

Laboratory MSME Testing Centre, 65/1 GST Road, Guindy, Chennai, Tamil Nadu
Accreditation Standard ISO/IEC 17025: 2005
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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	MEASURE			
1.	DC Voltage ^{\$}	5 mV to 1V 1 V to 1000 V	0.07% to 0.032 % 0.03 % to 0.06%	Using 7½ DMM and 6½ DMM by Direct Method
2.	DC Current ^{\$}	10 mA to 20 mA	0.05 %	Using 7½ DMM and 6½ DMM by Direct Method
3.	Resistance ^{\$}	10 Ω to 1k Ω 1 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 100 M Ω	0.016% to 0.07% 0.07 % to 0.017 % 0.017 % to 0.02% 0.02 %to 0.94 %	Using 7½ DMM and 6½ DMM by Direct Method
4.	AC Voltage ^{\$}	45Hz to 10 kHz 10 mV to 100mV 100mV to 750 V	0.15% to 0.11% 0.11% to 0.14%	Using 7½ DMM and 6½ DMM by Direct Method
5.	AC Current ^{\$}	45Hz to 1 k Hz 100 mA to 2.7 A	0.58%	Using 7½ DMM and 6½ DMM by Direct Method
6.	Frequency ^{\$}	4 Hz to 10 MHz	0.039%	Using 7½ DMM and 6½ DMM by Direct Method
7.	Temperature Simulation ^{\$} J Type Thermocouple K Type Thermocouple S Type Thermocouple T Type Thermocouple R Type Thermocouple N Type Thermocouple RTD – PT 100	2°C to 700°C 3°C to 1300°C 20°C to 1700°C 3°C to 350°C 20°C to 1700°C 5°C to 1200°C (-)100°C to 360°C	0.69°C 0.60°C 3.00°C 0.69°C 3.00°C 2.34°C 0.60°C	Using 7½ DMM and Universal Calibrator CA 150 by Direct Method

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8.	Temperature Simulation* J Type Thermocouple K Type Thermocouple S Type Thermocouple T Type Thermocouple R Type Thermocouple N Type Thermocouple RTD – PT100	(-) 90°C to 750°C (-)90°C to 1350°C 100°C to 1700°C (-)90°C to 350°C 100°C to 1700°C 5°C to 1300°C (-)200°C to 800°C	2.40°C 2.56°C 3.50°C 2.28°C 3.50°C 1.80°C 1.18°C	Using Universal Calibrator CA 150 by Direct Method
9.	DC Voltage*	50 mV to 30 V	0.10 %	by Direct Method
10.	Resistance*	50 Ω to 45 k Ω	0.19% to 0.10%	by Direct Method
II.	SOURCE			
1.	DC Voltage\$	4 mV to 10 mV 10 mV to 1V 1 V to 1000 V	0.96 % to 0.043 % 0.043% to 0.012 % 0.012% to 0.011 %	Using Multi Product Calibrator Fluke 5500 A by Direct Method
2.	DC Current\$	10 mA to 20 mA	0.16 % to 0.11%	Using Universal Calibrator CA 150 by Direct Method
3.	Resistance \$	1 Ω to 10 Ω 10 Ω to 100 k Ω 1 m Ω 10 m Ω 0.1 Ω 1 Ω 10 Ω 100 Ω 1 k Ω 10 k Ω	1.2 % to 0.21% 0.21% to 0.058% 1.13 % 0.58 % 0.024 % 0.042 % 0.014 % 0.013 % 0.01 % 0.015 %	Using Standard Resistor's by Direct Method

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		5 kV 1 M Ω to 100M Ω 100M Ω to 10G Ω	6.34 % to 2.74 % 2.74 % to 6.28%	Using DRB and DMB 8400HV by Direct Method
4.	AC Voltage ^{\$}	50 Hz to 1 kHz 4 mV to 30 mV 30 mV to 10V 10 V to 1000V	1.31 % to 0.29 % 0.31 % to 0.07 % 0.12 % to 0.24 %	Using Multi Product Calibrator Fluke 5500 A by Direct Method
5.	AC Current ^{\$}	50 Hz 100 mA to 10A	0.31 % to 0.15 %	Using AC Voltage and Current Standard by Direct Method
6.	Frequency ^{\$}	10 Hz to 10 kHz 10 kHz to 1 MHz	0.1 % 0.1 % to 0.58 %	Using Multi Product Calibrator Fluke 5500 A by Direct Method
7.	Capacitance ^{\$}	350 Hz to 1 kHz 10 pF to 1 μ F 1 μ F to 6 μ F	1.74 % to 0.72% 0.72 % to 1.3%	Using Multiproduct Calibrator Fluke 5500 A and Decade Capacitance Box by Direct Method
8.	Inductance ^{\$}	1 kHz 1mH to 100 H	1.3 % to 1.2%	Using Decade Inductance Box by Direct Method
9.	Temperature Simulation [#] J Type Thermocouple K Type Thermocouple S Type Thermocouple T Type Thermocouple R Type Thermocouple N Type Thermocouple PT100	27 °C to 1000°C 27°C to 1300°C 150°C to 1700°C 30°C to 400°C 150°C to 1700°C 5°C to 1300°C (-)200°C to 800°C	0.8°C 1.37°C 2.96°C 1.41°C 2.9°C 1.62°C 0.43°C	Using Universal Calibrator CA 150 by Direct Method

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Radius Gauges ^{\$}	1 to 25 mm	11 μ m	Using Profile Projector
2.	Bevel Protractor ^{\$} L.C: 5'	180°	4.2 minutes of arc	Using Profile Projector
3.	Combination Set/ Protractor ^{\$} L.C: 1°	180°	18 minutes of arc	Using Profile Projector
II	PRESSURE INDICATING DEVICES			
1.	Pressure (Hydraulic) Pressure Gauges ^{\$}	0 to 1000 bar 0 to 700 bar	0.1 % rdg 0.3 % rdg	Using Digital Pressure Sensor and Indicators as per DKD-R-6-1
2.	Pressure (Pneumatic) Pressure Gauges ^{\$}	0 to 24 bar	0.04 % rdg	Using Digital Pressure Calibrator as per DKD-R-6-1
3.	Pressure Gauges [*] (Hydraulic)	0 to 700 bar	0.6% rdg	Using Digital Pressure Gauge as per DKD-R-6-1
4.	Pressure Gauges [*] (Pneumatic)	0 to 24 bar	0.1% rdg	Using Digital Pressure Indicator as per DKD-R-6-1

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IV	TORQUE GENERATING DEVICES			
1.	Torque Wrenches * (Type I – Class B, C & Type II – Class A, B)	2 Nm to 20 Nm 5 to 50 Nm 10 to 100 Nm 20 to 200 Nm 50 to 500 Nm 100 to 1000 Nm 200 to 2000 Nm	0.60 %rdg 0.60 %rdg 0.60 %rdg 0.60 %rdg 0.60 %rdg 0.60 %rdg 0.60 %rdg	Using Torque Wrench Calibration System with sensors and Indicators as per IS 6789

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<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	RTD / Thermocouple/ Temperature Gauge [§] (With or without Indicator)	30°C to 200 °C	0.39°C	Using High Stability Bath with 4 Wire RTD (PT-100) and 6.5 DMM
2.	Thermocouple with or without Indicator [§]	200°C to 500°C 500°C to 1200°C	1.76°C 2.94°C	Using Dry Block Furnace with S Type Thermocouple and 6.5 DMM

* 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.

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