

Laboratory Techno Measure Pvt. Ltd., C-31, 2nd Floor, Sector -13, VMB Tower, Vasundhara, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2821

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Validity 30.08.2018 to 29.08.2020

Last Amended on 12.11.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage #	20 mV to 180 mV 180 mV to 1.8 V 1.8 V to 18 V 18 V to 180 V 180 V to 1000 V	0.2 % to 0.35 % 0.35 % to 0.18 % 0.18 % 0.18 % 0.18 %	Using ZMMFC 5.5 Zeal Calibrator by Direct Method
2.	AC Voltage #	50 Hz 5 mV to 180 mV 180 mV to 1.8 V 1.8 V to 18 V 18 V to 180 V 180 V to 1000 V	3.5 % to 0.38% 0.38 % 0.38 % 0.38 % 0.38 %	Using ZMMFC 5.5 Zeal Calibrator by Direct Method
3.	AC Current #	50 Hz 0.2 mA to 1.8 mA 1.8 mA to 18 mA 18 mA to 180 mA 180 mA to 1.8 A 1.8 A to 10 A 10 A to 100 A 100 A to 900 A	3.60 % to 0.43 % 0.43 % 0.43 % 0.43 % 0.73 % 0.73 % to 2.4 % 2.4 % to 1.25 %	Using ZMMFC 5.5 Zeal Calibrator by Direct Method
4.	DC Current #	0.2 mA to 1.8 mA 1.8 mA to 18mA 18 mA to 180 mA 180 mA to 1.8 A 1.8A to 10 A 10 A to 100 A 100 A to 900 A	3.60 % to 0.41% 0.41 % 0.41 % 0.41 % 0.41 % 0.41 % to 1.4 % 1.4 % to 1.0 %	Using ZMMFC 5.5 Zeal Calibrator by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Frequency #	50 Hz to 5 kHz	0.12 %	Using Druk Calibrator DPI 620-IS by Direct Method
6.	Temperature Simulation# (Indicator Controller/ Recorder)			Using Druk Calibrator DPI 620-IS by Direct Method
	RTD (PT-100)	(-) 200°C to 650°C	0.5°C	
	Thermocouple			
	J Type	(-) 20°C to 750°C	0.8°C	
	K Type	0°C to 1300 °C	0.9°C	
	R Type	600°C to 1600°C	1.3°C	
	N Type	0°C to 1400°C	1.1°C	
	S Type	0°C to 1600°C	3.4°C	
7.	Resistance \$ 4W	1 mΩ to 10 m Ω	1.0 %	Using Standard Resistance Box ZEAL ZMDRB by Direct Method
		10 mΩ to 100 mΩ	1.0 %	
		1 Ω to 10 Ω	1.0 % to 0.8 %	
		10 Ω to 100 Ω	0.8 % to 0.5 %	
		100 Ω to 10 kΩ	0.5 %	
		10 kΩ to 100 kΩ	0.5 % to 0.6 %	
	2W	100 kΩ to 1 MΩ	0.6 % to 1.40 %	
	1 MΩ to 10 MΩ	1.40 %		
	10 MΩ to 100 MΩ	1.40 %		
II.	MEASURE			
1.	DC Voltage #	1 mV to 100 mV	0.92 % to 0.11 %	Using Keysight 6½ DMM by Direct Method
		100 mV to 1 V	0.11 %	
		1 V to 10 V	0.11 %	
		10V to 100V	0.11 %	
		100 V to 1000 V	0.11 %	

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2.	AC Voltage [#]	50 Hz 10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10V to 100V 100 V to 600 V	0.74 % to 0.15 % 0.15 % 0.15 % 0.15 % 0.15 %	Using Keysight 6½ DMM by Direct Method
3.	AC Current [#]	50 Hz 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.3 % to 0.2 % 0.2 % 0.2 % 0.2 % 0.2 %	Using Keysight 6½ DMM by Direct Method
4.	DC Current [#]	0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	1.18 % to 0.27 % 0.27 % 0.27 % 0.27 % 0.27 %	Using Keysight 6½ DMM by Direct Method
5.	Resistance [#] 4W 2W	1 Ω to 10 Ω 10 Ω to 1k Ω 1k Ω to 1M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω	0.5 % to 0.1 % 0.1 % to 0.02 % 0.02 % to 0.01% 0.01 % to 0.3 % 0.3 % to 4.64 %	Using Keysight 6½ DMM by Direct Method
6.	Stop Watch [#]	60 s to 1 hr 1 hr to 24 hr	0.62 s to 0.4 min 0.4 min to 1 min	Using Stop Watch Medichem by Direct Method
7.	Frequency ^{\$}	10 Hz to 300 kHz	1.23 % to 2.3 %	Using Keysight 6½ DMM by Direct Method

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8.	Temperature Simulation ^s (Indicator Controller / Recorder)			Using Druk Calibrator DPI 620-IS by Direct Method
	RTD (PT-100)	(-) 200°C to 650°C	0.5°C	
	Thermocouple			
	J Type	(-) 20°C to 750°C	1.0°C	
	K Type	0°C to 1300 °C	1.0°C	
	R Type	600°C to 1600°C	1.3°C	
	N Type	0°C to 1400°C	1.2°C	
	S Type	0°C to 1600°C	3.5°C	

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<u>MECHANICAL CALIBRATION</u>				
I. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)				
1.	Caliper [§] (Dial/Digital/Vernier) L.C: 0.01 mm ^φ	10 mm to 200 mm > 20 mm to 600 mm > 60 mm to 1000 mm	18.5 μm 43.1 μm 87.2 μm	Using Slip Gauge Set with Accessories, Caliper Checker
2.	Micrometer [§] L.C: 0.001 mm ^φ	10 mm to 100 mm > 100 mm to 1000 mm	6.35 μm 62 μm	Using Slip Gauge Set and Steel Gauge Block
3.	Depth Micrometer [§] L.C: 0.001 mm ^φ	0 to 25 mm	6.0 μm	Using Slip Gauge Set, Steel Gauge Block
4.	Inside Dial Caliper [§] L.C: 0.025 mm ^φ	10 mm to 55 mm	14.9 μm	Using Slip Gauge and Accessories
5.	Dial Thickness Gauge [§] L.C: 0.01 mm ^φ	10 mm to 10 mm	5.8 μm	Using Slip Gauge Set
6.	Height Gauge [§] L.C: 0.01 mm ^φ	10 mm to 300 mm 0 to 600 mm	14.1 μm 24.9 μm	Using Slip Gauge Set & Dial Test Indicator, Caliper Checker
7.	Snap Gauge/Dial Snap Gauge [§]	3 mm to 100 mm	3.7 μm	Using Slip Gauge Set

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8.	Plain Plug Gauge [§]	3 mm to 200 mm	7.5 µm	Using Slip Gauge Set & Dial Gauge
9.	Dial Gauge [§] (Plunger Type) L.C: 0.001 mm ^φ	10 mm to 50 mm	1.8 µm	Using Slip Gauge Set & Dial Calibration Tester
10.	Dial Gauge [§] (Lever Type) L.C: 0.001 mm L.C: 0.01 mm	0 to 0.14 mm 0 to 0.5 mm	1.5 µm 6 µm	Using Slip Gauge Set & Dial Calibration Tester
11.	Feeler Gauge [§]	0.005 mm to 1 mm	1.6 µm	Using Digital Micrometer
12.	Coating Thickness Gauge [§]	10 µm to 1000 µm	3 µm	Using Std. Foils Set
13.	V-Block [§] (Flatness Parallelism Symmetry)	Up to 200 mm	7.5 µm	Using Dial Gauge, Test Mandrel
14.	Comparator Stand [§]	150 mm X 150 mm	3.4 µm	Using Lever Dial Gauge With Stand
15.	Depth Caliper [§]	0 to 200 mm	11.2 µm	Using Slip Gauge Set
16.	Bevel Protector/Angle Protector [§] L.C: 5 min.	0 - 90° - 0	4 min.	Using Angle Gauge Set

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17.	Pistol Caliper ^s L.C.: 0.1 mm ^φ	Up to 100 mm	80.0 μ m	Using Slip Gauge Set
18.	Test Sieves ^s	4 mm to 80 mm	21.8 μ m	Using Digital Caliper
II.	DIMENSION (PRECISION INSTRUMENTS)			
1.	Profile Projector/Video Measuring M/c [*] Linear Scale L.C.: 0.001 mm ^φ Angular Scale L.C.: 1'' ^φ Magnification	0 to 300 mm 0 - 360° 10X to 50X	17.6 μ m 41 sec. 0.30%	Using Glass Scale, Angle Gauge & Digital Caliper
III.	ACCELERATION & SPEED			
1.	Tachometer/RPM Indicator [*] (Non-Contact Type)	50 rpm to 3000 rpm	1.9 %	Using Digital Tachometer

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IV.	WEIGHTS			
1.	Weights ^s (Conventional Mass)	1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg	0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.03 mg 0.05 mg 0.06 mg 0.08 mg 0.10 mg 0.12 mg 0.16 mg 0.20 mg 0.25 mg 0.30 mg 0.50 mg 0.90 mg 0.90 mg 0.90 mg 0.01 g 0.02 g 0.1 g 0.8 g	Using Standard Weights of F1 Class (1 mg to 20 kg) & Weighing Balance Resolution: 0.01mg (1 mg to 100g) Resolution :0.01g (200g to 5 kg) & (10 kg to 20 kg) As per OIML R 111-1
V.	WEIGHING SCALE AND BALANCE			
1.	Weighing Balance [#] (Electronic) d: 0.1 mg d: 0.1 mg d: 0.01 g d: 0.1 g	1mg to 100 g 100 g to 1 kg 1kg to 10 kg 10 kg to 20 kg	0.4 mg 0.002 g 0.02 g 0.3 g	Using Standard Weights of F1 Class (1 mg to 20 kg) As per OIML R 76-1

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VI.	VOLUME			
1.	Micro Pipette ^s	10 μ l to 100 μ l 100 μ l to 1000 μ l	0.5 μ l 0.6 μ l	Using Standard Weights of F1 Class Weighing Balance with resolution: 0.01mg and Distilled Water By Gravimetric Method As per ISO: 8655-6, ISO 20461 Ref. Temp. 27°
2.	Glass Pipette ^s	100 μ l to 1 ml > 1 ml to 10 ml > 10 ml to 50 ml	0.3 μ l 0.8 μ l 8.2 μ l	Using Standard Weights of F1 Class Weighing Balance with Resolution: 0.01mg based on Gravimetric Method as per IS/ISO: 4787 & ISO 20461 Ref. Temp. 27°
3.	Burette ^s	100 μ l to 10 ml > 10 ml to 50 ml	0.8 μ l 8.2 μ l	Using Standard Weights of F1 Class Weighing Balance with Resolution: 0.01mg based on Gravimetric Method as per IS/ISO: 4787 & ISO 20461 Ref. Temp. 27°

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4.	Measuring Cylinder/ Volumetric Flask Graduated Jar/ Beaker ^s	1 ml to 10 ml > 10 ml to 50 ml > 1L to 5 L	0.8 μ l 8.2 μ l 1.5 ml	Using Standard Weights of F1 Class Weighing Balance with Resolution: 0.01mg (1 ml to 50 ml) Resolution: 0.01 g (100 ml to 2L) Resolution: 0.1 g (5L) Based on Gravimetric Method as per IS/ISO: 4787 & ISO 20461 Ref. Temp. 27°
VII. PRESSURE INDICATING DEVICES				
1.	Pneumatic Pressure Gauge [#] (Dial / Digital / Switch / Transmitter / Transducers)	0 to 30 bar	0.1 bar	Using Digital Pressure Gauge based on DKD-R6:1
2.	Hydraulic Pressure Gauge [#] (Dial / Digital / Switch / Transmitter / Transducers)	0 to 700 bar	0.3 bar	Using Digital Pressure Gauge based on DKD-R6:1
3.	Pneumatic Low Pressure Gauge [#] (Dial / Digital / Megnehelic / Transmitter / Switch / Transducers)	0 to 1 bar	0.003 bar	Using Pneumatic Pump & Digital Pressure Calibrator based on DKD-R6-1

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4.	Vacuum Gauge # (Dial / Digital / Transmitter / Switch / Transducers)	0 to (-)0.90 bar	0.002 bar	Using Digital Pressure Calibrator based on DKD-R6-1

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<u>THERMAL CALIBRATION</u>				
1.	RTD , Thermocouple With or Without Temperature Indicator/ Data Logger/ Recorder, Temperature Transmitter With Sensor, Digital/Glass Thermometer, Dial Temperature Gauge [#]	(-) 30 °C to 50 °C 50 °C to 250 °C	0.53 °C 0.35°C	Using RTD (4 wire) with Temperature indicator, Process Calibrator, Liquid baths by Comparison Method
2.	Thermocouples With or without Temperature/ Indicator/ Data logger / Recorder, Temperature Transmitter With Sensor, Digital Thermometer [#]	300°C to 600 °C 600°C to 1150 °C	2.6°C 2.8°C	Using 'S' Type Thermocouple With Temperature indicator, Process Calibrator, High temperature bath by Comparison Method
3.	Temperature & Humidity indicator with sensor (In built or External) Data logger /Recorder With Sensor, Humidity transmitter with Sensor ^{\$}	5°C to 50 °C @50%RH 20%RH to 95%RH @25°C	0.5°C 2.2%RH	Using Temperature/ Humidity Indicator With Sensor, Temperature/ Humidity Generator by Comparison Method

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4.	Temperature Indicator With Sensor of Bath, Dry Block Furnace, Oven, Chamber, Furnace*	(-) 80°C to 250°C 250°C to 1200°C	0.5°C 2.8°C	Using RTD, S Type Thermocouple with Temperature Indicator Single Position Calibration
5.	Temperature/ Humidity Indicator With Sensor of Humidity Chamber, Environmental Chamber*	15°C to 50 °C @50%RH 20%RH to 90%RH @25°C	0.5°C 2.1%RH	Using Temperature/ Humidity Indicator with sensor 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

Ø Laboratory can also calibrate Instruments/devices of coarser resolution/least count within the accredited range using same reference standard/master equipment under the scope of accreditation.

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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