

Laboratory Calibration Solutions, 20, Friends Colony Industrial Area, Lane No.3,
G.T. Road, Shahdara, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2754

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Validity 22.06.2018 to 21.06.2020

Last Amended on -

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage ^{\$}	1 mV to 100 mV 100 mV to 1kV 1 to 30 kV	0.1 % to 0.01 % 0.01 % to 0.015 % 1 %	Using Fluke 5522A Calibrator by Direct Method Using HV Source with HV Probe & DMM
2.	DC Current ^{\$}	10 μ A to 100 mA 100 mA to 20A 20A to 1000A	0.3 % to 0.03 % 0.03 % to 0.12 % 2.0 %	Using Direct Fluke 5522A Calibrator Fluke 5522A Calibrator + Current Coil
3.	DC Resistance ^{\$}	100 $\mu\Omega$, 1m Ω 10 m Ω to 10 Ω >10 Ω to 500 M Ω 1G to 1T Ω	0.1 % 0.1 % 0.1 % to 1.5 % 1.5 % to 3.8 %	Using Resistance Box SR 8 Discrete values Decade Resis. Boxes Discrete values by Direct Method
4.	AC Voltage ^{\$}	50Hz to 1kHz 10 mV to 300 V 50Hz 300 to 1000 V 1 to 40 kV	0.1 % to 0.05 % 1 %	Using Fluke 5522A Calibrator by Direct Method Using AC Power Supply

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Convenor

Avijit Das
Program Manager

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5.	AC Resistance ^{\$}	1kHz 1,10 ,100 Ω , 1 k Ω ,10 k Ω & 100 k Ω	0.3 %	Using Direct Resistance Box SR4AS by Direct Method (discrete)
6.	AC Current ^{\$}	50 Hz to 1kHz 10 μ A to 1 mA 1mA to 20A 50Hz 20Ato1000A	0.5 %to 0.14 % 0.14 % to 0.2 % 3.0 %	Using Fluke 5522A Calibrator by Direct Method + current coil
7.	AC Power ^{\$} (Single Phase 50Hz) UPF & LPF DC power	(10-600V/0.1-20A) 1W to 12 kW at UPF 1W to 1kW at LPF 1W to 12 kW	0.28 % 0.93 % to 0.24 %	Using Fluke 5522A Calibrator by Direct Method
8.	Power Factor / Phase Angle ^{\$}	50Hz +/- (0.1 to 1)	+/-0.001 PF	Using Fluke 5522A Calibrator by Direct Method
9.	Capacitance ^{\$}	1 kHz 1nF to 100 μ F 100 Hz 10 to 100 μ F	0.3 % 0.2 %	Using Capacitor Box by Direct Method
10.	Inductance ^{\$}	1 kHz 1mH to 10 H 100 μ H	0.2 %	Using Inductance box by Direct Method
11.	Frequency ^{\$}	1 Hz to 1 GHz	25 ppm	Using Fluke 5522A Calibrator Signal Generator by Direct Method

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12.	C.T. Ratio / Phase Error ^{\$} (For CT Bridge calibration)	5/5 A - -8 to +8% (RE) 1-50 min. (PE)	0.15 (RE) % 3 min (PE)	Using CT Bridge Test Jig by Direct Method
13.	P.T. Ratio/ Phase Error ^{\$} For PT Bridge calibration	110/110V -4 to +4%(RE) 8 min. (PE)	Ratio 0.12 % Phase 2.8 min	Using PT test jig by Direct Method
14.	Transformer Turns Ratio Error ^{\$}	1,10,20,30,60,100, 200 & 300	0.15 %	Using Std. PTs by Direct Method
15.	Temperature Simulation ^{\$} RTD T/C : J,K,R	(-) 200° C to 600°C (-) 200° C to 1300°C	0.35°C 1°C	Using Fluke 5522A Calibrator by Direct Method
16.	Oscilloscope ^{\$} Amplitude Time Base Band Width	Sinusoidal/Square 1kHz 1 mV to 10 V 100 ns to 50 msec. Up to 300 M Hz	2.8 % to 1.5 % 1.0 % 2.0 %	Using Fluke 5522A Calibrator Signal Generator by Direct Method
II.	MEASURE			
1.	DC Voltage ^{\$}	1 mV to 100 mV 100 mV to 1 kV 1 to 30 kV	0.4 %to 0.03 % 0.03 % to 0.015 % 1.38 %	Using HP – 34401A 6.5 dgt DMM Using HV Probe + DMM

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2.	DC Current ^s	0.01 to 10 mA 10 mA to 20 A 5A to 20A	0.2 % to 0.08 % 0.08 % to 0.2 % 0.3 %	Using Direct Shunt Box +HP DMM HP DMM HP DMM with shunt & V/R Method
3.	DC Resistance ^s	100 μΩ to 10Ω 10Ω to 10 MΩ 10MΩ to 100M Ω 500V to 5 kV 100M to 1TΩ	0.2 % to 0.1 % 0.1 % 0.1 % to 0.3 % 0.3 % to 2.3 %	Using V/I method / Direct / Comparison Method Fluke 5522A MFC & HP DMM Using Fluke 5522A Resistance box & HV Probe with DMM
4.	AC Resistance ^s	1 kHz 1 Ω to 100 k Ω	0.12 % to 0.23 %	Using Direct Agilent LCR Meter
5.	AC Voltage ^s	50 Hz to 1 kHz 10mV to 330V 330V to 750V 50 Hz >1kV to 35 kV 35 kV to 70 kV (For calibration of Oil Test Set with dual winding)	0.5% 0.26 % 1 % 1.5 %	Using Dual winding measurement
6.	AC Current ^s	50 Hz 100uA to100mA >100mA to 20A 20 to2000A	0.1% to 0.16 % 0.16 % to 0.23 % 0.5 %	Using Direct HP DMM with shunt & ct + Power meter

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7.	AC Power ^{\$} (Single Phase 50Hz) Apparent Power (Single Phase 50Hz)	Voltage 40 to 300 V Current 5 mA to 20 A 0.02 W to 16 kW at UPF at 0.2 PF 1 to 300 VA Voltage 15 to 150 V Current 6 mA to 20 A	0.2 % 0.24 % 0.2 %	Using With Power meter Direct / Comparison Method Direct / Comparison Method
8.	Power Factor / Phase Angle ^{\$}	50 Hz +/- 0.1 to 1	+/- 0.0008 to .001 PF	Using Yokogawa Power meter by Direct Method
9.	Capacitance ^{\$}	1 kHz 100 pF to 100 μ F	0.38 %	Using Agilent LCR meter U1732B by Direct Method
10.	Inductance ^{\$}	1 kHz 100 μ H to 10 H	0.38 %	Using Agilent LCR meter U1732B by Direct Method
11.	Frequency / Period ^{\$}	1 Hz to 1 GHz (1s to 1 μ s)	25 ppm	Using Timer / Counter by Direct Method
12.	Time Interval ^{\$}	100 ms to 1 Hr	0.3 s to 0.01 s	Using Time Interval Meter IE make by Direct / Comparison Method
13.	C.T. Ratio Error / Phase Error ^{\$}	5/5A to 1200/5A 5/1A to 1200/1A	0.15 (RE) 3 min.(PE)	Using CT Test set & Std CTs by Direct Method

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14.	P.T. Ratio Error / Phase Error ^{\$}	Ratio 1 to 300 (max 40 kV) 0-50 min. (PE) 1.1 kV to 33 kV/110V	(RE) 0.1 (PE) 2 min.	Using Std.PT & PT Bridge Direct
15.	Energy ^{\$} (Single Phase 50Hz)	(1 to 600V/ 0 to 20A) 300 mWh – 5 kWh At UPF At 0.5 PF	0.2% 0.2%	Using Yokogawa Power Meter by Comparison Method
16.	Temperature Simulation ^{\$} RTD T/C : J, K , R	(-)200° C to 800°C (-) 200° C to 1300°C	0.3°C 1°C	Using Fluke 5522A Calibrator by Direct Method

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

^{\$}Only in Permanent Laboratory

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