National Accreditation Board for Testing and Calibration Laboratories

CERTIFICATE OF ACCREDITATION

ELECTRONICS REGIONAL TEST LABORATORY (EAST)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

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

for its facilities at

BLOCK DN 63,SECTOR V, SALT LAKE, KOLKATA, WEST BENGAL, INDIA

in the field of

CALIBRATION

Certificate Number: CC-2008

Issue Date: 21/01/2024 **Valid Until:** 20/01/2026

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of thislaboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Entity: ELECTRONICS REGIONAL TEST LABORATORY (EAST)

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

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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)(±)
Permanent Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (100 MHz to 1 GHz)	Using RF MilliVoltmeter, Signal Generator with Amplifier by Direct/ Comparison Method	10 mV to 7 V	3.5 %
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Energy 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF to 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method.	0.3 Wh to 28.8 kWh	0.014 % to 0.023 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 Wh to 86.4 kWh	0.017 % to 0.023 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 W to 86.4 kW	0.015 % to 0.023 %

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5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method.	0.3 W to 28.8 kW	0.014 % to 0.023 %
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (40 Hz to 5 kHz)	Using 8½ digit DMM by Direct/Comparison Method	1 mA to 20 A	0.02 % to 0.3 %
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current at 50 Hz	Using Three phase comparator by Direct Method	0.01 A to 120 A	0.013 %
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current at 1 kHz	Using DMM With AC Shunt by Direct/Comparison Method	10 µA to 1 A	0.05 % to 0.02 %
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC High Voltage at 50 Hz	Using DMM & HV Probe By Direct Method	>1 kV to 28 kV	6 %

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10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Energy 1Ph2W (50 Hz), 60 V to 240 V,10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.3 VARh to 28.8 kVARh	0.014 % to 0.023 %
11	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 VARh to 86.4 kVARh	0.014 % to 0.023 %
12	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Power 1Ph2W (50Hz) 60 V to 240V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.3 VAR to 28.8 kVAR	0.014 % to 0.023 %
13	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Power 3Ph3W/ 3Ph4W (50 Hz) (active and reactive) 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 VAR to 86.4 kVAR	0.015 % to 0.023 %
14	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Resistance at 1kHz	Using RLC Digibridge By Direct Method	1 ohm to 100 kohm	0.3 % to 0.1% %

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15	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (1 MHz to 100 MHz)	Using Multifunction Calibrator, Signal Generator with amplifier, RF MilliVoltmeter by Direct/ Comparison Method	10 mV to 10 V	3.3 %
16	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 Hz to 40 Hz)	Using DMM, Calibrator, Thermal Voltage Converter by Direct/ Comparison Method	1 mV to 1000 V	0.5 % to 0.2 %
17	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 kHz to 100 kHz)	Using DMM, Calibrator by Direct/ Comparison Method	1 mV to 1 V	0.43 % to 0.2 %
18	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 kHz to 100 kHz)	Using DMM, Calibrator, Thermal Voltage Converter by Direct/ Comparison Method:	1 V to 100 V	0.014 % to 0.02 %
19	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (100 kHz to 1 MHz)	Using Calibrator, DMM & AC Measurement Standard by Direct/Comparison Method	1 mV to 1 V	1.34 % to 0.1 %

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20	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (40 Hz to 10 kHz)	Using DMM, Calibrator & Thermal Voltage Converter by Direct/ Comparison Method:	1 mV to 1000 V	0.5 % to 0.17 %
21	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Capacitance at 1 kHz	Using RLC Digibridge By Direct Method	1 mF to 10 mF	1.2 % to 0.3 %
22	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Capacitance at 1 kHz	Using RLC Digibridge by Direct Method	1 pF to 1.0 mF	0.04 % to 1.2 %
23	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Inductance at 1 kHz	Using RLC Digibridge by Direct Method	100 µH to 10 H	0.2 % to 0.06 %
24	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Phase Angle (50 Hz, 240 V, 5 A)	Using Three Phase Comparator by Direct Method	0° to 180° (Lead & Lag)	0.006°

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25	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Power Factor (50 Hz, 240 V, 5 A)	Using Three Phase Comparator by Direct Method	0.1 (lag & lead) to 1	0.01 %
26	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Energy 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 Wh to 28.8 kWh	0.017 % to 0.023 %
27	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Energy 3Ph4W/ 3Ph3W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 Wh to 86.4 kWh	0.014 % to 0.023 %
28	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 W to 86.4 kW	0.017 % to 0.023 %
29	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 W to 28.8 kW	0.012 % to 0.025 %

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30	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current at 50 Hz	Using Multifunction Calibrator and Current Coil by Direct Method	20 A to 6000 A	0.55 %
31	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (10 Hz to 5 kHz)	Using Multifunction Calibrator by Direct Method	1 A to 20 A	0.05 % to 0.035 %
32	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (10 Hz to 5 kHz)	Using Multifunction Calibrator by Direct Method	10 µA to 1 A	0.08 % to 0.05 %
33	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current at 50Hz	Using Three phase comparator by Direct Method	10 mA to 100 A	0.013 %
34	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC High Voltage at 50 Hz	Using HV Source, HV Probe With DMM By Comparison Method	>1 kV to 28 kV	6 %
35	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Energy 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 VARh to 28.8 kVARh	0.02 % to 0.023 %

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36	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 VARh to 86.4 kVARh	0.017 % to 0.023 %
37	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 VAR to 28.8 kVAR	0.014 % to 0.025 %
38	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 VAR to 86.4 kVAR	0.014 % to 0.023 %
39	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Resistance at 1 kHz	Using AC/DC Resistance Standard by Direct Method	1 ohm, 10 ohm, 100 ohm, 1 kohm, 10 kohm	0.01 %
40	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (1 MHz to 1 GHz)	Using Calibrator, Signal Generator With Amplifier by Comparison Method	10 mV to 7 V	3.5 %

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41	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 Hz to 45 Hz)	Using Multifunction Calibrator by Direct Method	1 mV to 1000 V	0.7 % to 0.025 %
42	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 kHz to 50 kHz)	Using Multifunction Calibrator by Direct Method	1 V to 100 V	0.014 % to 0.02 %
43	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 kHz to 50 kHz)	Using Multifunction Calibrator by Direct Method	1 mV to 1 V	0.2 % to 0.014 %
44	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (45 Hz to 10 kHz)	Using Multifunction Calibrator by Direct Method	1 mV to 100 V	0.4 % to 0.01 %
45	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (45 Hz to 10 kHz)	Using Multifunction Calibrator by Direct Method	100 V to 1000 V	0.008 % to 0.02 %
46	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50 kHz to 1 MHz)	Using Multifunction Calibrator by Direct Method	1 mV to 100 mV	0.05 % to 1.2 %

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47	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50 kHz to 1 MHz)	Using Multifunction Calibrator by Direct Method	100 mV to 10 V	0.25 % to 0.12 %
48	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	1 µF, 10 µF, 100µF, 1mF, 10 mF	0.1 %
49	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	1 pF	0.01 %
50	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	10 pF, 100 pF, 1000 pF	0.01 %
51	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Decade Capacitor By Direct Method	100 pF to 1 µF	0.25 %
52	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Multifunction Calibrator By Direct Method	190 pF to 300 nF	0.50 %

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53	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Standard Inductor by Direct Method	1 mH, 10 mH, 100 mH, 1 H, 10 H	0.03 %
54	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Standard Inductor by Direct Method	100 µH	0.05 %
55	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Decade Inductor by Direct Method	100 µH to 10 H	0.30 %
56	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Direct/Comparison Method	1 mA to 20 A	0.002 % to 0.005 %
57	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Direct/Comparison Method	10 µA to 1 mA	0.006 % to 0.002 %
58	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Comparison (V/R) Method	20 A to 100 A	0.008 % to 0.05 %

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59	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC High Voltage	Using HV probe and and Digital Multimeter by Direct method	1 kV to 40 kV	2.5 %
60	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance - 2 Wire	Using DMM, Standard High Resistance Meter by Substitution Method	1 Mohm to 20 Gohm	0.001 % to 0.20 %
61	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance - 2 Wire	Using High Resistance Meter & Standard Resistance by Substitution Method	20 Gohm to 1 Tohm	0.2 % to 2.5 %
62	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance- 2 Wire & 4 Wire	Using DMM, Calibrator by Direct / Comparison (V/I) Method	0.0001 ohm to 0.001 ohm	0.03 % to 0.004 %
63	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance- 2 Wire & 4 Wire	Using DMM, Standard Resistance with Calibrator by Substitution Method	0.001 ohm to 1 Mohm	0.004 % to 0.001 %
64	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	1 mV to 10 V	0.02 % to 0.0004 %

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65	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	10 µV to 1 mV	2.2 % to 0.014 %
66	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	10 V to 1000 V	0.0004 % to 0.0005 %
67	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Multifunction Calibrator By Direct Method	1 A to 20 A	0.005 % to 0.01 %
68	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Calibrator By Direct/ V/R Method	10 µA to 1 A	0.01 % to 0.005 %
69	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Multifunction Calibrator & current coil By Direct Method	20 A to 1000 A	0.53 %
70	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Calibrator with High Current Source By Direct Method	20 A to 850 A	0.01 % to 0.06 %

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71	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC High Voltage	Using HIgh Voltage Source, HV Probe and Digital Multimeter by Comparison Method	>1 kV to 40 kV	2.5 %
72	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	1 Gohm	0.02 %
73	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	10 Gohm, 100 Gohm, 1 Tohm	0.5 %
74	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Decade Resistance By Direct Method	100 kohm to 1 Tohm	0.003 % to 5 %
75	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	100 Mohm	0.002 %
76	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire & 4 Wire	Using Standard Resistance By Direct Method	0.0001 ohm	0.05 %

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77	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Standard Resistance by direct method	0.001 ohm, 0.01 ohm, 0.1 ohm, 1 ohm, 10 ohm	0.02 % to 0.001 %
78	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Decade Resistance By Direct Method	0.01 ohm to 100 kohm	0.3 % to 0.004 %
79	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Standard Resistance by Direct Method	100 ohm, 1 kohm, 10 kohm 100 kohm, 1 Mohm, 10 Mohm	0.001 %
80	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Multifunction Calibrator By Direct Method	10 µV to 10 V	2 % to 0.0003 %
81	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using DC Reference Standard by direct method	1.018 V	0.0002 %
82	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using DC Reference Standard by direct method	10 V	0.0003 %

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83	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Multifunction Calibrator By Direct Method	10 V to 1000 V	0.0003 % to 0.0004 %
84	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	Attenuation (50 MHz to 1 GHz)	Using RF Millivoltmeter by Direct Method	1 dB to 60 dB	0.17 dB
85	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	Bandwidth (100 Hz to 2 GHz)	Using Signal Generator & RF Power Meter by Comparison Method	3 dB	2.9 %
86	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 mW to 40 mW	4%
87	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 nW to 1 mW	6 %

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88	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and meters (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 nW to 1 mW	6 %
89	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and RF power meters (50 MHz to 1 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	40 mW to 80 W	4 %
90	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and RF power meters (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 mW to 40 mW	4 %
91	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	VSWR (50 MHz to 1 GHz)	Using SWR Bridge & RF Level Meter By Comparison Method	1.05 to 3	0.15
92	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	Attenuation (50 MHz to 1 GHz)	Using RF Attenuator By Direct Method	1 dB to 60 dB	0.27 dB

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93	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	VSWR (50 MHz to 2 GHz)	Using SWR Bridge & RF Level Meter By Comparison Method	1.05 to 3	0.15
94	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	B- Type Thermocouple	Using 8½ digit DMM by Direct method	600 °C to 1800 °C	0.30 °C
95	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	E- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)250 °C to 1000 °C	0.20 °C
96	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	J- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)210 °C to 1200 °C	0.20 °C
97	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	K- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 1350 °C	0.20 °C

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98	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	L Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 900 °C	0.20 °C
99	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	N Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 1400 °C	0.20 °C
100	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	R- Type Thermocouple	Using 8½ digit DMM by Direct method	0 °C to 1750 °C	0.2 °C
101	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	RTD Type PT 100	Using 8½ digit DMM by Direct method	(-)200 °C to 800 °C	0.02 °C
102	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	S- Type Thermocouple	Using 8½ digit DMM by Direct method	0 °C to 1750 °C	0.2 °C
103	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	U- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 600 °C	0.25 °C

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104	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	B-Type Thermocouple	Using Multiproduct Calibrator by Direct method	600 °C to 1800 °C	0.30 °C
105	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	E- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)250 °C to 1000 °C	0.20 °C
106	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	J- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)210 °C to 1200 °C	0.20 °C
107	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	K- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 1350 °C	0.20 °C
108	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	L- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 900 °C	0.20 °C
109	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	N- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 1400 °C	0.20

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110	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	R- Type Thermocouple	Using Multiproduct Calibrator by Direct method	0 °C to 1750 °C	0.10 °C
111	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	RTD Type PT 100	Using Multiproduct Calibrator by Direct method	(-)200 °C to 800 °C	0.05 °C
112	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	S- Type Thermocouple	Using Multiproduct Calibrator by Direct method	0 °C to 1750 °C	0.10 °C
113	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	T- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)250 °C to 400 °C	0.40 °C
114	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	U- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 600 °C	0.25 °C

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115	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source,Measure)	TC T- Type	Using 8.5 dgt DMM by Direct method	(-)250 °C to 400 °C	0.40 °C
116	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Frequency	Using frequency Counter logged with GPS Controlled Rubidium frequency standard & Signal Generator by Direct / Comparison Method	10 Hz to 20 GHz	0.0005 % to 0.00000006 %
117	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time Interval / Time Period	Using Frequency Counter by Direct/Comparison Method	20 ns to 2000 s	0.0002 %
118	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Frequency	Using Signal Generator logged with GPS Controlled Rubidium Frequency Standard by Direct Method.	10 Hz to 20 GHz	0.0005 % to 0.00000006 %
119	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Time Interval / Time Period	Using Function Generator by Direct Method	20 ns to 2000 s	0.0002 %

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120	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Contact Type)	Using Precision Tachometer & RPM Generator by Comparison method	100 rpm to 6000 rpm	0.84 %
121	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Non Contact type)	Using Precision Tachometer & standard Stroboscope by Comparison method	30 rpm to 70000 rpm	1.5 % to 0.1 %
122	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Bevel Protractor (L.C.: 1 minute)	Using Angle Gauge Set By comparison method	0° to 360°	37 s
123	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Depth Micrometer (L.C.: 0.01 mm)	Using Gauge Block Set/ Surface Plate By Comparison Method	0 to 300 mm	10 µm
124	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Thickness Gauge (L.C.: 0.01 mm)	Using Gauge Block Set By comparison method	0 to 10 mm	6.0 µm

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125	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	0 to 25 mm	1.8 µm
126	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	100 mm to 150 mm	3.0 µm
127	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	150 mm to 300 mm	5.0 µm
128	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	25 mm to 50 mm	2.0 µm
129	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	300 mm to 400 mm	6.0 µm

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130	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	50 mm to 75 mm	2.5 µm
131	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer (L.C.: 0.001 mm)	Using Slip Gauge Block Set/Long Gauge Block Set By Comparison Method	75 mm to 100 mm	2.8 µm
132	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Feeler Gauge	Using Electronic comparator with stand By comparison method	0.01 mm to 1 mm	2.8 µm
133	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Height Gauge- Dial / Digital / Analog (L.C.: 0.01 mm)	Using Gauge block, Long Gauge Block Set/Surface Plate By comparison method	0 to 1000 mm	15 µm
134	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Internal Micrometer (L.C.: 0.001 mm)	Using Gauge Block Set/ Gauge Block Accessories, Long Gauge Block Set By Comparison Method	50 mm to 500 mm	6.1 µm

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135	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Length Bar	Using Long Gauge Block Set/Electronic Probe with DRO By Comparison Method	25 mm to 600 mm	8.0 µm
136	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Lever Dial (L.C.: 0.01 mm)	Using Dial Calibration Tester By comparison method	0 to 2 mm	3 µm
137	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Measuring Scale (L.C.: 1 mm)	Using Scale & Tape Calibrator By comparison method	0 to 2000 mm	220 sqrt of (L) µm, where L in m
138	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Measuring Tape (L.C.: 1 mm)	Using Scale & Tape Calibrator By comparison method	0 to 10 m	220 sqrt of (L) µm, where L in m
139	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Pie Tape (L.C.: 0.5 mm)	Using Scale & Tape Calibrator By comparison method	0 to 1200 mm	220 sqrt of (L) µm, where L in m

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140	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Plunger Dial (L.C: 0.01 mm)	Using Dial Calibration Tester By Comparison method	0 to 25 mm	8.3 µm
141	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Test Sieves	Using Profile Projector by Comparison method	0.032 mm to 15 mm	4.48 µm
142	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Test Sieves	Using Digital Vernier Caliper by Comparison method	15 mm to 25 mm	17.36 µm
143	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Vernier Caliper - Dial/Digital/Analog (L.C.: 0.01 mm)	Using Gauge Block Set/Accessory Set By Comparison Method	300 mm to 1000 mm	25.0 µm
144	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Vernier Caliper - Dial/Digital/Analog (L.C: 0.01 mm)	Using Gauge Block Set/Accessory Set By Comparison Method	0 to 300 mm	13.5 µm

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145	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure Gauge, Pressure Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to 700 bar	0.23 bar
146	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure Gauge, Pressure Transmitter & Sensors	Using Dead Weight Tester and digital multimeter by direct method as per DKD R-6-1	6 bar to 700 bar	0.02 %
147	MECHANICAL-PRESSURE INDICATING DEVICES	Pneumatic Precision Gauges, Precision Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to 40 bar	0.021 bar
148	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Gauges, Vacuum Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to (-) 0.9 bar	0.0042 bar
149	OPTICAL-OPTICAL	Colour Temperature	Using Standard Lamp by direct method	2856 K to 7000 K	30 K

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150	OPTICAL-OPTICAL	Illuminance	Using Photometer by Comparison Method	10 lx to 5000 lx	2.7 %
151	OPTICAL-OPTICAL	Optical Attenuation (1310 nm, 1550 nm, 1625 nm)	Using Optical Power meter by direct method	5 dB to 30 dB	2.09 %
152	OPTICAL-OPTICAL	Optical Power (850 nm, 1300 nm, 1310 nm, 1550 nm, 1625 nm)	Using Optical power meter & optical attenuator by comparison method	-10 dBm to -40 dBm	2.09 %
153	OPTICAL-OPTICAL	Optical Wavelength	Using Set of inductive voltage divider, Spectral standard lamps ((1) He-Ne Laser, A 4302 (2) Kr, 6031 (3) Ne, 6032) and Optical Spectrum Analyzer by direct method	400 nm to 1750 nm	1.2 nm
154	OPTICAL-OPTICAL	X, Y Colour coordinate	Using Standard Lamp (TH) by Direct Method	X, Y: 0.001 to 1	0.0427
155	THERMAL-TEMPERATURE	IR Thermometer, Optical Pyrometer and Radiation Thermometer	Using Black Body Radiation Source, Reference IR Thermometer by Comparison Method	200 °C to 1200 °C	3.5 °C

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156	THERMAL-TEMPERATURE	Liquid In Glass Thermometer	Using SPRT, Liquid Bath and Temperature Indicator by comparison method	(-)80 °C to 90 °C	0.08 °C
157	THERMAL-TEMPERATURE	Liquid in Glass Thermometer	Using SPRT, Silicon bath and Temperature Indicator by comparison method	90 °C to 250 °C	0.08 °C
158	THERMAL-TEMPERATURE	RTD/ PRT, Temperature Gauge, Thermocouple with or without Indicator	Using Liquid Baths, Dry Block Calibrator, SPRT & Temperature Indicator by Comparison Method	(-) 80 °C to 250 °C	0.08 °C
159	THERMAL-TEMPERATURE	RTD/ PRT, Temperature Gauge, Thermocouple with or without Indicator	Using SPRT, Dry Block Calibrator & Temperature Indicator by Comparison Method	250 °C to 550 °C	0.12 °C
160	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Dry Block Calibrator, Temperature Furnace	Using R- Type Thermocouple & Temperature Indicator by Comparison Method	1200 °C to 1300 °C	3.5 °C

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161	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Dry Block Calibrator, Temperature Furnace (Single Position)	Using R-Type Thermocouple & Temperature Indicator by Comparison Method	550 °C to 1200 °C	2.0 °C
162	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Liquid Bath, Dry Block Calibrators, Temperature Furnace (Single Position)	Using SPRT & Temperature Indicator by Comparison Method	250 °C to 550 °C	0.12 °C
163	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Liquid Baths, Dry Block Calibrators (Single Position)	Using SPRT & Temperature Indicator by Comparison Method	(-)80 °C to 250 °C	0.08 °C
164	THERMAL-TEMPERATURE	Thermocouple with or without Indicator, Temperature Recorder With Sensor	Using R-Type Thermocouple, Temperature Indicator & Tube Furnace by Comparison Method	1200 °C to 1300 °C	3.6 °C

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165	THERMAL-TEMPERATURE	Thermocouple with or without Indicator, Temperature Recorder With Sensor	Using R-Type Thermocouple, Dry Block Calibrator & Temperature Indicator by Comparison Method	550 °C to 1200 °C	2 °C

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Site Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (100 MHz to 1 GHz)	Using RF MilliVoltmeter, Signal Generator with Amplifier by Direct/ Comparison Method	10 mV to 7 V	3.5 %
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 Wh to 86.4 kWh	0.017 % to 0.023 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 W to 86.4 kW	0.015 % to 0.023 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Active Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method.	0.3 W to 28.8 kW	0.014 % to 0.023 %

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5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (40 Hz to 5 kHz)	Using 8½ digit DMM by Direct/Comparison Method	1 mA to 20 A	0.02 % to 0.3 %
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current at 50 Hz	Using Three phase comparator by Direct Method	0.01 A to 120 A	0.013 %
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current at 1 kHz	Using DMM With AC Shunt by Direct/Comparison Method	10 µA to 1 A	0.05 % to 0.02 %
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC High Voltage at 50 Hz	Using DMM & HV Probe By Direct Method	>1 kV to 28 kV	6 %
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Energy 1Ph2W (50 Hz), 60 V to 240 V,10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.3 VARh to 28.8 kVARh	0.014 % to 0.023 %

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10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 VARh to 86.4 kVARh	0.014 % to 0.023 %
11	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Power 1Ph2W (50Hz) 60 V to 240V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.3 VAR to 28.8 kVAR	0.014 % to 0.023 %
12	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Reactive Power 3Ph3W/ 3Ph4W (50 Hz) (active and reactive) 60 V to 240 V, 10 mA to 120 A , UPF – 0.5 PF (lead & Lag)	Using Three Phase Comparator by Comparison Method	0.9 VAR to 86.4 kVAR	0.015 % to 0.023 %
13	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Resistance at 1kHz	Using RLC Digibridge By Direct Method	1 ohm to 100 kohm	0.3 % to 0.1% %

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14	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (1 MHz to 100 MHz)	Using Multifunction Calibrator, Signal Generator with amplifier, RF MilliVoltmeter by Direct/ Comparison Method	10 mV to 10 V	3.3 %
15	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 Hz to 40 Hz)	Using DMM, Calibrator, Thermal Voltage Converter by Direct/ Comparison Method	1 mV to 1000 V	0.5 % to 0.2 %
16	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 kHz to 100 kHz)	Using DMM, Calibrator by Direct/ Comparison Method	1 mV to 1 V	0.43 % to 0.2 %
17	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (10 kHz to 100 kHz)	Using DMM, Calibrator, Thermal Voltage Converter by Direct/ Comparison Method:	1 V to 100 V	0.014 % to 0.02 %
18	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (100 kHz to 1 MHz)	Using Calibrator, DMM & AC Measurement Standard by Direct/Comparison Method	1 mV to 1 V	1.34 % to 0.1 %

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19	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Voltage (40 Hz to 10 kHz)	Using DMM, Calibrator & Thermal Voltage Converter by Direct/ Comparison Method:	1 mV to 1000 V	0.5 % to 0.17 %
20	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Capacitance at 1 kHz	Using RLC Digibridge By Direct Method	1 mF to 10 mF	1.2 % to 0.3 %
21	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Capacitance at 1 kHz	Using RLC Digibridge by Direct Method	1 pF to 1.0 mF	0.04 % to 1.2 %
22	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Inductance at 1 kHz	Using RLC Digibridge by Direct Method	100 µH to 10 H	0.2 % to 0.06 %
23	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Phase Angle (50 Hz, 240 V, 5 A)	Using Three Phase Comparator by Direct Method	0° to 180° (Lead & Lag)	0.006°

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24	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	Power Factor (50 Hz, 240 V, 5 A)	Using Three Phase Comparator by Direct Method	0.1 (lag & lead) to 1	0.01 %
25	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Energy 3Ph4W/ 3Ph3W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 Wh to 86.4 kWh	0.014 % to 0.023 %
26	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 W to 86.4 kW	0.017 % to 0.023 %
27	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Active Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 W to 28.8 kW	0.012 % to 0.025 %
28	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current at 50 Hz	Using Multifunction Calibrator and Current Coil by Direct Method	20 A to 6000 A	0.55 %

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29	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (10 Hz to 5 kHz)	Using Multifunction Calibrator by Direct Method	1 A to 20 A	0.05 % to 0.035 %
30	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (10 Hz to 5 kHz)	Using Multifunction Calibrator by Direct Method	10 µA to 1 A	0.08 % to 0.05 %
31	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current at 50Hz	Using Three phase comparator by Direct Method	10 mA to 100 A	0.013 %
32	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC High Voltage at 50 Hz	Using HV Source, HV Probe With DMM By Comparison Method	>1 kV to 28 kV	6 %
33	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Energy 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 VARh to 28.8 kVARh	0.02 % to 0.023 %

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34	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Energy 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 VARh to 86.4 kVARh	0.017 % to 0.023 %
35	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Power 1Ph2W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.3 VAR to 28.8 kVAR	0.014 % to 0.025 %
36	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Reactive Power 3Ph3W/ 3Ph4W (50 Hz), 60 V to 240 V, 10 mA to 120 A, UPF – 0.5 PF (lead & Lag)	Using Three Phase Power/ Energy Test Bench by Direct Method	0.9 VAR to 86.4 kVAR	0.014 % to 0.023 %
37	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Resistance at 1 kHz	Using AC/DC Resistance Standard by Direct Method	1 ohm, 10 ohm, 100 ohm, 1 kohm, 10 kohm	0.01 %
38	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (1 MHz to 1 GHz)	Using Calibrator, Signal Generator With Amplifier by Comparison Method	10 mV to 7 V	3.5 %

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39	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 Hz to 45 Hz)	Using Multifunction Calibrator by Direct Method	1 mV to 1000 V	0.7 % to 0.025 %
40	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 kHz to 50 kHz)	Using Multifunction Calibrator by Direct Method	1 V to 100 V	0.014 % to 0.02 %
41	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (10 kHz to 50 kHz)	Using Multifunction Calibrator by Direct Method	1 mV to 1 V	0.2 % to 0.014 %
42	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (45 Hz to 10 kHz)	Using Multifunction Calibrator by Direct Method	1 mV to 100 V	0.4 % to 0.01 %
43	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (45 Hz to 10 kHz)	Using Multifunction Calibrator by Direct Method	100 V to 1000 V	0.008 % to 0.02 %
44	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50 kHz to 1 MHz)	Using Multifunction Calibrator by Direct Method	1 mV to 100 mV	0.05 % to 1.2 %

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45	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Voltage (50 kHz to 1 MHz)	Using Multifunction Calibrator by Direct Method	100 mV to 10 V	0.25 % to 0.12 %
46	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	1 µF, 10 µF, 100µF, 1mF, 10 mF	0.1 %
47	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	1 pF	0.01 %
48	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Standard Capacitor By Direct Method	10 pF, 100 pF, 1000 pF	0.01 %
49	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Decade Capacitor By Direct Method	100 pF to 1 µF	0.25 %
50	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Capacitance at 1 kHz	Using Multifunction Calibrator By Direct Method	190 pF to 300 nF	0.50 %

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51	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Standard Inductor by Direct Method	1 mH, 10 mH, 100 mH, 1 H, 10 H	0.03 %
52	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Standard Inductor by Direct Method	100 µH	0.05 %
53	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	Inductance at 1 kHz	Using Decade Inductor by Direct Method	100 µH to 10 H	0.30 %
54	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Direct/Comparison Method	1 mA to 20 A	0.002 % to 0.005 %
55	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Direct/Comparison Method	10 µA to 1 mA	0.006 % to 0.002 %
56	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Current	Using Current Shunt, Current Source & DMM by Comparison (V/R) Method	20 A to 100 A	0.008 % to 0.05 %

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57	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC High Voltage	Using HV probe and and Digital Multimeter by Direct method	1 kV to 40 kV	2.5 %
58	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance - 2 Wire	Using DMM, Standard High Resistance Meter by Substitution Method	1 Mohm to 20 Gohm	0.001 % to 0.20 %
59	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance - 2 Wire	Using High Resistance Meter & Standard Resistance by Substitution Method	20 Gohm to 1 Tohm	0.2 % to 2.5 %
60	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance- 2 Wire & 4 Wire	Using DMM, Calibrator by Direct / Comparison (V/I) Method	0.0001 ohm to 0.001 ohm	0.03 % to 0.004 %
61	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Resistance- 2 Wire & 4 Wire	Using DMM, Standard Resistance with Calibrator by Substitution Method	0.001 ohm to 1 Mohm	0.004 % to 0.001 %
62	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	1 mV to 10 V	0.02 % to 0.0004 %

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63	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	10 µV to 1 mV	2.2 % to 0.014 %
64	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC Voltage	Using DMM by Direct method	10 V to 1000 V	0.0004 % to 0.0005 %
65	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Multifunction Calibrator By Direct Method	1 A to 20 A	0.005 % to 0.01 %
66	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Calibrator By Direct/ V/R Method	10 µA to 1 A	0.01 % to 0.005 %
67	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Multifunction Calibrator & current coil By Direct Method	20 A to 1000 A	0.53 %
68	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Current	Using Calibrator with High Current Source By Direct Method	20 A to 850 A	0.01 % to 0.06 %

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69	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC High Voltage	Using HIgh Voltage Source, HV Probe and Digital Multimeter by Comparison Method	>1 kV to 40 kV	2.5 %
70	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	1 Gohm	0.02 %
71	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	10 Gohm, 100 Gohm, 1 Tohm	0.5 %
72	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Decade Resistance By Direct Method	100 kohm to 1 Tohm	0.003 % to 5 %
73	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire	Using Standard Resistance By Direct Method	100 Mohm	0.002 %
74	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance- 2 Wire & 4 Wire	Using Standard Resistance By Direct Method	0.0001 ohm	0.05 %

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75	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Standard Resistance by direct method	0.001 ohm, 0.01 ohm, 0.1 ohm, 1 ohm, 10 ohm	0.02 % to 0.001 %
76	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Decade Resistance By Direct Method	0.01 ohm to 100 kohm	0.3 % to 0.004 %
77	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Resistance-2Wire & 4Wire	Using Standard Resistance by Direct Method	100 ohm, 1 kohm, 10 kohm 100 kohm, 1 Mohm, 10 Mohm	0.001 %
78	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Multifunction Calibrator By Direct Method	10 µV to 10 V	2 % to 0.0003 %
79	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC Voltage	Using Multifunction Calibrator By Direct Method	10 V to 1000 V	0.0003 % to 0.0004 %

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80	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	Attenuation (50 MHz to 1 GHz)	Using RF Millivoltmeter by Direct Method	1 dB to 60 dB	0.17 dB
81	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 mW to 40 mW	4%
82	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 nW to 1 mW	6 %
83	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and meters (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 nW to 1 mW	6 %
84	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and RF power meters (50 MHz to 1 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	40 mW to 80 W	4 %

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85	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power sources and RF power meters (50 MHz to 2 GHz)	Using RF Level Meter, RF Signal Generator By Direct/ Comparison Method	1 mW to 40 mW	4 %
86	ELECTRO-TECHNICAL-RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	Attenuation (50 MHz to 1 GHz)	Using RF Attenuator By Direct Method	1 dB to 60 dB	0.27 dB
87	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	B- Type Thermocouple	Using 8½ digit DMM by Direct method	600 °C to 1800 °C	0.30 °C
88	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	E- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)250 °C to 1000 °C	0.20 °C
89	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	J- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)210 °C to 1200 °C	0.20 °C

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90	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	K- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 1350 °C	0.20 °C
91	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	L Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 900 °C	0.20 °C
92	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	N Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 1400 °C	0.20 °C
93	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	R- Type Thermocouple	Using 8½ digit DMM by Direct method	0 °C to 1750 °C	0.2 °C
94	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	RTD Type PT 100	Using 8½ digit DMM by Direct method	(-)200 °C to 800 °C	0.02 °C
95	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	S- Type Thermocouple	Using 8½ digit DMM by Direct method	0 °C to 1750 °C	0.2 °C

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96	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	U- Type Thermocouple	Using 8½ digit DMM by Direct method	(-)200 °C to 600 °C	0.25 °C
97	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	B-Type Thermocouple	Using Multiproduct Calibrator by Direct method	600 °C to 1800 °C	0.30 °C
98	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	E- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)250 °C to 1000 °C	0.20 °C
99	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	J- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)210 °C to 1200 °C	0.20 °C
100	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	K- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 1350 °C	0.20 °C
101	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	L- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 900 °C	0.20 °C

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102	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	N- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 1400 °C	0.20
103	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	R- Type Thermocouple	Using Multiproduct Calibrator by Direct method	0 °C to 1750 °C	0.10 °C
104	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	RTD Type PT 100	Using Multiproduct Calibrator by Direct method	(-)200 °C to 800 °C	0.05 °C
105	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	S- Type Thermocouple	Using Multiproduct Calibrator by Direct method	0 °C to 1750 °C	0.10 °C
106	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	T- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)250 °C to 400 °C	0.40 °C
107	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	U- Type Thermocouple	Using Multiproduct Calibrator by Direct method	(-)200 °C to 600 °C	0.25 °C

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108	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source,Measure)	TC T- Type	Using 8.5 dgt DMM by Direct method	(-)250 °C to 400 °C	0.40 °C
109	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Frequency	Using frequency Counter logged with GPS Controlled Rubidium frequency standard & Signal Generator by Direct / Comparison Method	10 Hz to 20 GHz	0.0005 % to 0.00000006 %
110	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	Time Interval / Time Period	Using Frequency Counter by Direct/Comparison Method	20 ns to 2000 s	0.0002 %
111	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Frequency	Using Signal Generator logged with GPS Controlled Rubidium Frequency Standard by Direct Method.	10 Hz to 20 GHz	0.0005 % to 0.00000006 %
112	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	Time Interval / Time Period	Using Function Generator by Direct Method	20 ns to 2000 s	0.0002 %

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113	MECHANICAL-ACCELERATION AND SPEED	Tachometer (Non Contact type)	Using Precision Tachometer & standard Stroboscope by Comparison method	30 rpm to 70000 rpm	1.5 % to 0.1 %
114	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure Gauge, Pressure Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to 700 bar	0.23 bar
115	MECHANICAL-PRESSURE INDICATING DEVICES	Pneumatic Precision Gauges, Precision Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to 40 bar	0.021 bar
116	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Gauges, Vacuum Transmitter	Using Digital Pressure Indicator, Digital Pressure Calibrator and digital multimeter by comparison method as per DKD R-6-1	0 bar to (-) 0.9 bar	0.0042 bar

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117	THERMAL-SPECIFIC HEAT & HUMIDITY	Environmental Chamber & Humidity Chambers	Using Humidity Indicator with Sensor, RTD & Data Loggers (minimum nine sensors) By spatial mapping Method	35 %rh to 95 %rh (25°C to 60°C)	2 %rh
118	THERMAL-TEMPERATURE	Bath, Oven, Chamber, Incubator & Autoclave (for Non- Medical Application) (Single Position)	Using RTD , Temperature Indicator & Data Loggers by Comparison Method	(-)50 °C to 300 °C	1.0 °C
119	THERMAL-TEMPERATURE	Bath, Oven, Chamber, Incubator & Furnace (Multi position)	Using RTDs & Data Loggers (minimum 9 Sensors) by comparison Method	(-)50 °C to 300 °C	1.0 °C
120	THERMAL-TEMPERATURE	Refrigerator & Cold Chamber (Multi Position)	Using RTDs & Data Loggers (minimum 9 Sensors) by comparison Method	(-) 80 °C to 50 °C	1.0 °C
121	THERMAL-TEMPERATURE	Refrigerator & Cold Chamber (Single Position)	Using RTD, Temperature Indicator & Data Logger by Comparison Method	(-) 80 °C to 50 °C	1.0 °C

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122	THERMAL-TEMPERATURE	Temperature Gauge, Temperature Sensor with or without indicator	Using SPRT, Dry Block Calibrator & Temperature Indicator By Comparison Method	50 °C to 300 °C	1 °C
123	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Bath, Oven, Chamber, Incubator & Autoclave (for Non-Medical Application) (Single Position)	Using PRT with Temperature Indicator by Comparison Method	(-)50 °C to 300 °C	0.5°C
124	THERMAL-TEMPERATURE	Temperature Indicator with Sensor of Dry Well Calibrator, Furnace, Hot Chamber	Using 'R' Type Thermocouple & Temperature Indicator by Comparison Method	300 °C to 1300 °C	2.0 °C
125	THERMAL-TEMPERATURE	Thermocouple, Temperature Gauge with or without Indicator	Using R Type Thermocouple, Dry block Calibrator & Temperature Indicator By Comparison Method	300 °C to 1200 °C	2 °C

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