Laboratory	**Calsytech, No. 38, North Mada Street, Nandambakkam, Chennai, Tamil Nadu**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO-TECHNICAL CALIBRATION		
I.	**SOURCE**			
1.	DC Voltage[$]	1 mV to 10 mV 10 mV to 100 mV 100 mV to 1000 V	0.43 % to 0.05 % 0.05 % to 0.01 % 0.01 % to 0.005 %	Using Multi Product Calibrator by Direct Method
2.	AC Voltage[$]	**40 Hz to 1 kHz** 20 mV to 1 V 1 V to 1000 V	 0.7 % to 0.1 % 0.1 % to 0.09 %	Using Multi Product Calibrator by Direct Method
3.	AC Voltage[$]	**1 kHz to 10 kHz** 100 mV to 10 V 10 V to 700 V	 2 % to 0.2 % 0.2 % to 0.34 %	Using Multi Product Calibrator by Direct Method
4.	DC Current[$]	1 µA to 10 µA 10 µA to 100 µA 100 µA to 1 A 1 A to 20 A 20 A to 1000 A	2.8 % to 0.24 % 0.24 % to 0.34 % 0.34 % to 0.02 % 0.02 % to 0.1 % 0.8 % to 0.36 %	Using Multi Product Calibrator by Direct Method Using Multi Product Calibrator & Current Coil by Direct Method
5.	AC Current[$]	**45 Hz to 1 kHz** 20 µA to 100 µA **50 Hz to 60 Hz** 1 A to 20 A **500 Hz** 2 A to 20 A	 4 % to 0.88 % 0.88 % to 0.19 % 0.14 %	Using Multi Product. Calibrator A Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		50 Hz to 60 Hz 20 A to 1000 A	0.77 % to 0.38 %	Using Multi Product Calibrator & Current Coil by Direct Method
6.	Frequency[$]	45 Hz to 10 MHz 10 MHz to 600 MHz	0.004 % 0.004 %	Using Multi Product Calibrator by Direct Method
7.	Capacitance[$]	**1 kHz** 1 nF to 100 µF	0.4 % to 1 %	Using Multi Product Calibrator by Direct Method
8.	AC Resistance[#]	**1 kHz** 100 Ω ,1 kΩ 10 kΩ	0.07 %	Using Standard Resistor by Direct Method
9.	DC Resistance[$] 4 Wire/2 Wire	100 µΩ 1 mΩ 10 mΩ 100 mΩ to 1 Ω 1 Ω to 1 kΩ 1 kΩ to 1 MΩ 1 MΩ to 1 GΩ 1 GΩ to 100 GΩ	0.46 % 0.46 % 0.46 % 0.15 % to 0.13 % 0.13 % to 0.005 % 0.005 % to 0.012 % 0.012 % to 2.4 % 2.4 % to 6.2 %	Using Standard Resistor by Direct Method Multi Product Calibrator by Direct Method Using Multi Product Calibrator 2041 & HV Resistance Box by Direct Method
10.	Oscilloscope[$] Amplitude Time Base Bandwidth	2 mV/Div to 20 V/Div (12 mV to 120 V) 2 ns to 5 sec 10 MHz to 600 MHz Ref: 50 kHz	0.1 % to 0.013 % 0.03 % to 0.012 % 1.3 dB	Using Multi Product. Calibrator by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
11.	DC Power #	10 V to 600 V 1 A to 20 A 10 W to 12 kW	0.038 % to 0.09 %	Using Multi Product Calibrator by Direct Method
12.	Phase Angle #	0° to 330°	0.3°	Using Multi Product Calibrator by Direct Method
13.	Inductance#	**1 kHz** 1 mH to 10 H	0.61 %	Using Inductance Box by Direct Method
	Temperature Simulation #			
	RTD Thermocouple "K & J" Type Thermocouple "B" Type Thermocouple "E" Type Thermocouple "N" Type Thermocouple "R & S" Type Thermocouple "T" Type	(-) 100 °C to 800 °C (-) 140 °C to 1200 °C 600 °C to 1800 °C 0 °C to 800 °C (-) 180 °C to 1300 °C 0 °C to 1700 °C 0 °C to 400 °C	0.15 °C 0.54 °C 1.5 °C 0.36 °C 0.25 °C to 0.5 °C 0.7 °C to 1.17 °C 0.26 °C	Using Multifunction Calibrator by Direct Method
15.	Energy # 1φ and 3φ (0.5PF to UPF)	**50 Hz** 63.5 V to 300 V 1 A to 15 A	0.27 %	Using Energy Cal Source by Direct Method
16.	AC Power @ 50 Hz$ 1φ & 3φ (0.5 PF to UPF)	110 V to 300 V 1 A to 20 A 110 W to 6000 W 300 V to 600 V 20 A	0.24 %	Using Energy Cal Source by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		6000 W to 12000 W 110 V to 300 V 1 A to 20 A 110 W to 6000 W	0.24 % 0.24 %	
17.	Power Factor #	0.5 PF to 1 PF	0.1 %	Using Energy Cal Source by Direct Method
18.	DC Voltage♣	1 mV to 20 mV 20 mV to 200 mV 200 mV to 1000 V	0.47 % to 0.04 % 0.04 % to 0.008 % 0.008 %	Using Multi Product Calibrator by Direct Method
19.	AC Voltage ♣	**50 Hz to 1 kHz** 20 mV to 200 V 200 V to 1000 V	 0.26 % to 0.07 % 0.07 %	Using Multi Product Calibrator by Direct Method
20.	DC Current ♣	1 µA to 100 µA 100 µA to 200 mA 200 mA to 20 A 20 A to 1000 A	2.32 % to 0.06 % 0.06 % to 0.02 % 0.02 % to 0.05 % 0.77 % to 0.36 %	Using Multi Product Calibrator by Direct Method
21.	AC Current ♣	**50 Hz to 1 kHz** 25 µA to 20 mA 20 mA to 2 A 2 A to 20 A **50 Hz** 20 A to 1000 A	 1.4 % to 0.5 % 0.5 % to 0.1 % 0.1 % 0.1 % to 0.3 %	Using Multi Product Calibrator by Direct Method
22.	DC Resistance♣	100 µΩ 1 mΩ 10 mΩ 100 mΩ 1 Ω 10 Ω to 100 kΩ 100 kΩ to 10 MΩ	0.46 % 0.46 % 0.46 % 0.5 % 0.15 % 0.12 % to 0.06 % 0.06 % to 0.07 %	Using Multi Product Calibrator by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		10 MΩ to 100 MΩ 100 MΩ to 1 GΩ 1 GΩ to 100 GΩ	0.07 % to 0.6 % 0.6 % to 2.3 % 2.3 % to 6.3 %	
23.	Frequency♣	100 Hz to 10 MHz 10 MHz to 250 MHz	0.002 % to 0.0023 % 0.0023 % to 0.004 %	Using Multi Product Calibrator by Direct Method
24.	Oscilloscope♣ Amplitude Time Base Bandwidth	2 mV/Div to 20 V/Div 20 ns to 1 s 10 MHz to 250 MHz ref 50 kHz	0.1 % to 0.013 % 0.03 % to 0.012 % 1.3 dB	Using Multi Product Calibrator by Direct Method
25.	AC Power@ 50 Hz ♣ 1φ UPF	100 V to 300 V 1 A to 20 A 100 W to 6 kW	0.35 % to 1.2 %	Using Multi Product Calibrator by Direct Method
26.	Capacitance♣	**1 kHz** 1 nF to 100 µF	1.7 % to 5.78 %	Using Multi Product Calibrator by Direct Method
II.	**MEASURE**			
	DC Voltage #	1 mV to 100 mV 100 mV to 1000 V	0.054 % to 0.008 % 0.008 % to 0.002 %	Using 8½ Digital Multimeter by Direct Method
	DC High Voltage #	1 kV to 35 kV	2.7 %	High Voltage Probe with 8½ Digital Multimeter by Direct Method
	AC Voltage #	**50 Hz to 1 kHz** 50 mV to 100 V 100 V to 1000 V **1 kHz to 10 kHz** 100 mV to 700 V	 0.2 % to 0.04 % 0.04 % to 0.051 % 0.08 %	Using 8½ Digital Multimeter by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	AC High Voltage #	**50 Hz** 1 kV to 28 kV	6 %	High Voltage Probe with 8½ Digital Multimeter by Direct Method
3.	DC Current #	1 µA to 10 µA 10 µA to 100 µA 100 µA to 100 mA 100 mA to 1 A 1 A to 20 A 20 A to 100 A	0.046 % to 0.05 % 0.05 % to 0.002 % 0.002 % to 0.005 % 0.005 % to 0.02 % 0.02 % to 0.09 % 0.7 %	Using 8½ Digital Multimeter by Direct Method Using Precision Shunt with Digital Multimeter by Direct Method
4.	AC Current #	**50 Hz to 1 kHz** 20 µA to 1 A 1 A to 20 A **50 Hz** 20 A to 100 A	 0.15 % to 0.058 % 0.058 % to 0.16 % 0.93 %	Using 8½ Digital Multimeter by Direct Method Using Precision Shunt with Digital Multimeter by Direct Method
5.	DC Resistance #	1 Ω to 100 Ω 100 Ω to 1 MΩ 1 MΩ to 100 MΩ 100 MΩ to 100 GΩ	0.003 % to 0.0012 % 0.0012 % to 0.0016 % 0.0016 % to 0.015 % 0.05 % to 0.5 %	Using 8½ Digital Multimeter by Direct Method
6.	Timer #	100 ms to1000 s	0.34 %	Using Timer by Direct Method
	Temperature #			
	Thermocouple “K” Type	(-) 180 °C to 1200 °C	0.51 °C	
	Thermocouple “J” Type	(-) 140 °C to 1340 °C	0.61 °C	
	Thermocouple “B” Type	300 °C to 1800 °C	0.52 °C	

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	"E" Type Thermocouple	0 °C to 800 °C	0.31 °C	
	"N" Type Thermocouple	(-) 180 °C to 1300 °C	0.32 °C	
	"R" Type Thermocouple	0 °C to 1700 °C	1.2 °C	
	"S" Type Thermocouple	0 °C to 1700 °C	0.58 °C	
	"T" Type	0 °C to 400 °C	0.41 °C	
	RTD	(-) 100 °C to 800 °C	0.07 °C	
8.	AC Power@ 50 Hz[$] UPF 1φ	10 V to 600 V 1 A to 20 A 10 W to 12 kW	0.42 % to 0.34 %	Using Digital Power Meter by Direct Method
9.	Frequency[$]	0.1 kHz to 200000 kHz	0.84 % to 0.004 %	Using Universal Counter by Direct 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.

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