



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Name ELECTRONICS TEST AND DEVELOPMENT CENTRE, DR. VSI ESTATE, THIRUVANMIYUR, CHENNAI, TAMIL NADU , INDIA

Accreditation Standard ISO/IEC 17025:2017

Certificate Number CC-2389 Page No. : 1 / 57

Validity 07/11/2019 to 06/11/2021 Last Amended on 05/12/2019

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 Current 1 kHz to 5 kHz	1 A to 10 A	0.016% to 0.015%	Fluke 8508A, Fluke 5790A with Shunt
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 1 kHz to 5 kHz	10 A to 19.9 A	0.015% to 0.30%	Fluke 8508A, Fluke 5790A with Shunt
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 1 kHz to 5 kHz	100 µA to 1 A	0.016%	Fluke 8508A, Fluke 5790A with Shunt
4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 40 Hz to 1 kHz	1 A to 10 A	0.013% to 0.012%	Fluke 8508A, Fluke 5790A with Shunt
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 40 Hz to 1 kHz	10 A to 19.9 A	0.011% to 0.19%	Fluke 8508A, Fluke 5790A with Shunt



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6	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 40 Hz to 1 kHz	100 µA to 1 A	0.013%	Fluke 8508A, Fluke 5790A with Shunt
7	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 5 kHz to 10 kHz	1 A to 10 A	0.11% to 0.31%	Fluke 8508A, Fluke 5790A with Shunt
8	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 5 kHz to 10 kHz	10 mA to 1 A	0.059% to 0.11%	Fluke 8508A, Fluke 5790A with Shunt
9	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 50 Hz (For calibration of Sources and meters)	50 mA to 100 A	0.02%	ZERA COM 3003
10	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Energy - Active, Reactive @ 50 Hz (1-Phase & 3-Phase), 60 V to 240 V, 10 mA to 100 A, 0.5 PF to UPF (For calibration of power/ Energy Calibrators and Energy meters)	0.3 W/Var(x)hr to 72 kW/Kvar(x)hr	0.014% / PF to 0.026% / PF	ZERA Source with COM 3003



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11	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Power - Active, Reactive @ 50 Hz (1-Phase & 3-Phase), 60 V to 240 V, 10 mA to 100 A, 0.5 PF to UPF(For calibration of Power Sources and power Analysers)	0.3 W/Var to 72 kW/Var	0.019% / PF to 0.019% / PF	ZERA Test Bench with COM3003
12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >1 kHz to 10 kHz	1 mV to 10 mV	0.26% to 0.058%	Fluke 8508A, Fluke 5790A
13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >1 kHz to 10 kHz	1 V to 100 V	0.0043% to 0.0055%	Fluke 8508A, Fluke 5790A
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >1 kHz to 10 kHz	10 mV to 100 mV	0.058% to 0.0084%	Fluke 8508A, Fluke 5790A
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >1 kHz to 10 kHz	100 mV to 1 V	0.0084% to 0.0043%	Fluke 8508A, Fluke 5790A



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16	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >1 kHz to 10 kHz	100 V to 1000 V	0.0055% to 0.0075%	Fluke 8508A, Fluke 5790A
17	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >10 kHz to 30 kHz	1 mV to 10 mV	0.28% to 0.042%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
18	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >10 kHz to 30 kHz	1 V to 100 V	0.0067% to 0.010%	Fluke 8508A,Fluke 5790A
19	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >10 kHz to 30 kHz	10 mV to 100 mV	0.042% to 0.024%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
20	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >10 kHz to 30 kHz	100 mV to 1 V	0.024% to 0.0067%	Fluke 8508A, Fluke 5790A



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21	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >10 kHz to 30 kHz	100 V to 1000 V	0.010% to 0.020%	Fluke 8508A, Fluke 5790A
22	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >100 kHz to 1 MHz	1 V to 10 V	3.5% to 3.5%	Fluke 8508A, Fluke 5790A
23	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >30 kHz to 100 kHz	1 mV to 10 mV	0.34% to 0.061%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
24	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >30 kHz to 100 kHz	1 V to 750 V	0.010% to 0.078%	Fluke 8508A, Fluke 5790A
25	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >30 kHz to 100 kHz	10 mV to 100 mV	0.065% to 0.030%	Fluke 8508A, Fluke 5790A



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26	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >30 kHz to 100 kHz	100 mV to 1 V	0.030% to 0.010%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
27	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >40 Hz to 1 kHz	1 mV to 10 mV	0.26% to 0.029%	Fluke 8508A, Fluke 5790A
28	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >40 Hz to 1 kHz	1 V to 100 V	0.0041% to 0.0044%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
29	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >40 Hz to 1 kHz	10 mV to 100 mV	0.029% to 0.0078%	Fluke 8508A, Fluke 5790A
30	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >40 Hz to 1 kHz	100 mV to 1 V	0.0078% to 0.0041%	Fluke 8508A, Fluke 5790A



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31	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage >40 Hz to 1 kHz	100 V to 1000 V	0.0044% to 0.0055%	Fluke 8508A, Fluke 5790A
32	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 Hz to 40 Hz	1 mV to 10 mV	0.63% to 0.047%	Fluke 8508A, Fluke 5790A
33	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 Hz to 40 Hz	1 V to 100 V	0.028% to 0.030%	Fluke 8508A, Datron 1271, Agilent 34401A, Fluke 5790A
34	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 Hz to 40 Hz	10 mV to 100 mV	0.047% to 0.030%	Fluke 8508A, Fluke 5790A
35	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 10 Hz to 40 Hz	100 mV to 1 V	0.030% to 0.028%	Fluke 8508A, Fluke 5790A



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36	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 50 Hz	1 kV to 10 kV	5.92%	Using High Voltage Probe with DMM
37	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	Phase Angle (Power Factor) 50 Hz	0.2 Lag & Lead to 1 Lag & Lead	0.0006PF	Voltech PM3000, Direct/Indirect Method
38	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 1 kHz to 5 kHz	1 A to 20 A	0.06% to 3.50%	Wavetek 9100
39	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 1 kHz to 5 kHz	10 mA to 1 A	0.046% to 0.090%	Wavetek 4808, Wavetek 9100, Fluke 5520A
40	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 1 kHz	1 A to 10 A	0.05% to 0.13%	Fluke 5520A



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41	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 1 kHz	1 mA to 10 mA	0.025%	Wavetek 4808
42	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 1 kHz	10 A to 20 A	0.13% to 0.20%	Wavetek 4808, Wavetek 9100, Fluke 5520A
43	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 1 kHz	10 mA to 1 A	0.025% to 0.05%	Wavetek 4808
44	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 10 Hz to 1 kHz	100 µA to 1 mA	0.031% to 0.025%	Wavetek 4808 MFC
45	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	20 A to 200 A	0.6% to 0.60%	Wavetek 9100, x10 Current Coil



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46	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	200 A to 1000 A	2.35%	Wavetek 9100, x50 Current Coil
47	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance @ 1 kHz	1 kOhm	0.0066%	Tinsley 5685A
48	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance @ 1 kHz	10 kOhm	0.0066%	Tinsley 5685A
49	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance @ 1 kHz	10 Ohm	0.0071%	Tinsley 5685A
50	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Resistance @ 1 kHz	100 Ohm	0.0066%	Tinsley 5685A



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51	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	1 mV to 10 mV	0.65% to 0.075%	Wavetek 4808,
52	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	1 V to 100 V	0.0070% to 0.0091%	Wavetek 4808
53	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	10 mV to 100 mV	0.075% to 0.020%	Wavetek 4808,
54	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	100 mV to 1 V	0.020% to 0.0070%	Wavetek 4808,
55	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	100 V to 1000 V	0.0091% to 0.020%	Wavetek 4808, Wavetek 9100, Fluke 5520A



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56	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 Hz to 40 Hz	1 mV to 10 mV	0.64% to 0.080%	Wavetek 4808, Wavetek 9100, Fluke 5520A
57	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 Hz to 40 Hz	1 V to 100 V	0.015%	Wavetek 4808
58	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 Hz to 40 Hz	10 mV to 100 mV	0.080% to 0.030%	Wavetek 4808,
59	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 Hz to 40 Hz	100 mV to 1 V	0.030% to 0.015%	Wavetek 4808
60	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 Hz to 40 Hz	100 V to 1000 V	0.015% to 0.022%	Wavetek 4808



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61	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	1 mV to 10 mV	0.66% to 0.077%	Wavetek 4808, Wavetek 9100, Fluke 5520A
62	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	1 V to 100 V	0.0085% to 0.014%	Wavetek 4808,
63	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	10 mV to 100 mV	0.077% to 0.021%	Wavetek 4808
64	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	100 mV to 1 V	0.021% to 0.0085%	Wavetek 4808,
65	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	100 V to 500 V	0.01% to 0.028%	Wavetek 4808,



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66	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 30 kHz	500 V to 1000 V	0.028% to 0.027%	Wavetek 4808,
67	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 50 kHz	100 mV to 100 V	0.59% to 0.23%	Wavetek 9100
68	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 100 kHz to 1 MHz	1 mV to 10 mV	1.14% to 1.10%	Wavetek 4808, Wavetek 9100, Fluke 5520A
69	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 100 kHz to 1 MHz	10 mV to 100 mV	1.10% to 0.39%	Wavetek 4808
70	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 100 kHz to 1 MHz	100 mV to 10 V	0.39% to 0.27%	Wavetek 4808,



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71	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 30 kHz to 100 kHz	1 mV to 10 mV	0.71% to 0.11%	Wavetek 4808, Wavetek 9100, Fluke 5520A
72	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 30 kHz to 100 kHz	1 V to 100 V	0.020%	Wavetek 4808, Wavetek 9100, Fluke 5520A
73	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 30 kHz to 100 kHz	10 mV to 100 mV	0.11% to 0.050%	Wavetek 4808
74	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 30 kHz to 100 kHz	100 mV to 1 V	0.050% to 0.020%	Wavetek 4808,
75	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 30 kHz to 100 kHz	100 V to 750 V	0.020% to 0.015%	Wavetek 4808



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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
76	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 40 Hz to 1 kHz	1 mV to 10 mV	0.65% to 0.075%	Wavetek 4808, Wavetek 9100, Fluke 5520A
77	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 40 Hz to 1 kHz	1 V to 100 V	0.0070% to 0.0080%	Wavetek 4808,
78	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 40 Hz to 1 kHz	10 mV to 100 mV	0.075% to 0.020%	Wavetek 4808,
79	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 40 Hz to 1 kHz	100 mV to 1 V	0.020% to 0.0070%	Wavetek 4808,
80	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 40 Hz to 1 kHz	100 V to 1000 V	0.0080% to 0.023%	Wavetek 4808



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81	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	1 µF	0.060%	Standard capacitor GenRad 1409 IET labs
82	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	1 pF	0.18%	Standard Capacitance GenRad 1409 IET labs
83	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	10 µF	0.2% to 0.2%	Standard capacitor GenRad 1409 IET labs
84	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	10 nF	0.060%	Standard capacitor GenRad 1409 IET labs
85	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	10 pF	0.18%	Standard capacitor GenRad 1409 IET labs



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86	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	100 µF	0.4% to 0.4%	Standard capacitor GenRad 1409 IET labs
87	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	100 nF	0.060%	Standard capacitor GenRad 1409 IET labs
88	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	100 pF	0.18%	Standard capacitor GenRad 1409 IET labs
89	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	1000 µF	0.8% to 0.80%	Standard capacitor GenRad 1409 IET labs
90	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance @ 1 kHz	1000 pF	0.18%	Standard capacitor GenRad 1409 IET labs



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91	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	1 H	0.047%	GenRad GR1482
92	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	1 mH	0.071%	GenRad GR1482
93	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	10 H	0.052%	GenRad GR1482
94	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	10 mH	0.066%	GenRad GR1482
95	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	100 µH	0.081%	GenRad GR1482



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96	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Inductance @ 1 kHz	100 mH	0.060%	GenRad GR1482
97	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Oscilloscope	10 mV @ 1 kHz to 130 V @ 1 kHz	0.60% to 0.06%	Fluke 5520A
98	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Oscilloscope	10 mV DC to 130 V DC	0.5% to 0.05%	Fluke 5520A
99	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Oscilloscope	10 ns to 5 s	0.0005% to 0.58%	Fluke 5520A
100	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Oscilloscope (Bandwidth)	1 MHz to 600 MHz	4%	Fluke 5520A



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101	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	Powerfactor at 50 Hz	0.2 PF to UPF Lead/Lag	0.025PF	Fluke 5520A
102	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 10 A	0.025% to 0.054%	Datron 1271, Agilent 34401A, Fluke 8508A with Shunt
103	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 µA to 100 µA	0.0029% to 0.002%	Datron 1271, Agilent 34401A, Fluke 8508A with Shunt
104	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	10 A to 20 A	0.054%	Datron 1271, Agilent 34401A, Fluke 8508A with Shunt
105	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 µA to 100 mA	0.002% to 0.0072%	Datron 1271, Agilent 34401A, Fluke 8508A with Shunt
106	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 mA to 1 A	0.0072% to 0.025%	Datron 1271, Agilent 34401A, Fluke 8508A with Shunt
107	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Gohm to 10 Gohm	0.21% to 0.22%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808, Direct/Indirect Method



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108	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 mohm to 1 ohm	0.037% to 0.0021%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
109	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 Mohm to 10 Mohm	0.0016% to 0.0028%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
110	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 ohm to 10 ohm	0.0021% to 0.0012%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
111	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 Mohm to 100 Mohm	0.0028% to 0.020%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
112	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 ohm to 100 ohm	0.0012% to 0.0011%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
113	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 Mohm to 1 Gohm	0.020% to 0.21%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808, Direct/Indirect Method



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114	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	100 ohm to 1 Mohm	0.0011% to 0.0016%	Wavetek 4950, Datron 1271, Agilent 34401A, Agilent 34410A, Fluke 8508A, Wavetek 4808
115	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	> 1 kV to 10 kV	1.8%	Using High Voltage Probe
116	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 µV to 10 µV	11.58% to 1.17%	Fluke 8508A, Datron 1271, Agilent 34401A
117	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 100 mV	0.065% to 0.00076%	Fluke 8508A, Datron 1271, Agilent 34401A
118	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 V to 1000 V	0.00058% to 0.00096%	Fluke 8508A, Datron 1271, Agilent 34401A
119	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	10 µV to 100 µV	1.17% to 0.64%	Fluke 8508A, Datron 1271, Agilent 34401A
120	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 µV to 1 mV	0.64% to 0.065%	Fluke 8508A, Datron 1271, Agilent 34401A
121	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	100 mV to 1 V	0.00076% to 0.00058%	Fluke 8508A, Datron 1271, Agilent 34401A



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122	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 A to 10 A	0.014% to 0.06%	Wavetek 9100 with x10 Current Coil
123	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 A to 10 A	0.025% to 0.092%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
124	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 mA to 100 mA	0.006%	Wavetek 4808, Wavetek 9100
125	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 µA to 100 µA	0.045% to 0.015%	Wavetek 4808, Wavetek 9100
126	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 µA to 1 A	0.3% to 0.025%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
127	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 20 A	0.060% to 0.10%	Wavetek 9100 with x50 Current Coil
128	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 20 A	0.092% to 0.11%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
129	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 µA to 1 mA	0.015% to 0.006%	Wavetek 4808, Wavetek 9100
130	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	100 mA to 1 A	0.006% to 0.014%	Wavetek 4808, Wavetek 9100



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131	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 A to 1000 A	0.10% to 1.25%	Wavetek 9100 with x50 Current Coil
132	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 A to 1000 A	1.2%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
133	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	0.333 mOhm	0.24%	Guildline 9211A; Direct/Indirect Method
134	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 GOhm	0.058%	Shunt Fluke 8508-7000k; Direct/Indirect Method
135	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 kOhm	0.0013%	Tinsley 5685A,B; Direct/Indirect Method
136	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 mOhm	0.10%	Guildline 9211A; Direct/Indirect Method
137	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 MOhm	0.0031%	Wavetek 4808; Direct/Indirect Method
138	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 MOhm to 400 MOhm	0.0082% to 1.88%	Fluke 5320A, Wavetek 9100; Direct/Indirect Method
139	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 Ohm	0.0013%	Tinsley 5685A,B; Direct/Indirect Method



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140	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	1 Ohm to 10 Ohm	5.9% to 0.69%	Fluke 5320A, Wavetek 9100; Direct/Indirect Method
141	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 GOhm to 100 GOhm	1.16%	HRRS; Direct/Indirect Method
142	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 kOhm	0.0013%	Tinsley 5685A,B; Direct/Indirect Method
143	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 mOhm	0.071%	Guildline 9211A; Direct/Indirect Method
144	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 MOhm	0.0059%	Wavetek 4808; Direct/Indirect Method
145	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 MOhm	0.0059%	Guildline 9211A and Tinsley 5685A, 5685B by direct method
146	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 Ohm	0.0013%	Tinsley 5685A,B; Direct/Indirect Method
147	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 Ohm to 100 Ohm	0.016% to 0.005%	Fluke 5320A, Wavetek 9100; Direct/Indirect Method
148	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 Ohm to 400 MOhm	0.7% to 0.38%	Wavetek 9100 (Direct Method)



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149	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 kOhm	0.0012%	Wavetek 4808; Direct/Indirect Method
150	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 kOhm to 1 MOhm	0.0036% to 0.0082%	Fluke 5320A, Wavetek 9100; Direct/Indirect Method
151	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 mOhm	0.013%	Guidline 9211A; Direct/Indirect Method
152	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 MOhm	0.0085%	Shunt Fluke 8508-7000k; Direct/Indirect Method
153	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 Ohm	0.0013%	Tinsley 5685A,B; Direct/Indirect Method
154	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	100 Ohm to 100 kOhm	0.005% to 0.0036%	Fluke 5320A, Wavetek 9100; Direct/Indirect Method
155	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	400 MOhm to 10 GOhm	1.16%	HRRS; Direct/Indirect Method
156	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	+10 µV to 100 µV	5.8% to 0.60%	Wavetek 4808, Wavetek 9100
157	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 10 mV	0.060% to 0.0066%	Wavetek 4808, Wavetek 9100



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158	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-1 mV to -100 uV	0.060% to 0.58%	Wavetek 4808, Wavetek 9100
159	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 1000 V	0.06% to 0.0093%	Wavetek 9100
160	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 V to 1000 V	0.00075% to 0.00090%	Wavetek 4808, Wavetek 9100
161	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-10 mV to -1 mV	0.0066% to 0.060%	Wavetek 4808, Wavetek 9100
162	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	10 mV to 100 mV	0.0066% to 0.0015%	Wavetek 4808, Wavetek 9100
163	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 µV to 1 mV	0.60% to 0.060%	Wavetek 4808, Wavetek 9100
164	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-100 µV to -10 µV	0.58% to 5.8%	Wavetek 4808, Wavetek 9100
165	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	100 mV to 1 V	0.0015% to 0.00075%	Wavetek 4808, Wavetek 9100
166	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	-100 mV to -10 mV	0.0014% to 0.0066%	Wavetek 4808, Wavetek 9100



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167	ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Measure)	Impulse Measurement Rise Time	0.84 μ s to 1.56 μ s	6%	Oscilloscope Agilent/Tektronix 3012B
168	ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Measure)	Impulse Measurement Pulse Width	40 μ s to 60 μ s	6%	Oscilloscope Agilent/Tektronix 3012B with HV probe
169	ELECTRO-TECHNICAL-ELECTRICAL EQUIPMENT (Measure)	Impulse Measurement Amplitude 1 kV to 10 kV with scope output 0.5 V to 6 V	0.9 kV to 10.1 kV	6%	Oscilloscope Agilent/Tektronix 3012B, High Voltage Probe
170	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, RTD - Pt100	-199 °C to 800 °C	0.011°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
171	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, RTD - Pt1000	-199 °C to 600 °C	0.04°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A



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172	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - B	400 °C to 1800 °C	0.77°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
173	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - E	-200 °C to 1000 °C	0.09°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
174	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - J	-200 °C to 1200 °C	0.12°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
175	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - K	-200 °C to 1350 °C	0.18°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
176	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - N	-200 °C to 1250 °C	0.073°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A



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177	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - R	2 °C to 1750 °C	0.47°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
178	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - S	2 °C to 1750 °C	0.59°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
179	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, - Indicators, - Simulators without sensors, Thermocouple Type - T	-200 °C to 400 °C	0.13°C	Datron 1271, Fluke 8508A, Fluke Chub-E4, Fluke 5520A
180	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsRTD - Pt100/PT 1000	-199 °C to 800 °C	0.02°C	Wavetek 9100
181	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsRTD - PT100/PT1000	-200 °C to 800 °C	0.02°C	Wavetek 9100



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182	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsRTD - PT1000/PT100	-200 °C to 800 °C	0.08°C	Wavetek 9100/wavetek 4808
183	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - B	400 °C to 1800 °C	0.5°C	Wavetek 9100
184	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - E	-250 °C to 1000 °C	0.2°C	Wavetek 9100
185	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - J	-200 °C to 1000 °C	0.3°C	Wavetek 9100
186	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - K	-200 °C to 1350 °C	0.3°C	Wavetek 9100



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187	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - N	-200 °C to 1300 °C	0.2°C	Wavetek 9100
188	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - S, -R	0 °C to 1800 °C	0.4°C	Wavetek 9100
189	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - T	-250 °C to 400 °C	0.2°C	Wavetek 9100
190	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without SensorsThermocouple Type -B	500 °C to 1800 °C	0.06°C	Wavetek 4808, Wavetek 9100, Fluke 5520A
191	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without SensorsThermocouple Type -E	-250 °C to 1000 °C	0.02°C	Wavetek 4808, Wavetek 9100



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192	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -J	-200 °C to 1200 °C	0.02°C	Wavetek 4808, Wavetek 9100
193	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -K	-200 °C to 1350 °C	0.03°C	Wavetek 4808, Wavetek 9100
194	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -N	-200 °C to 1300 °C	0.02°C	Wavetek 4808, Wavetek 9100, Fluke 5520A
195	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -R	0 °C to 1800 °C	0.03°C	Wavetek 4808, Wavetek 9100, Fluke 5520A
196	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -S	0 °C to 1800 °C	0.03°C	Wavetek 4808, Wavetek 9100, Fluke 5520A



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197	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, -Indicators, -Simulators without Sensors Thermocouple Type -T	-250 °C to 400 °C	0.02°C	Wavetek 4808, Wavetek 9100, Fluke 5520A
198	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 Hz to 10 Hz	2.5ppm to 0.065ppm	Pendulum CNT91R, HP5335A
199	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 kHz to 1 MHz	0.0086ppm	Pendulum CNT91R, HP5335A
200	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 MHz to 10 MHz	0.0086ppm to 0.00043ppm	Pendulum CNT91R, HP5335A
201	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	10 Hz to 1 kHz	0.065ppm to 0.0086ppm	Pendulum CNT91R, HP5335A
202	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	10 MHz to 3 GHz	0.0043ppm to 0.00042ppm	Pendulum CNT91R, HP5335A



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203	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Time	1 s to 5400 s	0.0012%	Pendulum CNT91R, HP5335A
204	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	1 Hz to 10 kHz	29ppm to 0.76 ppm	Agilent 33210/Tabor WS8101, General Electric 2018
205	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 Hz to 2 MHz	70ppm to 30ppm	Agilent 33210, Wavetek 9100
206	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 kHz to 400 MHz	0.76ppm	Agilent 33210/Tabor WS8101, General Electric 2018
207	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	2 MHz to 10 MHz	30ppm	Agilent 33210, Wavetek 9100
208	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters & Pressure Transducers	0 bar to 20 bar	0.045 bar	Using Digital Pressure Calibrators with uncertainty of 0.003 bar. Procedure based on DKD-R 6-1 guidelines.
209	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters & Pressure Transducers.	6 bar to 60 bar	0.25%rdg	Using Standard Dead Weight Tester with uncertainty of 0.0061 bar. Procedure based on DKD-R 6-1 guidelines.



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210	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters & Pressure Transducers.	60 bar to 700 bar	0.031% rdg	Using Standard Dead Weight Tester with uncertainty of 0.0061 bar. Procedure based on DKD-R 6-1 guidelines.
211	MECHANICAL-WEIGHING SCALE AND BALANCE	MASS -ELECTRONIC WEIGHING BALANCE Readability: 0.01 mg(Class II)	1 mg to 200 g	0.60 mg	Using std. E2 Class weights. Procedure based on OIML R 76-1 guidelines.
212	MECHANICAL-WEIGHING SCALE AND BALANCE	MASS-ELECTRONIC WEIGHING BALANCE Readability : 0.1 g(Class II)	1 mg to 12 kg	1.14 g	Using std. E2 Class accuracy weights and procedure based on OIML R76-1 guidelines.
213	MECHANICAL-WEIGHTS	MASS -WEIGHTS (Class M1 & coarser)	2 mg	0.026 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
214	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	2 g	0.07 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.



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215	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1)	10 mg	0.022 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
216	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	1 g	0.07 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
217	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	10 g	0.11 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
218	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	100 g	0.18 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.



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219	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	100 mg	0.027 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
220	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	20 g	0.14 mg	Using E2 Class accuracy Weights and Electronic Weighing Balancenwith readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
221	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	200 g	0.39 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.



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222	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	200 mg	0.031 mg	Using E2 Class accuracy Weights and Electronic Weighing Balancenwith readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
223	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	5 g	0.07 mg	Using E2 Class accuracy Weights and Electronic Weighing Balancenwith readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
224	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	50 g	0.18 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.



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225	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1 & coarser)	500 mg	0.031 mg	Using E2 Class accuracy Weights and Electronic Weighing Balancenwith readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
226	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1)	1 mg	0.041 mg	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
227	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1)	20 mg	0.023 mg	Using E2 Class accuracy Weights and Electronic Weighing Balancenwith readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
228	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1)	5 mg	0.021mg	Using E2 Class accuracy Weights and Precision Balance; ABBA Weighing Cycle Procedure based on OIML R111.1



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229	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M1)	50 mg	0.024 mg	Using E2 Class accuracy Weights and Electronic Weighing Balances with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
230	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M3)	1 kg	0.13 g	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.1g. Procedure based on OIML R 111-1 guidelines.
231	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M3)	2 kg	0.13 g	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.



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232	MECHANICAL-WEIGHTS	MASS-WEIGHTS (Class M3)	500 g	0.08 g	Using E2 Class accuracy Weights and Electronic Weighing Balances with readability of 0.1 g. Procedure based on OIML R 111-1 guidelines.
233	MECHANICAL-WEIGHTS	MASS-WEIGHTS (M1 & coarser)	10 kg	0.12 g	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
234	MECHANICAL-WEIGHTS	MASS-WEIGHTS (M2 & Coarser)	5 kg	0.12 g	Using E2 Class accuracy Weights and Electronic Weighing Balance with readability of 0.01 mg. Procedure based on OIML R 111-1 guidelines.
235	THERMAL-TEMPERATURE	Glass Thermometers, Temperature Gauges	-40 to +40 ° C	0.067°C	SSPRT Pt-100; Comparison method using RTD (Pt-100), Low Temperature Bath



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236	THERMAL-TEMPERATURE	Temperature Sensors (RTDs and Thermocouples) with or without Temperature Indicators and Controllers, Temperature Sensor (RTD/TC) with indicator of Chamber/Bath/Calibrat or (Single Point)	+40 to 200 ° C	0.41°C	SSPRT Pt-100; Comparison method using RTD (Pt-100), Low Temperature Bath, Fast Cal Temperature Calibrator/Oil Bath, 6½ DMM and Thermometer Readout, Ice Point (Zero) Calibrator
237	THERMAL-TEMPERATURE	Temperature Sensors (RTDs and Thermocouples) with or without Temperature Indicators and Controllers, Temperature Sensor (RTD/TC) with indicator of Chamber/Bath/Calibrat or (Single Point)	0 ° C	0.06°C	SSPRT Pt-100; Comparison method using RTD (Pt-100), Low Temperature Bath, Fast Cal Temperature Calibrator/Oil Bath, 6½ DMM and Thermometer Readout, Ice Point (Zero) Calibrator



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Laboratory Name ELECTRONICS TEST AND DEVELOPMENT CENTRE, DR. VSI ESTATE, THIRUVANMIYUR, CHENNAI, TAMIL NADU , INDIA

Accreditation Standard ISO/IEC 17025:2017

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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured / Instrument	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)	Calibration or Measurement Method or procedure
238	THERMAL-TEMPERATURE	Temperature Sensors (RTDs and Thermocouples) with or without Temperature Indicators and Controllers, Temperature Sensor (RTD/TC) with indicator of Chamber/Bath/Calibrator or (Single Point)	200 to 600 ° C	0.62° C	SSPRT Pt-100; Comparison method using RTD (Pt-100), Low Temperature Bath, Fast Cal Temperature Calibrator/Oil Bath, 6½ DMM and Thermometer Readout, Ice Point (Zero) Calibrator
239	THERMAL-TEMPERATURE	Temperature Sensors (RTDs and Thermocouples) with or without Temperature Indicators and Controllers, Temperature Sensor (RTD/TC) with indicator of Chamber/Bath/Calibrator or (Single Point)	-40 to +40 ° C	0.06° C	SSPRT Pt-100; Comparison method using RTD (Pt-100), Low Temperature Bath, Fast Cal Temperature Calibrator/Oil Bath, 6½ DMM and Thermometer Readout, Ice Point (Zero) Calibrator
240	THERMAL-TEMPERATURE	Temperature Sensors (RTDs, Thermocouples) with or without Temperature Indicators and Controllers	600 to 1000 ° C	1.50°C	S-Type Thermocouple; Comparison method using S-Type T/C with Dry Block Calibrator, 6½ DMM and Thermometer Readout



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Site Facility					
1	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 50 Hz	1 A to 3 A	0.21% to 0.24%	Agilent 34401A, Agilent 34330A
2	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Current 50 Hz	10 µA to 1 A	4.2% to 0.21%	Agilent 34401A, Agilent 34330A
3	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage > 1 kHz to 30 kHz	10 mV to 100 V	0.70% to 0.2%	Agilent 34401A DMM
4	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 50 Hz	1 kV to 10 kV	6.5%	High Voltage Probe with DMM
5	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Measure)	AC Voltage 50 Hz to 1 kHz	1 mV to 750 V	0.66% to 0.10%	Agilent 34401A DMM



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Site Facility					
6	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 1kHz to 5 kHz	1 A to 20 A	0.70% to 1.0%	Wavetek 9100
7	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 1kHz to 5 kHz	10 mA to 1 A	0.20% to 0.70%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
8	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	20 A to 1000 A	2.3%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
9	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz	3 A to 20 A	0.24% to 0.30%	Agilent 34401A, Agilent 34330A
10	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz to 1 kHz	1 A to 20 A	0.2% to 0.30%	Wavetek 9100 with x10 Current Coil, x50 Current Coil



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Site Facility					
11	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Current 50 Hz to 1 kHz	100 µA to 1 A	0.60% to 0.2%	Wavetek 9100
12	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 1 kHz to 10 kHz	30 mV to 300 V	0.59% to 0.11%	Wavetek 9100
13	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 10 kHz to 50 kHz	100 mV to 100 V	0.59% to 0.23%	Wavetek 9100
14	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 1 kHz	100 V to 1000 V	0.078%	Wavetek 9100
15	ELECTRO-TECHNICAL-ALTERNATING CURRENT (< 1 GHZ) (Source)	AC Voltage 50 Hz to 10 kHz	30 mV to 100 V	0.42% to 0.076%	Wavetek 9100



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Site Facility					
16	ELECTRO-TECHNICAL- ALTERNATING CURRENT (< 1 GHZ) (Source)	Capacitance 1kHz	1 nF to 100 µF	0.15% to 0.50%	GenRad, IET
17	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	1 A to 3 A	0.21% to 0.24%	Agilent 34401A, Agilent 34330A
18	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	100 µA to 1 A	2.4% to 0.21%	Agilent 34401A, Agilent 34330A
19	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Current	3 A to 20 A	0.24% to 0.37%	Agilent 34401A, Agilent 34330A
20	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 kOhm to 1 MOhm	0.01% to 0.02%	Agilent 34401A
21	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	1 MOhm to 100 MOhm	0.02% to 0.94%	Agilent 34401A
22	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Resistance	10 Ohm to 1 kOhm	0.07% to 0.01%	Agilent 34401A
23	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	>1 kV to 10 kV	2.5%	Agilent 34401A, High Voltage Probe with DMM



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Site Facility					
24	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	1 mV to 10 mV	0.43% to 0.019%	Agilent 34401A, High Voltage Probe with DMM
25	ELECTRO-TECHNICAL- DIRECT CURRENT (Measure)	DC Voltage	10 mV to 1000 V	0.019% to 0.0064%	Agilent 34401A, High Voltage Probe with DMM
26	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	1 A to 10 A	0.025% to 0.092%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
27	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 µA to 1 A	0.3% to 0.025%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
28	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	10 A to 20 A	0.092% to 0.11%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
29	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Current	20 A to 1000 A	1.2%	Wavetek 9100 with x10 Current Coil, x50 Current Coil
30	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Resistance	10 Ohm to 400 MOhm	0.7% to 0.38%	Wavetek 9100 (Direct Method)
31	ELECTRO-TECHNICAL- DIRECT CURRENT (Source)	DC Voltage	1 mV to 1000 V	0.06% to 0.0093%	Wavetek 9100



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Site Facility					
32	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors RTD-Pt100	-199 °C to 800 °C	0.065°C	Chub E-4
33	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors RTD-Pt1000	-199 °C to 800 °C	0.065°C	Chub E-4
34	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - B	400 °C to 1800 °C	0.80°C	Chub E-4
35	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - E	-200 °C to 1000 °C	0.25°C	Chub E-4
36	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - J	-200 °C to 1200 °C	0.25°C	Chub E-4



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Site Facility					
37	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - K	-200 °C to 1350 °C	0.25°C	Chub E-4
38	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - N	-200 °C to 1250 °C	0.25°C	Chub E-
39	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - R	2 °C to 1800 °C	0.61°C	Chub E-4
40	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - S	2 °C to 1800 °C	0.61°C	Chub E-4
41	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature - Controllers, -Indicators, - Simulators without Sensors Thermocouple Type - T	-200 °C to 400 °C	0.17°C	Chub E-4



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Site Facility					
42	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsRTD - Pt100/PT 1000	-199 °C to 800 °C	0.02°C	Wavetek 9100
43	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsRTD - PT100/PT1000	-200 °C to 800 °C	0.02°C	Wavetek 9100
44	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - B	400 °C to 1800 °C	0.5°C	Wavetek 9100
45	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - E	-250 °C to 1000 °C	0.2°C	Wavetek 9100



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Site Facility					
46	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - J	-200 °C to 1000 °C	0.3°C	Wavetek 9100
47	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - K	-200 °C to 1350 °C	0.3°C	Wavetek 9100
48	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - N	-200 °C to 1300 °C	0.2°C	Wavetek 9100
49	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without SensorsThermocouple Type - S, -R	0 °C to 1800 °C	0.4°C	Wavetek 9100



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Site Facility					
50	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature - Controllers, - Indicators, - Simulators without Sensors Thermocouple Type - T	-250 °C to 400 °C	0.2°C	Wavetek 9100
51	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	1 Hz to 10 Hz	2.60ppm to 0.27ppm	Agilent 34401A, HP5335A
52	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Frequency	10 Hz to 1 GHz	0.27ppm to 0.23ppm	Agilent 34401A, HP5335A
53	ELECTRO-TECHNICAL- TIME & FREQUENCY (Measure)	Time	1 s to 1800 s	0.064% to 0.013%	HP5335A
54	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	10 Hz to 2 MHz	70ppm to 30ppm	Agilent 33210, Wavetek 9100
55	ELECTRO-TECHNICAL- TIME & FREQUENCY (Source)	Frequency	2 MHz to 10 MHz	30ppm	Agilent 33210, Wavetek 9100



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Site Facility					
56	MECHANICAL-PRESSURE INDICATING DEVICES	Digital/Analog Pressure Gauges, Pressure Transmitters & Pressure Transducers	0 bar to 20 bar	0.045 bar	Using Digital Pressure Calibrators with uncertainty of 0.003 bar. Procedure based on DKD-R 6-1 guidelines.
57	MECHANICAL-WEIGHING SCALE AND BALANCE	MASS -ELECTRONIC WEIGHING BALANCE Readability: 0.01 mg(Class II)	1 mg to 200 g	0.60 mg	Using std. E2 Class weights. Procedure based on OIML R 76-1 guidelines.
58	MECHANICAL-WEIGHING SCALE AND BALANCE	MASS-ELECTRONIC WEIGHING BALANCE Readability : 0.1 g(Class II)	1 mg to 12 kg	1.14 g	Using std. E2 Class accuracy weights and procedure based on OIML R76-1 guidelines.
59	THERMAL-TEMPERATURE	Calibration of Chambers, Ovens, Baths, Furnaces (Multi Point)	-40 to 200 °C	0.98° C	RTD Pt-100; Using RTDs with DMM and Thermometer Readout
60	THERMAL-TEMPERATURE	Temperature Sensors with Indicators of Climatic Chambers, Ovens, Baths, Furnaces, Dry Block Calibrators (Single Point)	200 to 600 ° C	0.62°C	RTD Pt-100; Using RTDs with 6½ DMM and Thermometer Readout and Fast Cal Temperature Calibrator



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Site Facility					
61	THERMAL-TEMPERATURE	Temperature Sensors with Indicators of Climatic Chambers, Ovens, Baths, Furnaces, Dry Block Calibrators (Single Point)	-40 to 200 ° C	0.41° C	RTD Pt-100; Using RTDs with 6½ DMM and Thermometer Readout and Fast Cal Temperature Calibrator

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