) | RF Level / Power @ 3 GHz to 18 GHz | Using RF Power Meter with sensor by Direct Method | (-) 50 dBm to 13 dBm | 0.22 dBm to 0.26 dBm |
| 86 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source) | RF Level / Power @ 10 kHz to 3 GHz | Using Synthesized Signal Generator by Direct Method | (-) 50 dB to 13 dB | 0.24 dB to 0.28 dB |
| 87 | ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source) | RF Level / Power @ 3 GHz to 6 GHz | Using Synthesized Signal Generator by Direct Method | (-) 50 dB to 13 dB | 0.24 dB to 0.28 dB |
| 88 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | B - Type Thermocouple | Using 8½ DMM by Direct Method | 600 ° C to 1800 °C | 0.04 °C |

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|---|---|---|---|---|---|
| 89 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | C - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 2300 °C | 0.9 °C |
| 90 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | E - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 250 °C to 400 °C | 0.038 °C |
| 91 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | E - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 250 °C to 1000 °C | 0.012 °C |
| 92 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | J - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 1200 °C | 0.013 °C |
| 93 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | K - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 1350 °C | 0.03 °C |
| 94 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | L - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 900 °C | 0.4 °C |

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| 95 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | N - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 1300 °C | 0.025 °C |
| 96 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | R - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 1750 °C | 0.035 °C |
| 97 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | RTD (PT 385 - 100 ohm) | Using 8½ DMM by Direct Method | (-) 199 °C to 800 °C | 0.04 °C |
| 98 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | RTD (PT 385 - 1000 ohm) | Using 8½ DMM by Direct Method | (-) 199 °C to 800 °C | 0.04 °C |
| 99 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | S - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 1750 °C | 0.15 °C |
| 100 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | S - Type Thermocouple | Using 8½ DMM by Direct Method | 0 °C to 1750 °C | 0.043 °C |

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|---|---|---|---|---|---|
| 101 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | U - Type Thermocouple | Using 8½ DMM by Direct Method | (-) 200 °C to 600 °C | 0.6 °C |
| 102 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | B - Type Thermocouple | Using MFC by Direct Method | 600 °C to 1800 °C | 0.15 °C |
| 103 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | C - Type Thermocouple | Using MFC by Direct Method | 0 °C to 2300 °C | 0.9 °C |
| 104 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | E - Type Thermocouple | Using MFC by Direct Method | (-) 250 °C to 1000 °C | 0.11 °C |
| 105 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | J - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 1200 °C | 0.08 °C |
| 106 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | K - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 1350 °C | 0.11 °C |

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|---|---|---|---|---|---|
| 107 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | L - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 900 °C | 0.4 °C |
| 108 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | N - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 1300 °C | 0.025 °C |
| 109 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | R - Type Thermocouple | Using MFC by Direct Method | 0 °C to 1750 °C | 0.15 °C |
| 110 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | RTD (PT 385 - 100 ohm & 1000 ohm) | Using MFC by Direct Method | (-) 199 °C to 800 °C | 0.03 °C |
| 111 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | T - Type Thermocouple | Using MFC by Direct Method | (-) 250 °C to 400 °C | 0.13 °C |
| 112 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | U - Type Thermocouple | Using MFC by Direct Method | (-) 200 °C to 600 °C | 0.6 °C |

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|---|---|---|---|---|---|
| 113 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Frequency | Using Frequency Counter by Direct Method | 1 Hz to 18 GHz | 3 E-8 |
| 114 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Frequency | Using Frequency counter by Direct Method | 1 Hz to 6 GHz | 3 E-8 |
| 115 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Time Interval | Using Frequency counter by Direct Method | 100 ms to 10000 s | 0.007 % |
| 116 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Time Period | Using Frequency Counter by Direct Method | 1 µs to 1000 s | 9.7 E-10 |
| 117 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Time | Using Signal Generator by Direct Method | 1 µs to 1000 s | 3 E - 8 |
| 118 | MECHANICAL-ACCELERATION AND SPEED | Tachometer - (Non Contact) | Using Digital Tachometer & RPM generator by Comparison Method | 1000 rpm to 99900 rpm | 0.13 % |

# SCOPE OF ACCREDITATION

**Laboratory Name :** ELECTRONICS REGIONAL TEST LABORATORY(WEST), GOVERNMENT OF INDIA, MINISTRY OF ELECTRONICS & INFORMATION TECHNOLOGY, STQC DIRECTORATE, PLOT NO. F-7&8, MIDC AREA, OPP.SEEPZ, ANDHERI(EAST), MUMBAI, MAHARASHTRA, INDIA

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

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|---|---|---|---|---|---|
| 119 | MECHANICAL-ACCELERATION AND SPEED | Tachometer - (Non Contact) | Using Digital Tachometer & RPM generator by Comparison Method | 50 rpm to 1000 rpm | 1.1 % |
| 120 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class I and Coarser (Readability : 0.002 mg) | Using E1 class standard weights as per OIML R 76-1 | 0 to 20 g | 0.03 mg |
| 121 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class I and Coarser (Readability : 0.01 mg) | Using E1 Class standard weights as per OIML R 76-1 | > 20 g to 200 g | 0.14 mg |
| 122 | MECHANICAL-WEIGHING SCALE AND BALANCE | Electronic Weighing Balance - Class II and Coarser (Readability : 0.1 g) | Using E1 & E2 class standard weights as per OIML R 76-1 | > 200 g to 12 kg | 76 mg |
| 123 | THERMAL-SPECIFIC HEAT & HUMIDITY | RH &Temperature Indicator with Inbuilt or External sensors, Thermo-Hygrometer | Using RH / Temperature indicator with sensor & Chamber by comparison Method | 20 % rh to 95 % rh @ 25 ºC, 40 °C, 55 ºC | 1.5 % rh |
| 124 | THERMAL-TEMPERATURE | RTD with or without indicator | Using PRT with DTI and Dry Block Calibrator by Comparison Method | (-) 25 °C to 600 °C | 0.2 °C |
| 125 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Oven, Deep freezer, Chamber (Single Position) | Using RTD (PT-100) with DTI by Comparison Method | (-) 80 °C to 200 °C | 0.5 °C |

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|---|---|---|---|---|---|
| 126 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Ovens, baths, chambers (Single Position) | Using S type Thermocouple with DTI by Comparison Method | 300 °C to 1000 °C | 1.39 °C |
| 127 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Ovens, baths, Deep freezers, Chambers (Single Position) | Using PRT with DTI by Comparison Method | (-) 25 °C to 600 °C | 0.2 °C |

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