Laboratory	**Instruments Calibration and Test Centre, 88-C, 5th Cross, Barathi Colony, Peelamedu, Coimbatore, Tamil Nadu**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**CC-2446** **Page 1 of 12**
Validity	**13.07.2018 to 12.07.2020** **Last Amended on -**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO-TECHNICAL CALIBRATION		
I	**SOURCE**			
1.	DC Voltage#	1 mV to 10 mV 10 mV to 100 mV 100 mV to 1000 V	0.41 % to 0.044 % 0.044 % to 0.011 % 0.011 % to 0.008 %	Using Multi Product Calibrator - 5502A by Direct Method
2.	DC Current#	1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 20 A	0.020 % to 0.016 % 0.016 % to 0.025 % 0.025 % to 0.069 % 0.069 % to 0.090 % 0.090 % to 0.14 %	Using Multi Product Calibrator - 5502A by Direct Method
	DC Current$	20 A to 1000 A	0.3 % to 0.84 %	Using 5502A with AC/DC Current Calibrator with Current Coil by Direct Method
		0.5 Ώ to 1 Ώ 1 Ώ to 10 Ώ 10 Ώ to 1 MΏ 1 MΏ to 100 MΏ 100 MΏ to 1000 MΏ	0.12 % to 0.06 % 0.06 % to 0.016 % 0.016 % to 0.019 % 0.019 % to 0.58 % 0.58 % to 1.74 %	Using Multi Product Calibrator - 5502A by Direct Method
		Discrete values 1 mΏ 10 mΏ 100 mΏ 1 Ώ 10 Ώ 100 Ώ	 0.48 % 0.039 % 0.024 % 0.012 % 0.012 % 0.012 %	Using DC resistance Box by V/I method
	AC Voltage#	**50 Hz to 1 kHz** 1 mV to 10 mV 10 mV to 100 mV	 2.62 % to 0.35 % 0.35 % to 0.058 %	Using Multi Product Calibrator - 5502A by Direct Method

Rajeshwar Kumar
Convenor

Avijit Das
Program Manager

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		100 mV to 10 V 10 V to 1000 V	0.058 % to 0.043 % 0.043 % to 0.061 %	
	AC Voltage#	**1 kHz to 10 kHz** 1 mV to 10 mV 10 mV to 10 V 10 V to 1000 V	 2.54 % to 0.37 % 0.37 % to 0.14 % 0.14 % to 0.11 %	Using Multi Product Calibrator - 5502A by Direct Method
		50 Hz to 1 kHz 1 mA to 10 mA 10 mA to 1 A 1 A to 10 A 10 A to 20 A	 0.015 % to 0.074 % 0.074 % 0.074 % to 0.099 % 0.17 %	Using Multi Product Calibrator - 5502A by Direct Method
		50 Hz 20 A to 50 A	 0.17 % to 0.35 %	Using Multi Product Calibrator - 5502A & AC/DC Current Calibrator by Direct Method
	AC Current$	**50 Hz** 50 A to 600 A	 0.35 % to 1 %	Using Multi Product Calibrator - 5502A & AC/DC Current Calibrator with Current Coil by Direct Method
6.	Capacitance#	1 nF to 1 µF 1 µF to 300 µF	0.65 % to 0.53 % 0.53 % to 0.65 %	Using Multi Product Calibrator - 5502A by Direct Method
7.	Frequency#	1 Hz to 10 Hz 10 Hz to 500 kHz	0.59% to 0.06 % 0.06% to 0.012 %	Using Multi Product Calibrator - 5502A by Direct Method
8.	Temperature Simulation# J Type	 (-) 200 °C to 1200 °C	 0.32 °C	Using Multi Product Calibrator - 5502A by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	K Type T Type R Type N Type S Type E Type B Type PT - 100	(-) 200 °C to 1200 °C (-) 270 °C to 400 °C 0 °C to 1799 °C (-) 100 °C to 1300 °C 0 °C to 1699 °C (-) 250 °C to 1000 °C 600 °C to 1700 °C (-) 250 °C to 750 °C	0.47 °C 0.73 °C 0.88 °C 0.47 °C 0.79 °C 0.581 °C 0.92 °C 0.27 °C	
9.	Insulation Resistance#	0.1 MΩ to 10 MΩ 10 MΩ to 100 GΩ 100 GΩ to 1 TΩ	1.16 % to 1.29 % 1.29 % to 2.32 % 2.32 % to 5.78 %	Using Decade Megohm Box by Direct Method
10.	Power at 1P2W @ UPF 240V, 0.1A to 20A @ 50Hz# 0.1 to 0.1 Lead/LAG 240V, 0.1A to 20A at 50Hz	24 W to 4800 W 2.4 W to 480 W	0.33 % to 0.2 % 0.8 % to 0.51 %	Using Multi Product Calibrator - 5502A by Direct Method
II.	**MEASURE**			
1.	DC Voltage#	100 µV to 1 mV 1 mV to 100 mV 100 mV to 10 V 10 V to 100 V 100 V to 1000 V 1 kV to 10 kV	0.11 % to 0.015 % 0.015 % to 0.0007 % 0.0007 % to 0.0004 % 0.0004 % to 0.0006 % 0.0006 % to 0.0007 % 3.73 %	Using 8½ Digit Reference Multimeter by Direct Method Using High Voltage Probe with Oscilloscope by Direct Method
2.	DC Current#	100 µA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 19.95 A	0.0019 % 0.0019 % to 0.0056 % 0.0056 % to 0.025 % 0.025 % to 0.044 % 0.044 % to 0.047 %	Using 8½ Digit Reference Multimeter by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
3.	AC Voltage#	**50 Hz to 1 kHz**		Using 8½ Digit Reference Multimeter by Direct Method
		1 mV to 100 mV	0.94 % to 0.016 %	
		100 mV to 1 V	0.016 % to 0.019 %	
		1 V to 100 V	0.019 % to 0.022 %	
		100 V to 1000 V	0.022 % to 0.016 %	
		1 kHz to 10 kHz		
		1 mV to 100 mV	1.49 % to 0.020 %	
		100 mV to 1 V	0.020 % to 0.015 %	
		1 V to 100 V	0.015 %	
		100 V to 1000 V	0.015 % to 0.016 %	
		10 kHz to 100 kHz		
		1 mV to100 mV	2.4 % to 0.032 %	
		100 mV to 1 V	0.032 % to 0.11 %	
		1 V to 100 V	0.11 % to 0.077 %	
		50Hz		
		1 kV to 20 kV	3.47 %	Using High Voltage Probe with Osciloscope by Direct Method
4.	AC Current#	**50 Hz to 1 kHz**		Using 8½ Digit Reference Multimeter by Direct Method
		100 µA to 1 mA	0.081 % to 0.058 %	
		1 mA to 10 mA	0.058 %	
		10 mA to 1 A	0.058 % to 0.095 %	
		1 A to 10 A	0.095 % to 0.11 %	
		10 A to 19.95 A	0.11 %	
		1kHz to 10kHz		
		100µA to 1mA	0.09% to 0.058%	
		1mA to 100mA	0.058%	
		100mA to 1A	0.058% to 0.11%	
		1A to 10A	0.11% to 0.31%	
		10A to 19.95A	0.31%	
		50Hz		Using Digital Power Meter by Direct Method
		19.95A to 50A	0.31% to 0.18%	

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Resistance#	0.1 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ 1 GΩ to 10 GΩ 10 GΩ to 20 GΩ	0.58 % to 0.058 % 0.058 % to 0.0059 % 0.0059 % to 0.0012 % 0.0012 % 0.0012 % to 0.0014 % 0.0014 % to 0.0049 % 0.0049 % to 0.027 % 0.027 % to 0.29 % 0.29 % 0.29 % to 0.25 %	Using 8½ Digit Reference Multimeter by Direct Method
6.	Frequency#	4 Hz to 10 Hz 10 Hz to 10 kHz 10 kHz to 500 kHz	0.18 % to 0.082 % 0.082 % to 0.013 % 0.013 % to 0.016 %	Using 6½ Digit Precision Multimeter by Direct Method
7.	Time Interval#	1 sec to 86400 sec (24 hrs)	0.09 sec to 4.65 sec	Using Time Totalizer By Comparison Method
8.	Temperature Simulation# J Type K Type T Type R Type S Type E Type B Type N Type PT - 100	 (-) 200 °C to 1200 °C (-) 200 °C to 1200 °C (-) 200 °C to 400 °C 0 °C to 1700 °C 0 °C to 1699 °C (-) 250 °C to 1000 °C 600 °C to 1700 °C (-) 100 ° to 1300 °C (-) 200 °C to 600 °C	 0.32 °C 0.47 °C 0.73 °C 0.90 °C 0.82 °C 0.71 °C 0.92 °C 0.47 °C 0.26 °C	Using Multi Product Calibrator - 5502A by Direct Method Using Precision Multimeter by Direct Method
9.	AC Power / Energy# at 50Hz 1P2W at 0.1lead/lag to UPF 60V to 240V	0.6 W to 4.8 kW	1.32 % to 0.24 %	Using Digital Power Meter By Direct/ Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	0.1A to 20A AC Power #at 60Hz 1P2w 60V to 240V at UPF 1A to 5A AC Power / Energy# at 50Hz 3P4W 0.1lead/lag to UPF 60V to 240V 0.1A to 20A	 60 W to 1200 W 1.8 W to 14.4 kW	 0.24 % 0.5 % to 0.24 %	
10.	Power Factor# 1 P2W & 3 P4W 50 Hz	100 V, 1 A 0.1 - UPF -0.1PF Lead / Lag	0.006 %	Using Digital Power Meter By Direct / Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	MECHANICAL CALIBRATION			
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)**			
1.	External Micrometer$ (Analog /Digital) L.C.: 0.001 mmΦ	Up to 100 mm	0.8 µm	Using Gauge Blocks
2.	Depth Micrometer$ (Analog /Digital) L.C.: 0.001 mmΦ	Up to 25 mm	0.7 µm	Using Gauge Blocks
3.	Caliper$ (Vernier/Dial/Digital) L.C.: 0.01 mmΦ	Up to 300 mm Up to 600 mm	6.9 µm 7.3 µm	Using Gauge Blocks and Caliper Checker
4.	Depth Gauge$ (Analog/Dial/Digital) L.C.: 0.01 mmΦ	Up to 300 mm	6.9 µm	Using Gauge Blocks and Caliper Checker
5.	Height Gauge$ (Vernier/Dial/Digital) L.C.: 0.01 mmΦ	Up to 600 mm	7.1 µm	Using Gauge Blocks and Caliper Checker
6.	Plunger Type Dial Gauge$ (Analog/Dial/Digital) L.C.: 0.001 mmΦ	Up to 10 mm	2.5 µm	Using Dial Calibration Tester
7.	Lever Type Dial Gauge$ L.C.: 0.01 mmΦ	Up to 0.8 mm	3.8 µm	Using Dial Calibration Tester

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
8.	Bore Gauge$ (Transmission Only) L.C.: 0.001 mmΦ	Up to 1.5 mm	3.0 µm	Using Dial Calibration Tester & HLM
9.	Dial Thickness Gauge$ L.C.: 0.001mmΦ L.C.: 0.01mmΦ	Up to 1 mm Up to 10 mm	0.8 µm 6.13 µm	Using Gauge blocks
10.	Feeler Gauge$	Up to 1 mm	0.9 µm	Using HLM
11.	Foils$	Up to 1 mm	0.9 µm	Using HLM
12.	Extension Rods / Micrometer Setting Standards$	25 mm to 75 mm	1.2 µm	Using HLM
13.	Plain Plug Gauge$	1 mm to 100 mm	1.0 µm	Using HLM
14.	Thread Plug Gauge$	2 mm to 100 mm	1.3 µm	Using HLM
15.	Plain Ring Gauge$	2 mm to 100 mm	2.1 µm	Using HLM
16.	Thread Ring Gauge$	2 mm to 100 mm	2.1 µm	Using HLM
17.	Snap Gauge$	1 mm to 100 mm	2.1 µm	Using HLM
18.	Thread Measuring Wires$	0.17 mm to 3.2 mm	0.9 µm	Using HLM
19.	Pistol Caliper$ L.C.: 0.1 mmΦ	Up to 100 mm	35.1 µm	Using Gauge Blocks
20.	Bevel Protractor$ L.C.: 5 minΦ	0 to 360°	3.3 min	Using Angel Gauge Blocks

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
II.	**PRESSURE INDICATING DEVICES**			
1.	Hydraulic Pressure Dial / Digital Pressure Gauge & Pressure Transmitter#	0 to 700 bar	0.225 bar	Using Digital Pressure with Gauge Hydraulic Pump
2.	Hydraulic Pressure Dial / Digital Pressure Gauge & Pressure Transmitter#	0 to 100 bar	0.088 bar	Using Pressure Transmitter with Hydraulic Pump
3.	Pneumatic Pressure Dial /Digital (Low Pressure Gauge & Pressure Transmitter) #	0 to 0.5 bar	0.004 bar	Using Digital Manometer & Low Pressure Screw Pump
4.	Pneumatic Pressure Dial /Digital (Low Pressure Gauge & Pressure Transmitter) #	0 to 16 bar	0.094 % rdg	Using Pressure Transmitter with Pneumatic Pump
5.	Dial /Digital (Low, Vacuum Gauge & Vacuum Transmitter#	(-) 0.5 bar to 0 bar	0.001 bar	Using Digital Manometer & Low Pressure Screw Pump
6.	Dial / Digital (Low, Vacuum Gauge & Vacuum Transmitter#	(-) 0.90 bar to 0 bar	0.007 bar	Using Digital Manometer & Pneumatic Hand Held Pump
III.	**ACCELERATION AND SPEED**			
1.	Dig/Analog Tachometer, RPM Meter$ (Contact Type)	100 RPM to 3500 RPM	1.83 % to 0.06 %	Using Digital Tachometer

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
2.	Dig/Analog Tachometer, RPM Meter$ (Non Contact Type)	60 RPM to 20000 RPM	2.177 % to 0.011 %	Using Digital Tachometer
3.	Analog/Digital Vibration Meter$ (Acceleration Only)	1m/s² to 50 m/s² (pk) [20Hz to 500 Hz]	4.02 %	Using Vibration Calibrator
IV.	**ACOUSTICS**			
1.	Sound Level Meter$	**1 kHz** 94 dB & 114 dB	0.51 dB	Using Sound Level Calibrator

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		THERMAL CALIBRATION		
I.	**TEMPERATURE**			
1.	Liquid-in-Glass Thermometer #	(-) 10 °C to 150 °C	0.31 °C	Using PRT with Indicator, High Precision Oil Bath by Comparison Method
2.	Infrared/Non-Contact Thermometer $	50 °C to 500 °C	2.30 °C	Using Infrared Thermometer, Black Body Furnace by Comparison Method
3.	Humidity Sensors, Analog / Digital Hygrometers $	20 % RH to 95 % RH @ 25 °C	2.0 % RH	Temperature & Humidity Indicator with Sensor, Relative Humidity Calibrator by Comparison Method
4.	RTD, Thermocouples, Temperature Sensors With/Without Indicator,	(-) 40 °C to 150 °C	0.11 °C	Using PRT with Indicator, High Precision Oil Bath by Comparison Method
	Temperature Gauges, Temperature Transmitters #	150 °C to 600 °C	2.95 °C	Using PRT with Indicator, Dry Temperature Calibrator by Comparison Method
5.	RTD, Thermocouples, Temperature Sensors With/ Without Indicator, Temperature	600 °C to 1200 °C	3.89 °C	Using 'S' Type Thermocouple with DMM, Dry Block Furnace by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Gauges, Temperature Transmitters #			
6.	Freezer, Refrigerator, Incubator (for Non-Medical Applications), Oven, Furnace, Autoclave (for Non-Medical Applications) at Single Point♣	(-) 20 °C to 400 °C 400 °C to 1000 °C	0.98 °C 2.19 °C	Using RTD & 'S' Type Thermocouple with DMM by Comparison Method
7.	Freezer, Refrigerator, Oven Etc (Spatial Mapping) ♣	(-) 20 °C to 150 °C	3.95 °C	Using RTD with Recorder by Comparison Method
8.	Humidity Chamber, Environmental Chamber etc. at Single Point♣	20 % RH to 95 % RH @ 25 °C	1.96 % RH	Temperature & Humidity Indicator by Comparison Method

*** Measurement Capability is expressed as an uncertainty (±) 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.