

Laboratory

Voltagram Testing and Calibration, Plot No. C-88-89, Sector B-3, TDS
City, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

CC-2935

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Validity

21.01.2019 to 20.01.2021

Last Amended on -

“In view of the transition for ISO/IEC 17025:2017, the validity of this accreditation certificate will cease on 30.11.2020”

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1 mV to 300 mV 300 mV to 1000 V 1kV to 5kV	0.36 % to 0.01 % 0.01 % to 0.005 % 9.3% to 4.6%	Using Fluke 5502A Multi-Product Calibrator By Direct Method Using High Voltage 80K 40 with DMM By Direct Method
2.	AC Voltage [#]	50 Hz to 1 kHz 1 mV to 300 mV 300 mV to 10V 10V to 1000V 1 kV to 25 kV	2.5 % to 0.1 % 0.1 % to 0.05 % 0.05 % to 0.059 % 7.7% to 6.1%	Using Fluke 5502A Multi-Product Calibrator By Direct Method Using High Voltage 80K 40+ DMM By Direct Method
3.	DC Current [#]	1 μ A to 10 μ A 10 μ A to 1 mA 1 mA to 20A 20 A to 1000 A	2.4 % to 0.25% 0.25% to 0.08% 0.08% to 0.09% 0.09% to 0.65%	Using Fluke 5502A Multi-Product Calibrator & 50 Turn Current Coil By Direct Method
4.	AC Current [#]	50 Hz to 1kHz 30 μ A to 1 A 1 A to 20 A 20 A to 1000 A	0.57 % to 0.069 % 0.069 % to 0.18 % 0.18 % to 0.76 %	Using Fluke 5502A Multi-Product Calibrator & 50 Turn Current Coil By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
5.	Resistance [#] (4 Wire)	1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 100 k Ω	0.13% to 0.025 % 0.025 % to 0.012 % 0.012 % to 0.013 %	Using Fluke 5502A Multi-Product Calibrator By Direct Method
		100 $\mu\Omega$, 500 $\mu\Omega$, 1m Ω , 10m Ω , 100m Ω , 1 Ω , 2 Ω , 5 Ω , 10 Ω , 20 Ω , 50 Ω , 100 Ω , 200 Ω , 500 Ω , 1k Ω , 100k Ω	1.8% to 0.8%	Using Standard Resistance box By Direct Method
6.	Resistance [#] (2 wire)	300 k Ω to 100 M Ω 100 M Ω to 1000 M Ω	0.015 % to 0.58 % 0.58 % to 1.79 %	Using Fluke 5502A Multi-Product calibrator By Direct Method
		1M Ω , 2 M Ω , 5M Ω , 10 M Ω , 20 M Ω , 50 M Ω , 100 M Ω , 200 M Ω , 500 M Ω , 1000 M Ω	0.58 to 2.5 %	Using HV Megohm box By Direct Method
7.	High Resistance [#]	2 G Ω , 20 Ω , 40G Ω , 100G Ω , 200 G Ω , 1000G Ω	2.25 % to 3.5 %	Using HV Giga ohm Box By Direct Method
8.	Capacitance [#]	1kHz 0.5 nF to 1 μ F	2.47 %	Using Fluke 5502A Multi-Product Calibrator By Direct Method
		100 Hz 1 μ F to 100 μ F	2.47 % to 0.65 %	
9.	DC Power [#]	10V to 1000 V 0.1A to 20 A 1 W to 20 kW	1.6 % to 0.7%	Using Fluke 5502A Multi-Product Calibrator & 50 Turn Current Coil By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
10.	AC Power [#] (1 Phase)	50 Hz @ UPF 10 V to 600 V 0.1 A to 20 A 1 W to 12 kW	1.3% to 1.1 %	Using Fluke 5502A Multi-Product Calibrator & 50 Turn Current Coil By Direct Method
		50 Hz @ 0.5 Lead/Lag 10 V to 600 V 0.5 A to 20 A 2.5 W to 6 kW	0.8 % to 2.2 %	
11.	Power Factor [#] (Lead / Lag)	0.2 to 1.0	0.012 PF	Using Fluke 5502A Multi-Product Calibrator By Direct Method
12.	Frequency [#]	10 Hz to 50 Hz	0.16 % to 0.01 %	Using Fluke 5502A Multi-Product Calibrator By Direct Method
		50 Hz to 1 MHz	0.01 % to 0.29 %	
13.	Temperature Simulation (Temperature Indicator/ Recorder/ Controller/Data Logger / Scanner / Calibrator/ Transmitter/ PID/ Process Meter) [#]			Using Fluke 5502A Multi-Product Calibrator By Direct Method
	Thermocouple			
	Type 'B'	600 °C to 1800 °C	0.42 °C	
	Type 'E'	(-) 200 °C to 1000 °C	0.58 °C	
	Type 'J'	(-) 200 °C to 1000 °C	0.39 °C	
	Type 'K'	0 to 1300 °C	0.47 °C	
	Type 'N'	0 to 1300 °C	0.47 °C	
	Type 'R'	0 to 1750 °C	0.48 °C	
	Type 'S'	0 to 1750 °C	0.47 °C	
Type 'T'	(-) 250 °C to 390 °C	0.73 °C		
RTD	(-)199 °C to 800 °C	0.26 °C		

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
14.	Time Interval / Stop Watch (Digital/ Analog), Hour meter, Dig. Timers [#]	1 s to 600 s 600 s to 86400 s	0.006 s to 0.072 s 0.072 s to 1.1 s	Using Digital time Interval Calibrator By Direct Method
II.	MEASURE			
1.	DC Voltage [#]	1 mV to 100 mV 100 mV to 10V 10V to 1000 V	0.41% to 0.008 % 0.008 % to 0.0039 % 0.0039 % to 0.0060 %	Using Fluke 8846A DMM By Direct Method
2.	DC High Voltage [#]	1 kV to 5 kV	9.3% to 4.6%	Using High Voltage 80K 40+ DMM By Comparison Method
3.	AC Voltage [#]	50 Hz to 1kHz 1 mV to 1 V 1 V to 10 V 10 V to 1000 V	0.47 % to 0.10 % 0.10 % to 0.12 % 0.12 % to 0.59 %	Using Fluke 8846A DMM By Direct Method
4.	AC High Voltage [#]	50 Hz 1 kV to 25 kV	7.7% to 6.1%	Using High Voltage 80K 40 with DMM By Comparison Method
5.	DC Current [#]	1 μ A to 10 μ A 10 μ A to 1 mA 1 mA to 3 A 3A to 10 A	2.9 % to 0.35 % 0.35 % to 0.087 % 0.087 % to 0.16 % 0.16 % to 1.8 %	Using Fluke 8846A DMM By Direct Method
6.	AC Current [#]	50 Hz to 1 kHz 100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A 50 Hz 10 A to 1000 A	0.49 % to 0.39 % 0.39 % to 0.21 % 0.21 % to 0.26 % 1.6 % to 1.3 %	Using Fluke 8846A DMM By Direct Method Using Fluke 1730 Energy Logger By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
7.	Resistance [#] (4 Wire)	1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 100 k Ω 100 $\mu\Omega$ to 10 Ω	0.047 % 0.047 % to 0.016 % 0.016 % 1.2 % to 1.17 %	Using Fluke 8846A DMM By Direct Method Using Dig. Micro ohm Meter By Direct Method
	(2 Wire)	200 k Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	0.017 to 0.048 % 0.048 to 0.95 % 0.95 to 2.96 %	Using Fluke 8846A DMM By Direct Method
8.	High Resistance [#]	350M Ω to 1000 G Ω	1.2% to 2.6 %	Using Amprobe AMB-50 Digital Megger By Direct Method
		10 M Ω to 20 G Ω	1.53 %	Using Sigma Digital Megger By Direct Method
9.	Temperature Simulation [#] (Temperature Indicator/ Recorder/ Controller/Data Logger / Scanner / Calibrator/ Transmitter/ PID/ Process Meter)			Using Fluke 5502A Multi-Product Calibrator By Electrical Simulation Method
	Thermocouple Type 'B' Type 'E' Type 'J' Type 'K' Type 'N' Type 'R' Type 'S' Type 'T'	600 $^{\circ}$ C to 1800 $^{\circ}$ C (-)200 $^{\circ}$ C to 1000 $^{\circ}$ C (-)200 $^{\circ}$ C to 1000 $^{\circ}$ C 0 to 1300 $^{\circ}$ C 0 to 1300 $^{\circ}$ C 0 to 1750 $^{\circ}$ C 0 to 1750 $^{\circ}$ C (-)200 $^{\circ}$ C to 390 $^{\circ}$ C	0.52 $^{\circ}$ C 0.47 $^{\circ}$ C 0.32 $^{\circ}$ C 0.46 $^{\circ}$ C 0.46 $^{\circ}$ C 0.80 $^{\circ}$ C 0.54 $^{\circ}$ C 0.72 $^{\circ}$ C	
	RTD	(-)200 $^{\circ}$ C to 600 $^{\circ}$ C	0.38 $^{\circ}$ C	Using Fluke 8846A DMM By Electrical Simulation Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
10.	Frequency [#]	10 Hz to 50Hz 50Hz to 1MHz	0.012 %	Using Fluke 8846A DMM By Direct Method
11.	Capacitance [#]	1 nF to 10 μ F	1.79 %	Using Fluke 8846A DMM By Direct Method
12.	Time Interval / Stop Watch [#] (Digital/ Analog)	1 s to 600 s 600 s to 86400 s	0.006 s to 0.072 s 0.072 s to 1.1 s	Using Digital Timer By Comparison Method
13.	Power factor [#] (Lead/Lag)	0.2 PF to 1.00 PF	0.014 PF	Using Fluke 1730 Energy Logger By Direct Method
14.	AC Energy [#] 1 Phase, 2 Wire	50 Hz 240 V, 50 Hz, UPF 0.5 A to 25 A 0.12 kWh to 6 kWh	1.1 %	Using Fluke 1730 Energy Logger By Comparison Method
15.	Frequency [#]	45 Hz to 65 Hz	0.12 %	Using Fluke 1730 Energy Logger By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
16.	AC Power [#]	50Hz, UPF, 100V to 600 V 10A to 1000A 1kW to 600 kW	1.3 % to 0.3 %	Using Fluke 1730 Energy Logger By Direct Method
		50Hz, 0.5 Lag/Lead 100V to 600 V 10A to 1000A 0.5kW to 300 kW	2.5 % to 0.6 %	

* 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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