

**Laboratory**                      **Electronics Test and Development Centre, Housefed Complex,  
Central Block, 1st & 2nd Floor, Beltola-Basistha Road, Dispur, Guwahati,  
Assam**

**Accreditation Standard**   **ISO/IEC 17025:2005**

**Discipline**                      **Electro-Technical Calibration**                      **Issue Date**      **20.11.2014**

**Certificate Number**        **C-0024**                      **Valid Until**      **19.11.2016**

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Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability ( $\pm$ )	Remarks
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**SOURCE**

<b>1. DC VOLTAGE<sup>#</sup></b>	1 mV to 100 mV 100 mV to 1 V 1 V to 1000 V	0.073 % to 0.0010 % 0.0010 % to 0.0006 % 0.0006 % to 0.0010 %	Using Multifunction Calibrator Fluke 5520A/ 5720 A by Direct Method
<b>2. DC CURRENT<sup>#</sup></b>	100 $\mu$ A to 2 A 2 A to 10 A 10 A to 20 A	0.012 % to 0.006 % 0.006 % to 0.05 % 0.05 % to 0.12 %	Using Guildline Discrete Resistances/ MFC Fluke 5720A/ 5520A by Direct Method
<b>3. DC RESISTANCE<sup>\$</sup></b>	100 $\mu\Omega$ 1 m $\Omega$ to 1 $\Omega$ 1 $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 100 M $\Omega$ 100 M $\Omega$ to 1 T $\Omega$	0.011 % 0.001 % to 0.0006 % 0.0006 % to 0.0007 % 0.0007 % to 0.0025 % 0.0025 % to 0.2 %	Using Guildline 9334A Standard Resistor/ MFC Fluke 5720A/ 5520A by Direct Method
<b>DC RESISTANCE<sup>*</sup></b>	100 M $\Omega$ to 1 G $\Omega$	1.5 % to 0.002 %	Using MFC Fluke 5520A by Direct Method
<b>4. AC VOLTAGE<sup>#</sup></b>	<b>50 Hz to 20 kHz</b> 10 mV to 100 mV 100 mV to 100V 100 V to 1000 V	0.06 % to 0.015 % 0.015 % to 0.008 % 0.008 % to 0.018 %	Using MFC Fluke 5720A/ 5520A by Direct Method

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**Vishal Shukla**  
Convenor

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**Avijit Das**  
Program Manager



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<b>8. CAPACITANCE<sup>§</sup></b>	<b>1 kHz</b> 10 pF to 100 pF 100 pF to 1 $\mu$ F	0.24 % to 0.03 %	Using Ref. Standard Capacitor 1408 IET/ Decade Capacitance Box GR HACS-Z by Direct Method
<b>CAPACITANCE*</b>	<b>1 kHz</b> 10 pf to 1.1 $\mu$ F	0.06 %	Using Fluke 5520 Programmable Generator by Direct Method
<b>9. 3 <math>\phi</math> POWER/ ENERGY<sup>#</sup></b>	<b>50 Hz</b> 9 W to 45 kW 60 V to 300 V 0.05 A to 50 A 0.5 pF to UPF	0.015 % to 0.065 %	Using Rotek 8100/Zera Com 3003 Calibrators by Direct Method
<b><u>MEASURE</u></b>			
<b>1. DC VOLTAGE<sup>#</sup></b>	1 mV to 100 mV 100 mV to 10 V 10 V to 1000 V	0.015 % to 0.0010 % 0.0010 % to 0.0006 % 0.0006 % to 0.001 %	Using 8 1/2 DMM Fluke 8508/Wavetek 1271 by Direct/Comparison Method

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Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability ( $\pm$ )	Remarks
<b>2. AC VOLTAGE<sup>#</sup></b>	<b>50 Hz to 10 kHz</b>		Using 8 ½ DMM Fluke 8508/Wavetek 1271 by Direct/Comparison Method
	10 mV to 100 mV	0.061 % to 0.015 %	
	100 mV to 1000 V	0.015 % to 0.01 %	
	<b>10 kHz to 100 kHz</b>		
	10 mV to 100 mV	0.3 % to 0.12 %	
	100 mV to 100 V	0.12 % to 0.091%	
<b>3. DC CURRENT<sup>#</sup></b>	100 $\mu$ A to 200 mA	0.003 % to 0.0053 %	Using 8 ½ DMM Fluke 8508/Wavetek 1271 by Direct/Comparison Method
	200 mA to 2 A	0.0053 % to 0.022 %	
	2 A to 20 A	0.022 % to 0.05 %	
<b>4. AC CURRENT<sup>#</sup></b>	<b>50 Hz to 1 kHz</b>		Using 8 ½ DMM Fluke 8508/Wavetek 1271 by Direct/Comparison Method
	100 $\mu$ A to 200 mA	0.06 % to 0.05 %	
	200 mA to 2 A	0.05 % to 0.1 %	
	2 A to 20 A	0.1 %	
<b>5. DC RESISTANCE<sup>\$</sup></b>	100 $\mu\Omega$ to 1 $\Omega$	0.011 % to 0.001 %	Using DCC Bridge 6622 & 6520 Tera ohmmeter Guildline/8 ½ DMM Fluke 8508A by Direct/Comparison Method
	1 $\Omega$ to 1 M $\Omega$	0.001 % to 0.002 %	
	1 M $\Omega$ to 100 M $\Omega$	0.002 % to 0.01 %	
	100 M $\Omega$ to 20 G $\Omega$	0.01 % to 0.1 %	

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<b>DC RESISTANCE*</b>	100 $\mu\Omega$ to 20 G $\Omega$	0.005 % to 1.0 %	Using 8 ½ DMM Fluke 1271 by Direct/ Comparison Method
<b>6. CAPACITANCE#</b>	<b>1 kHz</b> 10 pF to 1 uF	0.2 % to 0.02 %	Using RLC Digibridge Quad Tech 1689 by Direct/Comparison Method
<b>7. INDUCTANCE#</b>	<b>1 kHz</b> 100 $\mu$ H to 11 H	0.025 % to 0.25 %	Using RLC Digibridge Quad Tech 1689 by Direct/Comparison Method
<b>8. FREQUENCY#</b>	10 Hz to 3 GHz	0.001 % to 0.00001 %	Using Fluke 6680B Programable Counter by Direct/Comparison Method

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Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability ( $\pm$ )	Remarks
9. 3 $\phi$ POWER / ENERGY <sup>#</sup>	50 Hz 9 W to 45 kW 60 V to 300 V 0.05 A to 50 A 0.5 pF to UPF	0.0250 %	Using Rotek 8100/ MSB 100/Zera Com3003 Calibrators by Direct/Comparison Method

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

<sup>\$</sup>Only in Permanent Laboratory

\*Only for Site Calibration

<sup>#</sup>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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