Laboratory	**Matrix Lab, B-209-B212, B Wing M Cube, Balitha, Vapi, Gujarat**			
Accreditation Standard	**ISO/IEC 17025: 2005**			
Certificate Number	**CC-2664**	**Page**	**1 of 14**	
Validity	**26.04.2019 to 25.04.2020**	**Last Amended on**	**-**	

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO TECHNICAL CALIBRATION		
I.	**SOURCE**			
1.	DC Voltage #	1mV to100 mV 100mV to 1 V 1 V to 10 V 10 V to 1000 V	0.49% to 0.037% 0.037% to 0.007% 0.007% 0.007%	Using Multiproduct Calibrator Fluke 5502E by Direct Method
2.	DC Current #	0.2 mA to 1A 1A to 10 A 10 A to 20 A 20A to 1000 A	0.042% to 0.076% 0.076% 0.076% to 0.13% 0.31% to 0.92%	Using Multiproduct Calibrator Fluke 5502E with by Direct Method With 50Tcurrent Coil
3.	DC Resistance #	2 Ω to 100 Ω 100 Ω to 100kΩ 100kΩ to 10MΩ 10MΩ to 300MΩ 300MΩ to 1GΩ	0.38% to 0.22% 0.22% to 0.016% 0.016% to 0.07% 0.07% to 0.58% 0.58% to 1.83%	Using Multiproduct Calibrator Fluke 5502E by Direct Method
4.	DC Resistance Fix Point #	1mΩ 100 mΩ 1 GΩ 10 GΩ 100 GΩ 1000 GΩ	0.95% 0.15% 2.45% 2.51% 5.87% 5.80%	Using Low Resistance Jig by Direct Method Using HV Decade Resistance Jig by Direct Method
5.	AC Voltage $	**50Hz** 3mV to100 mV 100mV to 1 V 1 V to 1000 V	 0.63% to 0.052% 0.052% to 0.065% 0.065% to 0.061%	Using Multiproduct Calibrator Fluke 5502E by Direct Method

Abhinav Thakur
Convenor

Srikanth R.
Program Manager

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
6.	AC Current #	**50Hz** 190µA to 1 A 1A to 20A 20A to 1000A	 0.63% to 0.10% 0.10% to 0.21% 0.91% to 0.97%	Using Multiproduct Calibrator Fluke 5502E with by Direct Method With 50Tcurrent Coil
7.	Capacitance #	**1kHz** 350pF to 300nF **100Hz** 300µF to 700nF	 3.47 % to 0.54% 0.91% to 0.71%	Using Multiproduct Calibrator Fluke 5502E by Direct Method
8.	Inductance #	**1kHz** 100µH to 1H	 0.66 % to 0.59%	Using Inductance Decade Box by Direct Method
9.	Frequency#	40Hz to 100 Hz 120 Hz to 100 kHz	0.39% to 0.45% 0.48% to 0.45%	Using 5 ½ Multifunction Calibrator by Direct Method Using Multiproduct Calibrator Fluke 5502E by Direct Method
10.	Temperature Simulation# K–Type Thermocouple J– Type Thermocouple E- Type Thermocouple T– Type Thermocouple U– Type Thermocouple S– Type Thermocouple R– Type Thermocouple B- Type Thermocouple N- Type Thermocouple RTD Sensor	 (-) 200 °C to 1370 °C (-) 200 °C to 1200 °C (-) 250 °C to 1000 °C (-) 250 °C to 400 °C (-) 200 °C to 600 °C 0 °C to 1760 °C 0 °C to 1760 °C 600 °C to 1800 °C (-) 200 °C to 1300 °C (–) 200 °C to 800 °C	 0.45°C to 0.59 °C 0.3°C 0.92°C to 0.29°C 0.53°C to 0.30°C 0.65°C to 0.35°C 0.59°C to 0.58°C 0.42°C to 0.58°C 0.58°C to 0.41°C 0.47°C to 0.35°C 0.16°C	Using Multi Function Calibrator / ITS-90 Scale by Simulation Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
II.	**MEASURE**			
1.	DC Voltage #	1mV to 100 mV 100 mV to 10 V 10 V to 1000 V	0.38% to 0.009% 0.009% 0.009%	Using 6½ Digital Multimeter by Direct Method
2.	DC High Voltage #	1kV to 15 kV	2.0% to 1.93%	Using HV Voltage Divider Probe with DMM by Direct Method
3.	DC Resistance #	1 Ω to 10 Ω 10 Ω to 10MΩ 10MΩ to 1GΩ	1.49% to 0.0016% 0.0016% to 0.0032% 0.0032% to 2.94%	Using 6½ Digital Multimeter by Direct Method
4.	DC Current #	10µA to 100µA 100µA to 100mA 100mA to 1A 1A to 10A	0.96% to 0.092% 0.092% to 065% 0.65% to 0.16% 0.16% to 0.25%	Using 6½ Digital Multimeter by Direct Method
5.	AC Voltage #	**50Hz** 2mV to 100mV 100mV to 1000V	 0.44% to 0.019% 0.019% to 0.11%	Using 6½ Digital Multimeter by Direct Method
6.	AC High Voltage #	**50Hz** 1kV to 15 kV	 2.03% to 3.67%	Using HV Voltage Divider Probe with DMM by Direct Method
7.	AC Current #	**50Hz to 10kHz** 10µA to 100mA 100mA to 1A 1A to 10A	 0.33% to 0.18% 0.18% to 0.11% 0.11% to 0.14%	Using 6½ Digital Multimeter by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
8.	Frequency #	40Hz to 1000Hz	0.31% to 0.012%	Using 6½ Digital Multimeter by Direct Method
9.	Time Interval # Stop Watch/ Timer	5 s to 9000 s	0.2 s to 11.8 s	Using Digital Programmable Time by Comparison Method
10.	AC Power # Single Phase	**50Hz** 240V 1.2 to 5 A (2.88 to 1220 Watt)	1.41%	Using Watt Calibrator by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		MECHANICAL CALIBRATION		
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.**			
1.	Calipers[$] (Vernier **/** Digital/Dial) L.C.0.01mm[Φ]	0 to 600mm 0 to 1000mm	12.3µm 13.8 µm	Using Caliper Checker Long Slip Gauge by Comparison method
2.	Depth Caliper[$] (Vernier **/** Digital **/** Dial) L.C.0.01mm[Φ]	0 to 300mm	11.2 µm	Using Caliper checker Gauge Block Set By Comparison method
3.	Height Gauge[$] (Vernier **/** Digital/Dial) L.C.0.01mm[Φ]	0 to 600mm 0 to 1000mm	13.9 µm 16.1 µm	Using Caliper Checker Long Slip Gauge, Surface Plate Comparison method
4.	External Micrometer[$] L.C.0.001mm[Φ]	0 to 100mm 100 mm to 600 mm	2.2 µm 4.4 µm	Using Gauge Block Set Comparator stand With Dial gauge, Long Slip Gauge, By comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Micrometer Setting Standard[$]	25 mm to 575 mm	6.8 µm	Using Gauge Block Set , Comparator Stand with Dial Gauge, Long Slip Gauge By Comparison method
6.	Inside Micrometer **/** Stick Micrometer[$] (2 Points) Basic Travel of Micrometer L.C.0.001mm	50 mm to 63 mm	8.5 µm	Using Gauge Block Set Comparator Stand with Dial Gauge By Comparison method
	Overall Length accuracy with Extension Rod	Up to 1000 mm	17.7 µm	Using Slip Gauge Accessory Set, Long Slip Gauge By Comparison method
7.	Depth Micrometer[$] L.C.0.001mm	0 to 300mm	6 µm	Using Gauge Block Set, Surface Plate Comparison method
8.	Plunger Dial[$] L.C.0.001mm	0 to 25mm	6.8 µm	Using Dial Calibration Tester By Comparison method
9.	Lever Dial[$] L.C.0.001mm	0 to 1mm	4.3 µm	Using Dial Calibration Tester By Comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
10.	Bore Gauge[$] (for Transmission Error) L.C.0.001mm	Up to 1mm	7.2 µm	Using Dial Calibration Tester By Comparison method
11.	Dial Thickness Gauge[$] L.C.0.001mm	0 to 50 mm	5 µm	Using Gauge Block Set By Comparison method
12.	Feeler Gauge **/** Thickness Foils[$]	Up to 1 mm	2.6 µm	Using Digital Micrometer By Comparison method
13.	Ultrasonic Thickness Gauge[$] L.C.0.01mm	0 to 100 mm	12.5 µm	Using Gauge Block Set By Comparison method
14.	Plain Plug Gauge[$]	Up to 100 mm	6.5 µm	Using Gauge Block Set, Comparator Stand with Dial Gauge By Comparison method
15.	Snap Gauge[$]	Up to 100 mm 100 mm to 300 mm 300 mm to 600 mm	2.8 µm 4.2 µm 8.6 µm	Using Gauge Block Set By Comparison method
16.	Bevel Protector[$]	0° - 90°-0[U] **/** 5min	9min	Using Angle Gauge Block Set & Surface Plate By Comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
17.	Combination Set[$] L. C.: 1°	0° - 180°	37min	Using Angle Gauge Block Set & Surface Plate By Comparison method
II.	**PRESSURE INDICATING DEVICES**			
1.	(Pneumatic-Gauge Pressure) Digital & Dial Pressure Gauge, Pressure Transmitter, Pressure switch [#]	0 to 3 bar 0 to 30 bar	0.37% of rdg 0.05% of rdg	Using Digital Pressure Gauge & Pressure Comparator By Comparison method
2.	(Hydraulic-Gauge Pressure) Digital & Dial Pressure Gauge, Pressure Transmitter, Pressure switch [#]	0 to 400bar 0 to 700 bar 0 to 1000 bar	0.02% of rdg 0.02% of rdg 0.12% of rdg	Using Digital Pressure Gauge & Pressure Comparator By Comparison method
3.	Vacuum Dial **/** Digital Gauges, Manometer, Digital Indicators, Vacuum Calibrator & Vacuum Transmitters [#]	(-)0.98 to 0 bar	0.99% of rdg	Using Digital Vacuum Gauge & Comparator By Comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
III.	**ACOUSTIC**			
1.	Sound Level Meter[$]	94 dB & 114 dB	0.8 dB	Using Sound Calibrator & Calibration of sound level meter
IV.	**DUROMETER**			
1.	Rubber Hardness Tester: Spring Force Calibration [$]	Shore A Shore D	1.78 Shore A 1.78 Shore D	Using Rubber Hardness Tester Calibrator
V.	**WEIGHTS**			
1.	Mass[$] Calibration of weights of accuracy M1 and Coarser	1mg 2mg 5mg 10mg 20mg 50mg 100mg 200mg 500mg	0.04mg 0.04mg 0.04mg 0.04mg 0.04mg 0.04mg 0.04mg 0.04mg 0.14mg	Using Standard Weights Of E2 (1 mg to 500g),M1 Class (1 kg to 20 kg),& Weighing balance (s) With resolution of 0.01 mg (1 mg to 80 g) 0.1 mg (80g & 220g), 1 mg (200g & 1 kg), 0.1 g (2 kg & 5 kg), & 0.2 g (10 kg & 20 kg) as per OIML R 111

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Calibration of weights of accuracy M2 and Coarser	1g 2g 5g 10g 20g 50g 100g 200g 500g	0.20mg 0.20ng 0.20mg 0.02mg 0.02mg 0.02mg 0.10mg 0.10mg 10mg	
	Standard weight of M1 Class & Balance With Readability 10mg & 200mg Calibration of weights of accuracy M2 and Coarser	1 kg 2 kg 5 kg 10 kg 20 kg	10mg 10mg 12mg 223mg 223mg	
VI.	**WEIGHING SCALE AND BALANCE**			
1.	Electronics Weighing Balances♣			
	Readability :0.01mg Readability 0.1 mg	Up to 80g Up to 200 g	0.06 mg 0.2 mg	Using E2 class standard weights .weighing balance of Class II and Coarser as per OIML-R-76-1
	Readability :10 mg Readability :100 mg	Up to 1 kg Up to 5 kg Up to 20 kg	115 mg 200 mg 1.5 g	Using M1 class standard weights .weighing balance of Class II and Coarser as per OIML-R-76-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Readability :10 mg Readability : 100g	Up to 100 kg Up to 300 kg	20g 45g	Using M1 class standard weights .weighing balance of Class III and Coarser as per OIML-R-76-1
VII.	**VOLUME**			
1.	Micropipette[$]	10µl to 100µl 100µl to 1000µl	0.35µl 1µl	Using Weighing Balance Readability(0.01mg) By Gravimetric Method
2.	Glassware Pipettes, Measuring Cylinder**/** Volumetric Flask**/** Burette [$]	1 ml to 10 ml 10 ml to 50 ml 50 ml to 200 ml 200 ml to 1 L 1 L to 5 L 5 L to 20 L	0.1 ml 0.2 ml 0.2 ml 0.6 ml 1.3 ml 1.5 ml	Using weighing Balance of Readability 0.1 mg **/** 10 mg **/** 200 mg
VIII.	**ACCELERATION AND SPEED**			
1.	Tachometer, RPM Meter[$] (Non Contact Type)	5 rpm to 100000 rpm	0.36%	Using tachometer by comparison method
2.	Tachometer, RPM Meter[#] (Contact Type)	10 rpm to 10000 rpm	0.36%	Using tachometer by comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		THERMAL CALIBRATION		
I.	**TEMPERATURE**			
1.	RTD**/**PT-100 Sensor, (Thermocouple with & Without Controller**/** Indicator)	(-)30 °C to 50 °C	0.50°C	Using Low Temperature Ethanol Bath With SSPRT And Read Unit
	Data Logger, Temp. Recorder, Temp. Gauge, Temp. Transmitter, Digital Thermometer Temp. Controller **/** Indicator with RTD Sensor [$]	50 °C to 250 °C	0.23°C	Using Silicon Oil Bath With SSPRT And Read Unit
2.	Liquid In Glass Thermometers [$]	50°C to 250°C	0.77°C	Using Silicon Oil Bath With SSPRT And Read Unit
3.	RTD/PT-100 Sensor, (Thermocouple with & Without Controller**/**Indicator,)	50°C to 600°C	0.44°C	Using in Dry Block Calibrator With SSPRT And Read Unit
	Data Logger, Temp. Recorder, Temp. Gauge, Temp. Transmitter Digital Thermometer Temp. Controller**/**indicator with RTD Sensor [#]	600°C to 1200°C	2.70°C	Using in Dry Block Calibrator With S Type Thermocouple and Read Unit
4.	Infrared Thermometer[$] (Radiation Pyrometer)	50°C to 500°C	2.94°C	Using Black Body Source & Infrared Thermometer by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Temperature Indicator of Liquid bath, Oven, Dry Block, Furnace, Autoclave, Freezers, Incubator, Environmental Chamber[#]	(-)80°C to 400°C 400°C to 1200°C	0.69°C 2.88°C	Using Single Position Calibration at Measuring Location in DUC With SSPRT and Read Unit Single Position Calibration at Measuring Location in DUC With S type Thermocouple and Read Unit
6.	Oven, Incubator, Environment, Chamber, Furnaces [#]	(-)80°C to 400°C	2.53°C	Using data Logger with T-Thermocouple Sensors Multi Position Calibration (9 Nos)
7.	Dry Block Furnace, Muffle Furnace, Industrial furnace and Oven .[#]	>400°C to 1200°C	6.33°C	Using Data Logger With K type Thermocouples Multi Position Calibration (9 Nos)
II.	**SPECIFIC HEAT AND HUMIDITY**			
1.	Dial**/**Digital & Analog Thermo-Hygrometer**/**RH Sensors**/** with indicator**/** Recorder**/** Data logger [#]	(35%RH to 90% RH) @25°C	1.69%%RH	Using Humidity Chamber &Digital RH & Temperature indicator with Sensor probe

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
2.	Humidity Indicator of Humidity, Calibrator/ Generator/ Humidity Chamber [$]	(10°C to 50°C) @-50%RH (20%RH to 90%RH) @-25°C	0.53°C 1.69%RH	Using Digital RH & Temperature Indicator with Sensor probe Single Position Calibration
3.	Humidity Chamber/ Environmental chamber [#]	20%RH to 90%RH (@25°C)	3.17%RH	Using cordless RH loggers Multi Position Calibration (9nos)

*** Measurement Capability is expressed as an uncertainty (±) 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