National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name :	HI PHYSIX LABORATORY INDIA PRIVATE LIMITED, B-32/1/2, M.I.D.C. INDUSTRIAL AREA , RANJANGAON, PUNE, MAHARASHTRA, INDIA		
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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
Permanent Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 mA to 10 mA	0.16%
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 µA to 1 mA	0.85 % to 0.16 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 mA to 10 A	0.16 % to 0.25 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (At 50 Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	10 mA to 65 A	0.06%

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5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (3 Phase) (At 50Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	10 mA to 50 A	0.13 % to 0.034 %
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase & 3 Phase) @ 50 Hz	Using CALMET C300 Power/Energy Calibrator by Direct Method	20 A to 120 A	0.3%
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50 Hz	Using Fluke 9100 with Current coil ,By Direct Method	20 A to 1000 A	0.76%
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	10 µA to 300 µA	4.1 % to 0.25 %
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	300 mA to 20 A	0.25 % to 0.3 %

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10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current(1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	300 µA to 300 mA	0.25%
11	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	0.10 mA to 10 mA	0.085 % to 0.065 %
12	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 µA to 100 µA	3.06 % to 0.085 %
13	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	10 A to 65 A	0.13 % to 0.12 %
14	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 mA to 10 A	0.065 % to 0.8 %

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15	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Using Fluke 9100 MFC, By Direct Method	10 µA to 300 mA	0.59 % to 0.035 %
16	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Fluke 9100 with current coils ,By Direct Method	20 A to 1000 A	0.8 % to 0.8 %
17	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Using Fluke 9100 MFC, By Direct Method	300 mA to 20 A	0.035%
18	ELECTRO-TECHNICAL-OTHERS (Measure)	AC High Voltage (At 50Hz)	Using H.V. Probe & DMM Fluke ,By Direct Method	1 kV to 28 kV	2.33%
19	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Power (1 Phase) (At 50Hz) At UPF (10V to 600 V 0.1A to 65 A)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 39 kW	0.9%

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20	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Power (3 Phase) (At 50Hz ,At UPF) (10 V to 600 V, 0.01A to 50 A)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 30 kW	0.13 % to 0.034 %
21	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	1 mV to 100 mV	4.7 % to 0.12 %
22	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	1 V to 1000 V	0.1%
23	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	100 mV to 1 V	0.12 % to 0.1 %
24	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (At 100 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	10 mV to 100 V	6 % to 0.8 %
25	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (3 Phase) (At 50Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	0.1 V to 1000 V	0.7 % to 0.06 %

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26	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 µF to 1011 µF	0.91 % to 0.31 %
27	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 nF to 1000 nF	0.91 % to 0.06 %
28	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 pF to 1000 pF	0.96 % to 0.06 %
29	ELECTRO-TECHNICAL-OTHERS (Measure)	DC High Voltage	Using H.V. Probe & DMM Fluke ,By Direct Method	1 kV to 40 kV	2.38%
30	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Power (10 V to 600 V, 0.01A to 65 A)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 39 kW	0.2%
31	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM ,By Direct Method	0.1 mV to 1 mV	4.0 % to 0.4 %

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32	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 mV to 100 mV	0.4 % to 0.0085 %
33	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM , By Direct Method	1 V to 1000 V	0.0045 % to 0.006 %
34	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM , By Direct Method	100 mV to 1 mV	0.0085 % to 0.0045 %
35	ELECTRO-TECHNICAL-OTHERS (Measure)	Harmonics (1 Phase,3 Phase) (200V, 10A, 50Hz)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer ,By Direct Method	3^{rd} to 49^{th} Order	0.51%
36	ELECTRO-TECHNICAL-OTHERS (Measure)	Harmonics (1 Phase,3 Phase) (200V-240V, 0.5A to 10A, 50Hz)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer ,By Direct Method	3^{rd} to 39^{th} Order	0.51%

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37	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Duration - Half pulse width)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	10 µS to 1000 µS	1.6 % to 2.5 %
38	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Front Time)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	0.8 µS to 1000 µS	1.6 % to 2.5 %
39	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Voltage Magnitude)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	1 kVp to 17 kVp	3.69%
40	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	1 H to 10 H	0.061 % to 0.06 %
41	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	1 mH to 1003 mH	0.06 % to 0.28 %

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42	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	99 µH to 999.9 µH	0.28%
43	ELECTRO-TECHNICAL-OTHERS (Measure)	Power Factor	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer, By Direct Method	0.1 1PF lag – UPF to 0.1 PF lead	0.007PF
44	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using LCR Meter (At 1kHz), By Direct Method	0.01 Ohm to 100 Ohm	0.6 % to 0.07 %
45	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM,By Direct Method	0.1 Ohm to 100 kOhm	3.6 % to 0.013 %
46	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM,By Direct Method	10 MOhm to 1 GOhm	0.05 % to 2.5 %
47	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM, By Direct Method	100 kOhm to 10 MOhm	0.013 % to 0.05 %

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48	ELECTRO-TECHNICAL-OTHERS (Measure)	Surge	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	. up to 10 kV	1.6 % to 3.69 %
49	ELECTRO-TECHNICAL-OTHERS (Source)	AC Energy (1Phase & 3Phase) (Active/Reactive) UPF to 0.25PF Lead/Lag @ 50Hz (63.5 V to 240 V, 0.05 A to 120 A)	Using CALMET C300 Power/Energy calibrator ,By comparison method	0.79 Wh to 28.8 kWh	0.68 % to 0.06 %
50	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) (P.F. 0.8 Lag to 0.8 Lead) (At 50Hz)	Using Fluke 9100 MFC,By Direct Method	2.4 W to 8.96 kW	0.08 % to 0.65 %
51	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) P.F. 0.5 Lag to 0.5 Lead (At 50Hz)	Using Fluke 9100 MFC ,By Direct Method	1.5 W to 5.6 kW	0.08 % to 0.65 %
52	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) UPF @ 50Hz (30 V to 560 V, 0.1A to 20 A)	Using Fluke 9100 MFC ,By Direct Method	3 W to 11.2 kW	0.06 % to 0.6 %

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53	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (3 Phase) (UPF) @ 50Hz (10 V to 500 V, 0.1A to 100 A)	Using CALMET C300 Power/Energy calibrator,By Direct Method	1 W to 50.0 kW	1.5%
54	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (At 10Hz to 100 KHz)	Using Fluke 9100 MFC , By Direct Method	10 mV to 32 mV	4.56 % to 0.55 %
55	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (10Hz to 100 kHz)	Using Fluke 9100 MFC , By Direct Method	32 mV to 320 mV	0.55 % to 0.25 %
56	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (10Hz to 100kHz)	Using Fluke 9100 MFC , By Direct Method	320 mV to 1000 V	0.25 % to 0.2 %
57	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (3 Phase) (At 50 Hz)	Using CALMET C300 Power/ Energy Calibrator ,By Direct Method	0.5 V to 560 V	0.043 % to 0.049 %
58	ELECTRO-TECHNICAL-OTHERS (Source)	Capacitance (At 1 kHz)	Using Fluke 9100 MFC , By Direct Method	1 nF to 100 nF	2.04 % to 0.55 %
59	ELECTRO-TECHNICAL-OTHERS (Source)	Capacitance (At 1 kHz)	Using Fluke 9100 MFC , By Direct Method	100 nF to 1 mF	0.55 % to 1.85 %

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60	ELECTRO-TECHNICAL-OTHERS (Source)	DC Power (1 Phase) (10 V to 600 V, 0.1A to 20 A)	Using Fluke 9100 MFC,By Direct Method	1 W to 12 kW	6.3 % to 0.2 %
61	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	1 mV to 300 mV	0.7 % to 0.055 %
62	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	100 V to 1000 V	0.015 % to 0.01 %
63	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	300 mV to 100 V	0.055 % to 0.015 %
64	ELECTRO-TECHNICAL-OTHERS (Source)	High Resistance# (I.R Option) (at 250V to 1kV)	Using Fluke 9100 MFC , By Direct Method	1 MOhm to 1.8 GOhm	0.2 % to 1.1 %
65	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	0.1 mOhm to 0.1 mOhm	0.96%
66	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	1 mOhm to 1 mOhm	0.79%

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67	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	1 Ohm to 1 Ohm	0.31%
68	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	10 mOhm to 10 mOhm	0.31%
69	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	100 mOhm to 100 mOhm	0.31%
70	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	2 Ohm to 2 Ohm	0.31%
71	ELECTRO-TECHNICAL-OTHERS (Source)	Power Factor @ 50Hz	Using Fluke 9100 MFC by Direct Method	0.1 PF lag -UPF to 0.1 PF lead	0.002 % to 0.001 %
72	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	1 MOhm to 10 MOhm	0.076 % to 0.20 %
73	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	10 Ohm to 100 kOhm	0.20 % to 0.035 %

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74	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	10 MOhm to 300 MOhm	0.02 % to 0.59 %
75	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	100 kOhm to 1 MOhm	0.032 % to 0.076 %
76	ELECTRO-TECHNICAL-OTHERS (Source)	RESISTANCE (2W)	Using Fluke 9100 MFC ,By Direct Method	3 Ohm to 10 Ohm	0.46 % to 0.20 %
77	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (J Type Thermocouple)	Using Cropico digital thermometer, By Direct Method	-200 °C to 1200 °C	0.55°C
78	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (K Type Thermocouple))	Using Cropico digital thermometer, By Direct Method	-200 °C to 1300 °C	0.52°C
79	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (RTD Type)	Using Cropico digital thermometer, By Direct Method	-200 °C to 600 °C	0.2°C

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80	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Harmonics (1Phase & 3Phase) (10V to 300V, 0.5A to 100A)	Using CALMET C300 Power/Energy Calibrator , By Direct Method	2 nd to 31 st	0.6%
81	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (J Type Thermocouple)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 1200 °C	0.3°C
82	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (RTD TYPE)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 800 °C	0.2°C
83	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (K Type Thermocouple)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 1300 °C	0.3°C
84	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	FREQUENCY (1 Phase)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 Hz to 1 MHz	0.17 % to 0.011 %

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85	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	FREQUENCY (3 Phase) (At 240V)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	50 Hz to 50 kHz	0.02%
86	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	TIME INTERVAL	Using Time Interval Meter & Digital Stop Watch,By Comparison Method	0.1 s to 999.99 s	0.002 Sec to 1.13 Sec
87	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	TIME INTERVAL	Using Time Interval Meter & Digital Stop Watch,By Comparison Method	1000 s to 24 hrs	0.002 sec to 1.61 sec
88	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	FREQUENCY	Using Fluke 9100 MFC , By Direct Method	1 Hz to 100 Hz	0.6 % to 0.006 %
89	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	FREQUENCY	Using Fluke 9100 MFC , By Direct Method	100 Hz to 1 MHz	0.006 % to 0.003 %

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90	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Calipers (Vernier / Digital /Dial) L.C.: 0.01 mm	Using Gauge Block / Caliper Checker by Comparison method	0 to 300 mm	13µm
91	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	External Micrometer L.C.: 0.001 mm	Using Gauge Block Set by Comparison method	0 to 100 mm	2.7µm
92	MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)	Feeler Gauge	Using Digital Micrometer by Comparison method	0.01 mm to 2 mm	2.7µm
93	MECHANICAL-PRESSURE INDICATING DEVICES	(Pneumatic–Gauge Pressure) Digital & Dial Pressure Gauge	Using Digital Pressure Gauge & Comparator by Comparison Method as per DKD- R - 6 -1	0 to 10 bar	0.20% of rdg
94	MECHANICAL-PRESSURE INDICATING DEVICES	(Pneumatic–Gauge Pressure) Digital & Dial Pressure Gauge	Using Digital Vacuum Gauge & Vacuum Comparator by Comparison Method as per DKD-R - 6 -1	-90 bar to 0 bar	0.01% of rdg

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95	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure (Analog / Digital Gauges)	Using Dead weight Tester by Comparison Method as per DKD- R - 6 -1	0.1 bar to 700 bar	0.076% of rdg
96	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure # (Analog / Digital Gauges)	Using Digital Pressure Gauge with Hydraulic Comparator by Comparison Method as per DKD- R - 6 -1	0 to 700 bar	0.1% of rdg
97	MECHANICAL-VOLUME	Glassware like pipettes, burettes, measuring cylinder, volumetric flask etc @ 27°C	Using Weighing balance of 10kg capacity and 0.1g readability and distilled water ,Gravimetric method based on IS/ISO 4787	>2000 ml to 5000 ml	1.33ml
98	MECHANICAL-VOLUME	Glassware like pipettes, burettes, measuring cylinder, volumetric flask etc @ 27°C	Using Weighing balance of 200g capacity and 0.1mg readability and distilled water , Gravimetric method based on IS/ISO 4787	>50 ml to 100 ml	0.5ml

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99	MECHANICAL-VOLUME	Glassware like pipettes, burettes, measuring cylinder, volumetric flask etc @ 27°C	Using Weighing balance of 200g capacity and 0.1mg readability and distilled water , Gravimetric method based on IS/ISO 4787	1 ml to 50 ml	0.1ml
100	MECHANICAL-VOLUME	Micro-pipette @ 27°C	Using Weighing balance of 200g capacity and 0.1mg readability and distilled water , Gravimetric method based on ISO 8655 part6	100 µl to 200 µl	2.1µl
101	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	1 g	0.11mg

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102	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	1 mg	0.11mg
103	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	10 g	0.11mg
104	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	10 mg	0.11mg

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105	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	100 g	0.12mg
106	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	100 mg	0.11mg
107	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	2 g	0.11mg

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108	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	2 mg	0.11mg
109	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	20 g	0.12mg
110	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	20 mg	0.11mg

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111	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	200 g	0.16mg
112	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	200 mg	0.11mg
113	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	5 g	0.11mg

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114	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	5 mg	0.11mg
115	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	50 g	0.12mg
116	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	50 mg	0.11mg

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117	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	500 mg	0.11mg
118	OPTICAL-OPTICAL	Chromaticity Coordinates of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	x =0.005	1.0%

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119	OPTICAL-OPTICAL	Chromaticity Coordinates of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	y =0.005	1.0%
120	OPTICAL-OPTICAL	Color Coordinates	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	x =0.005	1.0%
121	OPTICAL-OPTICAL	Color Coordinates	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	y =0.005	1.0%

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122	OPTICAL-OPTICAL	Compact Fluorescent Lamps (CFL) (5 W to 26 W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	200 lm to 1600 lm	3.0%
123	OPTICAL-OPTICAL	Correlated Color Temperature	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	1500 K to 25000 K	1.5%
124	OPTICAL-OPTICAL	Correlated Color Temperature of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	1500 K to 25000 K	1.2%

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125	OPTICAL-OPTICAL	HPMVL (80W to 400W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	2000 lm to 30000 lm	3.2%
126	OPTICAL-OPTICAL	HPSVL (70W to 400W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	4800 lm to 60000 lm	3.2%
127	OPTICAL-OPTICAL	Illuminance	Using Illuminance meter with Intensity Standard Lamp WI 41G Lamp by Direct Method	1 lux to 25000 lux	2.1%

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128	OPTICAL-OPTICAL	Luminous Flux Of LED Lamp (0.5 W to 23 W)	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	20 lm to 3000 lm	2.2%
129	OPTICAL-OPTICAL	Luminous Intensity	Using Illuminance meter with Intensity Standard Lamp WI 41G Lamp by Direct Method	1 cd to 10000 cd	2.1%
130	OPTICAL-OPTICAL	MHL (70W to 400W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	4800 lm to 60000 lm	3.5%

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131	OPTICAL-OPTICAL	TFL (6W to 40W)	Using standard lamps & integrating sphere with standard spectrophotocolorimeter	150 lm to 4000 lm	3.0%
132	OPTICAL-OPTICAL	Tungsten Filament Lamps (15 W to 200 W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	115 lm to 3400 lm	3.0%
133	THERMAL-SPECIFIC HEAT & HUMIDITY	Calibration of Furnace, Freezer, Oven ,Chamber	Using 16-Channel Temperature Scanner with minimum 9 RTD Sensors by Multi Position Calibration	140 °C to 250 °C	1.7°C
134	THERMAL-SPECIFIC HEAT & HUMIDITY	Calibration of Furnace, Freezer, Oven ,Chamber	Using 16-Channel Temperature Scanner with minimum 9 RTD Sensors by Multi Position Calibration	-40 °C to 140 °C	1.7°C

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135	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	100 °C to 200 °C	0.14°C
136	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	200 °C to 600 °C	0.32°C
137	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	-40 °C to 100 °C	0.11°C

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138	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	600 °C to 1000 °C	1.55°C
139	THERMAL-TEMPERATURE	Glass Thermometer, Dial Gauge	Using Standard RTD Sensor with Standard Digital Thermometer and Low Temperature Bath , By Comparison Method	-40 °C to 200 °C	0.65°C
140	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using Standard RTD, S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	200 °C to 600 °C	0.48°C
141	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using Standard RTD, S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	-50 °C to 200 °C	0.2°C

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142	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	600 °C to 1000 °C	1.6°C

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Site Facility					
1	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 mA to 10 mA	0.16%
2	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 µA to 1 mA	0.85 % to 0.16 %
3	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 mA to 10 A	0.16 % to 0.25 %
4	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (1 Phase) (At 50 Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	10 mA to 65 A	0.06%

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5	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure)	AC Current (3 Phase) (At 50Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	10 mA to 50 A	0.13 % to 0.034 %
6	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase & 3 Phase) @ 50 Hz	Using CALMET C300 Power/Energy Calibrator by Direct Method	20 A to 120 A	0.3%
7	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50 Hz	Using Fluke 9100 with Current coil ,By Direct Method	20 A to 1000 A	0.76%
8	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	10 µA to 300 µA	4.1 % to 0.25 %
9	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current (1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	300 mA to 20 A	0.25 % to 0.3 %

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10	ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source)	AC Current(1 Phase) @ 50Hz to 5kHz	Using Fluke 9100 MFC ,By Direct Method	300 µA to 300 mA	0.25%
11	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	0.10 mA to 10 mA	0.085 % to 0.065 %
12	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 µA to 100 µA	3.06 % to 0.085 %
13	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	10 A to 65 A	0.13 % to 0.12 %
14	ELECTRO-TECHNICAL-DIRECT CURRENT (Measure)	DC CURRENT	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 mA to 10 A	0.065 % to 0.8 %

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15	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Using Fluke 9100 MFC, By Direct Method	10 µA to 300 mA	0.59 % to 0.035 %
16	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Fluke 9100 with current coils ,By Direct Method	20 A to 1000 A	0.8 % to 0.8 %
17	ELECTRO-TECHNICAL-DIRECT CURRENT (Source)	DC CURRENT	Using Fluke 9100 MFC, By Direct Method	300 mA to 20 A	0.035%
18	ELECTRO-TECHNICAL-OTHERS (Measure)	AC High Voltage (At 50Hz)	Using H.V. Probe & DMM Fluke ,By Direct Method	1 kV to 28 kV	2.33%
19	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Power (1 Phase) (At 50Hz) At UPF (10V to 600 V 0.1A to 65 A)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 39 kW	0.9%

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20	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Power (3 Phase) (At 50Hz ,At UPF) (10 V to 600 V, 0.01A to 50 A)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 30 kW	0.13 % to 0.034 %
21	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	1 mV to 100 mV	4.7 % to 0.12 %
22	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	1 V to 1000 V	0.1%
23	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (50 Hz to 5 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	100 mV to 1 V	0.12 % to 0.1 %
24	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (1 Phase) (At 100 kHz)	Using Fluke 8846A, 6½ DMM , By Direct Method	10 mV to 100 V	6 % to 0.8 %
25	ELECTRO-TECHNICAL-OTHERS (Measure)	AC Voltage (3 Phase) (At 50Hz)	Using HIOKI Digital Power Meter/Harmonic Analyzer ,By Direct Method	0.1 V to 1000 V	0.7 % to 0.06 %

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26	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 µF to 1011 µF	0.91 % to 0.31 %
27	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 nF to 1000 nF	0.91 % to 0.06 %
28	ELECTRO-TECHNICAL-OTHERS (Measure)	Capacitance (At 1 kHz)	Using LCR Meter ,By Direct Method	1 pF to 1000 pF	0.96 % to 0.06 %
29	ELECTRO-TECHNICAL-OTHERS (Measure)	DC High Voltage	Using H.V. Probe & DMM Fluke ,By Direct Method	1 kV to 40 kV	2.38%
30	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Power (10 V to 600 V, 0.01A to 65 A)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	0.1 W to 39 kW	0.2%
31	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM ,By Direct Method	0.1 mV to 1 mV	4.0 % to 0.4 %

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32	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM ,By Direct Method	1 mV to 100 mV	0.4 % to 0.0085 %
33	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM , By Direct Method	1 V to 1000 V	0.0045 % to 0.006 %
34	ELECTRO-TECHNICAL-OTHERS (Measure)	DC Voltage	Using Fluke 8846A, 6½ DMM , By Direct Method	100 mV to 1 mV	0.0085 % to 0.0045 %
35	ELECTRO-TECHNICAL-OTHERS (Measure)	Harmonics (1 Phase,3 Phase) (200V, 10A, 50Hz)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer ,By Direct Method	3^{rd} to 49^{th} Order	0.51%
36	ELECTRO-TECHNICAL-OTHERS (Measure)	Harmonics (1 Phase,3 Phase) (200V-240V, 0.5A to 10A, 50Hz)	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer ,By Direct Method	3^{rd} to 39^{th} Order	0.51%

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37	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Duration - Half pulse width)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	10 µS to 1000 µS	1.6 % to 2.5 %
38	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Front Time)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	0.8 µS to 1000 µS	1.6 % to 2.5 %
39	ELECTRO-TECHNICAL-OTHERS (Measure)	Impulse (Voltage Magnitude)	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	1 kVp to 17 kVp	3.69%
40	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	1 H to 10 H	0.061 % to 0.06 %
41	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	1 mH to 1003 mH	0.06 % to 0.28 %

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42	ELECTRO-TECHNICAL-OTHERS (Measure)	Inductance (At 1kHz)	Using LCR Meter ,By Direct Method	99 µH to 999.9 µH	0.28%
43	ELECTRO-TECHNICAL-OTHERS (Measure)	Power Factor	Using Yokogawa/HIOKI Digital power Meter/Harmonic Analyzer, By Direct Method	0.1 1PF lag – UPF to 0.1 PF lead	0.007PF
44	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using LCR Meter (At 1kHz), By Direct Method	0.01 Ohm to 100 Ohm	0.6 % to 0.07 %
45	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM,By Direct Method	0.1 Ohm to 100 kOhm	3.6 % to 0.013 %
46	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM,By Direct Method	10 MOhm to 1 GOhm	0.05 % to 2.5 %
47	ELECTRO-TECHNICAL-OTHERS (Measure)	Resistance	Using Fluke 8846A, 6½ DMM, By Direct Method	100 kOhm to 10 MOhm	0.013 % to 0.05 %

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48	ELECTRO-TECHNICAL-OTHERS (Measure)	Surge	Using Oscilloscope with HV Probe by Direct/Comparison method as per IEC 60060-2, IEC 61180, IS 2071 Part 1	. up to 10 kV	1.6 % to 3.69 %
49	ELECTRO-TECHNICAL-OTHERS (Source)	AC Energy (1Phase & 3Phase) (Active/Reactive) UPF to 0.25PF Lead/Lag @ 50Hz (63.5 V to 240 V, 0.05 A to 120 A)	Using CALMET C300 Power/Energy calibrator ,By comparison method	0.79 Wh to 28.8 kWh	0.68 % to 0.06 %
50	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) (P.F. 0.8 Lag to 0.8 Lead) (At 50Hz)	Using Fluke 9100 MFC,By Direct Method	2.4 W to 8.96 kW	0.08 % to 0.65 %
51	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) P.F. 0.5 Lag to 0.5 Lead (At 50Hz)	Using Fluke 9100 MFC ,By Direct Method	1.5 W to 5.6 kW	0.08 % to 0.65 %
52	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (1 Phase) UPF @ 50Hz (30 V to 560 V, 0.1A to 20 A)	Using Fluke 9100 MFC ,By Direct Method	3 W to 11.2 kW	0.06 % to 0.6 %

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53	ELECTRO-TECHNICAL-OTHERS (Source)	AC Power (3 Phase) (UPF) @ 50Hz (10 V to 500 V, 0.1A to 100 A)	Using CALMET C300 Power/Energy calibrator,By Direct Method	1 W to 50.0 kW	1.5%
54	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (At 10Hz to 100 KHz)	Using Fluke 9100 MFC , By Direct Method	10 mV to 32 mV	4.56 % to 0.55 %
55	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (10Hz to 100 kHz)	Using Fluke 9100 MFC , By Direct Method	32 mV to 320 mV	0.55 % to 0.25 %
56	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (1 Phase) (10Hz to 100kHz)	Using Fluke 9100 MFC , By Direct Method	320 mV to 1000 V	0.25 % to 0.2 %
57	ELECTRO-TECHNICAL-OTHERS (Source)	AC Voltage (3 Phase) (At 50 Hz)	Using CALMET C300 Power/ Energy Calibrator ,By Direct Method	0.5 V to 560 V	0.043 % to 0.049 %
58	ELECTRO-TECHNICAL-OTHERS (Source)	Capacitance (At 1 kHz)	Using Fluke 9100 MFC , By Direct Method	1 nF to 100 nF	2.04 % to 0.55 %
59	ELECTRO-TECHNICAL-OTHERS (Source)	Capacitance (At 1 kHz)	Using Fluke 9100 MFC , By Direct Method	100 nF to 1 mF	0.55 % to 1.85 %

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60	ELECTRO-TECHNICAL-OTHERS (Source)	DC Power (1 Phase) (10 V to 600 V, 0.1A to 20 A)	Using Fluke 9100 MFC,By Direct Method	1 W to 12 kW	6.3 % to 0.2 %
61	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	1 mV to 300 mV	0.7 % to 0.055 %
62	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	100 V to 1000 V	0.015 % to 0.01 %
63	ELECTRO-TECHNICAL-OTHERS (Source)	DC Voltage	Using Fluke 9100 MFC , By Direct Method	300 mV to 100 V	0.055 % to 0.015 %
64	ELECTRO-TECHNICAL-OTHERS (Source)	High Resistance# (I.R Option) (at 250V to 1kV)	Using Fluke 9100 MFC , By Direct Method	1 MOhm to 1.8 GOhm	0.2 % to 1.1 %
65	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	0.1 mOhm to 0.1 mOhm	0.96%
66	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	1 mOhm to 1 mOhm	0.79%

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67	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	1 Ohm to 1 Ohm	0.31%
68	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	10 mOhm to 10 mOhm	0.31%
69	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	100 mOhm to 100 mOhm	0.31%
70	ELECTRO-TECHNICAL-OTHERS (Source)	Low Resistance (4W)	Using OSAW Standard Resistance (Direct Values) ,By Direct Method	2 Ohm to 2 Ohm	0.31%
71	ELECTRO-TECHNICAL-OTHERS (Source)	Power Factor @ 50Hz	Using Fluke 9100 MFC by Direct Method	0.1 PF lag -UPF to 0.1 PF lead	0.002 % to 0.001 %
72	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	1 MOhm to 10 MOhm	0.076 % to 0.20 %
73	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	10 Ohm to 100 kOhm	0.20 % to 0.035 %

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74	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	10 MOhm to 300 MOhm	0.02 % to 0.59 %
75	ELECTRO-TECHNICAL-OTHERS (Source)	Resistance (2W)	Using Fluke 9100 MFC ,By Direct Method	100 kOhm to 1 MOhm	0.032 % to 0.076 %
76	ELECTRO-TECHNICAL-OTHERS (Source)	RESISTANCE (2W)	Using Fluke 9100 MFC ,By Direct Method	3 Ohm to 10 Ohm	0.46 % to 0.20 %
77	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (J Type Thermocouple)	Using Cropico digital thermometer, By Direct Method	-200 °C to 1200 °C	0.55°C
78	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (K Type Thermocouple))	Using Cropico digital thermometer, By Direct Method	-200 °C to 1300 °C	0.52°C
79	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure)	Temperature Simulation (By simulation method) (RTD Type)	Using Cropico digital thermometer, By Direct Method	-200 °C to 600 °C	0.2°C

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80	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Harmonics (1Phase & 3Phase) (10V to 300V, 0.5A to 100A)	Using CALMET C300 Power/Energy Calibrator , By Direct Method	2 nd to 31 st	0.6%
81	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (J Type Thermocouple)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 1200 °C	0.3°C
82	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (RTD TYPE)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 800 °C	0.2°C
83	ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source)	Temperature Indicator, Controller, Recorders (By simulation method) (K Type Thermocouple)	Using Fluke 9100 MFC, By Direct Method	-200 °C to 1300 °C	0.3°C
84	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	FREQUENCY (1 Phase)	Using Fluke 8846A, 6½ DMM ,By Direct Method	10 Hz to 1 MHz	0.17 % to 0.011 %

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85	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	FREQUENCY (3 Phase) (At 240V)	Using HIOKI Digital Power Meter/Harmonic Analyzer,By Direct Method	50 Hz to 50 kHz	0.02%
86	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	TIME INTERVAL	Using Time Interval Meter & Digital Stop Watch,By Comparison Method	0.1 s to 999.99 s	0.002 Sec to 1.13 Sec
87	ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure)	TIME INTERVAL	Using Time Interval Meter & Digital Stop Watch,By Comparison Method	1000 s to 24 hrs	0.002 sec to 1.61 sec
88	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	FREQUENCY	Using Fluke 9100 MFC , By Direct Method	1 Hz to 100 Hz	0.6 % to 0.006 %
89	ELECTRO-TECHNICAL-TIME & FREQUENCY (Source)	FREQUENCY	Using Fluke 9100 MFC , By Direct Method	100 Hz to 1 MHz	0.006 % to 0.003 %

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90	MECHANICAL-PRESSURE INDICATING DEVICES	(Pneumatic–Gauge Pressure) Digital & Dial Pressure Gauge	Using Digital Pressure Gauge & Comparator by Comparison Method as per DKD- R - 6 -1	0 to 10 bar	0.20% of rdg
91	MECHANICAL-PRESSURE INDICATING DEVICES	(Pneumatic–Gauge Pressure) Digital & Dial Pressure Gauge	Using Digital Vacuum Gauge & Vacuum Comparator by Comparison Method as per DKD- R - 6 -1	-90 bar to 0 bar	0.01% of rdg
92	MECHANICAL-PRESSURE INDICATING DEVICES	Hydraulic Pressure # (Analog / Digital Gauges)	Using Digital Pressure Gauge with Hydraulic Comparator by Comparison Method as per DKD- R - 6 -1	0 to 700 bar	0.1% of rdg
93	MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE	Force Measuring System of UTM Compression	Using Load cell with indicator of Class 0.5 and Class 1 accuracy by UTM of accuracy Class I and coarser based on ISO 1828,Part1	1 kN to 10 kN	0.24%

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94	MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE	Force Measuring System of UTM Tension	Using Load cell with indicator of Class 0.5 and Class 1 accuracy by UTM of accuracy Class I and coarser based on ISO 1828,Part1	1 kN to 10 kN	0.59%
95	MECHANICAL-WEIGHING SCALE AND BALANCE	Mass-Electronic weighing balances with readability d=10g	Using M1 class weights by Calibration of electronic weighing balance and comparator of Class III and coarser as per OIML R-76- 1	Maximum capacity up to 10 to	12.9g
96	MECHANICAL-WEIGHING SCALE AND BALANCE	Mass-Electronic weighing balances with readability d=10g	Using M1 class weights by Calibration of electronic weighing balance and comparator of Class III and coarser as per OIML R-76- 1	Maximum capacity up to 20	1.2g

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97	MECHANICAL-WEIGHING SCALE AND BALANCE	Mass-Electronic weighing balances with readability d=10g	Using M1 class weights by Calibration of electronic weighing balance and comparator of Class III and coarser as per OIML R-76- 1	Maximum capacity up to 60	3g
98	MECHANICAL-WEIGHING SCALE AND BALANCE	Mass-Electronic weighing balances with readability d=1mg	Using E2 class weights by Calibration of electronic weighing balance and comparator of Class I and coarser as per OIML R-76- 1	Maximum capacity up to 20	1mg
99	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	1 g	0.11mg

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100	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	1 mg	0.11mg
101	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	10 g	0.11mg
102	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	10 mg	0.11mg

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103	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	100 g	0.12mg
104	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	100 mg	0.11mg
105	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	2 g	0.11mg

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106	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	2 mg	0.11mg
107	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	20 g	0.12mg
108	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	20 mg	0.11mg

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109	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	200 g	0.16mg
110	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	200 mg	0.11mg
111	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	5 g	0.11mg

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112	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	5 mg	0.11mg
113	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	50 g	0.12mg
114	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	50 mg	0.11mg

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115	MECHANICAL-WEIGHTS	Mass-Weights	Using E2 class weights and balance of readability 0.1mg by Calibration of weights of Class M1 accuracy and coarser as per OIML R-111	500 mg	0.11mg
116	OPTICAL-OPTICAL	Chromaticity Coordinates of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	x =0.005	1.0%

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117	OPTICAL-OPTICAL	Chromaticity Coordinates of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	y =0.005	1.0%
118	OPTICAL-OPTICAL	Color Coordinates	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	x =0.005	1.0%
119	OPTICAL-OPTICAL	Color Coordinates	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	y =0.005	1.0%

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120	OPTICAL-OPTICAL	Compact Fluorescent Lamps (CFL) (5 W to 26 W)	Using standard lamps & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	200 lm to 1600 lm	3.0%
121	OPTICAL-OPTICAL	Correlated Color Temperature	Using THL lamps at 50W & integrating sphere with standard spectrophoto colorimeter by ab-initio Method & Substitution method	1500 K to 25000 K	1.5%
122	OPTICAL-OPTICAL	Correlated Color Temperature of LED Lamp	Using C-Type mirror Goniometer with Spectroradiometer and integrating sphere with standard spectroradiometer/ Spectrophotocolorimeter and Standard light source by Obsolete & Substitution method	1500 K to 25000 K	1.2%

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123	OPTICAL-OPTICAL	Illuminance	Using Illuminance meter with Intensity Standard Lamp WI 41G Lamp by Direct Method	1 lux to 25000 lux	2.1%
124	THERMAL-SPECIFIC HEAT & HUMIDITY	Calibration of Furnace, Freezer, Oven ,Chamber	Using 16-Channel Temperature Scanner with minimum 9 RTD Sensors by Multi Position Calibration	140 °C to 250 °C	1.7°C
125	THERMAL-SPECIFIC HEAT & HUMIDITY	Calibration of Furnace, Freezer, Oven ,Chamber	Using 16-Channel Temperature Scanner with minimum 9 RTD Sensors by Multi Position Calibration	-40 °C to 140 °C	1.7°C
126	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	100 °C to 200 °C	0.14°C

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Laboratory Name :	HI PHYSIX LABORATORY INDIA PRIVATE LIMITED, B-32/1/2, M.I.D.C. INDUSTRIAL AREA , RANJANGAON, PUNE, MAHARASHTRA, INDIA		
Accreditation Standard	ISO/IEC 17025:2017		
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* The validity is extended for one year up to 02.12.2021

*Transition to 2017 version completed w.e.f 19.03.2021 valid until 02.12.2021

S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
127	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	200 °C to 600 °C	0.32°C
128	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (RTDs, Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	-40 °C to 100 °C	0.11°C
129	THERMAL-TEMPERATURE	Calibration of Contact type temp. sensor (Thermocouples, Temp. indicators with Sensors)	Using Standard RTD, S- Type T/C Sensor with Standard Digital Thermometer and Low Temperature Bath & Dry Block Calibrators , By Comparison Method	600 °C to 1000 °C	1.55°C

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S.No	Discipline / Group	Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument	Calibration or Measurement Method or procedure	Measurement range and additional parameters where applicable(Range and Frequency)	* Calibration and Measurement Capability(CMC)(±)
130	THERMAL-TEMPERATURE	Glass Thermometer, Dial Gauge	Using Standard RTD Sensor with Standard Digital Thermometer and Low Temperature Bath , By Comparison Method	-40 °C to 200 °C	0.65°C
131	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using Standard RTD, S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	200 °C to 600 °C	0.48°C
132	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using Standard RTD, S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	-50 °C to 200 °C	0.2°C
133	THERMAL-TEMPERATURE	Temperature Indicator with sensor of Freezer, Chamber, Bath, Oven, & Furnace	Using S-Type Sensor with Digital Thermometer by Single Position Calibration (At measuring location in DUC)	600 °C to 1000 °C	1.6°C

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