

Laboratory **Accurate Measurements, Plot No.103, D Block, Meethapur Ext.,
Badarpur, New Delhi**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **CC-2286**

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Validity **22.09.2018 to 21.09.2020**

Last Amended on **03.12.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
1.	SOURCE			
1.	DC Voltage [§]	1 mV to 1000 V	0.36 % to 0.007 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method
2.	DC Current [§]	30 μ A to 3 A 3 A to 20 A 20 A to 1000 A	0.3 % to 0.1% 0.1 % to 0.3 % 0.8 % to 1.2 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method Using Current Coil
3.	AC Voltage [§]	50 Hz to 1 kHz 1 mV to 1000 V	0.4 % to 0.01 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method
4.	AC Current [§]	50 Hz to 1 kHz 30 μ A to 20 A >20 A to 1000 A	0.57 % to 0.3 % 0.7 % to 1.8 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method Using Current Coil
5.	DC Resistance [§] (4 Wire/2 Wire)	1 Ω to 3 M Ω 3 M Ω to 300 M Ω 300 M Ω to 1.0 G Ω	0.4 % to 0.018 % 0.018 % to 0.6 % 0.6 % to 0.63 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method
	DC 4 Wire Resistance [#] (Discrete)	10 $\mu\Omega$ 50 $\mu\Omega$ 100 $\mu\Omega$ 1 m Ω 10 m Ω 100 m Ω 1000 m Ω	2.13 % 0.6 % 0.3 % 0.15 % 0.15 % 0.15 % 0.13 %	Using Discrete Standard 4 Wire Low Resistance Box by Direct Method

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6.	High Resistance # @ Maximum Test Voltage 5000V	5 M Ω , 10 M Ω , 100 M Ω , 200 M Ω , 500 M Ω , 1 G Ω , 10 G Ω , 100 G Ω ,	5.97 % 5.97 % 5.97 % 5.97 % 5.97 % 5.97 % 5.97 %	Using Discrete Decade Resistance box by Direct Method
7.	Frequency ^{\$}	45 Hz to 100 kHz	0.02 % to 0.06 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method
8.	Capacitance #	1 kHz 1 nF to 100 μ F 1 kHz 1 nF to 100 μ F	0.8 % to 0.62 % 1.3 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method Using Decade Capacitance Box by Direct Method
9.	Inductance#	1 kHz 10 μ H to 1 H	1.2 %	Using Decade Inductance Box by Direct Method
10.	Active Power ^{\$}	50 Hz 40 V to 600 V 0.1 A to 20 A 0.4 W to 12 kW PF 0.1 (Lag & Lead) to UPF	0.06 to 0.7 %	Using Fluke 5502A Multi-Product Calibrator by Direct Method
11.	Power Factor ^{\$}	50 Hz, 240V, 5A PF 0.1 (Lag & Lead) to UPF	0.0017 PF	Using Fluke 5502A Multi-Product Calibrator by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	AC High Voltage*	1 kV to 15 kV	5.1 %	Using HV Probe with 4½ Digit Multimeter by Comparison Method
4.	AC Current#	50 Hz to 1 kHz 30 µA to 10 A >10 A to 1000 A	0.4 % to 0.18 % 0.8 % to 1.8 %	Using Fluke 8846A 6½ Digit Multimeter by Comparison Method Using Fluke 1730 by Comparison Method
5.	Resistance# (4 Wire / 2 Wire)	1 Ω to 300 Ω 300 Ω to 3 MΩ 3 MΩ to 1.0 GΩ	0.4 % to 0.01 % 0.01 % to 0.1 % 0.1 % to 1.0 %	Using Fluke 8846A 6½ Digit Multimeter by Comparison Method
6.	Frequency#	10 Hz to 1 kHz 1 kHz to 1000 MHz	0.1 % to 0.02 % 0.02 %	Using Fluke 8846A 6½ Digit Multimeter by Comparison Method
7.	Timer / Stop Watch# (Mechanical/Digital)	1 sec to 99999 sec	0.35 sec to 0.7 sec	Using Digital Time Interval Meter by Comparison Method
8.	AC Power / Energy* (kW / kWh) (1 Phase / 3 Phase)	50 Hz 200 V to 600 V 0.1 A to 120 A PF 0.5 (Lag & Lead) to UPF 10 W to 90 kW 0.01 kWh to 90 kWh	3.5 % to 1.3 %	Using Fluke 1730 Energy Logger by Comparison Method
9.	Power Factor*	50 Hz ±0.2 to UPF	0.005 PF	Using Fluke 1730 Energy Logger by Comparison Method

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10.	Temperature Simulation ^s (Indicator/Controller / Recorder/Calibrator)			
	RTD	(-) 200 °C to 800 °C	0.12 °C	Using Fluke 8846A 6½ Digit Multimeter by Direct/Comparison Method
	K-Type Thermocouple	(-) 200 °C to 1300 °C	0.18 °C	
	N-Type Thermocouple	(-) 200 °C to 1300 °C	0.18 °C	
	J-Type Thermocouple	(-) 200 °C to 1200 °C	0.15 °C	
	R-Type Thermocouple	0 °C to 1750 °C	0.40 °C	
	S-Type Thermocouple	0 °C to 1750 °C	0.30 °C	
T-Type Thermocouple	(-) 200 °C to 400 °C	0.1 °C	Using Fluke 5502A Multi-Product Calibrator	

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<u>MECHANICAL CALIBRATION</u>				
1.	DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)			
1.	Dial/Digital / Vernier Caliper [§] L.C.: 0.01 mm ^ϕ	0 to 300 mm 0 to 600 mm	7.0 μ m 8.0 μ m	Using Slip Gauge Set "0" Grade, Gauge Block, Slip Gauge Accessories, Caliper Checker
2.	Outside / Inside Micrometer [§] L.C.: 0.001 mm ^ϕ L.C.: 0.01 mm ^ϕ L.C.: 0.01 mm ^ϕ	Upto 100 mm 100 mm to 200 mm 200 mm to 500 mm	1.0 μ m 6.0 μ m 9.0 μ m	Using Slip Gauge Set "0" Grade, Gauge Block, Slip Gauge Accessories
3.	Depth Micro Meter [§] L.C.: 0.001 mm ^ϕ L.C.: 0.01 mm ^ϕ	Upto 100 mm 100 mm to 300 mm	1.5 μ m 7.0 μ m	Using Slip Gauge Set "0" Grade, Gauge Block, Slip Gauge Accessories
4.	Inside Caliper [§] L.C.: 0.01 mm ^ϕ	5 mm to 300 mm	8.0 μ m	Using Slip Gauge Set "0" Grade & Gauge Block
5.	Depth Caliper [§] L.C.: 0.01 mm ^ϕ	0 to 300 mm	7.0 μ m	Using Slip Gauge Set "0" Grade, Gauge Block & Surface Plate
6.	Plain/Dial / Digital Height Gauge [#] L.C.: 0.01 mm ^ϕ L.C.: 0.0001 mm ^ϕ	0 to 450 mm 0 to 600 mm	7.0 μ m 7.0 μ m	Using Slip Gauge Set "0" Grade, Gauge Block, Slip Gauge Accessories, Caliper Checker
7.	Dial Calibration Tester [§] L.C.: 0.001 mm ^ϕ	0 to 25 mm	0.4 μ m	Using Slip Gauge Set "0" Grade

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18.	Angle Plate [§] Flatness Squareness	Upto 300 mm	5.0 μ m 10.0 μ m	Using Dial Indicator, Slip Gauge Set '0' Grade & Master Cylinder
19.	Electronic Probe / LVDT [§] L.C.: 0.0001 mm ϕ L.C.: 0.001 mm ϕ L.C.: 0.01 mm ϕ	0 to 25 mm 0 to 50 mm 0 to 100 mm	0.6 μ m 1.5 μ m 7 μ m	Using Universal Length Measuring Machine
20.	Dial / Digital Indicator [§] (Plunger Type) L.C.: 0.001 mm ϕ	0 to 25 mm 25 mm to 100 mm	1.0 μ m 2.0 μ m	Using Universal Length Measuring Machine
21.	Dial / Digital Indicator [§] (Lever Type) L.C.: 0.001 mm ϕ	Upto 1 mm	1.0 μ m	Using Universal Length Measuring Machine
22.	Bore Gauge [§] L.C.: 0.001 mm ϕ	Upto 400mm Travel upto 1 mm	1.0 μ m	Using Universal Length Measuring Machine
23.	Feeler Gauge / Thickness Foil [§]	Upto 2 mm	2.0 μ m	Using Universal Length Measuring Machine
24.	Micrometer Setting Rod / Length Bar [§]	Upto 300 mm	2.0 μ m	Using Universal Length Measuring Machine
25.	Std. Pin Gauge / Three Wire Set [§]	Upto 50 mm	1.0 μ m	Using Universal Length Measuring Machine
26.	Plain Plug Gauge [§] (Diameter)	1 mm 100 mm 100 mm to 300 mm	2.5 μ m 3.0 μ m	Using Universal Length Measuring Machine

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27.	Taper Plain Plug Gauge ^s (Major Dia., Taper Angle & Total Length)	Upto 100 mm 100 mm to 300 mm	2.5 μ m 3.0 μ m	Using Universal Length Measuring Machine
28.	Plain Ring Gauge ^s (Diameter)	3 mm to 100 mm 100 mm to 300 mm	1.4 μ m 2.5 μ m	Using Universal Length Measuring Machine
29.	Taper Plain Ring Gauge ^s (Diameter, Position of Gauge Plane, Taper Angle)	3 mm to 100 mm	2.8 μ m	Using Universal Length Measuring Machine
30.	Wear Check / Thread Ring Gauge ^s (Effective Diameter)	3 mm to 300 mm	2.0 μ m	Using Universal Length Measuring Machine
31.	Taper Thread Ring Gauge ^s (Effective Dia., Gauge Plane & Taper Angle)	3 mm to 100 mm	3.0 μ m	Using Universal Length Measuring Machine
32.	Wear Check / Thread Plug Gauge ^s (Effective Diameter)	3 mm to 300 mm	3.0 μ m	Using Universal Length Measuring Machine
33.	Taper Thread Plug Gauge ^s (Effective Dia., Major Dia., Taper Angle, Gauge Plane)	3 mm to 300 mm	3.0 μ m	Using Universal Length Measuring Machine
34.	Snap/Width Gauge ^s	3 mm to 100 mm 100 mm to 300 mm	2.0 μ m 3.0 μ m	Using Universal Length Measuring Machine

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35.	Taper Scale [§]	Upto 15 mm	0.03 mm	Using Profile Projector
36.	Bench Centre [#] Parallelism Co-axility	Upto 600 mm	4.0 μ m 8.0 μ m	Using Dial Test Indicator & Mandrel
37.	Std. Mandrel [§] Run out Straightness Cylindercity	Upto 300 mm	1.0 μ m 2.0 μ m 2.0 μ m	Using Universal Length Measuring Machine & Dial Indicator
38.	Air Gauge Unit [§] L.C.: 0.001 mm	Upto 40 μ m	2.5 μ m	Using Std. Air Plug and Std. Setting Rings
39.	Ultrasonic Thickness Gauge [§] L.C : 0.1 mm	Upto 300 mm	0.07 mm	Using Slip Gauge Set "0" Grade
II.	DIMENSION (PRECISION INSTRUMENTS)			
1.	Universal Length Measuring Machine [#] L.C.: 0.0001 mm Φ	Upto 100 mm	1.5 μ m	Using Slip Gauge Set "0" Grade
2.	Profile Projector / Microscope [#] X/Y Axis Movement L.C 0.001 mm Φ Angle Scale L.C.: 0.01° Φ Magnification	0 to 300 mm 0 to 360° 10X to 100X	5.0 μ m 30" 0.4%	Using Glass Scale & Angle Gauge

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IV.	WEIGHING SCALE & BALANCE			
1.	Non-Automatic Weighing Balance / Scale [#] Readability: 0.001 mg ^Φ Readability: 0.01 mg ^Φ Readability: 0.1 mg ^Φ Readability: 0.1 mg ^Φ Readability: 10 mg ^Φ Readability: 10 mg ^Φ Readability: 1 g ^Φ Readability: 1 g ^Φ	0 to 1 g 0 to 3 g 0 to 50 g 0 to 200 g 0 to 5 kg 0 to 20 kg 0 to 100 kg 0 to 300 kg	0.033 mg 0.05 mg 0.07 mg 0.21 mg 90 mg 0.2 g 2 g 5 g	Using E ₁ Accuracy Class Standard Weights as per OIML R-76-1:2006 Using F ₂ Accuracy Class Standard Weights as per OIML R-76-1:2006 Using M ₁ Accuracy Class Standard Weights as per OIML R-76-1: 2006
V.	VOLUME			
1.	Micro Pipette ^{\$} (Piston Operated)	10 µl >10 µl to 100 µl >100 µl to 1000 µl >1000 µl to 10000 µl	0.09 µl 0.11 µl 0.11 µl 0.7 µl	Using Weighing Balance (Readability: 0.01 mg & 0.1 mg) and Distilled Water of known density as per Gravimetric Method, ISO 8655-6
2.	Pipette / Burette ^{\$}	0.5 ml to 1 ml >1 ml to 5 ml >5 ml to 25 ml >25 ml to 100 ml	0.67 µl 2 µl 5 µl 10 µl	Using Weighing Balance (Readability: 0.01 mg & 0.1 mg) and Distilled Water of known density as per Gravimetric Method, IS/ISO 4787

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	Pressure Transmitter, Pressure Transducer, Indicator of Pressure Switch, Pressure Recorder) #			as per DKD-R-6-1
3.	Vacuum -Pneumatic Vacuum Gauge, Vacuum Indicator, Vacuum Controller, Vacuum Calibrator, Vacuum Transmitter, Vacuum Transducer, Indicator of Vacuum Switch, Vacuum Recorder) #	(-) 0.90 to 0 bar	0.002 bar	Using Precision Pressure Indicator & Pressure Pump by Comparison Method as per ISO-3567 & ISO-27893

