

Laboratory Tii Techno Testing Services Pvt. Ltd., No. 238/16, Aathanencheri Village, Padappai, Sriperumbudur (T.K.), Kancheepuram (DT)., Tamil Nadu

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2796 (in lieu of C-1119, C-1120, C-1121) **Page** 1 of 21

Validity 12.09.2018 to 11.09.2020 **Last Amended on** -

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1 mV to 330 mV 330 mV to 33 V 33 V to 330 V 330 V to 1000 V	0.14 % to 0.0032 % 0.0032 % to 0.0025 % 0.0025 % to 0.0029 % 0.0029 % to 0.0025 %	Using Fluke Calibrator Model: 5522A by Direct Method
2.	AC Voltage [#]	45 Hz to 10 kHz 1 mV to 30 mV 30 mV to 300 mV 300 mV to 30 V 30 V to 300 V 300 V to 1000V 10 kHz to 20 kHz 30 mV to 300 V 20 kHz to 50 kHz 30mV to 300 mV 300 mV to 3 V 3 V to 30 V 50 kHz to 100 kHz 30 mV to 300 mV 300 mV to 3 V 3 V to 30 V 30 V to 100 V 100 kHz to 300 kHz 30 mV to 300 mV 300 mV to 3 V	0.72 % to 0.044 % 0.044 % to 0.021 % 0.021 % to 0.020 % 0.020 % to 0.026 % 0.026 % to 0.038 % 0.053 % to 0.032 % 0.14 % to 0.044 % 0.044 % to 0.037 % 0.037 % to 0.045 % 0.45 % to 0.11 % 0.11 % to 0.086 % 0.086 % to 0.11 % 0.11 % to 0.29 % 1.12 % to 0.26 % 0.26 % to 0.31 %	Using Fluke Calibrator Model: 5522A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
3.	DC Current [#]	190 μ A to 330 mA 330 mA to 3 A 3 A to 20 A 20 A to 1000 A	0.030 % to 0.013 % 0.013 % to 0.046 % 0.046 % to 0.12 % 0.53 % to 0.33 %	Using Fluke Calibrator Model: 5522A by Direct Method Using Fluke Calibrator Model: 5522A with 50 Turns Current Coil / Model 5500A By Direct Method
4.	AC Current [#]	45 Hz to 1kHz 190 μ A to 33 mA 33 mA to 3 A 3 A to 20 A 1 kHz to 5 kHz 19 mA to 33 mA 33 mA to 330 mA 330 mA to 1.1 A 1.1 A to 20 A 50 Hz 20 A to 200 A 200 A to 1000 A	0.21 % to 0.058 % 0.058 % to 0.077 % 0.077 % to 0.20 % 0.11 % to 0.10 % 0.10 % to 0.13 % 0.13 % to 0.80 % 0.80 % to 3.49 % 0.58 % to 0.42 % 0.42 % to 0.37 %	Using Fluke Calibrator Model: 5522A by Direct Method Using Fluke Calibrator Model: 5522A with 50 Turns Current Coil by Direct Method
5.	Resistance [#]	0.1 Ω to 1 Ω 1 Ω to 110 Ω 110 Ω to 1.1 k Ω 1.1k Ω to 110 k Ω 110k Ω to 1.1M Ω 1.1M Ω to 110M Ω 110M Ω to 300M Ω 300M Ω to 1000M Ω	1.16 % 1.16 % to 0.020 % 0.020 % to 0.0055 % 0.0055 % to 0.0044 % 0.0044 % to 0.0072 % 0.0072 % to 0.062 % 0.062 % to 0.39 % 0.39 % to 1.79 %	Using Tinsley DRB Model:ZX76E by Direct Method Using Fluke Calibrator Model: 5522A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
6.	Capacitance [#]	1 kHz 1 nF to 0.33 μ F 0.33 μ F to 1.1 mF	1.73 % to 0.67 % 0.67 % to 0.84 %	Using Fluke Calibrator Model: 5522A by Direct Method
7.	Frequency [#]	1 Hz to 10 Hz 10 Hz to 1000 Hz 1000 Hz to 100 kHz 100 kHz to 1 MHz	0.058 % to 0.00044 % 0.00044 % to 0.00033 % 0.00033 % to 0.00030 % 0.00030 % to 0.00029 %	Using Fluke Calibrator Model: 5522A by Direct Method
8.	AC Power [#]	50 Hz @ UPF 2.4 W to 4.8 kW 120 V to 240 V 0.02 A to 20 A 50 Hz @ 0.8 Lead 9.6 W to 3.8 kW 120 V to 240 V 0.1 A to 20 A 50 Hz @ 0.5 Lag 6 W to 2.4 kW 120 V to 240 V 0.1 A to 20 A	0.37 % to 0.17 % 0.12 % to 0.19 % 0.28 % to 0.27 %	Using Fluke Calibrator Model: 5522A by Direct Method
9.	DC Power [#]	1 W to 12 kW 1 V to 600 V 1 A to 20 A	0.063 % to 0.085 %	Using Fluke Calibrator Model: 5522A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
10.	Temperature Simulation [#] (Indicator, Controller, Recorder)			Using Eurotron MFC Model: Microcal 2000+ by Simulation Method
	Thermocouple Type			
	J - Type	(-) 190°C to 750°C	0.16°C	
	K - Type	(-) 160°C to 1340°C	0.20°C	
	T - Type	(-) 130°C to 400°C	0.17°C	
	R - Type	150°C to 1750°C	0.34°C	
	S - Type	170°C to 1750°C	0.34°C	
	B - Type	920°C to 1800°C	0.82°C	
	E - Type	(-) 200°C to 1000°C	0.19°C	
	N - Type	0°C to 1300°C	0.20°C	
	RTD Type PT100	(-) 200°C to 800°C	0.13°C	
II.	MEASURE			
1.	DC Voltage ^s	1mV to 100 mV 100mV to 10 V 10V to 100V 100V to 1000V	0.021 % to 0.00090 % 0.00090 % to 0.00056 % 0.00056 % to 0.00082 % 0.00083 %	Using Fluke DMM Model: 8508A by Direct/Comparison Method
2.	AC Voltage ^s	50 Hz 1mV to 100mV 50 Hz to 1 kHz 100 mV to 1000 V 1 kHz to 10 kHz 100 mV to 1 V 1 V to 100 V 10 kHz to 30 kHz 100 mV to 1 V 1 V to 100 V	0.55 % to 0.020 % 0.020 % to 0.022 % 0.022 % to 0.015 % 0.015 % to 0.019 % 0.049 % to 0.030 % 0.030 % to 0.030 %	Using Fluke DMM Model: 8508A by Direct/Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
		30 kHz to 100 kHz 100 mV to 100 V	0.11% to 0.089 %	
3.	AC High Voltage ^s	50 Hz 1 kV to 10 kV	6.0 %	Using Fluke High Voltage Probe Model: 80k-40 by Direct Method
4.	DC High Voltage ^s	1 kV to 10 kV	2.8 %	Using Fluke High Voltage Probe Model: 80k-40 by Direct Method
5.	DC Current ^s	100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 20 A	0.0037 % to 0.0067 % 0.0067 % to 0.024 % 0.024 % to 0.052 % 0.052 % to 0.050 %	Using Fluke DMM Model: 8508A by Direct/Comparison Method Using Fluke DMM Model: 8508A by Direct Method
6.	AC Current ^s	50 Hz to 300 Hz 100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 20 A 300 Hz to 1 kHz 100 μ A to 100 mA 100 mA to 1 A 1A to 10 A	0.098 % to 0.058 % 0.058 % to 0.096 % 0.096 % to 0.12 % 0.12 % to 0.11% 0.082 % to 0.057 % 0.057 % to 0.096 % 0.096 % to 0.12 %	Using Fluke DMM Model: 8508A by Direct/Comparison Method Using Fluke DMM Model: 8508A by Direct Method Using Fluke DMM Model: 8508A by Direct/Comparison

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
		1 kHz to 5 kHz 100 μ A to 100 mA 100 mA to 1A 1 A to 10 A 5 kHz to 10 kHz 1 mA to 1 A	0.084 % to 0.057 % 0.057 % to 0.11 % 0.11 % to 0.31 % 0.059 % to 0.11 %	
7.	Resistance ^s	1 Ω to 100 k Ω 100 k Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1G Ω	0.0087 % to 0.0012 % 0.0012 % to 0.0039 % 0.0037 % to 0.035 % 0.035 % to 0.32 %	Using Fluke DMM Model: 8508A by Direct/Comparison Method
8.	Frequency ^s	10 Hz to 100 kHz	0.082 % to 0.013 %	Using Fluke DMM Model: 8846A by Direct Method
9.	Time Interval ^s	1 s to 86400 s	0.059s to 54.12s	Using Beltronics Time Totalizer Model: 501 by Comparison Method
10.	Temperature Measurement ^s (Indicator, Controller, Recorder)			
	Thermocouple Type			
	J - Type	(-) 190 °C to 750 °C	0.17 °C	
	K - Type	(-) 160 °C to 1260 °C	0.19 °C	
	T - Type	(-) 130 °C to 400 °C	0.17 °C	
	R – Type	150 °C to 1750 °C	0.34 °C	
	S - Type	170 °C to 1750 °C	0.34 °C	
	B – Type	920 °C to 1800 °C	0.83 °C	
	E - Type	(-) 200 °C to 1000 °C	0.20 °C	
	N – Type	0 °C to 1300 °C	0.20 °C	
	RTD Type PT100	(-) 200 °C to 800 °C	0.13 °C	Using Eurotron MFC Model: Microcal 2000+ by Measurement Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
11.	DC Voltage*	100 mV to 10 V 10 V to 1000 V	0.0084 % to 0.0035 % 0.0035 % to 0.0060 %	Using Fluke DMM Model: 8846A by Direct Method
12.	AC Voltage*	50 Hz 100mV to 1V 1V to 100 V 100 V to 1000V 50 Hz to 30 kHz 100 mV to 100 V	0.13 % to 0.11 % 0.11 % to 0.11 % 0.11 % to 0.10 % 0.21 % to 0.20 %	Using Fluke DMM Model: 8846A by Direct Method
13.	AC High Voltage*	50 Hz 1 kV to 10 kV	6.0 %	Using Fluke High Voltage Probe Model: 80k-40 by Direct Method
14.	DC High Voltage*	1 kV to 10 kV	2.8%	Using Fluke High Voltage Probe Model: 80k-40 by Direct Method
15.	DC Current*	100 μ A to 1 mA 1 mA to 10 mA 10 mA to 400 mA 400 mA to 1 A 1 A to 10 A	0.087 % to 0.064 % 0.064 % to 0.081 % 0.081 % to 0.073 % 0.073 % to 0.087 % 0.087 % to 0.20 %	Using Fluke DMM Model: 8846A by Direct Method
16.	AC Current*	50 Hz 100 μ A to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 400 mA 400 mA to 1 A 1 A to 10 A	0.38 % to 0.19 % 0.19 % to 0.26 % 0.26 % to 0.19 % 0.19 % to 0.29 % 0.29 % to 0.21 % 0.21 % to 0.30 %	Using Fluke DMM Model: 8846A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
17.	Resistance*	1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 10 M Ω 10 M Ω to 1 G Ω	0.36 % to 0.046 % 0.046 % to 0.016 % 0.016 % to 0.049 % 0.049 % to 2.36 %	Using Fluke DMM Model: 8846A by Direct Method
18.	Frequency*	10 Hz to 100 kHz	0.082 % to 0.013 %	Using Fluke DMM Model: 8846A by Direct Method
19.	Time Interval*	1 s to 86400 s	0.059s to 54.12s	Using Beltronics Time Totalizer Model: 501 by Comparison Method
20.	Temperature Measurement* (Indicator, Controller, Recorder)			Using Eurotron MFC Model: Microcal 2000+ by Measurement Method
	Thermocouple Type			
	J - Type	(-) 190 $^{\circ}\text{C}$ to 750 $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	
	K - Type	(-) 160 $^{\circ}\text{C}$ to 1260 $^{\circ}\text{C}$	0.19 $^{\circ}\text{C}$	
	T - Type	(-) 130 $^{\circ}\text{C}$ to 400 $^{\circ}\text{C}$	0.17 $^{\circ}\text{C}$	
	R - Type	150 $^{\circ}\text{C}$ to 1750 $^{\circ}\text{C}$	0.34 $^{\circ}\text{C}$	
	S - Type	170 $^{\circ}\text{C}$ to 1750 $^{\circ}\text{C}$	0.34 $^{\circ}\text{C}$	
	B - Type	920 $^{\circ}\text{C}$ to 1800 $^{\circ}\text{C}$	0.83 $^{\circ}\text{C}$	
	E - Type	(-) 200 $^{\circ}\text{C}$ to 1000 $^{\circ}\text{C}$	0.20 $^{\circ}\text{C}$	
	N - Type	0 $^{\circ}\text{C}$ to 1300 $^{\circ}\text{C}$	0.20 $^{\circ}\text{C}$	
	RTD Type PT100	(-) 200 $^{\circ}\text{C}$ to 800 $^{\circ}\text{C}$	0.13 $^{\circ}\text{C}$	

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Caliper ^{\$} (Vernier/Digital/ Dial) L.C.: 0.01 mm ^Φ L.C.: 0.02 mm ^Φ	0 to 1000 mm 0 to 2000 mm	13.0 μ m 40.0 μ m	Using Caliper Checker & Length Bar IS 3651
2.	Depth Gauge – (Vernier/Digital/ Dial/Hook) ^{\$} L.C.: 0.01 mm ^Φ L.C.: 0.02 mm ^Φ	0 to 300 mm 0 to 600 mm	9.7 μ m 17.1 μ m	Using Slip Gauge & Length Bar IS 4213
3.	Internal Dial Caliper ^{\$} L.C : 0.01 mm ^Φ	5 mm to 100 mm	11.0 μ m	Using Slip Gauge & Slip Gauge Accessories (TSPL/WI/MECHCAL/ DIM/003)
4.	External Micrometer - Various Types ^{\$} L.C.: 0.001 mm ^Φ L.C.: 0.01 mm ^Φ	0 to 300 mm 0 to 600 mm 0 to 1400 mm	7.1 μ m 17.0 μ m 33.0 μ m	Using Slip Gauge & Length Bar IS 2967
5.	Stick Type Internal Micrometer ^{\$} L.C.: 0.01 mm ^Φ	50 mm to 1000 mm	5.2 μ m	Using ULMM IS 2966
6.	Depth Micrometer ^{\$} L.C : 0.001 mm ^Φ	0 to 300 mm	7.1 μ m	Using Slip Gauge & Length Bar IS 6468

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
7.	Length Bar/ Micrometer Setting Rod ^{\$}	Upto 1000 mm	6.9 μ m	Using ULMM IS 2984
8.	Digital Thickness Gauge ^{\$} L.C.: 0.001 mm $^{\phi}$	0 to 25 mm	1.1 μ m	Using Slip Gauges (TSPL/WI/MECHCAL/ DIM/009)
9.	Bore Gauge ^{\$} (Transmission Error) L.C.: 0.001 mm $^{\phi}$	Upto 1 mm	3.9 μ m	Using Dial Calibration Tester (TSPL/ WI/ MECHCAL/ DIM/010)
10.	Plunger Dial Gauge – (Dial / Digital) ^{\$} L.C.: 0.001 mm $^{\phi}$	0 to 100 mm	2.6 μ m	Using ULMM IS 2092
11.	Lever Type Dial Gauge ^{\$} L.C.: 0.001 mm $^{\phi}$	$\pm$ 0.8 mm	2.6 μ m	Using ULMM IS 11498
12.	Measuring Tape ^{\$} L.C.: 1 mm $^{\phi}$	Upto 50 meter	290 $\sqrt{L}$ μ m 'L' in meter	Using Tape & Scale Calibrator IS 1269
13.	Scale ^{\$} L.C.: 1 mm $^{\phi}$	0 to 2000 mm	290 $\sqrt{L}$ μ m 'L' in meter	Using Tape & Scale Calibrator IS 1481
14.	Snap Gauge ^{\$}	3 mm to 200 mm	2.6 μ m	Using ULMM & Master Setting Ring IS 3455
15.	Feeler Gauge ^{\$}	0.02 mm to 1 mm	2.8 μ m	Using ULMM IS 3179
16.	Coating Thickness Foils ^{\$}	Upto 1000 μ m	2.5 μ m	Using ULMM (TSPL/WI/ MECHCAL/ DIM/018)
17.	Plain Plug Gauge ^{\$}	2 mm to 200 mm	3.4 μ m	Using ULMM IS 3455

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
18.	Plain Ring Gauge ^{\$}	3 mm to 250 mm	4.1 μ m	Using ULMM & Master Ring IS 3485
19.	Thread Plug Gauge ^{\$} (Effective dia Only)	2 mm to 250 mm	5.6 μ m	Using ULMM & Thread Measuring Wires IS 2334
20.	Thread Ring Gauge ^{\$} (Effective Dia Only)	4 mm to 250 mm	2.7 μ m	Using ULMM & Master Ring IS 2334
21.	Thread Measuring Wire ^{\$}	0.17 mm to 6.35 mm	2.4 μ m	Using ULMM IS 6311
22.	Cylindrical Measuring Pin ^{\$}	0.05 mm to 25 mm	0.9 μ m	Using ULMM IS 11103
23.	Slip Gauge ^{\$}	0.5 mm to 50 mm 50 mm to 100 mm	0.13 μ m 0.20 μ m	Using Gauge Blocks & Gauge Block Calibrator IS 2984
24.	Vernier Height Gauge (All Types) ^{\$} L.C.: 0.01 mm ϕ	Upto 1000 mm	10.0 μ m	Using Length bar & Surface Plate IS 2921
25.	Engineers Parallels - Parallelism ^{\$}	300 mm x 60 mm	7.0 μ m	Using Electronic Probe & Surface Plate IS 4241
26.	Pistol Dial Caliper ^{\$} L.C.: 0.1 mm ϕ	0 to 100 mm	52.0 μ m	Using Slip Gauge (TSPL/WI/MECHCAL/ DIM/003)
27.	Micrometer Head ^{\$} L.C.: 0.01 mm ϕ	0 to 25 mm	3.0 μ m	Using ULMM IS 9483
28.	Electronic Probe ^{\$} L.C.: 0.0001 mm ϕ	0 to 25 mm	0.9 μ m	Using ULMM (TSPL/WI/MECHCAL/ DIM/038)

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29.	Limit Gauges (Height/Width/Depth) ^{\$}	Upto 100 mm	1.6 μ m	Using ULMM (TSPL/WI/MECHCAL/ DIM/056)
30.	Radius Gauge ^{\$}	Upto 25 mm	6.1 μ m	Using Profile Projector IS 5273
31.	Thread Pitch Gauge ^{\$}	0.25 mm to 6 mm Angle 55°/60°	3.4 μ m 12 min	Using Profile Projector IS 4211
32.	Hegman Gauge ^{\$}	Upto 100 μ m	2.7 μ m	Using Electronic Probe (TSPL/WI/MECHCAL/ DIM/008)
33.	Flush Pin Gauge ^{\$}	5 mm to 100 mm	2.0 μ m	Using ULMM (TSPL/WI/MECHCAL/ DIM/054)
34.	Coating Thickness Gauge ^{\$} L.C.: 0.1 μ m ^{ϕ}	9 μ m to 2000 μ m	12.0 μ m	Using Coating Thickness Foils (TSPL/WI/ MECHCAL/ DIM/055)
35.	Comparator Stand – Flatness ^{\$}	300 mm x 300 mm	7.4 μ m	Using Electronic Probe IS 7599
36.	Taper Thread Plug Gauge ^{\$}	Upto 150 mm	2.4 μ m	Using ULMM & Thread Measuring Wires IS 9475
37.	Taper Thread Ring Gauge ^{\$}	Upto 150 mm	3.0 μ m	Using ULMM & Master Ring IS 9529
38.	Bevel Protractor – Mechanical / Digital ^{\$} L.C.: 5 min ^{$\phi$}	Upto 360°	2.10 min	Using Profile Projector IS 4239

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39.	Combination Set / Degree Protractor ^{\$} L.C.: 1° ^Φ	Upto 180°	17.4 min	Using Profile Projector IS 5812
40.	Weld Fillet Gauge ^{\$}	Upto 25 mm Upto 60°	289 μ m 1.5°	Using Profile Projector (TSPL/WI/MEHCAL/ DIM/059)
41.	Test Sieves ^{\$}	0.075 mm to 40 mm	16.1 μ m	Using Profile Projector IS 460
42.	Glass Scale ^{\$} L.C.: 0.1 mm ^Φ	0 to 300 mm	30.0 μ m	Using Tape & Scale Calibrator (TSPL/WI/ MEHCAL/ DIM/015)
43.	Angular Graticule ^{\$} L.C.: 1° ^Φ	0 to 360°	18 min	Using Profile Projector (TSPL/WI/MEHCAL/ DIM/058)
44.	Taper Scale ^{\$} L.C.: 0.1 mm ^Φ	1 mm to 45 mm	30.0 μ m	Using Profile Projector (TSPL/WI/MEHCAL/ DIM/013)
45.	V-Block (Flatness/Parallelism/ Symmetry) ^{\$}	Upto 300 mm	4.2 μ m	Using Electronic Probe IS 2949
46.	Wet Film Thickness Gauge ^{\$}	Upto 3000 μ m	4.0 μ m	Using Profile Projector (TSPL/WI/MEHCAL/ DIM/060)
47.	Profile Projector* Linear L.C.: 0.0005 mm Angular L.C.: 1 s Magnification	x,y = 250 mm x 150 mm 360° 20 x	8.0 μ m 1.1 mins 0.4 %	Using Glass Scale & Glass Angular Graticule JIS B 7184

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
48.	Universal Length Measuring System* L.C.: 0.0001 mm	0 to 100 mm	1.0 μ m	Using Slip Gauge (TSPL/WI/MECHCAL/DIM/052)
49.	Electronic Height Gauge (2D)* L.C.: 0.0001 mm	0 to 1000 mm	22.2 μ m	Using Caliper Checker & Length Bar IS 2921
II.	PRESSURE INDICATING DEVICES			
1.	Pressure (Pneumatic) Pressure Gauges (Analog & Digital), Pressure Calibrator, Pressure Transducer, Pressure Transmitters, Differential Pressure Transmitter, Manometer, Pressure Switch, Pressure Safety Valve, Pressure Recorder ^{\$}	0 to 20 bar(g)	0.37 %rdg	Using Multi Range Digital Pressure Indicator Based on DKD R-6-1
2.	Pressure (Hydraulic) Pressure Gauges (Analog & Digital), Pressure Calibrators, Pressure Transducer, Pressure Transmitters, Pressure Recorder ^{\$}	0 to 1000 bar(g)	0.31 % rdg	Using Multi Range Digital Pressure Indicator Based on DKD R-6-1
3.	Pressure (Hydraulic) Pressure Calibrators & Digital Pressure Gauge ^{\$}	6 bar to 100 bar	0.18 %rdg	Using Dead Weight Tester based on DKD R-6-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
4.	Pressure (Hydraulic) Pressure Calibrators & Digital Pressure Gauge ^{\$}	100 bar to 1000 bar	0.082 % rdg	Using Dead Weight Tester based on DKD R-6-1
5.	Vacuum Gauges (Analog & Digital), Manometers Transmitters, Transducers ^{\$}	(-) 0.90 bar(g) to 0 bar(g)	0.84 %rdg	Using Multi Range Digital Pressure Indicator based on DKD R-6-1
6.	Low Pressure Magnehelic Gauge, Digital Manometer, Diff. Pressure Transmitter ^{\$}	(-) 0.14 bar to 0.2 bar 0 to 2 bar	2.33 %rdg 1.76 %rdg	Using Low Pressure Calibrator based on DKD R-6-1
7.	Absolute Pressure (Absolute Pressure Gauges, Barometers, Manometer, Absolute Transmitter) ^{\$}	300 mbar Abs to 1200 mbar Abs	2.71 %rdg	Using Absolute Pressure Gauge based on DKD R-6-1
8.	Pressure (Pneumatic) Pressure gauges (Analog & Digital), Pressure calibrator, Pressure Transducer, Pressure Transmitters , Differential Pressure Transmitter, Digital Manometer, Pressure Switch, Pressure Safety Valve, Pressure Recorder [*]	0 to 20 bar(g)	0.074 bar	Using Digital Pressure Gauge based on DKD R-6-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
9.	Pressure (Hydraulic) Pressure Gauges, (Analog & Digital), Pressure Calibrators, Pressure Transducer, Transmitters, Pressure Recorder*	0 to 700 bar(g)	2.17 bar	Using Digital Pressure Gauge Based on DKD R-6-1
10.	Vacuum Gauges (Analog & Digital), Manometers Vacuum Transmitters, Vacuum Transducers*	(-) 0.9 bar(g) to 0 bar(g)	0.008 bar	Using Digital Compound Gauge Based on DKD R-6-1
III.	ACOUSTICS			
1.	Sound Level Meter ^{\$}	@ 1k Hz 94 dB 114 dB	1.8 dB 1.8 dB	Using Sound Level Calibrator
IV.	ACCELERATION & SPEED			
1.	Tachometer (Non Contact) ^{\$}	200 RPM to 60000 RPM	1.13 % rdg to 0.06 % rdg	Using Digital Tachometer Based on SANAS
2.	Centrifuge, Motor Speed, Speed Indicator (Non Contact) *	200 RPM to 60000 RPM	1.13 % rdg to 0.06 % rdg	Using Digital Tachometer Based on SANAS
V.	WEIGHTS			
1.	Mass Weights ^{\$} Calibration of F2 Class Weights and	1 mg 2 mg 5 mg	0.01 mg 0.01 mg 0.013 mg	Using E2 Class Weight Set 1mg – 200 g and Electronic Balance of

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
	Coarser	10 mg 20 mg 50 mg	0.015 mg 0.010 mg 0.011 mg	Readability 0.01/0.1 mg as per OIML – R 111 Method Used : ABBA cycles
	Calibration of F1 Class Weights and Coarser	100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g	0.013 mg 0.013 mg 0.014 mg 0.013 mg 0.016 mg 0.026 mg 0.026 mg 0.037 mg 0.06 mg 0.08 mg 0.15 mg	Using E2 Class Weight Set 1 mg – 200 g and Electronic Balance of Readability 0.01/0.1 mg as per OIML - R 111 Method Used : ABBA Cycles
	Calibration of M1 Class Weights and Coarser	500 g 1 kg 2 kg 5 kg	0.008 g 0.009 g 0.009 g 0.009 g	Using F1 Class Weights and Electronic Balance of Readability 0.01 g as per OIML – R 111 Method: ABBA Cycles
VI.	WEIGHING SCALE & BALANCE			
1.	Electronic Weighing Balance* (Calibration Class I & Coarser) Readability: 0.01 mg Readability: 0.1 mg (Calibration Class II & coarser) Readability:0.01 g	Upto 100 g 100 g to 220 g 200 g to 5000 g	0.07 mg 0.11 mg 5.71 mg	Using E2 Class Standard Weights as per OIML R-76 Using F1 Class Standard Weights as per OIML R-76

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
	(Calibration Class III & Coarser) Readability:0.001 kg Readability:0.005 kg Readability:0.05 kg	5 kg to 20 kg 20 kg to 50 kg 50 kg to 200 kg	0.43 g 1.80 g 17.9 g	Using M1 Class Standard Weights as per OIML R-76
VII.	VOLUME			
1.	Graduated Jar / Measuring Cylinder ^s	1 ml to 50 ml 1000 ml to 2000 ml	6.6 μ l 0.67 ml	Using Weighing Balance, 0.01 / 0.1 mg and Distilled Water with Known Density by Gravimetric Method as per IS/ISO/4787 Using Weighing Balance 0.01 g and Distilled Water with Known Density by Gravimetric Method as per IS/ISO/4787
2.	Volumetric Flask / Standard Measuring Flask ^s	5 ml to 100 ml 1000 ml to 2000 ml	6.4 μ l 0.42 ml	Using Weighing Balance 0.01 / 0.1 mg and Distilled Water with Known Density by Gravimetric Method as per IS/ISO/4787 Using Weighing Balance 0.01 g and Distilled Water with Known Density by Gravimetric Method as per IS/ISO/4787

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
3.	Burette/Pipette ^s	1 ml to 50 ml	6.5 μ l	Using Weighing Balance 0.01 mg and Distilled Water with Known Density by Gravimetric Method as per IS/ISO/4787
4.	Micro Pipette ^s	10 μ l to 100 μ l 100 μ l to 1000 μ l	0.39 μ l 0.32 μ l	Using Weighing Balance 0.01 mg and Distilled Water with Known Density by Gravimetric Method as per ISO/8655-6

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	Thermometer, RTD, Thermocouple, Transmitter, Temperature Indicator/ Controller / Transmitter / Recorder with Sensor, Temperature Switch ^s	(-) 40 °C to 0 °C 0 °C to 250 °C 250 °C to 600 °C 600 °C to 1000 °C 1000 °C to 1200°C	0.34 °C 0.34 °C 0.49 °C 2.23 °C 2.25 °C	Using RTD, S-Type Thermocouple, Precision Thermometer, 6½ Digit Multimeter, Liquid Bath, Dry Temperature Bath by comparison method
2.	Glass Thermometer, Temperature Gauges ^s	(-) 10 °C to 100 °C 100 °C to 250 °C	0.34 °C 0.60 °C	Using RTD, Precision Thermometer, 6½ Digit Multimeter by Comparison Method
3.	Temperature Bath, Liquid Bath, Dry Block Calibrator ^s	(-) 40 °C to 0 °C 0 °C to 250 °C 250 °C to 600 °C 600 °C to 1000 °C 1000 °C to 1200 °C	1.67 °C 1.67 °C 2.71 °C 3.18 °C 5.99 °C	Using RTD, S-Type Thermocouple, Precision Thermometer, 6½ Digit Multimeter by Comparison Method
4.	Thermometer, RTD, Thermocouple, Transmitter, Temperature Indicator / Controller / Transmitter/Recorder With Sensor, Temperature Gauge, Temperature Switch [*]	(-) 15 °C to 0 °C 0 °C to 250 °C 250 °C to 600 °C 600 °C to 1000 °C 1000 °C to 1200 °C	0.34 °C 0.39 °C 0.49 °C 2.23 °C 2.25 °C	Using RTD, S-Type Thermocouple, Precision Thermometer, 6½ Digit Multimeter by Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
5.	Thermometer, RTD, Thermocouple, Temperature Indicator / Controller / Transmitter / Recorder With Sensor*	(-) 196 °C	0.73 °C	Using RTD, Precision Thermometer, 6½ Digit Multimeter by Comparison Method
6.	Temperature Indicator/Recorder / Controller With Sensor Of Deep Freezer, Freezer, Incubator, Autoclave, Chamber, Water Bath, Oven, Muffle Furnace*	(-) 80 °C to 0 °C 0 °C to 400 °C 400 °C to 1200 °C	1.0 °C 3.18 °C 4.71 °C	Using 6 ½ Digit Multimeter, RTD and S - Type Thermocouple by Comparison method @ Measuring Location in DUC (Single Position Calibration)
7.	Temperature Mapping Deep Freezer, Freezer, Incubator, Autoclave, Chamber, Water Bath, Oven, Furnace*	(-) 40 °C to 200 °C 200 °C to 400 °C 400 °C to 1200 °C	2.28 °C 3.08 °C 7.00 °C	Using RTD Sensors, N-Type Thermocouples, Data Logger by Comparison method (Multi Position Calibration)

* Measurement Capability is expressed as an uncertainty ($\pm$) at a confidence probability of 95%

§ Only in Permanent Laboratory

*Only for Site Calibration

The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

Φ Laboratory can also calibrate instruments/devices of coarser resolution / least count within the accredited range using same reference standard/ master equipment under the scope of accreditation.

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