

Laboratory Technical Services Department, BHEL, Piplani, Bhopal, Madhya Pradesh

Accreditation Standard ISO/IEC 17025:2005

Discipline Electro – Technical Calibration Issue Date 05.12.2015

Certificate Number C-0025 Valid Until 04.12.2017

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Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (\pm)	Remarks
5. DC RESISTANCE ^{\$}	2 Ω , 10 Ω , 100 Ω , 1k Ω , 190k Ω 1M Ω , 1.9M Ω , 19M Ω , 100M Ω (Discrete Values)	148ppm, 38ppm, 38ppm 18ppm, 19ppm 40ppm 164ppm, 164ppm 580ppm	Using Multifunction Calibrator Fluke 5522A by Direct Method
6. HIGH RESISTANCE [#]	500 V to 5kV 1k Ω to 100M Ω 100M Ω to 100G Ω	0.14% 0.14% to 1.4%	Using Decade Meg ohm Box H Tinsley Model 4720 by Direct Method
	1000 V to 5 kV 100G Ω to 600G Ω 600G Ω to 1T Ω	1.4% to 2.4% 2.4% to 3.5%	
7. LOW RESISTANCE [#]	250 $\mu\Omega$ to 1m Ω 1m Ω to 1000 Ω	0.13% to 0.08% 0.08%	Using Standard Resistance 4737B/C by Direct Method
8. 3 PHASE AC POWER ^{\$} 50Hz Active	Voltage range: 50V to 300V Current range: 100mA to 30A Power Factor Range: UPF to 0.5 0.5 to 0.1 0.1 to 0.01	0.04% 0.04% to 0.1% 0.1% to 0.91%	Using Power Calibrator Fluke 6100B & 6101B by Direct Method

Neeraj Verma
Convenor

Avijit Das
Program Manager

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9. 3 PHASE AC ENERGY ^{\$} 50Hz (Active)	Voltage Range: 50V to 300V Current Range: 100mA to 30A Power Factor Range: UPF to 0.5 0.5 to 0.1 0.1 to 0.01	0.04% 0.04% to 0.1% 0.1% to 0.91%	Using Power Calibrator Fluke 6100B & 6101B by Direct Method
10. FREQUENCY ^{\$}	10 Hz to 2 MHz	250ppm to 150ppm	Using Multifunction Calibrator Fluke 5522A, Reference Multimeter by Direct Method
11. HARMONICS ^{\$} a) Voltage Harmonics b) Current Harmonics	(Fundamental Frequency: 50Hz) Harmonic Voltage: 1V to 230V Harmonic: 1 to 17 th 18 th to 50 th Harmonic Current: 50mA to 24A Harmonics: 1 to 17 th 18 th to 50 th	0.62% 0.05% 0.05% to 0.15%	Using Power Calibrator 6100B & 6101B by Direct Method
12. TRANSFORMER TURNS RATIO ^{\$}	0.8 to 2220	0.06%	Using Three Phase TTR Biddle & Standard Ratios by Direct Method

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13. TEMPERATAURE SIMULATION# (Indicators/ Controllers/ Recorder)			
RTD	(-) 40 °C to 650 °C	0.27 °C	Using HP Resistance Box & Multifunction Calibrator Fluke 5522A by Direct Method
Thermocouple			
J Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
K Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
R Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
R Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
S Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
T Type	(-) 40 °C to 1400 °C	0.21 °C to 0.5 °C	
14. TAN DELTA CAPACITANCE*	Tan δ : 0.005, 0.05, 0.15	2.3%	Using Capacitance & Tan Delta Standard by Direct Method
	Capacitance 2000 pF	1.2%	
<u>MEASURE</u>			
1. DC VOLTAGE^s	100mV to 1 V 1 V to 1000 V	16ppm to 8ppm 8ppm to 14ppm	Using Reference Multimeter Fluke 8508A by Direct Method
2. DC HIGH VOLTAGE*	1kV to 100 kV	0.81%	Using AC/DC kV Meter with Divider, Hipotronics KVM100/200 by Direct Measurement
3. AC VOLTAGE^s	50 Hz to 1 kHz 10mV to 100mV 100mV to 100 V 100V to 1000 V	0.16% to 150ppm 150ppm to 106ppm 106ppm to 125ppm	Using Reference Multimeter Fluke 8508A by Direct Method

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4 AC HIGH VOLTAGE*	50 Hz 1kV to 170 kV	2.6%	Using AC/DC kV Meter with Using Divider, Hipotronics KVM100/200 by Direct Method
5. DC CURRENT^{\$}	100 μ A to 100mA 100mA to 1A 1A to 20A	265ppm to 135ppm 135ppm to 298ppm 298ppm to 620ppm	Using Reference Multimeter Fluke 8508A by Direct Method/V.I. Method
6. AC CURRENT^{\$}	50Hz to 1 kHz 10 μ A to 100 μ A 100 μ A to 100 mA 100mA to 1A 1A to 20A	0.35% to 0.06% 0.06% 0.06% to 0.1% 0.1% to 0.11%	Using Reference Multimeter Fluke 8508A by Direct Method / V.I. Method
7. DC RESISTANCE^{\$}	1 Ω to 100 Ω 100 Ω to 100k Ω 100k Ω to 10M Ω 10 M Ω to 100M Ω 100M Ω to 1G Ω 1G Ω to 1T Ω	57ppm to 15ppm 15ppm 15ppm to 50ppm 50ppm to 0.26% 0.26% 0.26% to 3.50%	Using Reference Multimeter Fluke 8508A by Direct Method Using High Resistance TERA1501 by Direct Method
8. LOW RESISTANCE^{\$}	250 u Ω to 1m Ω 1 m Ω to 1 Ω	540 ppm to 360 ppm 360 ppm to 69 ppm	Using VI Method and Direct Measurement (MF Calibrator 5522A & Ref. Multimeter 8508A)
9. FREQUENCY^{\$}	10 Hz to 1 MHz	715ppm to 355ppm	Using Frequency Counter Model PLA FC100 by Direct Method
10. TIME INTERVAL^{\$}	1 min to 60 min	0.09% to 0.02%	Using Digital Stop Watch by Comparison Method

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