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|---|---|---|---|
| **Laboratory** | **Cali-Labs Pvt. Ltd., HX-21, E-7, Arera Colony, Bhopal, Madhya Pradesh** | | |
| **Accreditation Standard** | **ISO/IEC 17025:2005** | | |
| **Discipline** | **Electro-Technical Calibration** | **Issue Date** | **30.06.2015** |
| **Certificate Number** | **C-0106** | **Valid Until** | **29.06.2017** |
| **Last Amended on** | **-** | **Page** | **1 of 3** |

| | Quantity Measured/ Instrument | Range / Frequency | *Calibration Measurement Capability (±) | Remarks |
|---|---|---|---|---|
| | **SOURCE** | | | |
| **1.** | **DC VOLTAGE**♯ | 1 mV to 10 mV<br>10 mV to 1V<br>1 V to 1000 V | 1.0 % to 0.1 %<br>0.1 % to 0.015 %<br>0.015 % to 0.01 % | Using Multifunction calibrator 5500 A Fluke by Direct Method |
| **2.** | **DC CURRENT**♯ | 10 μA to 100 μA<br>100 μA to 100 mA<br>100 mA to 10A | 0.6 % to 0.07 %<br>0.07 % to 0.02 %<br>0.02 % to 0.09 % | Using Multifunction calibrator 5500 A Fluke by Direct Method |
| **3.** | **RESISTANCE**♯ | 1 mΩ to 10 Ω | 1.35 % to 2.4 % | Using Shunts & Decade Box Maxwell, Model –DR-8 by Direct Method |
| | | 10 Ω to 100 kΩ<br>100 kΩ to 10 MΩ<br>10 MΩ to 100 MΩ<br>100 MΩ to 300 MΩ | 0.2 % to 0.02 %<br>0.02 % to 0.08 %<br>0.08 % to 0.6 %<br>0.6 % to 1.0 % | Using Multifunction calibrator 5500 A Fluke by Direct Method |
| | | 300 MΩ to 100 GΩ | 3.2 % | Using Meg Ohm Box Maxwell, Model DB 231 for calibration of Meggers upto 5kV by Direct Method |
| **4.** | **AC VOLTAGE**♯ | **50 Hz to 1 kHz**<br>10 mV to 10 V<br>10 V to 1000V | <br>0.45 % to 0.06 %<br>0.06 % to 0.1 % | <br>Using Multifunction calibrator 5500 A Fluke by Direct Method |
| **5.** | **AC CURRENT**♯ | **50 Hz to 1 kHz**<br>100 μA to 1 A<br>1 A to 10 A | <br>0.45 % to 0.16 %<br>0.16 % to 0.15 % | <br>Using Multifunction calibrator 5500 A Fluke by Direct Method |

**Naveen Jangra**
**Convenor**

**Avijit Das**
**Program Manager**

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| **6.** | **AC POWER**[#] | **50 Hz** | | |
| | | 0.5 W to 6 kW @ UPF to 0.2 PF | 0.3 % to 2.0 % | Using Multifunction calibrator 5500 A Fluke by Direct Method |
| **7.** | **FREQUENCY**[#] | 50 Hz to 100 kHz | 0.015 % to 0.065 % | Using Multifunction calibrator 5500 A Fluke by Direct Method |
| **8.** | **CAPACITANCE**[#] | **1 kHz** | | Multifunction calibrator 5500 A Fluke by Direct Method |
| | | 0.5 nF to 100 µF | 3.0 % to 0.7 % | |
| | | 100 µF to 300 µF | 0.7 % to 1.2 % | |
| **9.** | **TEMPERATURE SIMULATION**[#] | | | |
| | **Thermocouples** | | | |
| | **S Type** | 50 ºC to 1750 ºC | 0.75 ºC | Using Multifunction Calibrator 5500 A Fluke And for Site Radix Calibrator by Simulation Method |
| | **R Type** | 50 ºC to 1750 ºC | 0.75 ºC | |
| | **K Type** | (-) 200 ºC to 1350 ºC | 0.75 ºC | |
| | **J Type** | (-) 200 ºC to 750 ºC | 0.75 ºC | |
| | **B Type** | 50 ºC to 1750 ºC | 0.75 ºC | |
| | **N Type** | 50 ºC to 1750 ºC | 0.75 ºC | |
| | **T Type** | (-) 200 ºC to 400 ºC | 0.75 ºC | |
| | **E Type** | (-) 200 ºC to 1000 ºC | 0.75 ºC | |
| | **RTD** | (-) 200 ºC to 800 ºC | 0.35 ºC | |
| | **MEASURE** | | | |
| **1.** | **DC VOLTAGE**[$] | 1 mV to 200 mV | 1.00 % to 0.045 % | Using 6½ DMM Fluke 8846A / Fluke 5500 by Direct/Comparison Method |
| | | 200 mV to 1000 V | 0.045 % to 0.04 % | |
| **2.** | **DC CURRENT**[$] | 10 µA to 10 A | 0.7 % to 0.2 % | Using 6½ DMM Fluke 8846A by Direct Method |
| **3.** | **RESISTANCE**[$] | 10 Ω to 200 kΩ | 0.7 % to 0.2 % | Using 6½ DMM Fluke 8846A by Direct Method |
| | | 200 kΩ to 180 MΩ | 0.2 % to 2.4 % | |
| | | 180 MΩ to 1 GΩ | 2.4 % | |

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| | Quantity Measured/ Instrument | Range / Frequency | *Calibration Measurement Capability (±) | Remarks |
|---|---|---|---|---|
| **4.** | **AC VOLTAGE[$]** | **50 Hz**<br>10 mV to 200 mV<br>0.2 V to 1000 V | <br>1.5 % to 0.5 %<br>0.5 % to 0.11 % | Using 6 ½ DMM Fluke 8846A by Direct Method |
| **5.** | **AC CURRENT[$]** | **50 Hz**<br>100 µA to 100 mA<br>100 mA to 10 A | <br>2.0 % to 0.6 %<br>0.6 % to 0.7 % | Using 6 ½ DMM Fluke 8846A by Direct Method |
| **6.** | **LOW RESISTANCE[#]** | 1 mΩ to 10 Ω | 0.6 % | Using Micro Ohm Meter to Motwane, Model to L2065 by Direct Method |
| **7.** | **FREQUENCY[$]** | 50 Hz to 1MHz | 0.8 % to 0.1 % | Using 6½ DMM Fluke 8846A by Direct Method |
| **8.** | **AC HIGH VOLTAGE[$]** | **50 Hz**<br>1 kV to 5 kV AC | <br>3.5 % to 2.4 % | Using Motwane HV Probe with DMM motwane by Comparison Method |
| | **AC HIGH VOLTAGE[♣]** | **50 Hz**<br>1 kV to 20 kV AC | <br>3.5 % | Using Motwane HV Probe with DMM motwane by Comparison Method |
| **9.** | **DC HIGH VOLTAGE[#]** | 1 kV to 5 kV | 2.0 % | Using Motwane HV Probe with DMM motwane by Comparison Method |
| **10.** | **DIGITAL STOP WATCH[#]** | 10 s to 59 minute | 1.5 s to 2 s | Stop Watch by Comparison Method |

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

**[$]Only in Permanent Laboratory**

**[♣]Only for Site Calibration**

**[#] The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.**

**Naveen Jangra**
**Convenor**

**Avijit Das**
**Program Manager**