

Laboratory Material Testing Laboratory, Bharat Heavy Electricals Ltd., Jhansi, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2641 (in lieu of C-0626) **Page** 1 of 4

Validity 23.04.2018 to 22.04.2020 **Last Amended on** -

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
1.	SOURCE			
1.	DC Voltage ^s	1 mV to 33 mV 33 mV to 300 mV 300 mV to 1000 V	0.37 % to 0.018 % 0.018 % to 0.008 % 0.008 % to 0.007 %	Using Fluke MFC 5500A by Direct Method
2.	AC Voltage ^s	50 Hz 10mV to 30 mV 30 mV to 3 V 3 V to 1000 V	0.41 % to 0.25 % 0.25 % to 0.042 % 0.042 % to 0.055 %	Using Fluke MFC 5500A by Direct Method
3.	DC Current ^s	1 μ A to 100 μ A 100 μ A to 30 mA 30 mA to 10 A 50 A to 550 A	5.8 % to 0.16 % 0.16 % to 0.017 % 0.017 % to 0.084 % 0.93 %	Using Fluke MFC 5500A by Direct Method Using MFC 5500A With 50 Turn Coil
4.	AC Current ^s	50 Hz 30 μ A to 300 μ A 300 μ A to 30 mA 30 mA to 1 A 1 A to 10 A 50A to 550A	1.11 % to 0.42 % 0.42 % to 0.12 % 0.12 % to 0.17 % 0.17 % to 0.12 % 0.9 %	Using Fluke MFC 5500A by Direct Method Using MFC 5500A With 50 Turn Coil
5.	Low Resistance ^s	1m Ω , 10m Ω , 100m Ω 1 Ω , 10 Ω , 100 Ω	0.07 %	Using H.Tinsley 4737C Fixed Resistance Box by Direct Method
6.	Resistance ^s	100 Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 300 M Ω	0.03 % to 0.024 % 0.024 % to 0.076 % 0.076 % to 0.84 %	Using Fluke MFC 5500A by Direct Method

Ashish Kakran
Convenor

Avijit Das
Program Director

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7.	High Resistance ^s	300 M Ω to 1 G Ω 2 G Ω to 650 G Ω	1.2 % to 3.1 % 6.97 % to 5.1 %	Using Fluke 8400, Vaiseshika Decade Box & Fixed Keonics Resistors with Connectors by Direct Method
8.	Capacitance ^s	500 pF 1 KHz 1 nF to 1 μ F 1 μ F to 100 μ F	0.58 % 1.87 % to 0.41 % 0.41 % to 1.2 %	Using Shivananda Make Fixed Capacitor/ Using Fluke Make MFC 5500A By Direct Method
9.	AC Power ^s , single phase	50 Hz 10V to 640 V, 0.1A to 10 A, UPF 10V to 600 Volt, 0.1A to 10 A, 0.2 leg to 0.2 lead PF	0.18 % 0.18 % to 3.45 %	Using Fluke MFC 5500A by Direct Method
10.	DC Power ^s	10 V to 640 V 0.1 A to 10 A	0.07 % to 0.12 %	Using Fluke MFC 5500A by Direct Method
11.	Frequency ^s	10 Hz to 1 MHz	0.08 % to 0.013 %	Using Fluke MFC 5500A by Direct Method
12.	Voltage Ratio ^s (for Transformer Ratio Meter)	1:0.8 to 1: 2021 Ratio	0.06 %	Using Eitel Make TRS 800 Transformer Ratio Standard by Direct Method

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13.	Temperature Simulation ^s (Indicators/Controllers/ Recorders)			Using Fluke MFC 5500A by Direct Method
	RTD	(-) 200 °C to 800 °C	0.34 °C	
	T/C J Type	(-) 210 °C to 1200 °C	0.33 °C	
	T/C K Type	(-) 200 °C to 1000 °C	0.47 °C	
	T/C R Type	0 to 1760 °C	0.68 °C	
T/C S Type	0 to 1760 °C	0.56 °C		
II.	MEASURE			
1.	DC Voltage ^s	1 mV to 100 mV	0.07 % to 0.0025 %	Using HP3458A 8½ DMM 6½ DMM by Direct Method
		100 mV to 1000 V	0.0025 % to 0.002 %	
2.	AC Voltage ^s	50 Hz		Using HP3458A 8½ DMM 6½ DMM by Direct Method
		10 mV to 1 V	0.049 to 0.011 %	
		1 V to 700 V	0.011 to 0.05 %	
		700 V to 1000 V	0.05 % to 0.95 %	
3.	DC Current ^s	1µA to 1mA	0.9 % to 0.005 %	Using HP 3458A 8½ DMM by Direct Method
		1mA to 100mA	0.005 % to 0.008 %	
		100mA to 1A	0.008 % to 0.02 %	
		1A to 10A	0.06 % to 0.24 %	Using Fluke 8846A 6½ DMM by Direct Method
4.	AC Current ^s	50 Hz		Using HP 3458A 8½ DMM by Direct Method
		100 µA to 100 mA	0.11 % to 0.02 %	
		100 mA to 1 A	0.02 % to 0.12 %	
		1 A to 10 A	0.14 % to 0.25 %	Using Fluke 8846A 6½ DMM by Direct Method

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5.	Resistance [§]	10 Ω to 100 Ω 100 Ω to 10 M Ω 10 M Ω to 1000 M Ω	0.018 % to 0.0036 % 0.0036 % to 0.012 % 0.012 % to 1.2 %	Using HP 3458A 8½ DMM by Direct Method
6.	Frequency [§]	20 Hz to 1 MHz	0.07 % to 0.016 %	Using HP 3458A 8½ DMM by Direct Method
7.	Capacitance [§]	500 pF to 1 mF	8.3 % to 1.8 %	Using Fluke 8846A 6½ DMM 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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