



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Name C AND I CALIBRATIONS PVT. LTD., J-448, SITAPURA INDUSTRIAL AREA, JAIPUR, RAJASTHAN , INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2216 Page No. : 1 / 69

Validity 15/11/2019 to 14/11/2021 Last Amended on -

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured / Instrument	Measurement range and additional parameters where applicable(Range and Frequency)	Calibration and Measurement Capability(CMC)(±)	Calibration or Measurement Method or procedure)
Permanent Facility					
1	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Active Power / Energy, 1 phase & 3 phase $\cos \phi \pm 0.01$ to 0.1, 40Hz to 60Hz, 40V to 320V, >0.1 A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.04 W to 9.6 kW	0.011% / PF (Related to Apparent Power)	Using 3 Phase Reference Standard COM3003 / SY-3102 By Direct / Comparison Method
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Apparent Power / Energy, 1 & 3 phase 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	400VA to 115.2kVA	0.011%	Using 3 Phase Reference Standard COM 3003/SY 3102 by Direct/ Comparison Method
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Reactive Power / Energy, 1 phase $\sin \phi \pm 0.10$ to 1 50Hz 40V to 320V, 100A to 1000A	400VAr to 960kVAr	0.15% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003/SY 3102 With Turn Coil by Direct Method



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4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current, 40 Hz to 70 Hz (For Calibration of Current Sources, meters)	1 mA to 120 A	0.045% to 0.008%	Using Com 3003 /MTS/ SY-3102 By Direct / Comparison Method
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current, 50 Hz (For Calibration of Current Sources and AC Shunts)	>120 A to 2000 A	0.06%	Using Com 3003 /MTS / SY-3102 and Std. CT By Direct / Comparison Method
6	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current,10 Hz to 10 kHz (For Calibration of Current Sources and meters)	10 µA to 20 A	285 ppm to 122 ppm	Using Fluke 8508A DMM , Agilent, Fluke Shunt 40B, 5790 A By Direct / comparison & V/I Method
7	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current,50 Hz (For Calibration of Current Sources and measuring instruments)	2000 A to 3200 A	0.10%	Using Com3003/MTS/ SY-3102 and Std. CT By Direct / comparison Method
8	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage,50 Hz (For calibration of HV Sources, probes, Dividers)	500 V to 33 kV	0.6 %	Using EPD 33kV with Standard Capacitor,Standard VT, 6 ½ Digital Multimeter by Direct/ comparison Method



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9	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage,50 Hz(For calibration of HV Sources, Dividers and HV Probes)	>33 kV to 200 kV	3%	Using HV Divider with DMM/KV Meter (Direct / Comparison Method)
10	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power ,320V-600 V, 0.5A - 20 A, PF ± 0.1 to 11 phase	16 W to 12 kW	0.16 to 0.23% / PF to (Related to Apparent Power)	Using Power meter Yokogawa WT 230 By Direct Method
11	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy 1 phase & 3 phase ActiveCos Ø ± 0.10 to 1 , 40Hz to 60Hz, 40V to 320V5mA (For Calibration of Power/Energy Calibrators, Energy Meters, Power Analysers)	0.02 W to 4.8 W	0.023% / PF(Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method
12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Active, Cos Ø ± 0.1 to 1,40Hz to 60Hz ,40V to 320V ,1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.004W to 4.8W	0.04% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard SY-3102 By Direct / comparison Method



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13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Active, Cos $\phi \pm 0.10$ to 1,40Hz to 60Hz,40V to 320V,>5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02W to 48W	0.018% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct Method
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent,40Hz to 60Hz,40V to 320V,>50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	2VA to 9.6kVA	0.010%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / comparison MethodMethod
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent,40Hz to 60Hz,40V to 320V,>5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VA to 48VA	0.018%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method Method



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16	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phaseActive, Cos Ø ± 0.10 to 1,40Hz to 60Hz,40V to 320V,>10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	40W to 115.2kW	0.011% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct /Comparison Method
17	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phaseActive, Cos Ø ± 0.10 to 1,40Hz to 60Hz,40V to 320V,>50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2W to 9.6kW	0.010% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method



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18	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	400VA to 115.2kVA	0.011%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method
19	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, 1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.04VA to 4.8VA	0.04%	Using 3 Phase reference Standard SY-3102 By Direct / Comparison Method
20	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VA to 4.8VA	0.023%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / comparison Method



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21	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.1 to 1, 40Hz to 60Hz, 40V to 320V 1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.004VAr to 4.8VAr	0.04%% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard SY-3102 By Direct/ Comparison Method
22	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1, 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	40VAr to 115.2kVAr	0.011% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method



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23	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, >50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VAr to 9.6kVAr	0.010% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method
24	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, >5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02VAr to 48VAr	0.018% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method



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25	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02VAr to 4.8VAr	0.023% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method
26	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase Active, Cos Ø ± 0.10 to 1,50Hz , 40V to 320V, 100 A to 1000 A	400W to 960kW	0.15% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct Method
27	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance, 1kHz (For calibration of Standard Resistors and LCR meters)	1 Ohm to 100 kOhm	400 ppm to 550 ppm	Using LCR Meter By Direct / Comparison Method
28	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 V to 480 V (Calibration of Voltage Sources and meters)	40 Hz to 60 Hz	110ppm to 70ppm	Using 3 Phase Ref. Standard COM 3003/ SY- 3102 By Direct / Comparison Method



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29	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	10 Hz to 20 kHz	1700 ppm to 126 ppm	Using AC Std. Fluke 5790A, 8508A DMM , HP ,Agilent By Direct / Comparison Method
30	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	100 KHz to 1 MHz	0.3% to 1.4%	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
31	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	20 kHz to 100 kHz	0.012% to 0.3%	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
32	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 mV to 22 V (for calibration of Voltage sources and meters)	10 Hz to 10 kHz	165 ppm to 33 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct / Comparison Method
33	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 mV to 22 V (For calibration of Voltage Sources and meters)	10 kHz to 1 MHz	28 ppm to 3300 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct / comparison Method



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34	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 V to 220 V(For calibration of Voltage Sources and meters)	10 Hz to 100 KHz	28 ppm to 100 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
35	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 220 V to 1000 V(For calibration of Voltage Sources and meters)	10 Hz to 10 kHz	40 ppm to 85 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent by Direct /Comparison Method
36	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance , 1kHz (for calibration of std capacitors, LCR meter)	1 pF to 1000 pF	0.12% to 0.04%	Using LCR Meter, By Direct/ Comparison Method
37	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance , 1kHz(For calibration of capacitors and LCR meters)	1000 pF to 100 µF	0.04% to 0.38%	Using LCR Meter, by Direct / Comparison Method
38	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	CT-VT Comparator (AITTS), VT ModeRatio error & Phase error, 50Hz	63.5V to 110V	RE:0.01% & PE:0.5Min.	Using Standard Capacitor/Voltage Transformer with Automatic Instrument transformer test set (AITTS) By Comparison Method



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39	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	CT-VT Comparator (AITTS),CT ModeRatio error & Phase error, 50Hz	1 A to 5 A	RE:0.012% & PE:0.54Min.	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) By Comparison Method
40	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current Transformer Primary Injection method, Ratio error & Phase error at 50Hz, 1A & 5A (Secondary)	1% to 120% of Rated 5 A to 2000 A	RE : 0.03%, PE : 2.5 Min.	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source
41	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current TransformerPrimary Injection method, Ratio error & Phase error, 50Hz,1A, 5A(Secondary)	1% to 120% of Rated 1A to 5A	RE:0.12% to 0.46%;PE: 6.2 to 17min	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source By Direct Method
42	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current TransformerPrimary Injection method, Ratio error & Phase error, 50Hz,1A,5A(Secondary)	1% to 120% of Rated 2000A to 3200 A	RE:0.056 % to 0.067%;PE: 3 to 5.64 min	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source By Direct Method
43	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Harmonics in Current ,Fundamental Frequency 50 Hz 10 mA to 24 A (For calibrationof Harmonic analysers and generators)	1st order to 40th order	0.8%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method



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44	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Harmonics in Voltage ,Fundamental Frequency 50 Hz 40 V to 240 V (For calibrationof Harmonics analysers and generators)	1 st order to 40 th order	0.4%	Using 3 Phase reference Standard SY-3102 By Direct /Comparison Method
45	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance , 1kHz (for calibration of Inductors and LCR meters)	100 µH to 1000µH	0.3% to 0.04%	Using LCR Meter By Direct / Comparison Method
46	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance , 1kHz (For calibration of Inductors and LCR meters)	1000 µH to 10 H	0.04% to 0.06%	Using LCR Meter By Direct/ Comparison Method
47	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage Divider Primary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 110 V to 3.3 kV	RE:0.14% & PE: 7Min.	Using Standard Voltage Transformer, EPD with capacitor 33kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method



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48	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 110V/Root(3) Secondary (50V - 144V)	120%to 80% of Rated 66 kV/Root(3) to 66 kV/Root(3)	RE:0.12% & PE:7 Min.	Using Standard Voltage Transformer 66kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
49	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 3.3 kV/Root(3) to 33 kV/Root(3)	RE:0.07% & PE:3 Min.	Using EPD and Capacitor 33kV, Standard Voltage Transformer with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
50	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120%to80% of Rated 110 V/Root(3) to 3.3 kV/Root(3)	RE:0.14% & PE:7 Min.	Using Standard Voltage Transformer, EPD with capacitor 33kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method



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51	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage Divider, Primary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 3.3 kV to 33 kV	RE:0.07% & PE:3Min.	Using EPD and Capacitor 33kV, Standard Voltage Transformer with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
52	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Power Factor 40 Hz to 70 Hz (For calibration of Phase shifters and PF meters)	0.01 PF to 1 PF lead/lag	0.0005 PF	Using 3 Phase Reference Standard COM 3003/SY3102 by Direct / Comparison Method
53	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Voltage Ratio	0.8 Turn to 2021 Turn	0.04% to 0.05%	Using Fluke 8508A/Agilent/ HP By Direct Method
54	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 10 KHZ	10 µA to 20 A	0.11% to 0.017%	Fluke 5720A MFC with Amplifier by Direct Method
55	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 40 Hz to 70 Hz	1 mA to 100 A	0.045% to 0.16%	Using Fluke 5720 /52120 Amplifier



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56	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	120A to 1000 A	0.45% to 0.45%	MFC 9100 with Current Coil by Direct Method
57	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Power ,320V-600 V, 0.5A - 20 A, PF ± 0.1 to 11 phase	16 W to 12 kW	0.16% / PF to (Related to Apparent Power)	MFC Fluke 5080 A by Direct Method
58	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 20 kHz to 1 MHz	10 mV to 20 V	6500 ppm to 120 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
59	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 1 kHz	200 V to 1100 V	120 ppm to 65 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
60	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	1 mV to 20 mV	4800 ppm to 300 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method



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61	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	20 mV to 200 mV	300 ppm to 120 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
62	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	200 mV to 200 V	120 ppm to 59 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
63	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance 1kHz	1000 pF to 100 µF	0.35% to 0.7%	Using MFC 9100 by Direct Method
64	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance 1kHz	500 pF to 1000 pF	0.35%	Using MFC 9100 by Direct Method
65	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance 1kHz	100 µH to 1000 µH	0.3% to 0.04%	Using Decade Inductance box by Direct Method



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66	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance 1kHz	1000 µH to 10 H	0.04% to 0.06%	Using Decade Inductance box by Direct Method
67	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Voltage Ratio	0.8 Turn to 2021 Turn	0.05% to 0.08%	Amber make Ratio Standard by Direct Method
68	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	20 A to 100 A	0.05% to 0.5%	Using Fluke 8508A DMM , osaw Resistor Fluke 40B By Direct Method
69	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Meters, Shunts)	100 µA to 100 mA	20 ppm to 30 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B by Direct / Comparison by V/R Method
70	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Shunts and meters)	1µA to 100 µA	460 ppm to 20 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B By Direct / Comparison /V/R Method
71	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Shunts and metrs)	100 mA to 20 A	30 ppm to 50 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B By Direct / comparison & V/I Method



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72	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Meters)	0.05 nA to 1 µA	3 % to 0.25 %	Using PA meter Keithley 6485 by Direct / comparison Method Method
73	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Power ,1.5 V-1000 V ,0.1 A to 20 A	0.15 W to 20 kW	0.011% to 0.055%	Using Fluke 8508A/5080A, Yokogawa & 6 ½ DMM By Direct / Comparison Method
74	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	0.001 ohm to 1 ohm	0.02%	Using Std. Resistance By Direct / VI Method
75	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	0.1mohm to 1 mohm	0.032%	Using Fluke 5720 A and 8508 A by V/I Method
76	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 MOhm to 100 MOhm	11 ppm to 160 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
77	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Ohm to 1 MOhm	19 ppm to 11 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
78	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 MOhm to 20 GOhm	160 ppm to 1800 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
79	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	20 GOhm to 10 TOhm	1 % to 2 %	Using pA Meter/ Fluke 5080A Direct by V / I Method



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80	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (for calibration of HV Sources and Probes)	1 kV to 30kV	2.5 %	Using HV Probe with DMM & Source by Direct / Comparison Method
81	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (For calibration of Sources and meters)	1 mV to 10 V	200 ppm to 4 ppm	Using Fluke 8508A DMM , HP ,Agilent by Direct/ Comparison Method
82	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (for calibration of Sources and meters)	10 V to 1000 V	4 ppm to 8 ppm	Using Fluke 8508A DMM , HP ,Agilent by Direct/ Comparison Method
83	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 µA to 100 µA	0.61% to 0.02%	Using Fluke 5720A /5080A by Direct Method
84	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 µA to 20 A	200ppm	Using Fluke 5720A /52120A by Direct Method
85	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 A to 1000 A	0.45 %	Using Fluke 5720A with Amplifier /9100/ 5080A/52120A & Current Coil by Direct Method
86	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 A to 100 A	200 ppm to 360 ppm	Using Fluke 5720A with Amplifier 52120A by Direct Method



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87	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Power ,1.5 V-1000 V ,0.1 A to 20 A	0.15 W to 20 kW	0.011% to 0.055%	Using Fluke MFC 5080A by Direct Method
88	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	0.1mohm to 0.1mohm	0.012%	Using Standard Resistance by Direct method
89	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 mohm to 1 mohm	0.012%	Using Standard Resistance by Direct Method
90	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 MOhm to 100 MOhm	22 ppm to 120 ppm	Using Fluke 5720A/5080A / 9100 by Direct Method
91	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 Ohm to 19 Ohm	125 ppm to 100 ppm	Using Fluke 5720A/5080A / 9100 by Direct Method
92	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 mOhm to 10 mOhm	0.012%	Using Standard Resistance by Direct Method
93	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 mOhm to 100 mOhm	0.012%	Using Standard Resistance by Direct Method
94	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 MOhm to 400 MOhm	65 ppm to 900 ppm	Using MFC 9100 by Direct Method
95	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	19 Ohm to 1 MOhm	100 ppm to 22 ppm	Using Fluke 5720A/5080 / 9100 by Direct Method



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96	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 100 mV	470 ppm to 11 ppm	Using MFC Fluke 5720A By Direct Method
97	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 V to 1100 V	4.72 ppm to 9.7 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
98	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 mV to 10 V	11 ppm to 4.72 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
99	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	Insulation Resistance	10 kOhm to 18 GOhm	0.2% to 1.5%	Using Fluke 5080A MEG with 10 kV divider by Direct Method
100	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	Insulation Resistance up to 10kV	10 GOhm to 10 TOhm	1.5% to 2.5%	Using Fluke 5080A MEG with 10 kV divider by Direct Method
101	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power,10MHz-3 GHz,(-60 dBm to +13 dBm)	1 µW to 20 mW (-60 dBm to +13 dBm)	0.51dB to 0.86dB	Using R&S Meter By Direct / Comparison Method
102	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Voltage ,10MHz-3GHz	7 mV to 1 V	4.1%	Using R&S RF Voltmeter URV 55 By Direct Method



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103	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	RF Power 10 MHz to 1 GHz (-60dBm to +13 dBm)	1 µW to 20 mW (-60 dBm to +13 dBm)	0.48dB	Using HP Signal Generator by Direct Method
104	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	RF Voltage 10 MHz to 1 GHz	7mV to 1 V	1 % to 4.1%	Using Leveled Sine Generator and 9100 MFC By Direct Method
105	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller B Type Thermocouple	(-) 600°C to 1800 °C	0.03 °C	Using Fluke 8508 A by Direct Method
106	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller C Type Thermocouple	(-)400°C to 2320 °C	0.06 °C	Using Fluke 8508 A by Direct Method
107	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller E Type Thermocouple	(-)250°C to 1000 °C	0.023 °C	Using Fluke 8508 A by Direct Method



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108	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller J Type Thermocouple	(-)200°C to 1200 °C	0.018 °C	Using Fluke 8508 A by Direct Method
109	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller K Type Thermocouple	(-)200°C to 1370 °C	0.014 °C	Using Fluke 8508 A by Direct Method
110	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller L Type Thermocouple	(-)200°C to 1300 °C	0.02 °C	Using Fluke 8508 A by Direct Method
111	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller N Type Thermocouple	(-)200°C to 1300 °C	0.028 °C	Using Fluke 8508 A by Direct Method
112	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller R Type Thermocouple	(-)50°C to 1770 °C	0.03 °C	Using Fluke 8508 A by Direct Method



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113	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller RTD/PRT Type Thermocouple	(-)200°C to 850 °C	0.017 °C	Using Fluke 8508 A by Direct Method
114	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller S Type Thermocouple	(-)50°C to 1770 °C	0.03 °C	Using Fluke 8508 A /Agilent by Direct / Simulation Method
115	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller T Type Thermocouple	(-)200°C to 400 °C	0.018 °C	Using Fluke 8508 A /Agilent by Direct / Simulation Method
116	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)B Type Thermocouple	(-) 600°C to 1800 °C	0.06 °C	Using Fluke 5720/5080A/9100 by Direct Method
117	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)C Type Thermocouple	(-)400°C to 2320 °C	0.03 °C	Using Fluke 5720/5080A/9100by Direct Method
118	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)E Type Thermocouple	(-) 250°C to 1000 °C	0.08 °C	Using Fluke 5720/5080A/9100 by Direct Method



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119	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)J Type Thermocouple	(-) 200°C to 1200 °C	0.011 °C	Using Fluke 5720/5080A/9100 by Direct Method
120	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)K Type Thermocouple	(-)200°C to 1370 °C	0.013 °C	Using Fluke 5720/5080A/9100 by Direct Method
121	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)L Type Thermocouple	(-)200°C to 1300 °C	0.011 °C	Using Fluke 5720/5080A/9100 by Direct Method
122	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)N Type Thermocouple	(-)200°C to 1300 °C	0.02 °C	Using Fluke 5720/5080A/9100 by Direct Method
123	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)R Type Thermocouple	(-)50°C to 1770 °C	0.07 °C	Using Fluke 5720/5080A/9100 by Direct Method
124	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)RTD/PRT	(-)200°C to 850 °C	0.009 °C	Using Fluke 5720/5080A/9100/ by Direct Method
125	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)S Type Thermocouple	(-)50°C to 1770 °C	0.07 °C	Using Fluke 5720/5080A/9100 by Direct / Method



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126	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)T Type Thermocouple	(-)-200°C to 400 °C	0.02°C	Using Fluke 5720/9100 by Direct Method
127	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency (For calibration of Freq Sources and meters)	40 Hz to 70 Hz	0.025 %	Using 3 Phase reference Standard COM 3003/MTS by Direct/ Comparison Method
128	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency/period	1 Hz (1sec) to 3 GHz (0.33 n sec)	4 .1 ppm to 0.1 ppm	Using Fluke 8508A DMM , Agilent /Freq. Counter/ 9100 By Direct / Comparison Method
129	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Time Interval	10 nsec. to 100000 sec.	0.11ppm to 6.02ppm	Using Frequency Counter CNT90 by Comparison method
130	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency/Period	1 Hz to 1 GHz(1sec to 1nsec)	30 ppm to 5 ppm	Using MFC 9100 and HP Signal Generator by Direct Method
131	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Time Interval	10 nsec. to 100000 sec.	26ppm	MFC 9100 by Direct Method
132	FLUID FLOW- FLOW MEASURING DEVICES	Cumulative Mass of Fluid (Medium:Water)	100 kg to 10000kg	0.068 % rdg	Using Mass Flow Meter by Comparison Method



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133	FLUID FLOW- FLOW MEASURING DEVICES	Mass flow rate(Medium:Water)	0.1kg/min to 833 kg/min	0.07 % of rdg	Using Mass Flow Meter by Comparison Method
134	FLUID FLOW- FLOW MEASURING DEVICES	Quantity of Volume(Medium:Water)	0.1 m ³ to 10 m ³	0.08% rdg	Using Mass,Volume Flow Meter by Comparison Method
135	FLUID FLOW- FLOW MEASURING DEVICES	Volume Flow Rate (Medium:Water)	0.06 m ³ /h to 50 m ³ /h	0.09 % rdg	Using Mass Flow Meter by Comparison Method
136	FLUID FLOW- FLOW MEASURING DEVICES	Volume Flow Rate (Medium:Water)	1 m ³ /h to 50 m ³ /h	0.33%rdg	Using Electro Magnetic/Mass Flow meter by Comparison Method
137	MECHANICAL- ACCELERATION AND SPEED	SPEED (Contact type)Tachometer	100 rpm to 6000 rpm	11 rpm	Using Tachometer
138	MECHANICAL- ACCELERATION AND SPEED	SPEED (Non-contact type)RPM indicators, Centrifuges	100 rpm to 6000 rpm	5 rpm	Using Tachometer
139	MECHANICAL- ACCELERATION AND SPEED	SPEED (Non-contact type)Tachometer	6000 rpm to 60000 rpm	26 rpm	Using Tachometer
140	MECHANICAL- ACOUSTICS	Sound Level Meter	94 dB & 114dB at 1KHz	0.4 dB	Using Sound Level Calibrator



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141	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Angle Bevel Protector/ Combination Set / Clinometers,LC: 5 min	0 ° to 180 °	4min	Using Angle Gauges
142	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Caliper(Digital, Vernier) L.C.- 0.01 mm	0 mm to 1000 mm	31.8µm	Using Gauge Block Set & Caliper Checker
143	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Caliper(Digital/ Vernier) L.C.- 0.01 mm	0 mm to 600 mm	10.6µm	Using Gauge Block Set & Caliper Checker
144	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Coating Thickness Gauges	10 µm to 935 µm	2.0µm	Using Foils Set by comparison method
145	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Bore Gauge (Transmission Movement only) ,L.C. 0.01 mm	Upto 1.8 mm	3.5µm	Using Gauge Block Set / Digital Gauge Sylvac



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146	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Dial Gauge ,L.C. 0.001 mm	0 mm to 25 mm	0.9 µm	Using Gauge Block Set / Digital Gauge Sylvac
147	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer,L.C. 0.001 mm	0 mm to 100 mm	1.4µm	Using Gauge Block Set
148	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer,L.C. 0.01 mm	0 mm to 200 mm	7.0µm	Using Gauge Block Set & caliper checker With Gauge block accessories set
149	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer,L.C. 0.01 mm	200 mm to 600 mm	10.0µm	Using Gauge Block Set & caliper checker With Gauge block accessories set
150	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer,L.C. 0.01 mm	600 mm to 1000 mm	15.0µm	Using Gauge Block Set & caliper checker With Gauge block accessories set



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151	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Feeler Gauge	0.01 mm to 1.0 mm	1.5µm	Using Digital Micrometer
152	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Height Gauge ,L.C. 0.01 mm	0 mm to 300 mm	9 µm	Using Gauge Block Set & Caliper Checker
153	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Height GaugeL.C. 0.01 mm	0 mm to 1000 mm	11.0µm	Using Gauge Block Set & Caliper Checker
154	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Internal Micrometer,L.C. 0.001 mm	5 mm to 30 mm	1.2µm	Using Gauge Block Set & Gauge block accessories
155	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Internal Micrometer,L.C. 0.01 mm	5 mm to 1000 mm	15.0µm	Using Gauge Block Set & Gauge block accessories:



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156	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Sprit Level ,LC: 0.02 mm/Meter	0 mm to 200 mm	16µm/meter	Using Sine bar & Slip Gauge Set
157	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Std. Foils Set	10 µm to 2000 µm	1.3µm	Using Digital Plunger Dial Gauge L.C. 0.1µm
158	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Steel Scale / Measuring Tape	0 m to 10 m	0.25mm	Using Digital Scale Calibration System by comparison method
159	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Thickness Gauge(Dial/ Digital)	0.1 mm to 25 mm	7.0µm	Using Gauge Block Set
160	MECHANICAL-PRESSURE BALANCE OR DEAD WEIGHT TESTER	Deadweight Testers	6 bar to 60 bar	0.013 % rdg	Using Dead Weight Tester By Cross Float Principle Comparison method based on Euramet eg-3



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161	MECHANICAL-PRESSURE BALANCE OR DEAD WEIGHT TESTER	Deadweight Testers	60 bar to 1200 bar	0.013 % rdg	Using Dead Weight Tester By Cross Float Principle Comparison method based on Euramet eg-3
162	MECHANICAL-PRESSURE INDICATING DEVICES	Barometers	300 mbar to 1200 mbar	0.052% of rdg	Using Precision Digital Gauges
163	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters	0 bar to 700 bar	0.034% rdg	Using Precision Digital Gauges By Comparison Method
164	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Transmitters	0 bar to 2 bar	0.082% rdg	Using Precision Digital Gauges
165	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Calibrator, Analog & Digital Pressure Gauges, Pressure Transducers, Transmitters	6 bar to 1200 bar	0.012% rdg	Using Dead Weight Tester, Digital Pressure Calibrator, DMM based on DKD R 6-1
166	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauges, Absolute gauge	0 bar to 2 bar Abs	0.069% rdg	Using Precision Digital Gauge
167	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Gauges, Transducers, Transmitter	(-) 0.93 bar to 0 bar	0.07% rdg	Using Precision Digital Gauges



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168	MECHANICAL-VOLUME	Micro Pipettes	10 µl to 1000 µl	0.16 µl	Using Electronic weighing Balance with readability of 0.01 mg. Procedure based on ISO 8655 Part 6.
169	MECHANICAL-VOLUME	VOLUME Pipettes / Burettes / Measuring Flask & Cylinders	1 ml to 50 ml	0.26 µl	Electronic weighing Balance with readability of 80 g (0.01 mg), 220 g (0.1 mg) & 6100 g (10 mg). Procedure as per ISO 4787.
170	MECHANICAL-VOLUME	VOLUME Pipettes / Burettes / Measuring Flask & Cylinders	50 ml to 150 ml	0.30 µl	Electronic weighing Balance with readability of 80 g (0.01 mg), 220 g (0.1 mg) & 6100 g (10 mg). Procedure as per ISO 4787.
171	MECHANICAL-VOLUME	VOLUME Pipettes / Burettes / Measuring Flask & Cylinders	150 ml to 5 l	0.065 ml	Electronic weighing Balance with readability of 80 g (0.01 mg), 220 g (0.1 mg) & 6100 g (10 mg). Procedure as per ISO 4787.
172	MECHANICAL-WEIGHTS	Weights (Class of Weights E2, F1,F2,M1,M2,M3)	500 mg	0.01 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
173	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	1 g	0.018 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg



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174	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	1 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01mg
175	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	10 g	0.065 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
176	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	10 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01mg
177	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	100 g	0.16 mg	Using Weights E2 Balance ,Readability 0.1mg
178	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	100 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
179	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	1000 g	6.5 mg	Using Weights F1 Balance Readability 10 mg
180	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	10000 g	0.50 g	Using Weights F1/F2/M1 Balance Readability 1g
181	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	2 g	0.018 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
182	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	2 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01mg



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183	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	20 g	0.065 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
184	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	20 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
185	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	200 g	0.16 mg	Using Weights E2 Balance ,Readability 0.1mg
186	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	200 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
187	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	2000 g	6.5 mg	Using Weights F1 Balance Readability 10 mg
188	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	20000 g	0.50 g	Using Weights F1/F2/M1 Balance Readability 1g
189	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	5 g	0.018 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
190	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	5 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01mg
191	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	50 g	0.065 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg



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192	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	50 mg	0.008 mg	Using Standard Weights E1/E2 Balance ,Readability 0.01 mg
193	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	500 g	6.5 mg	Using Weights F1 Balance ,Readability 10 mg
194	MECHANICAL-WEIGHTS	Weights (Class of Weights F1,F2,M1,M2,M3)	5000 g	10 mg	Using Weights F1 Balance Readability 10 mg
195	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Sensor With Indicator/Controller,The rmo Hygrometer	20 % RH to 90 % RH @ 25°C	0.8% RH	Using Standard Humidity Indicator with sensor and humidity Chamber / Generator By Comparison Method
196	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Sensor With Indicator/Controller,The rmo Hygrometer	20 °C to 50 °C @50%RH	0.45 °C	Using Standard PRT PT-100 sensor with Indicator Chamber / Generator By Comparison Method
197	THERMAL- TEMPERATURE	Pyrometer, Black Body Source ,IR Thermometer.	50 °C to 500 °C	2.86 °C	Using Std. Non Contact Pyrometer & Black body Source(Emissivity:0.95) By Comparison Method



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198	THERMAL-TEMPERATURE	Pyrometer, Black Body Source, IR Thermometer	500 °C to 1200 °C	3.9 °C	Using Std. Non Contact Pyrometer & Black body Source(Emissivity:0.95) By Comparison Method
199	THERMAL-TEMPERATURE	RTD sensor, Thermocouple with or without Indicator, glass thermometer (up to 250°C), Analog Temp Gauge.	0°C to 650 °C	0.13 °C	Using Liquid Bath, Dry Block Calibrator, PRT with Indicator, DMM, by Comparison Method
200	THERMAL-TEMPERATURE	RTD sensor, Thermocouple with or without Indicator, Glass Thermometer, Analog Temp Gauge	(-) 35 °C to 0 °C	0.13 °C	Using Liquid Bath, PRT with Indicator ,DMM by Comparison Method
201	THERMAL-TEMPERATURE	RTD, Thermocouple Sensors with or without Indicator, Analog Temp Gauge.	500 °C to 1000 °C	1.91 °C	Using S Type Thermocouple with Indicator,DMM and Dry block calibrator by comparison method.
202	THERMAL-TEMPERATURE	Thermocouple with or without Indicator.	1000 °C to 1200 °C	2.04 °C	Using S Type Thermocouple with Indicator,DMM , dry well Temperature bath by comparison method.



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Site Facility					
1	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Active Power / Energy, 1 phase & 3 phase $\cos \phi \pm 0.01$ to 0.1, 40Hz to 60Hz, 40V to 320V, >0.1 A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.04 W to 9.6 kW	0.011% / PF (Related to Apparent Power)	Using 3 Phase Reference Standard COM3003 / SY-3102 By Direct / Comparison Method
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Apparent Power / Energy, 1 & 3 phase 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	400VA to 115.2kVA	0.011%	Using 3 Phase Reference Standard COM 3003/SY 3102 by Direct/ Comparison Method
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Reactive Power / Energy, 1 phase $\sin \phi \pm 0.10$ to 1 50Hz 40V to 320V, 100A to 1000A	400VAr to 960kVAr	0.15% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003/SY 3102 With Turn Coil by Direct Method



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4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current, 40 Hz to 70 Hz (For Calibration of Current Sources, meters)	1 mA to 120 A	0.045% to 0.008%	Using Com 3003 /MTS/ SY-3102 By Direct / Comparison Method
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current, 50 Hz (For Calibration of Current Sources and AC Shunts)	>120 A to 2000 A	0.06%	Using Com 3003 /MTS / SY-3102 and Std. CT By Direct / Comparison Method
6	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current,10 Hz to 10 kHz (For Calibration of Current Sources and meters)	10 µA to 20 A	285 ppm to 122 ppm	Using Fluke 8508A DMM , Agilent, Fluke Shunt 40B, 5790 A By Direct / comparison & V/I Method
7	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current,50 Hz (For Calibration of Current Sources and measuring instruments)	2000 A to 3200 A	0.10%	Using Com3003/MTS/ SY-3102 and Std. CT By Direct / comparison Method
8	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage,50 Hz (For calibration of HV Sources, probes, Dividers)	500 V to 33 kV	0.6 %	Using EPD 33kV with Standard Capacitor,Standard VT, 6 ½ Digital Multimeter by Direct/ comparison Method



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9	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC High Voltage,50 Hz(For calibration of HV Sources, Dividers and HV Probes)	>33 kV to 200 kV	3%	Using HV Divider with DMM/KV Meter (Direct / Comparison Method)
10	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power ,320V-600 V, 0.5A - 20 A, PF ± 0.1 to 11 phase	16 W to 12 kW	0.16 to 0.23% / PF to (Related to Apparent Power)	Using Power meter Yokogawa WT 230 By Direct Method
11	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy 1 phase & 3 phase ActiveCos Ø ± 0.10 to 1 , 40Hz to 60Hz, 40V to 320V5mA (For Calibration of Power/Energy Calibrators, Energy Meters, Power Analysers)	0.02 W to 4.8 W	0.023% / PF(Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method
12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Active, Cos Ø ± 0.1 to 1,40Hz to 60Hz ,40V to 320V ,1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.004W to 4.8W	0.04% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard SY-3102 By Direct / comparison Method



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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	Measurement range and additional parameters where applicable(Range and Frequency)	Calibration and Measurement Capability(CMC)(±)	Calibration or Measurement Method or procedure)
13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Active, Cos $\phi \pm 0.10$ to 1, 40Hz to 60Hz, 40V to 320V, >5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02W to 48W	0.018% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct Method
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, >50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	2VA to 9.6kVA	0.010%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / comparison Method Method
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, >5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VA to 48VA	0.018%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method Method



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16	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phaseActive, Cos Ø ± 0.10 to 1,40Hz to 60Hz,40V to 320V,>10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	40W to 115.2kW	0.011% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct /Comparison Method
17	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phaseActive, Cos Ø ± 0.10 to 1,40Hz to 60Hz,40V to 320V,>50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2W to 9.6kW	0.010% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method



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18	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	400VA to 115.2kVA	0.011%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method
19	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, 1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.04VA to 4.8VA	0.04%	Using 3 Phase reference Standard SY-3102 By Direct / Comparison Method
20	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Apparent, 40Hz to 60Hz, 40V to 320V, 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VA to 4.8VA	0.023%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / comparison Method



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21	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.1 to 1, 40Hz to 60Hz, 40V to 320V 1mA to 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.004VAr to 4.8VAr	0.04%% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard SY-3102 By Direct/ Comparison Method
22	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1, 40Hz to 60Hz, 40V to 320V, >10A to 120A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	40VAr to 115.2kVAr	0.011% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method



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23	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, >50mA to 10A (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.2VAr to 9.6kVAr	0.010% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method
24	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, >5mA to 50mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02VAr to 48VAr	0.018% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 by Direct / Comparison Method



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25	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase & 3 phase Reactive, Sin Ø ± 0.10 to 1,40Hz to 60Hz, 40V to 320V, 5mA (For Calibration of Power/ Energy Calibrators, Power Analysers, Energy Standards)	0.02VAr to 4.8VAr	0.023% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct / Comparison Method
26	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power / Energy, 1 phase Active, Cos Ø ± 0.10 to 1,50Hz , 40V to 320V, 100 A to 1000 A	400W to 960kW	0.15% / PF to (Related to Apparent Power)	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct Method
27	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Resistance, 1kHz (For calibration of Standard Resistors and LCR meters)	1 Ohm to 100 kOhm	400 ppm to 550 ppm	Using LCR Meter By Direct / Comparison Method
28	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 V to 480 V (Calibration of Voltage Sources and meters)	40 Hz to 60 Hz	110ppm to 70ppm	Using 3 Phase Ref. Standard COM 3003/ SY- 3102 By Direct / Comparison Method



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29	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	10 Hz to 20 kHz	1700 ppm to 126 ppm	Using AC Std. Fluke 5790A, 8508A DMM , HP ,Agilent By Direct / Comparison Method
30	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	100 KHz to 1 MHz	0.3% to 1.4%	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
31	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 1mV to 22mV(For calibration of Voltage Sources and meters)	20 kHz to 100 kHz	0.012% to 0.3%	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
32	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 mV to 22 V (for calibration of Voltage sources and meters)	10 Hz to 10 kHz	165 ppm to 33 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct / Comparison Method
33	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 mV to 22 V (For calibration of Voltage Sources and meters)	10 kHz to 1 MHz	28 ppm to 3300 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct / comparison Method



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34	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 22 V to 220 V(For calibration of Voltage Sources and meters)	10 Hz to 100 KHz	28 ppm to 100 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent By Direct/ Comparison Method
35	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 220 V to 1000 V(For calibration of Voltage Sources and meters)	10 Hz to 10 kHz	40 ppm to 85 ppm	Using AC Std. Fluke 5790, 8508A DMM , HP ,Agilent by Direct /Comparison Method
36	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance , 1kHz (for calibration of std capacitors, LCR meter)	1 pF to 1000 pF	0.12% to 0.04%	Using LCR Meter, By Direct/ Comparison Method
37	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Capacitance , 1kHz(For calibration of capacitors and LCR meters)	1000 pF to 100 µF	0.04% to 0.38%	Using LCR Meter, by Direct / Comparison Method
38	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	CT-VT Comparator (AITTS), VT ModeRatio error & Phase error, 50Hz	63.5V to 110V	RE:0.01% & PE:0.5Min.	Using Standard Capacitor/Voltage Transformer with Automatic Instrument transformer test set (AITTS) By Comparison Method



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39	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	CT-VT Comparator (AITTS),CT ModeRatio error & Phase error, 50Hz	1 A to 5 A	RE:0.012% & PE:0.54Min.	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) By Comparison Method
40	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current Transformer Primary Injection method, Ratio error & Phase error at 50Hz, 1A & 5A (Secondary)	1% to 120% of Rated 5 A to 2000 A	RE : 0.03%, PE : 2.5 Min.	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source
41	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current TransformerPrimary Injection method, Ratio error & Phase error, 50Hz,1A, 5A(Secondary)	1% to 120% of Rated 1A to 5A	RE:0.12% to 0.46%;PE: 6.2 to 17min	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source By Direct Method
42	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Current TransformerPrimary Injection method, Ratio error & Phase error, 50Hz,1A,5A(Secondary)	1% to 120% of Rated 2000A to 3200 A	RE:0.056 % to 0.067%;PE: 3 to 5.64 min	Using Precision current transformer, Automatic Instrument transformer test set (AITTS) and High Current Source By Direct Method
43	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Harmonics in Current ,Fundamental Frequency 50 Hz 10 mA to 24 A (For calibrationof Harmonic analysers and generators)	1st order to 40th order	0.8%	Using 3 Phase Reference Standard COM 3003 / SY-3102 By Direct/ Comparison Method



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44	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Harmonics in Voltage ,Fundamental Frequency 50 Hz 40 V to 240 V (For calibrationof Harmonics analysers and generators)	1 st order to 40 th order	0.4%	Using 3 Phase reference Standard SY-3102 By Direct /Comparison Method
45	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance , 1kHz (for calibration of Inductors and LCR meters)	100 µH to 1000µH	0.3% to 0.04%	Using LCR Meter By Direct / Comparison Method
46	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Inductance , 1kHz (For calibration of Inductors and LCR meters)	1000 µH to 10 H	0.04% to 0.06%	Using LCR Meter By Direct/ Comparison Method
47	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage Divider Primary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 110 V to 3.3 kV	RE:0.14% & PE: 7Min.	Using Standard Voltage Transformer, EPD with capacitor 33kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method



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48	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 110V/Root(3) Secondary (50V - 144V)	120%to 80% of Rated 66 kV/Root(3) to 66 kV/Root(3)	RE:0.12% & PE:7 Min.	Using Standard Voltage Transformer 66kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
49	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 3.3 kV/Root(3) to 33 kV/Root(3)	RE:0.07% & PE:3 Min.	Using EPD and Capacitor 33kV, Standard Voltage Transformer with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
50	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage DividerPrimary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120%to80% of Rated 110 V/Root(3) to 3.3 kV/Root(3)	RE:0.14% & PE:7 Min.	Using Standard Voltage Transformer, EPD with capacitor 33kV with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method



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51	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Potential Transformer / Capacitor Voltage Transformer/Voltage Divider, Primary Injection Method, Ratio error & Phase error, 50Hz, 63.5V/110V Secondary (50V - 144V)	120% to 80% of Rated 3.3 kV to 33 kV	RE:0.07% & PE:3Min.	Using EPD and Capacitor 33kV, Standard Voltage Transformer with Automatic instrument transformer test set (AITTS),and High Voltage Source By Direct Method
52	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Power Factor 40 Hz to 70 Hz (For calibration of Phase shifters and PF meters)	0.01 PF to 1 PF lead/lag	0.0005 PF	Using 3 Phase Reference Standard COM 3003/SY3102 by Direct / Comparison Method
53	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Voltage Ratio	0.8 Turn to 2021 Turn	0.04% to 0.05%	Using Fluke 8508A/Agilent/ HP By Direct Method
54	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 10 KHZ	10 µA to 20 A	0.11% to 0.017%	Fluke 5720A MFC with Amplifier by Direct Method
55	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 40 Hz to 70 Hz	1 mA to 100 A	0.045% to 0.16%	Using Fluke 5720 /52120 Amplifier



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56	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	120A to 1000 A	0.45% to 0.45%	MFC 9100 with Current Coil by Direct Method
57	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Power ,320V-600 V, 0.5A - 20 A, PF ± 0.1 to 11 phase	16 W to 12 kW	0.16% / PF to (Related to Apparent Power)	MFC Fluke 5080 A by Direct Method
58	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 20 kHz to 1 MHz	10 mV to 20 V	6500 ppm to 120 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
59	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 1 kHz	200 V to 1100 V	120 ppm to 65 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
60	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	1 mV to 20 mV	4800 ppm to 300 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method



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61	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	20 mV to 200 mV	300 ppm to 120 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
62	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 20 KHz	200 mV to 200 V	120 ppm to 59 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
63	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance 1kHz	1000 pF to 100 µF	0.35% to 0.7%	Using MFC 9100 by Direct Method
64	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance 1kHz	500 pF to 1000 pF	0.35%	Using MFC 9100 by Direct Method
65	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance 1kHz	100 µH to 1000 µH	0.3% to 0.04%	Using Decade Inductance box by Direct Method



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66	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance 1kHz	1000 µH to 10 H	0.04% to 0.06%	Using Decade Inductance box by Direct Method
67	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Voltage Ratio	0.8 Turn to 2021 Turn	0.05% to 0.08%	Amber make Ratio Standard by Direct Method
68	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	20 A to 100 A	0.05% to 0.5%	Using Fluke 8508A DMM , osaw Resistor Fluke 40B By Direct Method
69	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Meters, Shunts)	100 µA to 100 mA	20 ppm to 30 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B by Direct / Comparison by V/R Method
70	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Shunts and meters)	1µA to 100 µA	460 ppm to 20 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B By Direct / Comparison /V/R Method
71	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Shunts and metrs)	100 mA to 20 A	30 ppm to 50 ppm	Using Fluke 8508A DMM , Agilent, Shunt Fluke 40B By Direct / comparison & V/I Method



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72	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current (For calibration of Current Sources, Meters)	0.05 nA to 1 µA	3 % to 0.25 %	Using PA meter Keithley 6485 by Direct / comparison Method Method
73	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Power ,1.5 V-1000 V ,0.1 A to 20 A	0.15 W to 20 kW	0.011% to 0.055%	Using Fluke 8508A/5080A, Yokogawa & 6 ½ DMM By Direct / Comparison Method
74	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	0.001 ohm to 1 ohm	0.02%	Using Std. Resistance By Direct / VI Method
75	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	0.1mohm to 1 mohm	0.032%	Using Fluke 5720 A and 8508 A by V/I Method
76	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 MOhm to 100 MOhm	11 ppm to 160 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
77	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Ohm to 1 MOhm	19 ppm to 11 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
78	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 MOhm to 20 GOhm	160 ppm to 1800 ppm	Using Fluke 8508A DMM , 5720 A By Direct / VI Method
79	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	20 GOhm to 10 TOhm	1 % to 2 %	Using pA Meter/ Fluke 5080A Direct by V / I Method



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80	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (for calibration of HV Sources and Probes)	1 kV to 30kV	2.5 %	Using HV Probe with DMM & Source by Direct / Comparison Method
81	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (For calibration of Sources and meters)	1 mV to 10 V	200 ppm to 4 ppm	Using Fluke 8508A DMM , HP ,Agilent by Direct/ Comparison Method
82	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage (for calibration of Sources and meters)	10 V to 1000 V	4 ppm to 8 ppm	Using Fluke 8508A DMM , HP ,Agilent by Direct/ Comparison Method
83	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 µA to 100 µA	0.61% to 0.02%	Using Fluke 5720A /5080A by Direct Method
84	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 µA to 20 A	200ppm	Using Fluke 5720A /52120A by Direct Method
85	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 A to 1000 A	0.45 %	Using Fluke 5720A with Amplifier /9100/ 5080A/52120A & Current Coil by Direct Method
86	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 A to 100 A	200 ppm to 360 ppm	Using Fluke 5720A with Amplifier 52120A by Direct Method



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87	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Power ,1.5 V-1000 V ,0.1 A to 20 A	0.15 W to 20 kW	0.011% to 0.055%	Using Fluke MFC 5080A by Direct Method
88	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	0.1mohm to 0.1mohm	0.012%	Using Standard Resistance by Direct method
89	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 mohm to 1 mohm	0.012%	Using Standard Resistance by Direct Method
90	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 MOhm to 100 MOhm	22 ppm to 120 ppm	Using Fluke 5720A/5080A / 9100 by Direct Method
91	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 Ohm to 19 Ohm	125 ppm to 100 ppm	Using Fluke 5720A/5080A / 9100 by Direct Method
92	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 mOhm to 10 mOhm	0.012%	Using Standard Resistance by Direct Method
93	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 mOhm to 100 mOhm	0.012%	Using Standard Resistance by Direct Method
94	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 MOhm to 400 MOhm	65 ppm to 900 ppm	Using MFC 9100 by Direct Method
95	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	19 Ohm to 1 MOhm	100 ppm to 22 ppm	Using Fluke 5720A/5080 / 9100 by Direct Method



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96	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 100 mV	470 ppm to 11 ppm	Using MFC Fluke 5720A By Direct Method
97	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 V to 1100 V	4.72 ppm to 9.7 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
98	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 mV to 10 V	11 ppm to 4.72 ppm	Using MFC Fluke 5720A /9100/5080A By Direct Method
99	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	Insulation Resistance	10 kOhm to 18 GOhm	0.2% to 1.5%	Using Fluke 5080A MEG with 10 kV divider by Direct Method
100	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	Insulation Resistance up to 10kV	10 GOhm to 10 TOhm	1.5% to 2.5%	Using Fluke 5080A MEG with 10 kV divider by Direct Method
101	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Power,10MHz-3 GHz,(-60 dBm to +13 dBm)	1 µW to 20 mW (-60 dBm to +13 dBm)	0.51dB to 0.86dB	Using R&S Meter By Direct / Comparison Method
102	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Measure)	RF Voltage ,10MHz-3GHz	7 mV to 1 V	4.1%	Using R&S RF Voltmeter URV 55 By Direct Method



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103	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	RF Power 10 MHz to 1 GHz (-60dBm to +13 dBm)	1 µW to 20 mW (-60 dBm to +13 dBm)	0.48dB	Using HP Signal Generator by Direct Method
104	ELECTRO-TECHNICAL- RF/MICROWAVE (1 GHZ AND ABOVE) (Source)	RF Voltage 10 MHz to 1 GHz	7mV to 1 V	1 % to 4.1%	Using Leveled Sine Generator and 9100 MFC By Direct Method
105	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller B Type Thermocouple	(-) 600°C to 1800 °C	0.03 °C	Using Fluke 8508 A by Direct Method
106	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller C Type Thermocouple	(-)400°C to 2320 °C	0.06 °C	Using Fluke 8508 A by Direct Method
107	ELECTRO-TECHNICAL- TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller E Type Thermocouple	(-)250°C to 1000 °C	0.023 °C	Using Fluke 8508 A by Direct Method



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108	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller J Type Thermocouple	(-)200°C to 1200 °C	0.018 °C	Using Fluke 8508 A by Direct Method
109	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller K Type Thermocouple	(-)200°C to 1370 °C	0.014 °C	Using Fluke 8508 A by Direct Method
110	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller L Type Thermocouple	(-)200°C to 1300 °C	0.02 °C	Using Fluke 8508 A by Direct Method
111	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller N Type Thermocouple	(-)200°C to 1300 °C	0.028 °C	Using Fluke 8508 A by Direct Method
112	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller R Type Thermocouple	(-)50°C to 1770 °C	0.03 °C	Using Fluke 8508 A by Direct Method



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113	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller RTD/PRT Type Thermocouple	(-)200°C to 850 °C	0.017 °C	Using Fluke 8508 A by Direct Method
114	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller S Type Thermocouple	(-)50°C to 1770 °C	0.03 °C	Using Fluke 8508 A /Agilent by Direct / Simulation Method
115	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temp. SimulationProcess Calibrator/Recorder /Controller T Type Thermocouple	(-)200°C to 400 °C	0.018 °C	Using Fluke 8508 A /Agilent by Direct / Simulation Method
116	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)B Type Thermocouple	(-) 600°C to 1800 °C	0.06 °C	Using Fluke 5720/5080A/9100 by Direct Method
117	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)C Type Thermocouple	(-)400°C to 2320 °C	0.03 °C	Using Fluke 5720/5080A/9100by Direct Method
118	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)E Type Thermocouple	(-) 250°C to 1000 °C	0.08 °C	Using Fluke 5720/5080A/9100 by Direct Method



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119	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)J Type Thermocouple	(-) 200°C to 1200 °C	0.011 °C	Using Fluke 5720/5080A/9100 by Direct Method
120	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)K Type Thermocouple	(-)200°C to 1370 °C	0.013 °C	Using Fluke 5720/5080A/9100 by Direct Method
121	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)L Type Thermocouple	(-)200°C to 1300 °C	0.011 °C	Using Fluke 5720/5080A/9100 by Direct Method
122	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)N Type Thermocouple	(-)200°C to 1300 °C	0.02 °C	Using Fluke 5720/5080A/9100 by Direct Method
123	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)R Type Thermocouple	(-)50°C to 1770 °C	0.07 °C	Using Fluke 5720/5080A/9100 by Direct Method
124	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)RTD/PRT	(-)200°C to 850 °C	0.009 °C	Using Fluke 5720/5080A/9100/ by Direct Method
125	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)S Type Thermocouple	(-)50°C to 1770 °C	0.07 °C	Using Fluke 5720/5080A/9100 by Direct / Method



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126	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Simulation(Recorder/C ontroller)T Type Thermocouple	(-)-200°C to 400 °C	0.02°C	Using Fluke 5720/9100 by Direct Method
127	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency (For calibration of Freq Sources and meters)	40 Hz to 70 Hz	0.025 %	Using 3 Phase reference Standard COM 3003/MTS by Direct/ Comparison Method
128	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency/period	1 Hz (1sec) to 3 GHz (0.33 n sec)	4 .1 ppm to 0.1 ppm	Using Fluke 8508A DMM , Agilent /Freq. Counter/ 9100 By Direct / Comparison Method
129	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Time Interval	10 nsec. to 100000 sec.	0.11ppm to 6.02ppm	Using Frequency Counter CNT90 by Comparison method
130	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency/Period	1 Hz to 1 GHz(1sec to 1nsec)	30 ppm to 5 ppm	Using MFC 9100 and HP Signal Generator by Direct Method
131	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Time Interval	10 nsec. to 100000 sec.	26ppm	MFC 9100 by Direct Method
132	FLUID FLOW- FLOW MEASURING DEVICES	Cumulative Mass of Fluid (Medium:Water)	100 kg to 10000kg	0.068 % rdg	Using Mass Flow Meter by Comparison Method



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133	FLUID FLOW- FLOW MEASURING DEVICES	Mass flow rate(Medium:Water)	0.1kg/min to 833 kg/min	0.07 % of rdg	Using Mass Flow Meter by Comparison Method
134	FLUID FLOW- FLOW MEASURING DEVICES	Quantity of Volume(Medium:Water)	0.1 m ³ to 10 m ³	0.08% rdg	Using Mass,Volume Flow Meter by Comparison Method
135	FLUID FLOW- FLOW MEASURING DEVICES	Volume Flow Rate (Medium:Water)	0.06 m ³ /h to 50 m ³ /h	0.09 % rdg	Using Mass Flow Meter by Comparison Method
136	FLUID FLOW- FLOW MEASURING DEVICES	Volume Flow Rate (Medium:Water)	1 m ³ /h to 70 m ³ /h	1 % rdg	Using Ultrasonic Flow meter by Comparison Method
137	FLUID FLOW- FLOW MEASURING DEVICES	Volume Flow Rate (Medium:Water)	70 m ³ /h to 2300 m ³ /h	1% of rdg	Using UltraSonic Flow Meter by Comparison Method
138	MECHANICAL- ACCELERATION AND SPEED	SPEED (Non-contact type)RPM indicators, Centrifuges	100 rpm to 6000 rpm	5 rpm	Using Tachometer
139	MECHANICAL- PRESSURE INDICATING DEVICES	Barometers	300 mbar to 1200 mbar	0.052% of rdg	Using Precision Digital Gauges
140	MECHANICAL- PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters	0 bar to 700 bar	0.034% rdg	Using Precision Digital Gauges By Comparison Method
141	MECHANICAL- PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Transmitters	0 bar to 2 bar	0.082% rdg	Using Precision Digital Gauges



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142	MECHANICAL-PRESSURE INDICATING DEVICES	Pressure Gauges, Absolute gauge	0 bar to 2 bar Abs	0.069% rdg	Using Precision Digital Gauge
143	MECHANICAL-PRESSURE INDICATING DEVICES	Vacuum Gauges, Transducers, Transmitter	(-) 0.93 bar to 0 bar	0.07% rdg	Using Precision Digital Gauges
144	MECHANICAL-WEIGHING SCALE AND BALANCE	Balance (Class I - Class IV), Readability: 0.01mg	Up to 220 g	0.13mg	Using Standard Weights E1/E2 /F1/F2/M1
145	MECHANICAL-WEIGHING SCALE AND BALANCE	Balance (Class I - Class IV), Readability: 10mg	Up to 38 kg	0.71 g	Using Standard Weights E1/E2 /F1/F2/M1
146	MECHANICAL-WEIGHING SCALE AND BALANCE	Balance (Class I - Class IV), Readability: 1g	Upto 100kg	2.4 g	Using Standard Weights E1/E2 /F1/F2/M1
147	MECHANICAL-WEIGHING SCALE AND BALANCE	Balance (Class I - Class IV), Readability: 1mg	Up to 8 kg	0.01 g	Using Standard Weights E1/E2 /F1/F2/M1
148	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Sensor With Indicator/Controller, The rmo Hygrometer	20 % RH to 90 % RH @ 25°C	0.8% RH	Using Standard Humidity Indicator with sensor and humidity Chamber / Generator By Comparison Method
149	THERMAL- SPECIFIC HEAT & HUMIDITY	Humidity Sensor With Indicator/Controller, The rmo Hygrometer	20 °C to 50 °C @50%RH	0.45 °C	Using Standard PRT PT-100 sensor with Indicator Chamber / Generator By Comparison Method



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150	THERMAL-TEMPERATURE	Indicator of bath / furnace	1200 °C to 1600 °C	4.6 °C	Using S type Thermocouple with Indicator by comparison method at single specified location
151	THERMAL-TEMPERATURE	Indicator of deepfreeze/bath/oven.	(-) 80 °C to 200 °C	0.14 °C	Using SSPRT with Indicator, DMM, by Comparison Method
152	THERMAL-TEMPERATURE	Oven, Furnace, Temp.Bath/Deep Freezer (Thermal Mapping)	(-)35°C to 400 °C	0.7 °C	Using Multi Channel Data Logger with RTD & N Type Thermocouple (minimum nine locations) by mapping method.
153	THERMAL-TEMPERATURE	Oven, Furnace, Temp.Bath/Deep Freezer (Thermal Mapping)	400°C to 1200 °C	3.0 °C	Using Multi Channel Data Logger with RTD & N Type Thermocouple (minimum nine locations) by mapping method.
154	THERMAL-TEMPERATURE	Pyrometer, Black Body Source ,IR Thermometer.	50 °C to 500 °C	2.86 °C	Using Std. Non Contact Pyrometer & Black body Source(Emissivity:0.95) By Comparison Method



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Validity 15/11/2019 to 14/11/2021 Last Amended on -

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured / Instrument	Measurement range and additional parameters where applicable(Range and Frequency)	Calibration and Measurement Capability(CMC)(±)	Calibration or Measurement Method or procedure)
155	THERMAL-TEMPERATURE	Pyrometer, Black Body Source, IR Thermometer	500 °C to 1200 °C	3.9 °C	Using Std. Non Contact Pyrometer & Black body Source(Emissivity:0.95) By Comparison Method
156	THERMAL-TEMPERATURE	RTD sensor /Thermocouple with OR without Indicator, Analog Temp Gauge Indicator of bath/oven.	200°C to 650 °C	0.13°C	Using Liquid Bath, Dry Block Calibrator SSPRT with Indicator, DMM, by Comparison Method
157	THERMAL-TEMPERATURE	RTD, Thermocouple Sensors with or without Indicator, Analog Temp Gauge,Indicator of temperature oven/bath/furnace.	500 °C to 1000 °C	1.91 °C	Using S Type Thermocouple with Indicator, DMM, Dry block calibrator by comparison method.
158	THERMAL-TEMPERATURE	Thermocouple Sensors with or without Indicator, Analog Temp Gauge,Indicator of temperature bath/furnace	1000 °C to 1200 °C	2.04 °C	Using S Type Thermocouple with Indicator / DMM , Dry block calibrator by comparison method.