Laboratory	**Sai-Meena Calibration Laboratory Pvt. Ltd., Shop No. 52, Sector-8A,Yash Paradise, Airoli, Navi Mumbai, Maharashtra Location 1- Shop No. 52, Sector-8A,Yash Paradise, Airoli, Navi Mumbai Location 2- Unit No. 113, Ashok Service Indl. Estate, Gokul Nagar, Thane (W)**		
Accreditation Standard	**ISO/IEC 17025:2005**		
Discipline	**Electro-technical Calibration**	**Issue Date**	**01.12.2014**
Certificate Number	**C- 1167**	**Valid Until**	**05.08.2016**
Last Amended on	**21.12.2015**	**Page**	**1 of 5**

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
LOCATION 2			
I. SOURCE			
1. DC VOLTAGE#	1 mV to 2 V 2 V to 20 V 20 V to 1000 V	0.5 % to 0.0041% 0.041 % 0.041 %	Using 5½ Multifunction Calibrator with 6½ DMM by Comparison Method
2. DC CURRENT#	10 µA to 200 µA 200 µA to 200 mA 200 mA to 1 A 1 A to 10 A 10 A to 1000 A	0.49 % to 0.10 % 0.10 % 0.10% to 0.093% 0.093 % to 0.213 % 1.1 %	Using 5½ Multifunction Calibrator with 6½ DMM by Comparison Method Using 5½ MFC & Current Coil with 6½ DMM by Comparison Method
3. AC VOLTAGE#	**50 Hz to 1 kHz** 1 mV to 100mV 100 mV to 10 V 10 V to 1000 V	 4.7 % to 0.13 % 0.13 % to 0.11 % 0.11 %	 Using 5½ Multifunction Calibrator with 6½ DMM by Comparison Method
4. AC CURRENT#	**50 Hz** 10 µA to 200 µA 200 µA to 200 mA 200 mA to 1 A 1 A to 10 A	 0.89 % to 0.23% 0.23 % to 0.19% 0.19 % to 0.20 % 0.20 % to 0.27 %	 Using 5½ Multifunction Calibrator with 6½ DMM by Comparison Method
5. CAPACITANCE#	**1 kHz** 1 nF to 1000 nF 1000 nF to 100 µF	 3 % to 2.89 % 2.89 %	 Using Decade Capacitance Box by Direct Method
6. INDUCTANCE#	**1 kHz** 100 µH to 1000 mH	 2.93 %	 Using Decade Inductance Box by Direct Method

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
LOCATION 2			
7. FREQUENCY / PERIOD#	**25 ns to 100 ms**		
	0.5 Hz to 10 kHz	1.4 % to 0.0021 %	Using Function Generator by Direct Method
	10 kHz to 1 MHz	0.0021 % to 0.006%	
	1 MHz to 10 MHz	0.006 % to 0.0022%	
	10 MHz to 160 MHz	0.0022 % to 0.00201%	
8. RESISTANCE#	1 mΩ	0.6 %	Using 4W Standard Resistor & Decade Resistance Box by Direct Method
	10 mΩ	0.13 %	
	100 mΩ	0.13 %	
	1 Ω	0.13 %	
	1 Ω to 1 kΩ	1.4 % to 0.12 %	Using Decade Resistance Box by Direct Method
	1 kΩ to 1 MΩ	0.12 %	
	1 MΩ to 100 MΩ	0.12 % to 1.2 %	
	100 MΩ to 1000 MΩ	1.2 %	
	1 GΩ	2.3 %	Using High Resistance Jig and Fix Discrete Value Resistor by Direct Method
	2 GΩ	2.3 %	
	5 GΩ	2.3 %	
	7 GΩ	2.3 %	
	10 GΩ	6.2 %	
9. TEMPERATURE SIMULATION# (Indicator / Controller / Recorder / Universal Calibrator/ Transmitter DTI Thermocouple)			
RTD / PT–100	(-) 200 °C to 800 °C	0.35 °C to 0.78 °C	Using Handheld Multifunction Calibrator by Simulation Method
T–Type Thermocouple	(-) 250 °C to 400 °C	1.5 °C	
N–Type Thermocouple	(-) 200 °C to 1300 °C	0.5 °C	
U–Type Thermocouple	(-) 200 °C to 600 °C	0.76 °C	
E–Type Thermocouple	(-) 200 °C to 1000 °C	0.35 °C	
J–Type Thermocouple	(-) 210 °C to 1200 °C	1.183 °C	
K–Type Thermocouple	(-) 200 °C to 1350 °C	1.267 °C	
C–Type Thermocouple	0 °C to 2316 °C	2.7 °C	
B–Type Thermocouple	600 °C to 1000 °C	1.8 °C	
R–Type Thermocouple	0 °C to 1767 °C	1.6 °C	
S–Type Thermocouple	0 °C to 1767 °C	1.6 °C	

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
LOCATION 2			
11. AC ACTIVE POWER[#] (UPF, 3–Phase)	**50 Hz** 50V to 300 V 0.2 A to 6 A	1.161%	Using 3ϕ Power/Energy Meter Calibrator with 3ϕ Load Manager by comparison method
12. OSCILLOSCOPE[#]			
Amplitude (Sine Wave / Square Wave)	3 mV to 100 mV 100 mV to 10 V	7.18 % to 1.1 % 1.1 % to 1.6 %	Using 2 Channel Arbitrary Waveform and Function Generator by Direct Method
Time Base	25 ns to 100 ms	0.02 % to 0.12 %	
Bandwidth	50 kHz to 150 MHz	6.94 %	
II. MEASURE			
1. DC VOLTAGE[#]	1 mV to 2 V 2 V to 20 V 20 V to 1000 V	0.5 % – 0.0065 % 0.0065 % to 0.01 % 0.01 % to 0.009 %	Using Fluke 6½ DMM by Direct Method
	1 kV to 40 kV	2.0%	Using HV Probe with 6½ DMM
2. DC CURRENT[#]	10 µA to 200 µA 200 µA to 200 mA 200 mA to 1 A 1 A to 10 A	0.37 % to 0.088 % 0.088 % to 0.057 % 0.057 % to 0.13 % 0.13 % to 0.20 %	Using Fluke 6½ DMM by Direct Method
	10 A to 400 A	1.0%	Using Shunt with 6½ DMM Comparison Method
3. AC VOLTAGE[#]	**50 Hz to 1 kHz** 1 mV to 100 mV 100 mV to 10 V 10 V to 1000 V	5.4 % to 0.13 % 0.13 % to 0.11 % 0.11 %	Using Fluke 6½ DMM by Direct Method
	1 kV to 28 kV (RMS)	2.4%	Using HV Probe with DMM

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
LOCATION 2			
4. AC CURRENT#	**50 Hz**		
	10 µA to 200 µA	2.06 % to 0.39 %	Using Fluke 6½ DMM by Direct Method
	200 µA to 200 mA	0.39 % to 0.35 %	
	200 mA to 1 A	0.35 % to 0.2 %	
	1 A to 10 A	0.2 % to 0.27 %	
	10A to 1200A	1.1%	Using Shunt with 6½ DMM by Comparison Method
5. RESISTANCE#	10 µΩ to 1 Ω	0.8 %	Using 4W Standard Resistor & two 6½ DMM by V/I Method
	1 Ω to 1 kΩ	0.4 % to 0.1 %	Using Fluke 6½ DMM by Direct Method
	1 kΩ to 1 MΩ	0.1 % to 0.1 %	
	1 MΩ to 100 MΩ	0.1 % to 1.2 %	
	100 MΩ to 1000 MΩ	1.2 % to 2.3 %	
6. CAPACITANCE#	**1 kHz**		Using LCR Meter by Direct Method
	1 nF to 10 µF	0.4 % to 0.7%	
7. INDUCTANCE#	**1 kHz**		Using LCR Meter by Direct Method
	100 µH to 1 H	0.5 %	
8. TIME#	5 s to 24 hour	0.4 s to 19 s	Using Digital Timer by Comparison Method
9. FREQUENCY#	5 Hz to **1**00kHz	8 ppm	Using Frequency Counter Direct Method
	100 kHz to 160 MHz	8 ppm to 6 ppm	

Laboratory	**Sai-Meena Calibration Laboratory Pvt. Ltd., Shop No. 52, Sector-8A,Yash Paradise, Airoli, Navi Mumbai, Maharashtra Location 1- Shop No. 52, Sector-8A,Yash Paradise, Airoli, Navi Mumbai Location 2- Unit No. 113, Ashok Service Indl. Estate, Gokul Nagar, Thane (W)**		
Accreditation Standard	**ISO/IEC 17025:2005**		
Discipline	**Electro-technical Calibration**	**Issue Date**	**01.12.2014**
Certificate Number	**C- 1167**	**Valid Until**	**05.08.2016**
Last Amended on	**21.12.2015**	**Page**	**5 of 5**

Quantity Measured / Instrument	Range/ Frequency	* Calibration Measurement Capability (±)	Remarks
LOCATION 2			
10. TEMPERATURE SIMULATION[#] (Indicator / Controller / Recorder / Universal Calibrator/ Transmitter DTI Thermocouple)			
T–Type Thermocouple	200 °C to 400 °C	1.5 °C	Using Handheld Multifunction Calibrator by Simulation Method
N–Type Thermocouple	(-) 200 °C to 1300 °C	0.5 °C	
U–Type Thermocouple	(-) 200 °C to 600 °C	0.76 °C	
E–Type Thermocouple	(-) 250 °C to 1000 °C	0.35 °C	
J–Type Thermocouple	(-) 210 °C to 1200 °C	1.22 ºC to 1.184 ºC	
K–Type Thermocouple	(-) 200 °C to 1350 °C	1.32 ºC to 1.27 ºC	
C–Type Thermocouple	0 °C to 2316 °C	2.7 °C	
B–Type Thermocouple	600 °C to 1750 °C	1.93 ºC to 2.18 ºC	
R–Type Thermocouple	0 °C to 1767 °C	1.6 °C	
S–Type Thermocouple	0 °C to 1767 °C	1.6 °C	
RTD PT–100	(-) 200 °C to 800 °C	0.24 ºC to 0.78 ºC	

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

[#] 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