

Laboratory Advance Test & Calibration Lab, S-130, V. B. Mart, CC9 First Floor,
Neemrana, Alwar, Rajasthan

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2859

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Validity 10.10.2018 to 09.10.2020

Last Amended on -

	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage ^s	10 mV to 20 V 20 V to 950 V	1.15 % to 0.15 % 0.15 % to 0.12 %	Using Zeal Multi-Function Calibrator By Direct Method
2.	DC Current ^s	100 μ A to 2 mA 2 mA to 200 mA 200 mA to 9 A	7.03 % to 0.54 % 0.54 % to 0.2 % 0.22 % to 0.2 %	Using Zeal Multi-Function Calibrator By Direct Method
3.	AC Voltage ^s	50 Hz 10 mV to 200 V 200 V to 750 V	1.1 % to 0.58 % 0.58 % to 0.29 %	Using Zeal Multi-Function Calibrator By Direct Method
4.	AC Current ^s	50 Hz 100 μ A to 200 mA 200 mA to 2 A 2 A to 9 A	7.03 % to 0.28 % 0.28 % to 0.37 % 0.37 % to 0.38 %	Using Zeal Multi-Function Calibrator By Direct Method
5.	Resistance ^s 4 Wire	0.001 Ω 0.01 Ω 0.1 Ω 1.0 Ω 10 Ω 100 Ω 1k Ω	0.58 % 0.58 % 0.58 % 0.58 % 0.58 % 0.58 % 0.58 %	Using Standard Resistance (Fixed Values)
	2 Wire	10 Ω to 1000 k Ω	1.16 %	
6.	Capacitance ^s	1 kHz 1 nF to 10 μ F	2.4 % to 2.63 %	Using Standard Capacitance Box (Fixed Value)

Shally Sharma
Convenor

Anuja Anand
Program Manager

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7.	Inductance ^s (2 Wire)	100 μ H to 1000 mH	2.53 %	Using Standard Inductance Box (Fixed Value)
8.	Temperature Simulation ^s (Temperature Indicator/Controller/Recorder)			
	RTD (Pt-100) Thermocouple	(-)200 °C to 850 °C	1.51 °C	Using BTH C9 Calibrator By Direct Method
	"J" Type	50 °C to 200 °C	1.15 °C	
	"K" Type	50 °C to 1200 °C	6.0 °C	
	"T" Type	(-)100 °C to 400 °C	2.0 °C	
	"R" Type	300 °C to 1700 °C	8.5 °C	
	"S" Type	300 °C to 1700 °C	8.5 °C	
II.	MEASURE			
1.	DC Voltage ^s	1 mV to 100 V 100 V to 1000 V	0.92 % to 0.015 % 0.015 % to 0.031%	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
2.	DC Current ^s	1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.29 % to 0.081% 0.081% to 0.076% 0.076% to 0.41% 0.41% to 0.36%	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
3.	AC Voltage ^s	50 Hz 1 mV to 100 mV 100 mV to 10 V 10 V to 100 V 100 V to 750 V	5.9 % to 0.19% 0.19% to 0.36% 0.36% to 0.10% 0.10% to 0.19%	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
4.	AC Current ^s	50 Hz 0.1 A to 1 A 1 A to 10 A	0.90 % to 0.30 % 0.30 % to 0.72 %	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method

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5.	Resistance ^s (2 Wire)	1 Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 100 M Ω	0.61 % to 2.82 % 2.82 % to 0.025 % 0.025 % to 1.7 %	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
6.	Frequency ^s	10 Hz to 300 kHz	0.35% to 0.068%	Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
7.	Capacitance ^s	1 kHz 100 pf to 1 μ F	0.68% to 0.33%	Using LCR Meter By Direct/ Comparison Method
8.	Inductance ^s	1 kHz 100 μ H to 1 H	0.44 % to 0.29 %	Using LCR Meter By Direct/ Comparison Method
9.	Temperature Simulation ^s (Temperature Indicator/Controller/Recorder)			Using Kusam Meco M3510A 6½ DMM By Direct/ Comparison Method
	RTD (Pt-100)	(-)200 °C to 850 °C	0.49 °C	
	Thermocouple			
	“J” Type	(-)200 °C to 1200 °C	2.0 °C	
	“K” Type	(-)200 °C to 1300 °C	2.0 °C	
	“T” Type	(-)200 °C to 400 °C	1.15 °C	
	“R” Type	0 to 1750 °C	2.0 °C	
	“S” Type	0 to 1750 °C	2.0 °C	
10.	Temperature Simulation ^s Temperature Indicator/Controller/Recorder			Using BTH C9 Calibrator By Direct Method
	RTD (Pt-100)	(-)200°C to 850 °C	1.20 °C	
	Thermocouple			
	“J” Type	50°C to 200 °C	1.15 °C	
	“K” Type	50°C to 1200 °C	6.0 °C	
	“T” Type	(-)100°C to 400 °C	2.0 °C	
	“R” Type	300°C to 1700 °C	8.5 °C	
	“S” Type	300°C to 1700 °C	8.5 °C	

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<u>MECHANICAL CALIBRATION</u>				
I.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Caliper [§] (Vernier/ Dial/ Electronic) L.C.: 0.01 mm	0 to 600 mm	11 μ m	Using Caliper Checker
2.	Depth Caliper [§] (Vernier/ Digital/ Dial) L.C.: 0.01 mm	0 to 150 mm	7.8 μ m	Using Gauge Block Set, Surface Plate
3.	Height Gauge [§] (Vernier/Digital/ Dial) L.C.: 0.01 mm	0 to 600 mm	13.4 μ m	Using Caliper Checker, Surface Plate
4.	External Micrometer [§] (Vernier/Digital/ Dial) L.C.: 0.001 mm	0 to 100 mm	2.2 μ m	Using Gauge Block Set
5.	Plunger Dial [§] L.C.: 0.01 mm	0 to 10 mm	7.5 μ m	Using Gauge Block Set Comparator Stand with Dial Gauge
6.	Dial Thickness Gauge [§] L.C.: 0.01 mm	0 to 10 mm	3.0 μ m	Using Gauge Block Set

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II.	PRESSURE INDICATING DEVICES			
1.	Vacuum Gauge (Dial, Digital), Vacuum Transmitter, Switch, Transducer, Safety Value with or Without Indicator ^{\$}	(-)0.90 bar to 0	0.02 bar	Using Digital Pressure Gauge By Comparison method based on DKD-R-6-1 &2
2.	Pressure Gauge (Dial/ Digital) Pressure Transmitter, Switch, Safety Valve, Transducer with or Without Indicator ^{\$}	0 to 30 bar 0 to 700 bar	0.02 bar 0.83 bar	Using Digital Pressure Gauge By Comparison method based on DKD-R-6-1 &2

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<u>THERMAL CALIBRATION</u>				
1.	RTDs/ Thermocouple With or without Indicator, Controller, Data Logger, Recorder, Temperature Gauge, Digital Thermometer, Glass Thermometer, Temperature Transmitter [#]	(-) 30 °C to 50 °C	0.23 °C	Using 4 wire RTD with Digital Multimeter & Low Temperature Bath By Comparison Method
2.	RTDs/ Thermocouple With or without Indicator, Controller, Data Logger, Recorder, Temperature Gauge, Digital Thermometer, Temperature Transmitter [#]	50°C to 250°C	0.23°C	Using 4 wire RTD with Digital Multimeter & Oil Bath By Comparison Method
		250°C to 400°C	2.2°C	Using 4 wire RTD Sensor & S Type Thermocouple with Digital Multimeter & Dry Block Furnace By Comparison Method
		400°C to 1200°C	2.92°C	Using S type T/C with Digital Multimeter & Dry Block Furnace By Comparison Method

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3.	Temperature Indicator with Sensor of Equipments like Freezer, Oven, Environment, Chambers, Incubator, Liquid Bath, Dry Block Furnace [#]	(-) 80°C to 250 °C	0.63°C	Using 4 wire RTD Sensor with Digital Multimeter Calibration (Single Position Calibration)
4.	Temperature Indicator With Sensor of Furnace, Muffle Furnace, Dry Block Furnace [#]	250°C to 1200°C	2.7 °C	Using S type Thermocouple with Digital Multimeter (Single Position Calibration)

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

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