

Laboratory MSME-Testing Centre, 111 & 112 B.T. Road, Kolkata, West Bengal

Accreditation Standard ISO/IEC 17025:2005

Discipline Electro-Technical Calibration **Issue Date** 27.01.2014

Certificate Number C-0063 **Valid Until** 24.12.2015

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>SOURCE</u>			
1. DC VOLTAGE ^{\$}	330mV to 3.3V 3.3V to 1000V	0.008% to 0.029% 0.029% to 0.0065%	Using Multi Product Calibrator Fluke , 5500A By Direct Method
2. DC CURRENT ^{\$}	1mA to 10mA 10mA to 330mA 330mA to 1A 1A to 10A	0.07% to 0.02% 0.02% to 0.09% 0.09% to 0.05% 0.05% to 0.09%	Using Multi Product Calibrator Fluke , 5500A By Direct Method
3. AC VOLTAGE ^{\$}	50Hz 30mV to 100mV 100mV to 1V 1V to 10V 10V to 100V 100V to 1000V	0.26% to 0.08% 0.08% to 0.038% 0.038% to 0.063% 0.063% to 0.073% 0.073% to 0.077%	Using Multi Product Calibrator Fluke , 5500A By Direct Method
AC VOLTAGE [*]	50Hz 100 mV to 1 V 1V to 10V 10V to 100V 100 V to 1000 V	0.11% 0.11% to 0.15% 0.15% to 0.11% 0.11%	Using AC Voltage Current Standard Yokogawa, 2558 By Direct Method
4. AC CURRENT ^{\$}	50Hz 1mA to 10mA 10mA to 100mA 100mA to 2.2A	0.185% to 0.169% 0.169% 0.169% to 0.251%	Using Multi Product Calibrator Fluke , 5500A By Direct Method

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AC CURRENT [§]	2.2A to 11A	0.22% to 0.18%	Using AC Voltage Current Standard Yokogawa, 2558
	50 Hz 11A to 50A	0.18% to 0.24%	
AC CURRENT*	50Hz 100 mA to 1 A	0.11% to 0.26%	Using AC Voltage Current Standard Yokogawa, 2558
	1 A to 10 A	0.26% to 0.14%	
5. DC RESISTANCE [§]	1 m Ω to 10m Ω	0.132% to 0.12%	Using Standard Resistance Box, Tinsley , 4737 B & High Resistance Decade Box, Tinsley, 4720 By Direct Method
	10m Ω to 1 Ω	0.12% to 0.075%	
	1 Ω to 100 Ω	0.075% to 0.06%	
	100 Ω to 1k Ω	0.06%	
	1k Ω to 100k Ω	0.06% to 0.11%	
	100k Ω to 1M Ω	0.11%	
	1M Ω to 2G Ω	0.11% to 1.14%	
	2 G Ω to 10 G Ω 10 G Ω to 100 G Ω	1.14% to 1.5% 1.5% to 3.2%	
DC RESISTANCE*	1 m Ω to 10m Ω	0.13% to 0.12%	Using Standard Resistance Box, Tinsley, 4737 B High Precision Decade Resistance Box, Vaiseshika, 7400 & High Stability Decade Meg Ohm Box, Vaiseshika, 8400
	10m Ω to 100 m Ω	0.12% to 0.14%	
	100 m Ω to 1 Ω	0.14% to 1.34%	
	1 Ω to 10 Ω	1.34% to 1.13%	
	10 Ω to 100 Ω	1.13%	
	100 Ω to 1k Ω	1.13%	
	1k Ω to 10k Ω	1.13%	
	10k Ω to 100k Ω	1.13%	
	100k Ω to 1M Ω	1.13% to 2.27%	
	1M Ω to 10M Ω	2.27% to 2.36%	
	10M Ω to 100M Ω	2.36% to 2.44%	

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6. FREQUENCY [§]	50Hz to 119Hz 119Hz to 1kHz 1kHz to 10kHz	0.015% to 0.10% 0.10% to 0.12% 0.12% to 0.14%	Using Reference Multi Meter Fluke , 8508A By Indirect Method
7. AC POWER* UPF	50Hz 150W to 600W 600W to 3kW	0.589 to 0.637% 0.637% to 0.53%	Using Power Meter WT 210 By Indirect Method
<u>MEASURE</u>			
8. DC VOLTAGE [§]	100mV to 1V 1V to 1000V	0.001% to 0.0006% 0.0006% to 0.0009%	Using Reference Multi Meter Fluke , 8508A By Direct Method
DC HIGH VOLTAGE [#]	1kV to 10kV 10kV to 90kV	5.8% to 1.6% 1.6 % to 1.33%	Using H.V. Divider Hipotronics kVM-100-B By Direct Method
9. DC CURRENT [§]	100 μ A to 100mA 100mA to 1A 1A to 10A	0.0064% 0.0064% to 0.03% 0.03% to 0.06%	Using Reference Multi Meter Fluke , 8508A By Direct Method
10. AC VOLTAGE [§]	50Hz 100mV to 1V 1V to 100V 100V to 1000V	0.02% to 0.014% 0.014% to 0.035% 0.035% to 0.04%	Using AC Voltage current standard Yokogawa, 2558 By Direct Method

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AC HIGH VOLTAGE[#]	50Hz 1 kV to 10 kV 10 kV to 90 kV	11.3% to 1.13% 1.13% to 1.8%	Using H.V. Divider Hipotronics kVM-100-B By Direct Method
11. AC CURRENT^{\$}	50Hz 100 μ A to 1mA 1mA to 1A 1A to 10A 80A to 200A 200A to 600A	0.09% 0.1% 0.1% to 0.13% 2.11% to 2.10% 2.10%	Using AC Voltage current standard Yokogawa, 2558 By Direct Method
AC HIGH CURRENT[#]	50Hz 80A to 200A 200A to 600A	2.11% to 2.10% 2.10%	Using Clamp on Tester, Yokogawa, CL 255
12. DC RESISTANCE^{\$}	1 Ω to 1k Ω 1k Ω to 1M Ω 1M Ω to 1G Ω	0.0074% 0.007% 0.007% to 0.23%	Using Standard Resistance Box, Tinsley, 4737 B, High Precision Decade Resistance Box, Vaiseshika, 7400 & High Stability Decade Meg Ohm Box, Vaiseshika, 8400 by Direct Method
13. AC ENERGY^{\$}	Single Phase (1 Φ) 240V, 0.25A to 5A at UPF to 0.5 PF Lag Three Phase(3 Φ) 240V, 0.25A to 5A	1.9% to 3.0% 1.2% to 3.8%	Using Portable Meter Test Equipment ZERA, TPZ 308

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14. 2 STAGE VOLTAGE RATIO TRANSFORMER*	at UPF to 0.5 PF Lag 5 to 100 100 to 700	0.23% to 0.24% 0.24% to 0.23%	Using Voltage Ratio Measurement of Transformer Winding By Direct Method

* 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.