Laboratory	**R. R. Electronics, Door No. 3/459, Plot No. 22, Sri Venkateshwara Nagar, 1st Street, Kottivakkam (ECR), Chennai, Tamil Nadu**		
Accreditation Standard	**ISO/IEC 17025:2005**		
Discipline	**Electro-Technical Calibration**	**Issue Date**	**20.02.2015**
Certificate Number	**C-0334**	**Valid Until**	**19.02.2017**
Last Amended on	**19.03.2015**	**Page**	**1 of 5**

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
	SOURCE			
1.	**DC VOLTAGE**♯	1 mV to 10 V	0.33 % to 0.0016 %	Using Multiproduct Calibrator
		10 V to 1000 V	0.0016 % to 0.0023 %	by Direct Method
2.	**DC CURRENT**♯	100 µA to 1 mA	0.031 % to 0.012 %	Using Multiproduct Calibrator
		1 mA to 30 A	0.012 % to 0.070 %	by Direct Method
		20 A to 1500 A	0.82 % to 0.068 %	Using Multiproduct Calibrator with Current Coil by Direct Method
3.	**RESISTANCE**♯	1Ω	0.82 %	Using Multiproduct Calibrator
		10 Ω	0.08 %	by Direct Method
		100 Ω	0.01 %	
		1 k Ω	0.004 %	
		10 k Ω	0.0028 %	
		100 k Ω	0.0039 %	
		1 M Ω	0.0048 %	
		10 M Ω	0.016 %	
		100 M Ω	0.29 %	
		1 G Ω	1.56 %	
		1 Ω to 100 Ω	1.40 % to 0.02 %	Using Multifunction Calibrator
		100 Ω to 5 k Ω	0.02 % to 0.0086 %	by Direct Method
4.	**CAPACITANCE**♯	1nF	0.28 %	Using Multifunction Calibrator
		10nF	0.30 %	by Direct Method
		100 nF	0.30 %	
		1 µF	0.47 %	
		10 µF	0.70 %	
5.	**FREQUENCY**♯	10 Hz to 10 MHz	0.0023 %	Using Multiproduct Calibrator by Direct Method

Ranjith Kumar
Convenor

Avijit Das
Program Manager

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
6.	**TEMPERATURE SIMULATION**♯			
	Thermocouple			
	J,K,N Type	1°C to 1200°C	0.12 °C to 0.19°C	Using Multifunction Calibrator by Direct Method
	R Type	150°C to 1700°C	0.24°C to 0.33°C	
	S Type	170°C to 1700°C	0.24°C to 0.33°C	
	B Type	600°C to 920°C	1.93 °C to 1.52°C	Using Multifunction Calibrator by Direct Method
		920°C to 1800 °C	0.45°C to 0.56°C	
	RTD (Pt-100)	(-)200°C to 800°C	0.07°C to 0.11°C	Using Multifunction Calibrator by Direct Method
7.	**AC VOLTAGE**♯	**40 Hz to 1 kHz**		Using Multiproduct Calibrator by Direct Method
		20 mV to 200 V	0.2 % to 0.09 %	
		200 V to 1000 V	0.09 % to 0.12 %	
8.	**AC CURENT**♯	**40 Hz to 1 kHz**		Using Multiproduct Calibrator by Direct Method
		20µA to 2 A	2.34 % to 0.31 %	
		2 A to 20 A	0.31 % to 0.6 %	
		50 Hz to 1 kHz		
		20 A to 30 A	0.6 %	
		50 Hz		Using Multiproduct Calibrator with Current Coil by Direct Method
		20 A to 1500 A	0.78 % to 0.06 %	
	MEASURE			
1.	**DC VOLTAGE**$	1 mV to 10 V	0.02 % to 0.0007 %	Using Precision Multimeter by Direct Method
		10 V to1000 V	0.0007 % to 0.001 %	

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
2.	**DC CURRENT**[$]	100 µA to 1 A 1 A to 30 A	0.0033 % to 0.02 % 0.02 % to 0.074 %	Using Precision Multimeter by Direct Method
3.	**RESISTANCE**[$]	1Ω to 1k Ω 1 k Ω to 1 G Ω	0.0025 % to 0.0012 % 0.0012 % to 0.21 %	Using Precision Multimeter by Direct Method
4.	**CAPACITANCE**[$]	1nF to 10 µF	3.27 % to 1.86 %	Using 6 ½ digit DMM by Direct Method
5.	**FREQUENCY**[$]	10 Hz to 300 kHz	0.58 % to 0.012 %	Using 6 ½ digit DMM by Direct Method
6.	**AC VOLTAGE**[$]	**40 Hz to 1 kHz** 20 mV to 100 V 100 V to 1000 V	 0.079 % to 0.035 % 0.035 %	Using Precision Multimeter by Direct Method
7.	**AC CURRENT**[$]	**40 Hz to 1 kHz** 20 µA to 100 mA 100 mA to 20 A **50 Hz to 1 kHz** 20 A to 30 A	 0.15 % to 0.09 % 0.09 % to 0.16 % 0.12 %	Using Precision Multimeter by Direct Method
8.	**TIMER**[#]	1 s to 10 s 10 s to 9999.9 s	0.9 % to 0.09 % 0.09 % to 0.0064 %	Using Time Interval Meter by Direct Method
9.	**DC VOLTAGE**[♣]	1 mV to 1000 V	0.42 % to 0.006 %	Using 6½ digit DMM & Picotest by Direct Method
10.	**DC CURRENT**[♣]	1 mA to 100 mA 100 mA to 10 A	0.29 % to 0.06 % 0.06 % to 0.35 %	Using 6½ digit DMM by Direct Method

Ranjith Kumar
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Avijit Das
Program Manager

	Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
11.	**RESISTANCE♣**	1Ω to 1MΩ 1 MΩ to 100 MΩ	0.48 % to 0.013 % 0.013 % to 0.94 %	Using 6½ digit DMM by Direct Method
12.	**CAPACITANCE♣**	1 nF to 10 µF	3.27 % to 1.86 %	Using 6½ digit DMM by Direct Method
13.	**FREQUENCY♣**	10 Hz to 300 kHz	0.58 % to 0.012 %	Using 6½ digit DMM by Direct Method
14.	**TEMPERATURE SIMULATION♯**			
	Thermocouple			
	J,K,N Type	1°C to 1200°C	0.14 °C to 0.19°C	Using Multifunction Calibrator by Direct Method
	R Type	150°C to 1700°C	0.28°C to 0.34°C	
	S Type	170°C to 1700°C	0.27°C to 0.35°C	
	B Type	600°C to 920°C	0.61°C	Using Precision Multimeter & Multifunction Calibrator
		920°C to 1800 °C	0.47°C to 0.56°C	by Direct Method
	RTD (Pt-100)	(-)200°C to 800°C	0.07°C to 0.11°C	Using Multifunction Calibrator by Direct Method
15.	**AC VOLTAGE♣**	**40 Hz to 1 kHz**		
		100 mV to 100 V	0.12 % to 0.10 %	Using 6½ digit DMM by Direct Method
		100 V to 750 V	0.10 % to 0.11 %	

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
16. AC CURRENT♣	**40 Hz to 1 kHz** 0.1 A to 10 A	0.58 % to 0.96 %	Using 6½ digit DMM 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.

Ranjith Kumar
Convenor

Avijit Das
Program Manager