Laboratory	**Gatrad Cal-test Laboratories and Research Pvt. Ltd., 248, GIDC Industrial Estate, Telephone Exchange Road, Odhav, Ahmedabad, Gujarat**
Accreditation Standard	**ISO/IEC 17025: 2005**
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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO-TECHNICAL CALIBRATION		
I.	**SOURCE**			
1.	DC Voltage#	0.03 mV to 1 mV 1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 1000 V	4.36 % to 0.233 % 0.233 % to 0.004 % 0.003 % to 0.002 % 0.002 % 0.002 % to 0.0024 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
2.	DC Current#	10 μA to 190 μA 190 μA to 1 mA 1 mA to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 20 A	0.248 % to 0.030 % 0.030 % to 0.017 % 0.017 % to 0.015 % 0.015 % to 0.028 % 0.028 % to 0.064 % 0.064 % to 0.120 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
		10 A to 1000 A	0.89 % to 0.87 %	With 50 Turns Current Coil
3.	DC Power#	3 mW to 12 kW (0 to 1000V / 0.01A to 20 A)	0.256 % to 0.12 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
4.	DC Resistance#	0.2 Ω to 2 Ω 2 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 100 kΩ 100 kΩ to 10 MΩ 10 MΩ to 300 MΩ 300 MΩ to 1 GΩ	5.778 % to 0.582 % 0.582 % to 0.120 % 0.120 % to 0.021 % 0.021 % to 0.005 % 0.005 % to 0.018 % 0.018 % to 0.387 % 0.387 % to 1.791 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Insulation Resistance#	Up to 5 kV 100 kΩ to 1 GΩ 1 GΩ to 10 GΩ	 2.31 % to 5.78 % 5.78 % to 5.79 %	Using HV Decade Resistance Box By Direct Method
6.	Inductance #	**1 kHz** 10 μH to 1 mH 1 mH to 100 mH	 3.24 % to 2.89 % 2.89 %	Using Decade Inductance Box By Direct Method
7.	AC Voltage #	**10 Hz to 8 kHz** 1 mV to 3 mV 3 mV to 100 mV 100 mV to 1 V 1 V to 1000 V	 0.79 % to 0.261 % 0.261 % to 0.027 % 0.027 % to 0.024 % 0.024 % to 0.0365 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
8.	AC Current #	**45 Hz to 1 kHz** 30 μA to 100 mA 100 mA to 1 A 1 A to to 20 A **1 kHz to 5 kHz** 30 μA to 100 mA 100 mA to 1 A 1 A to 20 A	 0.530 % to 0.082 % 0.082 % to 0.074 % 0.074 % to 0.204 % 0.924 % to 0.179 % 0.179 % to 0.809 % 0.809 % to 3.493 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
		50 Hz 10 A to 1000 A	 0.78 % to 0.81 %	With 50 Turns Current Coil
9.	AC Power (Single phase)# (VA)	**50 Hz at UPF** 10 mW to 20 kW 0.1 V to1000 V) (0.01 A to 20 A)	 0.161 % to 3.302 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
		50 Hz at UPF 0.05 kW to 1 MW (0.1 V to 1000 V) (0.01 A to 20 A)	 0.78 % to 0.816 %	With 50 Turns Current Coil

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
10.	Power Factor/ Phase Angle #	**50 Hz** 0.5 Lag-1-0.5 Lead	0.11 % to 0.42 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
11.	Capacitance #	**1 kHz** 220 pF to 10 nF 10 nF to 200 nF 700 nF to 300 μF **@100 Hz**	5.845 % to 0.418 % 0.418 % to 0.420 % 0.35 % to 0.64 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
12.	Frequency #	10 Hz to 1 MHz	3.54 ppm to 3.0 ppm	Using Multi Product Calibrators Fluke 5522A/ 5500A by Direct Method
13.	Oscilloscope # Amplitude DC Signal Square Wave Signal Time Marker Band Width	 1 mV to 45 V 1 mV to 45 Vp-p 2 ns to 5 s 50 kHz to 1 GHz	 4.75 % to 0.21 % 4.74 % to 0.21 % 0.318 % to 0.58 % 2.05 % to 5.89 %	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method
14.	Temperature Simulation # K-Type J-Type E-Type T-Type U-Type S-Type R-Type	 (-) 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	 0.13 °C to 0.17 °C 0.09 °C to 0.05 °C 0.08 °C to 0.05 °C 0.13 °C to 0.04 °C 0.13 °C to 0.04 °C 0.47 °C 0.47 °C	Using Multi Product Calibrators Fluke 5522A/5500A by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	B-Type N-Type L-Type RTD Sensor	600 °C to 1800 °C (-) 200 °C to 1300 °C (-) 200 °C to 900 °C (-) 200 °C to 0 °C 0 °C to 800 °C	0.18 °C 0.20 °C to 0.08 °C 0.20 °C to 0.08 °C 0.03 °C 0.12 °C	
II	**MEASURE**			
1.	DC Voltage #	10 µV to 0.1 mV 0.1 mV to 1 mV 1 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 1000 V	1.308 % to 0.130 % 0.1312 % to 0.0135 % 0.0134 % to 0.0007 % 0.0007 % to 0.0005 % 0.0005 % to 0.0005 % 0.0005 % to 0.0007 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method
2.	DC High Voltage #	1 kV to 25 kV	6.70 % to 2.73 %	Using HV Voltage Divider Probe with Multimeter by Direct Method
3.	Resistance #	1 mΩ to 10 mΩ 10 mΩ to 10 Ω 10 Ω to 10 MΩ 10 MΩ to 1 GΩ 1 GΩ to 10 GΩ	0.48 % to 0.056 % 0.048 % to 0.001 % 0.001 % to 0.0025 % 0.0025 % to 0.1756 % 0.1756 % to 0.1841 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
4.	DC Current #	10 μA to 100 μA	0.072 % to 0.0021 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method
		100 μA to 10 mA	0.0021 % to 0.0022 %	
		10 mA to 100 mA	0.0022 % to 0.0050 %	
		100 mA to 1 A	0.0050 % to 0.0218 %	
		1 A to 10 A	0.0218 % to 0.0493 %	
		10 A to 20 A	0.0493 % to 0.0472 %	
5.	AC Voltage #	**10 Hz to 1 KHz** 1 mV to 100 mV	0.4869 % to 0.0315 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method
		100 mV to 100 V	0.0162 % to 0.0134 %	
		50 Hz to 1 kHz 100 V to 1000 V	0.0134 % to 0.0189 %	
		1 kHz to 10 kHz 1 mV to 100 mV	0.5003 % to 0.0183 %	
		100 mV to 100 V	0.0183 % to 0.0151 %	
		100 V to 1000 V	0.0151 % to 0.0315 %	
6.	AC High Voltage #	**50 Hz** 1 kV to 20kV	8.19 % to 5.81 %	Using HV Voltage Divider Probe with Multimeter by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
7.	AC Current #	**50 Hz to 10 kHz** 30 µA to 100 µA 100 µA to 100 mA 100 mA to 1 A 1 A to 20 A	 0.262 % to 0.058 % 0.053 % to 0.053 % 0.053 % to 0.0938 % 0.0105 % to 0.301 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method
8.	Frequency #	10 Hz to 1 MHz	0.2429 % to 0.0014 %	Using Fluke 8½ Digit DMM / 6 ½ Digit DMM by Direct Method
9.	Capacitance #	1 nF to 100 mF	16.74 % to 5.08 %	Using Fluke 6½ Digit DMM by Direct Method
10.	Stop Watch/Timer #	1 s to 24 hour	0.611s to 1.076 s	Using Digital Bench Timer by Comparison Method
11.	Temperature Simulation # K-Type J-Type E-Type T-Type U-Type S-Type R-Type B-Type N-Type L-Type 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 900 °C (-) 200 °C to 800 °C	 0.016 °C 0.012 °C 0.012 °C 0.012 °C 0.012 °C 0.02 °C 0.02 °C 0.02 °C 0.012 °C 0.012 °C 0.013 °C	Using Fluke 8½ Digit DMM (in temperature measurement mode) as per ITS-90 scale by simulation method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	MECHANICAL CALIBRATION			
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)**			
1.	Calipers $^{\$}$ (Vernier/Dial/Digital) L.C.: 0.01 mm$^{\phi}$	Up to 600 mm 600 mm to 1000 mm	9.0 µm 12 µm	Using Caliper Checker & Length Bars By Comparison Method as per IS 3651
2.	Height Gauge $^{\$}$ (Vernier/Dial/Digital) L.C.: 0.01 mm$^{\phi}$	Up to 600 mm 600 mm to 1000 mm	11 µm 12 µm	Using Caliper Checker & Length Bars By Comparison Method as per IS 2921
3.	Depth Gauge $^{\$}$ (Vernier/Dial/Digital) L.C.: 0.01 mm $^{\phi}$	Up to 300 mm	7.6 µm	Using Length Bars & Slip Gauges By Comparison Method as per IS 4213
4.	External Micrometer$^{\$}$ L.C.: 0.0001 mm$^{\phi}$ L.C.: 0.001 mm L.C.: 0.01 mm	0 to 25 mm 100 mm to 300 mm 0 to 500 mm 500 mm to 1000 mm	1.0 µm 2.0 µm 4.0 µm 7.0 µm	Using Gauge Blocks & Length Bars By Comparison Method as per IS 2967

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Inside Micrometer$^{\$}$ (Micrometer Head & Extension Rod) L.C.: 0.001mm$^{\phi}$	Up to 300 mm 300 mm to 600 mm 600 mm to 1000 mm	3.6 µm 5.0 µm 7.0 µm	Using LMM, Length Bars Digital Indicator by Comparison Method as per IS 2966
6.	Depth Micrometer$^{\$}$ L.C.: 0.001mm$^{\phi}$	Up to 300 mm	4.0 µm	Using Gauge Blocks & Length Bars by comparison method as per IS 6468
7.	Micrometer Head$^{\$}$ L.C.: 0.0002 mm L.C.: 0.001 mm$^{\phi}$	Up to 25 mm Up to 50 mm	1.0 µm 1.0 µm	Using Gauge Blocks & Electronic Probe By Comparison Method IS 9483
8.	Dial Indicator (Plunger/Lever)$^{\$}$ L.C.: 0.0005mm$^{\phi}$ L.C.: 0.001mm$^{\phi}$ L.C.: 0.01 mm$^{\phi}$	0 to 0.05 mm Up to 25 mm Up to 50 mm	0.4 µm 1.0 µm 1.3 µm	Using LMM By comparison method as per IS 2092 & IS 11498
9.	Dial Calibration Tester$^{\$}$ L.C.: 0.0001 mm$^{\phi}$	Up to 25 mm	0.6 µm	Using Gauge Blocks & Electronic Probe by comparison method as per IS 9483

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
10.	Dial Bore Gauge L.C.: 0.001 mm$^{\phi}$ (For Transmission Accuracy)	Up to 2 mm	0.67 µm	Using LMM by comparison method as per JIS B7515
11.	Dial Thickness Gauge$^{\$}$ L.C.: 0.001mm$^{\phi}$ L.C.: 0.05 mm$^{\phi}$	0 to 25 mm 0 to 50 mm	1.0 µm 30.0 µm	Using Gauge Block by comparison method as per IS 2092
12.	Inside Dial Caliper Gauge$^{\$}$ L.C.: 0.01 mm$^{\phi}$	Up to 100 mm	15.0 µm	Using Gauge Block by comparison method
13.	Steel Scale$^{\$}$	Up to 2000 mm	31 x √L µm L in meter	Using Tape & Scale Calibrator by comparison method as per IS 1481
14.	Measuring Tape$^{\$}$	Up to 200000 mm	48 x √L µm L in meter	Using Tape & Scale Calibrator by comparison method as per IS 1269
15.	2 Linear Probe$^{\$}$ (LVDT Probe) L.C.: 0.0001 mm$^{\phi}$	0 to 25 mm	0.90 µm	Using LMM by comparison method
16.	Coating Thickness Gauge$^{\$}$ L.C.: 0.0001mm$^{\phi}$ L.C.: 0.01mm$^{\phi}$	0 to 1.0 mm 0 to 10 mm	1.9 µm 10.0 µm	Using LMM by comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
17.	Ultrasonic Thickness Gauge[$] L.C.: 0.01 mm[ϕ]	0 to 300 mm	12.0 µm	Using Length Bar by comparison method as per IS 15468
18.	Diameter / Circumference Tape[$]	Up to 3000 mm	46 x √L µm L in meter	Using Tape & Scale Calibrator by comparison method
19.	Gauge Block Comparator[$]	Up to 100 mm	0.07 µm	Using Gauge Block-Gr:K as per Euramet cg-2
20.	Engineers Square/ Right Angle/ Tri-square[$] Straightness Perpendicularity Parallelism	Up to 500 mm	 4.8 µm 9.3 µm 4.6 µm	Using CMM by Comparison Method as per IS 2103
21.	Surface Plate[#]	300 mm x 300 mm to 2000 mm x 2000 mm	$1.1\sqrt{\frac{(L+W)}{100}}$ L & W in mm	Using Precision Electronic Level by comparison method as per IS 7327, IS 2285, IS 12937
22.	Straight Edge[#]	Up to 4000 mm	$4.5\sqrt{\frac{(L)}{100}}$ L in mm	Using Precision Electronic Level, Gauge Block & Surface Plate by comparison method as per IS 2220
23.	V- Block [#] Symmetricity Parallelism Squarness	Up to 300 mm	 4.0 µm 4.0 µm 4.0 µm	Using Surface Plate, Mandrel, Gauge Block & CMM by comparison method as per IS 2949

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
24.	Angle Plate[$] Flatness Perpendicularity Parallelism	Up to 350 mm	 4.5 µm 9.3 µm 4.6 µm 4.5 µm	Using Surface Plate, Cylindrical Square, Gauge Block by comparison method as per IS 2554 Using CMM
25.	Long Gauge Blocks[$]	100 mm to 300 mm	2.0 µm	Using LMM by comparison method
26.	Gauge Blocks[$] (Steel, Tungsten Carbide, Ceramic)	0.5 mm to 25 mm 30 mm to 50 mm 60 mm to 80 mm 90 mm to 100 mm	0.09 µm 0.25 µm 0.40 µm 0.47 µm	Using Gauge Block Calibrator & Gauge Block – Gr:K by Comparison Method as per IS 2984 ISO 3650
27.	Caliper Checker / Depth Micro-checker/ Internal Micrometer Checker[$]	0 to 300 mm 0 to 600 mm 0 to 1000 mm	3.6 µm 4.5 µm 6.0 µm	Using CMM by Comparison Method
28.	Cylindrical Setting Masters[$]	3 mm to 100 mm	1.6 µm	Using LMM by comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
29.	Length Bar / Micrometer Setting Standard[$]	Up to 100 mm 100 mm to 200 mm 200 mm to 300 mm 300 mm to 400 mm 400 mm to 500 mm 500 mm to 600 mm 600 mm to 700 mm 700 mm to 800 mm 800 mm to 900 mm 900 mm to1000 mm	2.0 µm 2.5 µm 3.0 µm 3.8 µm 4.4µm 4.8 µm 5.2 µm 5.6 µm 6.0 µm 6.5 µm	Using Length Bar, Electronic probe with DRO & CMM by comparison method as per IS 7014
30.	Bevel Protractor, Degree Protractor, Combination Set Inclinometer[$] L.C.: 0.5'[ϕ]	0° - 90° - 0°	3.3'	Using Angle Gauge Set & CMM by comparison method as per IS 4239
31.	Sine Bar, Sine Table[$] Centre Distance Angle	Up to 300 mm 300 mm to 500 mm	2.5 µm 4.4 µm 5.1''	Using Angle Gauge Set, Gauge Block, Digital Indicator & CMM By comparison method as per IS 5339
32.	Spirit Level, Electronic Level[$] Sensitivity 0.001 mm/m[ϕ]	Base size up to 600 mm Range: 2 mm/m	7.0 µm/m	Using Electronic Level & Tilt table by comparison method as per IS 5706 & IS 1632

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
33.	Thread Measuring Prisms[$] A, B, C & D	A, B, C & D	0.2 µm	Using LMM By comparison method as per IS 6150
34.	Plain Plug gauges, OD Master, Reference Disc[$]	1 mm to 100 mm 100 mm to 200 mm 200 mm to 300 mm	1.0 µm 2.0 µm 3.7 µm	Using LMM By comparison method as per IS 3455
35.	Plain Snap Gauge[$]	2 mm to 100 mm 100 mm to 300 mm	1.5 µm 2.2 µm	Using LMM By Comparison Method as per IS 7606, IS 3455, IS 7876
36.	Plain / Master Setting Ring Gauge[$]	3 mm to 100 mm 100 mm to 200 mm 200 mm to 300 mm 300 mm to 400 mm	1.0 µm 1.4 µm 1.8 µm 4.1 µm	Using LMM & CMM by comparison method as per IS 3485, IS 3455, IS 7876
37.	Taper Plain Ring Gauge[$] (Parameter Major Diameter, Angle, Step)	5 mm to 100 mm 100 mm to 200 mm	1.4 µm 3.5 µm 3.5”	Using LMM , Setting Rings & CMM by comparison method as per IS 9529
38.	Taper Plain Plug Gauge[$] (Parameter Major Diameter, Minor Diameter, Angle, Step)	5 mm to 100 mm 100 mm to 200 mm	2.0 µm 3.5 µm 3.1”	Using LMM, Setting Standards & CMM by comparison method as per IS 9529
39.	Thread Plug Gauge[$] (Parameter Major /Effective Diameter)	2 mm to 100 mm 100 mm to 200 mm 200 mm to 300 mm	3.0 µm 2.3 µm 3.8 µm	Using FCDM, Setting Masters, Thread Measuring Wires & LMM by Comparison Method as per IS 2334

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
40.	Thread Plug Gauge (Taper)[$]	5 mm to 170 mm	2.0 µm	Using LMM & Setting Masters by comparison method as per ASME B1.20.1 & ASME B1.20.5
41.	Thread Ring gauge[$] (Minor & Effective Diameter)	2 mm to 100 mm 100 mm to 200 mm 200 mm to 300 mm	1.2 µm 1.7 µm 2.4 µm	Using LMM & Setting Rings by comparison method as per IS 2334
42.	Taper Thread Ring Gauge[$] (Effective Diameter)	5 mm to 100 mm	1.5 µm	Using LMM & Setting Rings by comparison method as per ANSI/ASME B1.20.3
43.	Thread Measuring Wire, Measuring Pin & Pin Gauge[$]	0 to 6.35 mm 0 to 20 mm	0.3 µm 0.3 µm	Using LMM by comparison method as per IS 11103
44.	Thickness Foils, Calibration Foils Feeler Gauge[$]	Up to 10 mm	1.0 µm	Using LMM by comparison method as per IS 3179
II.	**ACOUSTIC**			
1.	Sound Level Meter[$]	**1 kHz** 94 dB & 114 dB	0.49 dB	Using Sound Level Calibrator by Comparison Method as per IS 15575
III.	**ACCELERATION & SPEED**			
1.	Tachometer (Speed Measurement) [#] Contact Type Non-contact Type	 6 RPM to 4500 RPM 6 RPM to 90000 RPM	 3.6 % to 0.02 % rdg 3.5 % to 0.015 % rdg	Using Digital Tachometer by Comparison method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
IV.	**TORQUE GENERATING DEVICES**			
1.	Torque Wrench, Torque Meter[$] (Type –I & Type II)	2 Nm to 20 Nm 20 Nm to 200 Nm 50 Nm to 500 Nm 200 Nm to 2000 Nm	0.86 % rdg 0.39% rdg 0.39 % rdg 0.40% rdg	Using Precision Torque Transducer with Digital Display & Test Rig As per ISO 6789:2003
V.	**PRESSURE INDICATING DEVICES**			
1.	Dead Weight Pressure Tester[$] (Hydraulic – Gauge Pressure)	6 bar to 1100 bar	0.011% rdg	Using Standard Dead Weight Pressure Tester by Direct Pressure Cross Float Measuring Method based on Euromet cg-3 V 1.0
2.	Pressure Calibrator, Digital & Dial Pressure Gauge & Pressure Transmitter (Hydraulic Gauge Pressure)[$]	6 bar to 1100 bar	0.014% rdg	Using Standard Dead Weight Pressure Tester By direct method based on DKD R-6-1
3.	Pressure Calibrator, Digital & Dial Pressure Gauge, Pressure Transmitter & Pressure Indicators (Hydraulic – Gauge Pressure)[$]	0.1 to 100 bar 100 bar to 700 bar 700 bar to 1000 bar	0.017 % rdg 0.025 %rdg 0.29 %rdg	Using Pressure Transducers with Display Unit by Comparison Method
4.	Pressure Dial Gauges, Digital Indicators & Recorders[#]	0 to 3 bar 3 bar to 30 bar 30 bar to 700 bar	0.005 bar 0.023 bar 0.25 bar	Using Digital Pressure Gauge by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Vacuum Dial Gauges, Digital Indicators, Vacuum Calibrator & Vacuum Transmitters[#]	(-)0.95 bar to 0.00 bar	0.00086 bar	Using Digital Vacuum Indicator / Pressure Gauge & comparator pump by comparison method
VI.	**WEIGHTS**			
1.	Accuracy Class F_1 and Coarser[$]	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	0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.03 mg 0.03 mg 0.03 mg 0.03 mg 0.03 mg 0.03 mg 0.03 mg 0.04 mg 0.04 mg 0.05 mg 0.1 mg 0.2 mg	Using Standard Weight of E_2 Class (1mg to 200 g), & Electronic Balance (Readability:0.01/0.1mg) as per OIML R-111:2004 By Substitution Method through ABBA Cycle
	Accuracy Class M_1 and Coarser	500 g 1 kg 2 kg 5 kg 10 kg 20 kg	3 mg 10 mg 10 mg 40 mg 100 mg 300 mg	Using Standard Weight of F1 Class Weights (500g to 20kg) & Electronic Balance (Readability: 0.001/0.01/0.1g) as per OIML R-111:2004 By Substitution Method through ABBA Cycle

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
VII.	**WEIGHING SCALE AND BALANCE**			
1.	Electronic Weighing Balance[#] (Class-I and Coarser) d ≥ 0.01 mg d ≥ 0.1 mg	 1 mg to 60 mg 10 mg to 200 mg	 0.16 mg 0.2 mg	 Using E2 Class Standard Weights (1 mg to 200g) as per OIML R-76
2.	Electronic Weighing Balance [#] (Class-II and Coarser) d ≥ 1 mg d ≥ 10 mg d ≥ 0.1 g	 50 mg to 500 g 0.5 g to 6 kg 20 g to 30 kg	 2 mg 20 mg 0.1 g	 Using F1 Class Standard Weights (upto 30 kg) as per OIML R-76
VIII.	**VOLUME**			
1.	Micro Pipettes[$]	10 µl < V ≤ 100 µl 100 µl < V ≤ 1000 µl	0.18 µl 0.5 µl	Using Electronic Weighing Balance (Range : 0 to 200g Readability: 0.01/0.1mg) & distilled water by Gravimetric Method as per ISO8655-6:2002

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
2.	Pipettes, Volumetric Flask, Burettes, Conical Flask, Dispensette[$]	1 ml < V ≤ 10 ml 10 ml < V ≤ 100 ml 100 ml < V ≤ 500 ml 1000 ml < V ≤ 5000 ml 5000 ml < V ≤ 10000 ml	3 µl 29 µl 0.29 ml 1.45 ml 2.9 ml	Using Electronic Weighing Balance(Range : upto 30kg & Readability: 0.01 to 100mg) & distilled water Calibration of Glassware based on Gravimetric Method as per ISO 4787
IX.	**DENSITY**			
1.	Specific Gravity Hydrometer[$]	0.6 g/ml to 2.0 g/ml	0.16%	Using Precision Weighing Balance & Appropriate Liquid based on NIST SP : 250-78 by Cuckow's Method
2.	Baume Hydrometer[$]	0 to 70° Be	0.37%	

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	THERMAL CALIBRATION			
I.	**TEMPERATURE**			
1.	PRT / RTD/ Thermocouple Sensors- with or without Temp. Indicators, Thermistors / Transmitter with Indicator, Digital Thermometer, Temperature Dial Gauges[$]	(-)196 °C (-) 80°C to 0 °C 0 °C to 100 °C 100 °C to 650 °C	0.028 °C 0.020 °C 0.023 °C 0.041 °C	By Comparison Method, Using PRT Sensors, Precision Temperature Read Outs, LN2 Container, Liquid Bath, Dry Well Baths
		650 °C to 1200 °C	1.68 °C	By Comparison Method, Using S-Type Thermocouple, Precision Temperature Read Out, Dry Well Baths, Temperature Furnace
2.	Liquid in Glass-Thermometer[$]	(-) 80 °C to 100 °C	0.067 °C	By comparison method
3.	Infrared Thermometer/ Thermal Imager / Thermal Radiation Pyrometer[$]	50 °C to 250 °C 250 °C to 500 °C	1.80 °C 2.41 °C	By Comparison method, using IR Calibrator and IR Thermometer
4.	Humidity Indicators with Sensor, Thermo-hygrometers/ Humidity Transmitters / Data Loggers with Humidity Sensors[$]	20% to 95% Rh (@ 23°C) 5°C to 50°C @ 50%Rh	1.18 % Rh 0.52 °C	By comparison method, using Temperature/ Humidity Meter and Humidity Generator with Chamber

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Humidity Indicators with Sensors Thermo-Hygrometers/ Humidity Transmitters /Data Loggers Humidity Sensors[$]	5 % Rh (@ 23 °C 20 % Rh (@ 23 °C 35 % Rh (@ 23 °C 50 % Rh (@ 23 °C 75 % Rh (@ 23 °C 95 % Rh (@ 23 °C)	0.32 % RH 0.32 % RH 0.5 % RH 0.9 % RH 1.2 % RH 1.2 % RH	By Fixed point Calibration, using Standard solutions with Realization Chamber
6.	Temperature Indicators With Sensors Of Liquid Baths, Dry Well Blocks Dry Well Baths, Furnaces, Ovens, Deep Freezers[#]	(-) 95 °C to 150 °C 150 °C to 425 °C 425 °C to 650 °C 650 °C to 1200 °C	0.034 °C 0.15 °C 0.23 °C 1.78 °C	Single Position Calibration (At measuring location in DUC) using PRT Sensor, Precision Temperature Readouts.
7.	Temperature Indicators With Sensors Of Dry Well Blocks, Furnaces [#]	650°C to 1200°C	1.78°C	Single Position Calibration (At measuring location in DUC) using PRT Sensor, Precision Temperature Readouts
8.	PRT / RTD / Thermocouple Sensors – with or without Temp. Indicators, Thermistors / Transmitter with Indicator, Digital Thermometer, Temperature Dial Gauges [♣]	(-)25°C to 150°C 150°C to 600°C	0.08°C 0.39°C	By comparison method, using PRT sensors, Precision Temperature Read Outs, Dry Well Baths

Laboratory	**Gatrad Cal-test Laboratories and Research Pvt. Ltd., 248, GIDC Industrial Estate, Telephone Exchange Road, Odhav, Ahmedabad, Gujarat**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**CC-2727**	**Page**	**21 of 21**
Validity	**22.06.2018 to 21.06.2020**	**Last Amended on**	**-**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		600°C to 1200°C	2.30°C	By comparison method, using S-Type Thermocouple, Precision Temperature Read Out, Dry Well Baths, Temperature Furnace

*** 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.
Φ 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.

Ashish Kakran
Convenor

Avijit Das
Program Director