

Laboratory Cal Labs Private Limited, 204 & 211, Gayatri Apartments,
 Trimulgherry "X" Road , Secunderabad, Telangana
Accreditation Standard ISO/IEC 17025: 2005
Certificate Number CC-2850 **Page** 1 of 7
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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1 mV to 100 mV 100 mV to 10 V 10 V to 100 V 100 V to 1000 V	0.16 % to 0.005 % 0.005 % to 0.002 % 0.002 % to 0.003 % 0.003 %	Using Multifunction Calibrator Fluke 5522A by Direct Method
2.	DC Current [#]	10 μ A to 100 μ A 100 μ A to 1 mA 1 mA to 3 mA 20 mA to 1 A 1 A to 10 A 20 A	1.21% to 0.027 % 0.027 % to 0.015 % 0.015 % to 0.02 % 0.02 % to 0.03 % 0.03 % to 0.08 % 0.12 %	Using Multifunction Calibrator Fluke 5522A by Direct Method
3.	Resistance [#]	1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10M Ω to 100M Ω 100M Ω to 1000M Ω	0.12 % to 0.02 % 0.02 % to 0.01 % 0.01 % to 0.002 % 0.002 % to 0.003 % 0.003 % to 0.0015 % 0.0015 % to 0.001 % 0.001 % to 0.02 % 0.02 % to 0.1 % 0.1 % to 1.80 %	Using Multifunction Calibrator Fluke 5522A by Direct Method

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4.	AC Voltage [#]	45 Hz to 10 kHz 1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V 10 kHz to 100 kHz 1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V	0.8 % to 0.25 % 0.25 % to 0.03 % 0.03 % to 0.02 % 0.02 % to 0.03 % 0.03 % to 0.04 % 1.90 % to 0.32 % 0.32 % to 0.08 % 0.08 % to 0.13 % 0.13 % to 0.30 %	Using Multifunction Calibrator Fluke 5522A by Direct Method
5.	AC Current [#]	45 Hz to 1 kHz 30 μ A to 100 μ A 100 μ A to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A 20 A	0.55 % to 0.30 % 0.30 % to 0.15 % 0.15 % to 0.12 % 0.12 % to 0.08 % 0.08 % to 0.07 % 0.07 % to 0.1 % 0.17 %	Using Multifunction Calibrator Fluke 5522A by Direct Method
6.	Frequency [#]	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 10 kHz 10 kHz to 1 MHz	0.7 % to 0.04 % 0.04 % to 0.004 % 0.004 % to 0.002 % 0.002 % to 0.006 %	Using Multifunction Calibrator Fluke 5522A by Direct Method
7.	DC Power [#]	10 V to 1000 V 0.1 A to 20 A 1 W to 10 kW	0.04% to 0.15%	Using Multifunction Calibrator Fluke 5522A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ($\pm$)	Remarks
8.	AC Power [#]	50Hz @ UPF 40 V to 300 V 0.1 A to 20 A 20 W to 6 kW 50Hz @ 0.8 PF 40V to 300V 0.5A to 20A 16 W to 5 kW 50Hz @ 0.25 PF 40V to 300V 0.5A to 20A 4 W to 1.2 kW	0.15% 0.35% 1.20%	Using Multifunction Calibrator Fluke 5522A by Direct Method
9.	Phase Angle [#]	1 V & 1 A@ 50Hz 0 to 180°	0.17°	Using Multifunction Calibrator Fluke 5522A by Direct Method
10.	Temperature Simulation [#] (Indicator Controller/ Recorder)			Using Multifunction Calibrator Fluke 5522A by Direct Method
	Thermocouple			
	K Type	(-) 200 °C to 1372 °C	0.5 °C	
	J Type	(-) 200 °C to 1200 °C	0.4 °C	
	B Type	600 °C to 1820 °C	0.8 °C	
	E Type	(-) 200 °C to 1000°C	0.6 °C	
	N Type	(-) 200 °C to 1200°C	0.5 °C	
	R Type	0 °C to 1767 °C	0.7 °C	
	S Type	0 °C to 1767 °C	0.6 °C	
	T Type	(-) 250 °C to 400 °C	0.6 °C	
	RTD (PT-100)	(-) 200 °C to 800 °C	0.3 °C	

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II.	MEASURE			
1.	DC Voltage [#]	1 mV to 100 mV 100 mV to 10 V 10 V to 100 V 100 V to 1000 V	0.02 % to 0.0007 % 0.0007 % to 0.0006 % 0.0006 % to 0.0007 % 0.0007 % to 0.0004 %	Using Reference Multimeter Fluke 8508A by Direct Method
2.	DC Current [#]	1 μ A to 2 mA 2 mA to 20 mA 20 mA to 100 mA 100 mA to 10 A 20 A	0.22 % to 0.0025 % 0.0025 % to 0.003 % 0.005 % 0.005 % to 0.06 % 0.06 %	Using Reference Multimeter Fluke 8508A by Direct Method
3.	AC Voltage [#]	45 Hz to 10 kHz 50 mV to 200 mV 0.2 V to 2 V 2 V to 100 V 500 V to 1000 V 10 kHz to 100 kHz 50 mV to 1 V 1 V to 10 V 10 V to 100 V	3.52 % to 0.08 % 0.08 % to 0.012 % 0.012 % to 0.06 % 0.06 % to 0.02 % 4 % to 0.19 % 0.19 % to 0.078 % 0.078 % to 0.17 %	Using Reference Multimeter Fluke 8508A by Direct Method
4.	AC Current [#]	45 Hz to 1 kHz 30 μ A to 1 mA 10 mA to 200 mA 1 A to 2 A 20 A	0.21 % to 0.08 % 0.08 % to 0.07 % 0.11 % to 0.10 % 0.12 %	Using Reference Multimeter Fluke 8508A by Direct Method
5.	Resistance [#]	1 Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω	0.0021 % to 0.0014 % 0.0014 % to 0.002 % 0.002 % to 0.02 % 0.02 % to 0.07 % 0.07 % to 1.1 %	Using Reference Multimeter Fluke 8508A by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
6.	Frequency #	10 Hz to 100 kHz 1 MHz	0.04 % to 0.012 % 0.006 %	Using Reference Multimeter HP 34401A by Direct Method
7.	Temperature Simulation# (Indicator Controller/Recorder)			Using High Precision Digital Thermometer By Direct Method
	Thermocouple			
	K Type	(-) 200 °C to 1372 °C	0.5 °C	
	J Type	(-) 200 °C to 1200 °C	0.5 °C	
	B Type	600 °C to 1820 °C	0.8 °C	
	E Type	(-) 200 °C to 1000 °C	0.6 °C	
	N Type	(-) 200 °C to 1200 °C	0.7 °C	
	R Type	0 °C to 1767 °C	0.7 °C	
	S Type	0 °C to 1767 °C	0.8 °C	
	T Type	(-) 250 °C to 400 °C	0.8 °C	
	RTD (PT-100)	(-) 200 °C to 800 °C	0.3 °C	
	RTD (PT-1000)	(-) 140 °C to 320 °C	0.2 °C	

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<u>MECHANICAL CALIBRATION</u>				
I.	PRESSURE INDICATING DEVICES			
1.	Pressure-Pneumatic[#] Dial, Digital Pressure Gauges	0 to 20 bar	0.15 % rdg.	Using Pneumatic Pump & Digital Pressure indicator DPI 104 by Comparison method based on DKD-R6-1
2.	Pressure-Hydraulic[#] Dial, Digital Pressure Gauges	0 to 70 bar 70 bar to 700 bar	0.15 % rdg 0.05 % rdg	Using Hydraulic Pump & Digital Pressure indicator DPI 104 by Comparison method based on DKD-R6-1
3.	Vacuum[#] Dial, Digital Vacuum Gauges	(-) 0.80 to 0 bar	3.8 % rdg	Using Vacuum Pump & Digital Vacuum indicator DPI 104 by Comparison method based on DKD-R6-1

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<u>THERMAL CALIBRATION</u>				
I.	TEMPERATURE			
1.	RTD & T/C Temperature Sensors (with or Without indicators/ controllers), Digital Thermometers [#]	(-) 25°C to 0 °C 0°C to 200 °C	0.15 °C 0.40 °C	Using 4 wire Sensor with 6.5 DMM & Dry well by Comparison Method
2.	RTD & T/C Temperature Sensors (with or without indicators/ controllers), Digital Thermometers [#]	200°C to 600 °C 600°C to 1000 °C 1000°C to 1100 °C	1.6 °C 2.10 °C 2.90 °C	Using R Type T/C Sensor with 6.5 DMM & Dry well by Comparison Method
3.	Temperature Indicator of Baths, Oven, Dry Block Calibrators [*]	(-) 25°C to 250 °C 0°C to 200 °C	0.15 °C 0.40 °C	Using 4 wire Sensor with 6.5 DMM & Dry well by Comparison Method Single Position Calibration
4.	Temperature Indicators of Baths, Oven, Dry Block Calibrators [*]	200°C to 600 °C 600°C to 1000 °C 1000°C to 1100 °C	1.6 °C 2.10 °C 2.90 °C	Using R type T/C Sensor with 6.5 DMM & Dry well by Comparison Method Single Position Calibration

* Measurement Capability is expressed as an uncertainty ($\pm$) 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.

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