



# National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



## CERTIFICATE OF ACCREDITATION

### TESTING ELECTRICAL STANDARDS LABORATORY AND R & D INSTITUTE PVT. LTD.

has been assessed and accredited in accordance with the standard

**ISO/IEC 17025:2005**

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

B1+B2+B3/24, G.I.D.C. Electronic Estate, Sector 25,  
Gandhinagar, Gujarat

in the field of

**CALIBRATION**

Certificate Number CC-2857  
Issue Date 10/10/2018

Valid Until 09/10/2020

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website [www.nabl-india.org](http://www.nabl-india.org))

Signed for and on behalf of NABL



89076970200020000633

*Anil Relia*

Anil Relia  
Chief Executive Officer



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## SCOPE OF ACCREDITATION

**Laboratory** Testing Electrical Standards Laboratory and R& D Institute Pvt. Ltd.,  
B1+B2+B3/24, G.I.D.C. Electronic Estate, Sector 25, Gandhinagar,  
Gujarat

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**Validity** 10.10.2018 to 09.10.2020

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	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>ELECTRO TECHNICAL CALIBRATION</u></b>				
<b>I.</b>	<b>SOURCE</b>			
1.	DC Voltage <sup>#</sup>	0.1 mV to 100 mV 100 mV to 1 V 1 V to 1000 V	3.6% to 0.011% 0.011% to 0.0065% 0.0065% to 0.0066%	Using Fluke MFC 5502A by Direct Method
2.	DC Current <sup>#</sup>	10 $\mu$ A to 100 $\mu$ A 0.1 mA to 100 mA 0.1 A to 20 A 20 A to 1000 A	0.265% to 0.042% 0.042% to 0.017% 0.017% to 0.13% 1.0% to 0.81%	Using Fluke MFC 5502A by Direct Method
3.	DC Power <sup>#</sup>	0.1 V to 1000 V 0.01 A to 20 A 0.15 W to 12 kW	0.137%	Using Fluke MFC 5502A by Direct Method
4.	DC Resistance <sup>#</sup>	1 $\Omega$ to 10 $\Omega$ 10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 100 k $\Omega$ 100 k $\Omega$ to 10 M $\Omega$ 10 M $\Omega$ to 100 M $\Omega$ 100 M $\Omega$ to 1 G $\Omega$	1.17% to 0.13 % 0.13% to 0.028% 0.028% to 0.017% 0.017% to 0.073% 0.073% to 0.58 % 0.58% to 1.79 %	Using Fluke MFC 5502A by Direct Method
5.	DC Resistance <sup>#</sup>	100 $\mu\Omega$ to 10 k $\Omega$	0.3%	Using Fix Standard Resistance by Direct Method
6.	Insulation Resistance <sup>#</sup>	Up to 5 kV 5 M $\Omega$ to 100 G $\Omega$	5.97% to 7.99%	Using Fix High Resistance Jig by Direct Method
7.	Inductance <sup>#</sup>	1 kHz 100 $\mu$ H to 1 H	1.2%	Using Decade Inductance Box By Direct Method

**Shally Sharma**  
Convenor

**Anuja Anand**  
Program Manager



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8.	Capacitance <sup>#</sup>	1kHz 220 pF to 10 nF  1 kHz to 500 Hz 10 nF to 10 $\mu$ F  500 to 100 Hz 10 $\mu$ F to 100 mF	6.42% to 0.42%  0.42%  0.42% to 1.39%	Using Fluke MFC 5502A by Direct Method
9.	AC Voltage <sup>#</sup>	45 Hz to 10 kHz 1 mV to 100 mV 100 mV to 1 V 1 V to 1000 V	2.62% to 0.06% 0.06% to 0.043% 0.043% to 0.061%	Using Fluke MFC 5502A by Direct Method
10.	AC Current <sup>#</sup>	45 Hz to 5 kHz 33 $\mu$ A to 100 mA 100 mA to 1 A 1 A to 20 A  45 to 65 Hz 20 to 1000 A	0.87% to 0.17% 0.17% to 0.80% 0.80 % to 0.20%  0.83%	Using Fluke MFC 5502A by Direct Method  Using Fluke MFC 5502A by Direct Method with 50 turn Current Coil By Direct Method
11.	AC Power <sup>#</sup>	45 Hz to 65 Hz 0.1 V to 1000 V 0.01 A to 20 A, UPF to $\pm$ 0.2 0.40 W to 12 kW  45 Hz to 65 Hz 0.1 V to 1000 V 20 A to 1000 A, UPF to $\pm$ 0.2 12 kW to 600 kW	0.104% to 0.45%  0.8%	Using Fluke MFC 5502A by Direct Method  Using MPC with 50 Turn Coil by Direct Method

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12.	Power Factor <sup>#</sup>	45 Hz to 65 Hz 0.1 V to 1000 V 0.1A to 20 A $\pm 0.05$ PF to 1.0 PF	6.2% to 0.1%	Using Fluke MFC 5502A by Direct Method
13.	Phase Angle <sup>#</sup>	45 Hz to 65 Hz 0.1 V to 1000 V 0.1A to 20 A 0° to 90°	6.2% to 0.1%	Using Fluke MFC 5502A by Direct Method
14.	Frequency <sup>#</sup>	0.1 V to 1000 V 10 Hz to 100 kHz	0.1% to 0.01%	Using Fluke MFC 5502A by Direct Method
15.	Temperature Simulation <sup>#</sup>			Using Fluke MFC 5502A/ Beamax MFC MC2-TC By Simulation Method
	Thermocouple			
	K Type	(-)200 °C to 1372°C	0.49 °C	
	J Type	(-)200 °C to 1200°C	0.39 °C	
	N Type	(-)200 °C to 1300°C	0.49 °C	
	R Type	0 to 1750°C	0.93 °C	
	S Type	0 to 1750°C	0.81 °C	
	T Type	(-)200 °C to 400°C	0.26 °C	
	E Type	250 °C to 1000°C	0.33 °C	
	B Type	600 °C to 1820°C	1.17 °C	
	RTD	(-)200 °C to 800°C	0.28 °C	
II.	<b>MEASURE</b>			
1.	DC Voltage <sup>#</sup>	1 mV to 1 V 1 V to 1000 V	0.43 % to 0.004 % 0.004 % to 0.007 %	Using 6 ½ DMM Fluke 8846A by Direct Method
2.	DC High Voltage <sup>#</sup>	1 kV to 40 kV	3.6 % to 4.5 %	Using HV Probe with DMM by Direct Method
3.	DC Current <sup>#</sup>	10 $\mu$ A to 400 mA 400 mA to 10 A	0.347 % to 0.065 % 0.065 % to 0.183 %	Using 6 ½ DMM Fluke 8846A by Direct Method

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4.	DC Resistance <sup>#</sup>	0.1 $\Omega$ to 1 k $\Omega$ 1 k $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 1 G $\Omega$	3.48 % to 0.013 % 0.013 % 0.013 % to 2.42 %	Using 6 ½ DMM Fluke 8846A by Direct Method
5.	AC Voltage <sup>#</sup>	10 Hz to 20 kHz 1 mV to 1 V 1 V to 1000 V	4.74% to 0.108% 0.108% to 0.096%	Using 6 ½ DMM Fluke 8846A by Direct Method
6.	AC High Voltage <sup>#</sup>	45 to 65 Hz 1 kV to 40 kV	5.35 % to 6.15%	Using HV Probe with DMM by Direct Method
7.	AC Current <sup>#</sup>	10 Hz to 5 kHz 29 $\mu$ A to 100 mA  45 Hz to 5 kHz 100 mA to 10 A	0.867% to 0.164%  0.164% to 0.247%	Using 6 ½ DMM Fluke 8846A by Direct Method
8.	Frequency <sup>#</sup>	0.1 V to 1000 V 10 Hz to 300 kHz 300 kHz to 1 MHz	0.036 % to 0.012 % 0.012 % to 0.015 %	Using 6 ½ DMM Fluke 8846A by Direct Method
9.	Capacitance <sup>#</sup>	1 kHz 1 nF to 10 nF 10 nF to 10 mF 10 mF to 100 mF	5.41% to 1.76 % 1.77 % 1.77 % to 5.0 %	Using 6 ½ DMM Fluke 8846A by Direct Method
10.	Stopwatch <sup>#</sup>	5 second to 10 hr	0.24 s to 17.5 s	Using Casio make Precision Stop watch By Comparison Method

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11.	Temperature Simulation			Using Fluke MFC 5502A/ Beamax MFC MC2-TC By Simulation Method
	Thermocouple			
	K Type	(-) 200 °C to 1372°C	0.54 °C	
	J Type	(-) 200 °C to 1200°C	0.42 °C	
	N Type	(-) 200 °C to 1300°C	0.53 °C	
	R Type	0 to 1750°C	0.93 °C	
	S Type	0 to 1750°C	1.16 °C	
	T Type	(-) 200 °C to 400°C	0.35 °C	
	E Type	250 °C to 1000°C	0.37 °C	
	B Type	600 °C to 1820°C	1.178 °C	
	RTD	(-)200 °C to 800°C	0.12 °C	

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<b>FLUID FLOW CALIBRATION</b>			
<b>I. FLOW MEASUREMENTS</b>			
1. Liquid Volume Flow Rate – Water <sup>§</sup>	0.5 m <sup>3</sup> /hr to 50 m <sup>3</sup> /hr	1.2%	Using Mass Flow Meters by Comparison Method
	50 m <sup>3</sup> /hr to 200 m <sup>3</sup> /hr	1.2 %	Using Electro Magnetic Flow Meters by Comparison Method
2. Liquid Volume Flow Rate – Water <sup>*</sup>	1 m <sup>3</sup> /hr to 1000 m <sup>3</sup> /hr	1.5 %	Using Ultrasonic Flow Meters by Comparison Method

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<b><u>MECHANICAL CALIBRATION</u></b>			
<b>I. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>			
1. Caliper <sup>s</sup> (Vernier/Electronic/ Dial) LC : 0.01 mm <sup>φ</sup> LC : 0.02 mm <sup>φ</sup>	0 to 600 mm 0 to 1000 mm	10 $\mu$ m 18 $\mu$ m	Using Caliper Checker, Slip Gauge Blocks and Length Bar
2. Height Gauge <sup>s</sup> (Vernier/Electronic/ Dial) LC : 0.01 mm <sup>φ</sup> LC : 0.02 mm <sup>φ</sup>	0 to 600 mm 0 to 1000 mm	10.5 $\mu$ m 18 $\mu$ m	Using Caliper Checker, Slip Gauge Blocks and Length Bar
3. Depth Gauge <sup>s</sup> (Vernier/Electronic/ Dial) LC : 0.01 mm <sup>φ</sup> LC : 0.02 mm <sup>φ</sup>	0 to 300 mm 0 to 600 mm	9.0 $\mu$ m 14.5 $\mu$ m	Using Caliper Checker, Slip Gauge Blocks and Length Bar
4. External Micrometer <sup>s</sup> LC : 0.001 mm <sup>φ</sup>  LC : 0.01 mm <sup>φ</sup>	0 to 100 mm >100 mm to 300 mm  >300 mm to 1000 mm	1.5 $\mu$ m 3.0 $\mu$ m  10.0 $\mu$ m	Using Steel Slip Gauge Blocks and Length Bar
5. Micrometer Setting Rods <sup>s</sup>	25 mm to 100 mm >100 mm to 500 mm >500 mm to 975 mm	1.6 $\mu$ m 6.0 $\mu$ m 10.0 $\mu$ m	Using Slip Gauge Blocks, Length bars, Comparator Stands, Electronic Probe with Display and Digital Dial

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6.	Inside Micrometer <sup>s</sup> LC : 0.01 mm <sup>φ</sup>  Micrometer Head Overall Length (Extension Rod)	5 mm to 300 mm Up to 1000 mm	7.5 $\mu$ m 11.6 $\mu$ m	Using Slip Gauge Blocks, Slip Gauge Accessories, Length bars, Digital Dial, V-Block and Comparator Stand
7.	Depth Micrometer <sup>s</sup> LC : 0.01 mm <sup>φ</sup>	0 to 300 mm	7.5 $\mu$ m	Using Slip Gauge Blocks, Length Bars
8.	Plunger Dial Gauge <sup>s</sup> LC : 0.001 mm <sup>φ</sup>	0 to 25 mm	1.3 $\mu$ m	Using Dial Calibration Tester
9.	Lever Dial Gauge <sup>s</sup> LC : 0.001 mm <sup>φ</sup> LC : 0.01 mm <sup>φ</sup>	0 to 0.14 mm 0 to 2 mm	1.3 $\mu$ m 1.5 $\mu$ m	Using Dial Calibration Tester
10.	Bore Gauge <sup>s</sup> (with or Without Dial) LC : 0.001 mm <sup>φ</sup>	Transmission Accuracy 0 to 2 mm	1.5 $\mu$ m	Using Dial Calibration Tester
11.	Dial Thickness Gauge <sup>s</sup> LC : 0.001 mm <sup>φ</sup>	0 to 25 mm	4.0 $\mu$ m	Using Slip Gauge Block
	Pistol Type Caliper Gauge <sup>s</sup> LC : 0.1 mm <sup>φ</sup>	0 to 50 mm	66.0 $\mu$ m	
12.	Inside Dial Caliper Gauge <sup>s</sup> LC: 0.01 mm <sup>φ</sup>	0 to 100 mm	7.5 $\mu$ m	Using Slip Gauge Block
13.	Linear Probe with Display Unit <sup>s</sup> LC : 0.1 $\mu$ m <sup>φ</sup>	0 to 200 $\mu$ m	1.0 $\mu$ m	Using Slip Gauge Block

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14.	Dial Calibration Tester <sup>s</sup> LC : 0.0002 mm $\phi$	0 to 25 mm	0.6 $\mu$ m	Using Slip Gauge Blocks and Electronic Probe with Display
15.	Ultrasonic Thickness Gauge <sup>s</sup> LC : 0.1 mm $\phi$	1 to 300 mm	218 $\mu$ m	Using Slip Gauge Blocks and Length bars
16.	Coating thickness Gauge <sup>s</sup> LC : 0.0001 mm $\phi$	0 to 3 mm	3.1 $\mu$ m	Using Standard Thickness Foils
17.	Thickness Foils <sup>s</sup>	0 to 5 mm	1.1 $\mu$ m	Using Electronic Probe & Comparator Stand
18.	Plug Gauges <sup>s</sup>	1 mm to 100 mm >100mm to 200 mm	1.6 $\mu$ m 2.2 $\mu$ m	Using Slip Gauge Blocks, Length Bars, Electronic Probe with display and Comparator Stand
19.	Disc Gauges <sup>s</sup>	1mm to 100 mm >100mm to 200 mm	1.6 $\mu$ m 2.2 $\mu$ m	Using Slip Gauge Blocks, Length Bars, Electronic Probe with display and Comparator Stand
20.	OD Gauge <sup>s</sup>	1mm to 100 mm >100mm to 200 mm	1.6 $\mu$ m 2.2 $\mu$ m	Using Slip Gauge Blocks, Length Bars, Electronic Probe with display and Comparator Stand
21.	Reference Block of Ultrasonic thickness Gauge <sup>s</sup>	1mm to 100 mm >100mm to 200 mm	1.6 $\mu$ m 2.2 $\mu$ m	Using Slip Gauge Blocks, Length Bars, Electronic Probe with display and Comparator Stand
22.	Plain Snap Gauge <sup>s</sup>	1mm to 100 mm >100mm to 150 mm	1.0 $\mu$ m 1.5 $\mu$ m	Using Slip Gauge Blocks

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23.	Dial Snap Gauge <sup>§</sup>	Up to 150 mm	1.5 $\mu$ m	Using Slip Gauge Blocks
24.	Cylindrical Pin Gauge <sup>§</sup>	0.1mm to 20 mm	1.2 $\mu$ m	Using Slip Gauge Blocks, Electronic Probe with display and Comparator Stand
25.	Feeler Gauge <sup>§</sup>	0.01mm to 1 mm	1.5 $\mu$ m	Using Digital External Micrometer
26.	Thread Plug Gauge <sup>§</sup>	2 mm to 100 mm	3.0 $\mu$ m	Using Floating Carriage Diameter Measuring Machine, Cylindrical Setting Standards And Thread Measuring Wire
27.	Taper Thread Plug Gauge <sup>§</sup>	5mm to 100 mm	4.0 $\mu$ m	Using Floating Carriage Diameter Measuring Machine, Cylindrical Setting Standards And Thread Measuring Wire
<b>II.</b>	<b>ACOUSTIC</b>			
1.	Sound Level Meter <sup>§</sup>	94 dB & 114 dB	0.5 dB	Using Sound level meter Calibrator
<b>III.</b>	<b>ACCELERATION &amp; SPEED</b>			
1.	Tachometer / Speed meter / Stroboscope <sup>#</sup> Contact Type Non-contact Type	20 RPM to 5000 RPM 20 RPM to 80000 RPM	1.5 RPM to 7.3 RPM 1.5 RPM to 10 RPM	Using Digital Tachometer by Comparison Method

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<b>IV.</b>	<b>PRESSURE INDICATING DEVICES</b>			
1.	<b>Pneumatic Pressure<sup>#</sup></b> (Pressure Gauge (Analogue / Digital), Pressure Transmitter, Switch, Manometer, Magnehelic Gauge, Differential Pressure Gauge)	0 to 3 bar 0 to 25 bar	0.014 bar 0.061 bar	Using Digital Pressure Gauges and Pneumatic Pressure Pump By Comparison Method Based on DKD R6-1
2.	<b>Hydraulic Pressure<sup>#</sup></b> (Pressure Gauge (Analogue / Digital), Pressure Transmitter)	0 to 250 bar >250 bar to 1000 bar	0.37 bar 4.8 bar	Using Digital Pressure Gauges and Hydraulic Pressure comparator By Comparison Method Based on DKD R6-1
3.	<b>Negative Pressure<sup>#</sup></b> (Vacuum Gauge (Analogue / Digital), Vacuum Transmitter)	(-) 0.90 to 0 bar	0.007 bar	Using Digital Pressure Gauges and Vacuum Pump By Comparison Method Based on DKD R6-2

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<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	RTD/Thermocouple, Thermistors and Transmitter with or Without Indicator/ Recorder/Controller, Digital Thermometer with Sensor, Temperature Dial Gauge <sup>#</sup>	(-) 35°C to 100°C	0.24°C	Using Low Temperature Bath, PT-100 RTD Sensor with 6½ DMM by Comparison Method
2.	Temperature Indicator with sensor of Liquid Baths, Dry Block, Chamber, Deep Freezer, Oven, Furnace, Incubator (For Non-Medical Applications only) <sup>#</sup>	(-) 35°C to 200°C	0.41°C	Using PT-100 RTD Sensor with Multifunction Calibrator  (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.

⊕ 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.

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