

Laboratory Global Calibration, 149 & 150, FF, Ashoka Plaza, Software Corporate Park,
S. No. 32/2, Viman Nagar, Nagar Road, Pune, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Discipline Electro-technical Calibration **Issue Date** 07.08.2015

Certificate Number C-0651 **Valid Until** 25.06.2017

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Quantity Measured/ Instrument	Range / Frequency	*Calibration Measurement Capability (\pm)	Remarks
I. MEASURE			
1. AC VOLTAGE #	50 Hz to 10 kHz 10 mV to 100 mV 100 mV to 750 V	0.88 % to 0.14 % 0.14 % to 0.10 %	Using 6½ DMM H.P. by direct / comparison method
	10 kHz to 50 kHz 10 mV to 100 V	0.88 % to 0.2 %	Using 6½ DMM H.P. by direct / comparison method
	50 Hz 1 kV to 15 kV	3.8 %	Using HV Probe with DMM by direct method
2. DC VOLTAGE #	1 mV to 1000 V	0.43 % to 0.01 %	Using 6½ DMM H.P. by direct / comparison method
	1 kV to 30 kV	3.5 %	Using 4½ DMM and HV Probe by Direct Method
3. DC RESISTANCE #	1 Ω to 10 M Ω 10 M Ω to 100 M Ω	0.49 % to 0.1 % 0.1 % to 0.9 %	Using 6½ DMM H.P. by direct / comparison method
4. INDUCTANCE #	1 kHz 100 μ H to 10 H	1.74 %	Using LCR Meter by direct / comparison method
5. CAPACITANCE #	1 kHz 100 pF to 100 μ F	1.74 %	Using LCR Meter by direct / comparison method
6. DC CURRENT #	1 mA to 100 mA	0.28 %	Using 6½ DMM H.P. by direct / comparison method
	100 mA to 2.9 A	0.28 % to 0.13 %	Using 6½ DMM with current shunt by direct / comparison method
	2.9 A to 30 A	0.66 %	

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7. AC CURRENT #	50 Hz to 1 kHz 100 mA to 3A	0.78 % to 0.26 %	Using 6½ DMM H.P. by direct / comparison Method
	3A to 10A	0.66 %	Using 6½ DMM with current shunt by direct / comparison method
8. FREQUENCY #	10 Hz to 1 kHz	0.04 % to 0.02 %	Using 6½ DMM by direct / comparison method
	1 kHz to 990 MHz	0.02 % to 0.0016 %	Using Frequency Counter by direct / comparison method
9. AC POWER #	50 Hz (20 V to 600 V) (0.5 A to 20 A) (UPF)	0.12 % to 0.15 %	Using Digital Power Meter by direct / comparison method
10. POWER FACTOR (1Ø) #	50 Hz (-) 0.5 to 0.5 (lead/lag)	0.002 PF	Using Digital Power Meter by direct / comparison method
11. ACTIVE ENERGY #	50 Hz (20 V to 600 V) (0.5 A to 20 A) (UPF)	0.42 %	Using Digital Power Meter by comparison method
12. RF VOLTAGE #	48.25 MHz to 825.25 MHz 40 dBµV to 120 dBµV	2.3 dB	Using TV Signal Level Meter by direct / comparison method
II. SOURCE			
1. DC VOLTAGE #	(-) 329 mV to 1 mV	0.007 % to 0.39 %	Using Multifunction Calibrator by direct method
	1 mV to 329.99 mV	0.399 % to 0.007 %	
	329.99 mV to 1000V	0.007 % to 0.014 %	
2. DC CURRENT #	(-) 329 µA to 1 µA	0.02 % to 2.0 %	Using Multifunction Calibrator by direct method
	1 µA to 2.99 A	2.0 % to 0.04 %	
	2.99 mA to 20 A	0.04 % to 0.13 %	
	20 mA to 1000 A	0.66 % to 0.8 %	

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3. DC RESISTANCE #	1 m Ω to 1 Ω	0.89 % to 0.15 %	Using Milli Ohm Box (discrete values in steps of 1 m Ω , 10 m Ω , 100 m Ω and 1 Ω)
	2 Ω to 300 k Ω 300 k Ω to 500 M Ω	0.064 % to 0.015 % 0.015 % to 0.6 %	Using Multifunction Calibrator Fluke by direct method
	2 M Ω to 200 M Ω 200 M Ω to 20 G Ω	0.91 % 0.91 % to 1.3 %	Using Mega Ohm Box (discrete values in steps of 2 M Ω , 20 M Ω , 200 M Ω , 2 G Ω and 20 G Ω)
4. AC VOLTAGE #	50 Hz to 10 KHz 3 mV to 3 V 3 V to 1000 V	0.86 % to 0.06 % 0.06 % to 0.10 %	Using Multifunction Calibrator by direct method
	10 kHz to 100 kHz 3 mV to 200 V	1.5 % to 0.3 %	Using Multifunction Calibrator by direct method
	100 kHz to 450 kHz 30 mV to 3 V	1.2 % to 0.6 %	Using Multifunction Calibrator by direct method
5. AC CURRENT #	10 KHz to 30 kHz 33 μ A to 33 mA	2.8 % to 0.5 %	Using Multifunction Calibrator Fluke by direct method
	50 Hz to 5 kHz 190 μ A to 3 A 3 A to 20 A	0.7 % to 0.06 % 0.06 % to 3.5 %	Using Multifunction Calibrator Fluke by direct method
	50 Hz 20 A to 1000A	0.66 % to 0.8 %	Using Multifunction Calibrator with coil by direct method
6. CAPACITANCE #	1 kHz 0.5 nF to 300 nF	2.6 % to 0.3%	Using Multifunction Calibrator by direct method
	100 Hz 300 nF to 30 μ F	0.3 % to 0.5 %	

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7. POWER FACTOR #	50 Hz 0.2 PF to UPF	0.002 PF	Using Multifunction Calibrator by direct method
8. DC POWER #	1 W to 12 kW (1 V to 600 V) (10 mA to 20 A)	0.025 % to 0.1 %	Using Multifunction Calibrator by direct method
9. AC POWER #	50 Hz 220 V / 1 \emptyset 1 A to 20 A	0.3 % to 0.55 %	Using Multifunction Calibrator by direct method
	50 Hz 220 V / 1 \emptyset & 3 \emptyset 0.5 A to 5 A / 0.5 to UPF	0.72 %	Using Power & Energy Meter Calibrator by direct method
10 FREQUENCY #	120 Hz to 100 kHz	0.005 %	Using Multifunction Calibrator by direct method
	100 kHz to 990 MHz	0.014 % to 0.13 %	Using Signal Generator by direct method
11 TEMPERATURE SIMULATION FOR CALIBRATION OF INDICATOR / CHART RECORDER / DATA LOGGER / TEST KIT / CONTROLLER / CALIBRATOR #			
J-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	Using Multifunction Calibrator by direct method
K-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
N-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
R-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
S-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
T-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
B-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
E-Type	(-) 200 °C to 1700 °C	0.62 % to 0.80 %	
RTD-Type	200 °C to 850 °C	0.40 °C to 0.60 °C	

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12. ENERGY #	50Hz 240 V / 1 \emptyset & 3 \emptyset 5 A @ UPF	0.72 %	Using Power and Energy Meter Calibrator by direct method

* Measurement Capability is expressed as an uncertainty (\pm) at a confidence probability of 95%

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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