



# NABL

**National Accreditation Board for  
Testing and Calibration Laboratories**  
Department of Science & Technology, India

---

**CERTIFICATE OF ACCREDITATION**

---

**NORTHLAB (INDIA) PVT. LTD.**

has been assessed and accredited in accordance with the standard

**ISO/IEC 17025:2005**

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

**CHENNAI**

in the field of

**ELECTRO-TECHNICAL CALIBRATION**

Certificate Number **C-0195**

Issue Date **17/05/2010**

Valid Until **16/05/2012**

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the additional requirements of NABL.

Signed for and on behalf of NABL

  
**Alok Jain**

Convenor

  
**Anil Relia**

Director

  
**Dr T. Ramasami**

Chairman





# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

Laboratory	NorthLab (India) Pvt. Ltd., Chennai		
Accreditation Standard	ISO/IEC 17025:2005		
Field	Electro-Technical Calibration	Issue Date	17.05.2010
Certificate Number	C-0195	Valid Until	16.05.2012
Last Amended on	-	Page	1 of 15

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

### AT LABORATORY

#### SOURCE

1. DC VOLTAGE	0.1 mV to 1 mV	3.4% to 0.35 %	Using MFC 3010 / MFC5700 A/ 3458. by Direct / Comparison Method	
	1 mV to 100 mV	0.35% to 0.002 %		
	0.1 V to 22 V	0.002% to 0.009 %		
	22 V to 1000 V	0.009% to 0.0012 %		
2. AC VOLTAGE	<b>40 Hz to 20 kHz</b>		Using MFC 5700A by Direct Method	
	1 mV to 2.2 mV	2.7% to 0.3 %		
	2.2 mV to 22 mV	0.3% to 0.065 %		
	22 mV to 220 mV	0.065% to 0.03 %		
	220 mV to 220 V	0.065% to 0.02 %		
	<b>20 kHz to 100 kHz</b>			Using MFC 5700A by Direct Method
	1 mV to 220 mV	1% to 0.15 %		
	220 mV to 100 V	0.15% to 0.07 %		
	<b>100 kHz to 1 MHz</b>			Using MFC 5700A by Direct Method
	1 mV to 220 mV	3% to 0.5 %		
	220 mV to 10 V	0.7% to 0.45 %		
	<b>40 Hz to 1 kHz</b>			Using MFC 5700A by Direct Method
220 V to 1000 V	0.05% to 0.015 %			
3. DC CURRENT	1 $\mu$ A to 20 $\mu$ A	1.2% to 0.085 %	Using MFC 3010 / MFC 5700A by Direct Method	
	20 $\mu$ A to 220 $\mu$ A	0.05% to 0.015 %		
	220 $\mu$ A to 220 mA	0.015% to 0.08 %		
	220 mA to 2 A	0.08% to 0.02 %		
	2 A to 20 A	0.055% to 0.43 %		



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	2 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
DC CURRENT	20 A to 1500 A	0.43% to 1.5 %	Using MFC 3010 with current coil by Direct Method
4. AC CURRENT	<b>40 Hz to 1 kHz</b> 0.1 mA to 220 mA 220 mA to 1 A	0.04% to 0.025 % 0.025 %	Using MFC 5700A by Direct Method
	<b>1 kHz to 5 kHz</b> 0.1 mA to 220 mA 220 mA to 1 A	0.35% to 0.15 % 0.15% to 0.25 %	"
	<b>5 kHz to 10 kHz</b> 0.1 mA to 220 mA 220 mA to 1 A	0.75% to 0.3 % 0.3% to 1.3 %	"
	<b>45 Hz to 3 kHz</b> 1 A to 20 A	0.36% to 0.15 %	Using MFC 3010 by Direct Method
	<b>50 Hz</b> 20 A to 1000 A	0.15% to 0.4%	Using C233B / MFC 3010 with current coil by Direct Method
	1000 A to 1500 A	0.4% to 1.5 %	Using MFC 3010 with current coil by Direct Method
5. DC RESISTANCE (DISCRETE VALUES)	i) 0.001 $\Omega$	0.2 %	Using Standard Resistor by Direct Method
	ii) 0.1 $\Omega$	5.8 %	Using MFC 3010 by Direct Method



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

Laboratory	NorthLab (India) Pvt. Ltd., Chennai		
Accreditation Standard	ISO/IEC 17025:2005		
Field	Electro-Technical Calibration	Issue Date	17.05.2010
Certificate Number	C-0195	Valid Until	16.05.2012
Last Amended on	-	Page	3 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks		
DC RESISTANCE (DISCRETE VALUES)	iii) 1 $\Omega$ , 1.9 $\Omega$	0.015 %	Using MFC 5700A by Direct Method		
	iv) 10 $\Omega$ , 19 $\Omega$	0.008 %			
	v) 100 $\Omega$ , 190 $\Omega$	0.0022 %			
	vi) 1 $\Omega$ , 1.9 $\Omega$ , 10 $\Omega$ , 19 $\Omega$ , 100 $\Omega$ , 190k $\Omega$	0.0017 %			
	vii) 1 $\Omega$ , 1.9M $\Omega$	0.0024 %			
	viii) 10M $\Omega$ , 19M $\Omega$	0.0065 %			
	ix) 100M $\Omega$	0.015 %			
	x) 1G $\Omega$	0.85 %		Using VRS-100-10-10k by Direct Method	
	xi) 10G $\Omega$	0.6 %			
	xii) 100G $\Omega$	1.2 %			
	xiii) 1T $\Omega$	3.2 %			
	6. CAPACITANCE	1 kHz 100 pF to 10 $\mu$ F		1.6 %	Using Decade Capacitance Box by Direct Method
	CAPACITANCE (DISCRETE VALUES)	1 kHz			Using MFC 3010 by Direct Method
i) 1nF, 10nF, 20nF, 50nF, 100nF		0.35 %			
ii) 1 $\mu$ F iii) 10 $\mu$ F		0.45 % 0.65 %			
7 INDUCTANCE	1 kHz 0.1 mH to 10 H	1.2 %	Using Decade Inductance Box by Direct Method		

*Paul*



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

Laboratory	NorthLab (India) Pvt. Ltd., Chennai		
Accreditation Standard	ISO/IEC 17025:2005		
Field	Electro-Technical Calibration	Issue Date	17.05.2010
Certificate Number	C-0195	Valid Until	16.05.2012
Last Amended on	-	Page	5 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
<b>12. THREE PHASE AC POWER at 50 Hz, UPF</b> 40V to 320V, 0.1 A to 30 A	0.3 kW to 36 kW	1% to 0.17%	Using Power Calibrator, C233B by Direct Method
<b>13 SINGLE PHASE AC ENERGY @ 50 Hz, UPF</b> 1V to 1000V, 0.3A to 20A 1000V, 20A to 1kA	0.3Wh to 20kWh 20kWh to 1MWh	0.6% to 0.2 % 0.4% to 2 %	Using MFC 3010 by Direct Method Using MFC 3010 With Coil by Direct Method
<b>14 THREE PHASE AC ENERGY @ 50 Hz, UPF</b> 40V to 320V, 0.1A to 30A	75 Wh to 90 kWh	1% to 0.17 %	Using C233B by Direct Method
<b>15. FREQUENCY</b>	1 Hz to 18 GHz	0.001 Hz	Using MPC 3010, 53132A & 69059A
<b>16. RF POWER</b>	100 kHz to 1 GHz 1 nW to 100 mW	9.3% to 4.8%	Using HP 438A, HP 8482A, 8901B, E4406A, 69059A, 8494B & 8495B



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	6 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
17. RF ATTENUATION	10 kHz to 1 GHz 1 dB to 70 dB	0.43 to 2.4 dB	Using HP 8482A, 8901B, E4406A, 69059A, HP 8494B & 8495B
18. TOTAL HARMONIC DISTORTION (THD)	0.02 to 20 kHz -95 dB to 0 dB	1.2 dB	Using HP 8903B
19. TEMPERATURE CONTROLLERS/INDICATORS ( BY ELECTRICAL SIMULATION EMTHOD)			
a) RTD CONTROLLERS / INDICATORS	-100°C to 800°C	0.07°C to 0.025°C	Using MFC 3010
b) THERMOCOUPLES			
i) TYPE K / J	-200°C to 1370°C	0.55°C to 0.35°C	Using MFC 3010
ii) TYPE R / S	100°C to 1750°C	0.84°C to 2.2°C	
iii) TYPE T	-200°C to 400°C	0.65°C to 0.8°C	
iv) TYPE N	-250°C to 1300°C	0.7°C	

### MEASURE

20. DC VOLTAGE	0.1 mV to 1 mV	2.65% to 0.25%	Using MFC 3010 by Comparison Method
	1 mV to 100 mV	0.06% to 0.002 %	Using DMM 3458A by Direct Method
	0.1 V to 1000 V	0.002% to 0.0015%	
	1 kV to 10 kV	2.5 %	Using HV probe 80k6 & 80k40 with 189 by Direct Method



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	7 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks	
<b>21. AC VOLTAGE</b>	<b>20Hz to 40 Hz</b>			
	1 mV to 100 mV	0.8% to 0.07 %	Using DMM 3458A by Direct Method	
	0.1 V to 10 V	0.07% to 0.02 %		
	10 V to 700 V	0.02% to 0.06 %		
	<b>40 Hz to 1 kHz</b>			
	1 mV to 10 mV	0.75% to 0.4 %	Using DMM 3458A by Direct Method	
	10mV to 10 V	0.4% to 0.012 %		
	10 V to 700 V	0.012% to 0.05 %		
	<b>45 Hz to 1 kHz</b>			Using DMM 189 by Direct Method
	700 V to 1000 V	1.1% to 1.0 %		
	<b>1 kHz to 100 kHz</b>			Using DMM 3458A by Direct Method
	1mV to 1 V	1.7% to 1.0 %		
	1 V to 100 V	0.35%		
	<b>100 kHz to 1 MHz</b>			Using DMM 3458A by Direct Method
10 V to 100 V	0.65%			
<b>50 Hz</b>			Using HV probe 80k6 & 80k40 with 189 by Direct Method	
1 kV to 5 kV	6.8% to 1.8 %			
<b>22. DC CURRENT</b>	1.9 nA to 10 $\mu$ A	2.7% to 0.8 %	Using Picoamp Meter DMM 3458A by Direct Method	
	10 $\mu$ A to 100 mA	0.8% to 0.025 %		
	100 mA to 1 A	0.025% to 0.02 %		
	1 A to 10 A	0.03% to 0.25 %	Using Power Meter, WT210 by Direct Method	
	10 A to 20 A	0.25% to 0.7 %		
	20 A to 100 A	0.7 %		
			Using Shunt 200A & 34401A by V/I Method	

*[Handwritten Signature]*



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

Laboratory	NorthLab (India) Pvt. Ltd., Chennai		
Accreditation Standard	ISO/IEC 17025:2005		
Field	Electro-Technical Calibration	Issue Date	17.05.2010
Certificate Number	C-0195	Valid Until	16.05.2012
Last Amended on	-	Page	8 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks	
23. AC CURRENT	20 Hz to 100 Hz			
	10 $\mu$ A to 100 $\mu$ A	1.2% to 0.25 %	Using DMM 3458A by Direct Method	
	100 $\mu$ A to 100 mA	0.25% to 0.5 %		
	100 mA to 1 A	0.5% to 0.15 %		
	100 Hz to 10 kHz			
	0.1 mA to 100mA	0.3% to 0.08 %	Using DMM 3458A by Direct Method	
	0.1 A to 1 A	0.08% to 0.4 %		
	50 Hz			
	1 A to 20 A	0.35% to 0.6 %	Using Power Meter, WT210 by Direct Method	
	50 Hz			
	20 A to 100 A	0.6% to 1.5 %	Using Shunt 200A & DMM 34401A by V/I Method	
	24. DC RESISTANCE	1 $\Omega$ to 100 $\Omega$	0.0085% to 0.0025 %	Using DMM 3458A by Direct/Comparison Method
100 $\Omega$ to 100 k $\Omega$		0.0025% to 0.002 %		
100 k $\Omega$ to 1 M $\Omega$		0.002% to 0.003 %		
1 M $\Omega$ to 10 M $\Omega$		0.003% to 0.009 %		
10 M $\Omega$ to 100M $\Omega$		0.009% to 0.07 %		
100 M $\Omega$ to 1 G $\Omega$		0.07% to 0.6 %		
25. CAPACITANCE	20Hz, 100Hz, 1kHz, 10kHz, 100kHz, 1 MHz			
	10pF to 1 $\mu$ F	0.3 %	Using LCR Meter 4284A by Direct / Comparison Method	

  
Convenor



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	9 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
26. INDUCTANCE	100Hz, 1 kHz 1 mH to 1 H	1.2% to 0.20 %	Using LCR Meter 4284A by Direct/Comparison Method
27. AC RESISTANCE	20Hz, 100Hz, 1kHz, 10kHz, 100kHz, 1MHz 100 $\Omega$ to 100 k $\Omega$	0.3% to 0.06 %	Using LCR Meter 4284A by Direct Method
28. FREQUENCY	1 Hz to 18 GHz	0.001 Hz to 40 Hz	Using DMM 3458A, 53132A, MS2667C
29. RF POWER	10 kHz to 1 GHz 1 pW to 100 mW	9.3% to 4.8%	Using HP 8901B, 8482A, E4406A
30. RF ATTENUATION	10 kHz to 1 GHz 1 dB to 70 dB	0.43 dB to 2.4 dB	Using HP 8901B, 8482A, E4406A, 69059A
31. MODULATION			
a. Amplitude Modulation Carrier Frequency = 150 kHz to 1.3 GHz Rate = 20 Hz to 200 kHz	Modulation Depth 5% to 99 %	1.4 % to 3.4 %	Using HP 8901B
Demodulated Output Distortion For Modulation Depth <95% 20 Hz to 100 kHz	THD -99.99dB to 0 dB	1.2 dB to 2.4 dB	Using HP 8901B & HP 8903B



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	10 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
<b>b. Frequency Modulation</b> Carrier Frequency= 150kHz to 1.3 GHz Rate = 20Hz to 100kHz	Freq.Deviation 10 kHz to 400 kHz	1.4 % to 5.8 %	Using HP 8901B
<b>Demodulated Output Distortion</b> For Deviation<100 kHz 20 Hz to 100 kHz	THD -99.99dB to 0 dB	1.2 dB to 2.4 dB	Using HP 8901B & 8903B
<b>c. Phase Modulation</b> Carrier Frequency= 150kHz to 1.3 GHz Rate = 200 Hz to 20 kHz	Phase Deviation 10 rad to 400 rad	4.8 %	Using HP 8901B
<b>Demodulated Output Distortion</b> For Deviation<400 rad. 20 Hz to 100 kHz	THD -99.99 dB to 0 dB	1.2 dB to 2.4 dB	Using HP 8901B & 8903B
<b>32. Time Interval</b>	1 s to 99999 s	0.006 s to 0.007 s	Using Universal Counter, 53132A
<b>33. TEMPERATURE CALIBRATORS (BY ELECTRICAL SIMULATION METHOD)</b>			
<b>a) RTD CALIBRATOR</b>	-200°C to 800 °C	0.45°C	Using MFC 725 by Direct Method
<b>b) THERMOCOUPLES</b>			
i) TYPE K, J	-200°C to 1370 °C	0.45°C to 1.05°C	Using MFC 725 by Direct Method
ii) TYPE R,S	100°C to 1750 °C	0.84°C to 2.0°C	
iii) TYPE T	-200°C to 400°C	1.2°C	
iv) TYPE N,E	-200°C to 1300°C	0.7°C	

*[Handwritten signature]*



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	11 of 15

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

### AT SITE

#### SOURCE

34. DC VOLTAGE	0.1 mV to 10 mV	3.0% to 0.03 %	Using MFC 3010 by Direct Method
	10 mV to 200 mV	0.03% to 0.003 %	
	200 mV to 1000 V	0.003% to 0.002 %	
35. AC VOLTAGE	<b>0.05 kHz to 1kHz</b>		Using MFC 3010 by Direct Method
	10 mV to 20 mV	1.2% to 0.6 %	
	20 mV to 200 mV	0.6% to 0.04 %	
	<b>0.05 kHz to 1kHz</b>		Using MFC 3010 by Direct Method
	0.2 V to 2 V	0.04% to 0.06 %	
	2 V to 700 V	0.06% to 0.035 %	
36. DC CURRENT	<b>50 Hz</b>		Using MFC 3010 with Current Coil by Direct Method
	700 V to 1000 V	0.035% to 0.05 %	
	100 $\mu$ A to 200 $\mu$ A	0.12% to 0.02 %	
	200 $\mu$ A to 2 mA	0.02% to 0.01 %	
	2 mA to 200 mA	0.01% to 0.013 %	
	200 mA to 2 A	0.013% to 0.025 %	
	2 A to 20 A	0.025% to 0.04 %	
20 A to 30 A	0.04% to 0.4 %		
30 A to 1500 A	0.4% to 1.5 %		



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	<b>17.05.2010</b>
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	<b>16.05.2012</b>
<b>Last Amended on</b>	-	<b>Page</b>	<b>12 of 15</b>

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
37. AC CURRENT	0.045 kHz to 1 kHz		
	20 $\mu$ A to 200 $\mu$ A	0.8% to 0.2 %	Using MFC 3010 by Direct Method
200 $\mu$ A to 20 mA	0.2% to 0.10 %		
20 mA to 30 A	0.10% to 0.15 %		
37. AC CURRENT	50 Hz		
	30 A to 1500 A	0.15% to 1.5 %	Using MFC 3010 with Current Coil by Direct Method
38. DC RESISTANCE	0.01 M $\Omega$ to 100 M $\Omega$	0.24 %	Using HRRS
	100 M $\Omega$ to 1000 M $\Omega$	0.24% to 0.5 %	
DC RESISTANCE (DISCRETE VALUES)	0.001 $\Omega$	0.2 %	Using Standard Resistor & MFC 3010
	0.1 $\Omega$	6.0 %	
	1 $\Omega$	0.6 %	
	10 $\Omega$	0.07 %	
	100 $\Omega$	0.015 %	
	1 k $\Omega$ , 10 k $\Omega$ , 100 k $\Omega$	0.01 %	
39. CAPACITANCE	1 kHz		
	100 pF to 10 $\mu$ F	1.6 %	Using Decade Capacitance Box
40. INDUCTANCE	1 kHz		
	0.1 H to 10 H	1.2% to 0.2%	Using Decade Inductance Box by Direct Method



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	13 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
<b>41. TEMPERATURE CONTROLLERS / INDICATORS (BY ELECTRICAL SIMULATION METHOD)</b>			
a) RTD CONTROLLERS	- 100°C to 800°C	0.07 °C to 0.025 °C	Using MPC 3010 by Direct Method
b) THERMOCOUPLES			
i) TYPE K, J	-200°C to 1372 °C	0.55 °C to 0.35 °C	Using MPC 3010 by Direct method
ii) TYPE R,S	100°C to 1750 °C	0.84 °C to 2.2 °C	
iii) TYPE T	-200°C to 400 °C	0.65 °C to 0.8 °C	
iv) TYPE N,E	-200°C to 1300 °C	0.7 °C	
<b><u>MEASURE</u></b>			
<b>42. DC VOLTAGE</b>	1 mV to 100 mV 0.1 V to 1 V 1 V to 1000 V 1 kV to 10 kV	0.3% to 0.06 % 0.06% to 0.0015 % 0.0015 % 2.5 %	Using 8.5 DMM 3458  Using HV probe 80k6 & 80k40 with 189
<b>43. AC VOLTAGE</b>	<b>0.05kHz to 1 kHz</b> 0.01 V to 10 V 10 V to 700 V  <b>0.045 kHz to 1 kHz</b> 700 V to 1000 V  <b>50 Hz</b> 1 kV to 28 kV	 0.045% to 0.05 % 0.05 %  1.1 %  6.8 %	Using 8.5 DMM3458 by Direct Method  Using DMM 189 by Direct Method  Using HV probe 80k6 & 80k40 with 189 by Direct Method

Convenor



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

<b>Laboratory</b>	NorthLab (India) Pvt. Ltd., Chennai		
<b>Accreditation Standard</b>	ISO/IEC 17025:2005		
<b>Field</b>	Electro-Technical Calibration	<b>Issue Date</b>	17.05.2010
<b>Certificate Number</b>	C-0195	<b>Valid Until</b>	16.05.2012
<b>Last Amended on</b>	-	<b>Page</b>	14 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability (±)	Remarks
<b>44. DC CURRENT</b>	0.1 mA to 100 mA	0.004% to 0.025 %	Using 8.5 DMM 3458 by Direct Method
	100 mA to 1 A	0.025 %	
	1 A to 20 A	0.025% to 0.7 %	Using Power Meter, WT210 by Direct Method
	20 A to 100 A	0.7 %	Using Shunt CS200A & 34401A by Direct Method
<b>45. AC CURRENT</b>	<b>20Hz to 1kHz</b>		Using 8.5 DMM 3458 by Direct / Comparison Method
	10 µA to 100 µA	1.2% to 0.4 %	
	100 µA to 100 mA	0.4% to 0.1 %	
	100 mA to 1 A	0.1 %	
	<b>0.045 kHz to 1 kHz</b>		Using Power Meter, WT210 by Direct / Comparison Method
	1 A to 20 A	0.35% to 0.6 %	
<b>50 Hz</b>		Using Shunt 200A & 34401A by Direct / Comparison Method	
20 A to 100 A	0.6 %		
<b>46. DC RESISTANCE</b>	10 Ω to 100 Ω	0.007% to 0.002 %	Using 8.5 DMM 3458 by Direct / Comparison Method
	100 Ω to 100 kΩ	0.002 %	
	100 kΩ to 1 MΩ	0.002% to 0.03 %	
	1 MΩ to 10 MΩ	0.03% to 0.07 %	
	10 MΩ to 1 GΩ	0.07% to 0.6 %	
<b>47. FREQUENCY</b>	1 Hz to 10 MHz	0.06 % to 0.015 %	Using 8.5 DMM 3458 by Direct Method



# NABL

**Department of Science & Technology, India**

## SCOPE OF ACCREDITATION

Laboratory	NorthLab (India) Pvt. Ltd., Chennai		
Accreditation Standard	ISO/IEC 17025:2005		
Field	Electro-Technical Calibration	Issue Date	17.05.2010
Certificate Number	C-0195	Valid Until	16.05.2012
Last Amended on	-	Page	15 of 15

Quantity Measured / Instrument	Range	* Calibration Measurement Capability ( $\pm$ )	Remarks
<b>48. TEMPERATURE CALIBRATORS (BY ELECTRICAL SIMULATION METHOD)</b>			
a) RTD CONTROLLERS	-200 °C to 800 °C	0.45 °C	Using MFC 725 by Direct Method
<b>b) THERMOCOUPLES</b>			
i) TYPE K, J	-200 °C to 1372°C	0.45 °C to 1.05 °C	
ii) TYPE R,S	100 °C to 1750 °C	0.84 °C to 2.0 °C	
iii) TYPE T	-200 °C to 400 °C	1.2 °C	
iv) TYPE N,E	-200 °C to 1300 °C	0.7 °C	
<b>49. TIME INTERVAL</b>	3 s to 60 min	0.4 %	

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

*Aw*