Laboratory	**Vashisth Calibration Private Limited, Plot No. 6 & 7, Rajeev Gandhi Complex, 21/3, Mathura Road, Faridabad, Haryana**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**CC-2167** **Page 1 of 16**
Validity	**30.08.2018 to 29.08.2020** **Last Amended on -**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	ELECTRO-TECHNICAL CALIBRATION			
I.	**MEASURE**			
1.	DC Voltage#	1 mV to 1 V 1 V to 1000 V	0.43 % to 0.04 % 0.04 % to 0.01 %	Using 6 ½ D.M.M. by Direct Comparison Method
	DC High Voltage#	1 kV to 20 kV	3.6 %	Using High Voltage Probe with D.M.M by Direct Comparison Method
2.	DC Current#	100 µA to 1 mA 1 mA to 100 mA 100 mA to 3 A 3 A to 10 A	0.91 % to 0.73 % 0.73 % to 0.064 % 0.064 % to 0.17 % 0.17 % to 0.24 %	Using 6 ½ D.M.M. 5 ½ D.M.M. by Direct Comparison Method
3.	DC Resistance# (2 Wire & 4 Wire)	0.001Ω to 1 Ω 1 Ω to 10 kΩ 10 k Ω to 100 M Ω 100 M Ω to 40 G Ω	2.34 % to 0.46 % 0.46 % to 1.3 % 1.3 % 1.3 % to 6.03 %	Using Low Resistance Meter 6 ½ D.M.M. Digital High Resistance Meter by Direct Comparison Method
4.	AC High Voltage#	**50 Hz & 60 Hz** 10 mV to 1V 1 V to 750 V	 0.54 % to 0.1 % 0.1 % to 0.5 %	Using 6 ½ D.M.M. by Direct Comparison Method
		50 Hz 0.75 kV to 25 kV	 5.81 %	Using High Voltage Probe With D.M.M. by Direct Comparison Method
5.	Frequency#	1 Hz to 1MHz 1 MHz to 50 MHz 50 MHz to 1 GHz	0.12 % to 0.59 % 0.02 % to 0.05 % 0.05 % to 0.3 %	Using 6 ½ D.M.M.& High Frequency Counter by Direct Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
6.	AC Current #	**50 Hz & 60 Hz** 1 mA to 100 mA 100 mA to 3 A 3 A to 10 A	 1.73 % to 0.46 % 0.46 % to 0.25 % 0.25 % to 1.16 %	Using 5 ½ D.M.M. 6 ½ D.M.M. by Direct Comparison Method
7.	AC Power/ Energy# at 50 Hz (P.F.: Unity) (1Φ/3 Φ)	0.5 Amp to 5 Amp 110 / 220 Volt A C (upto 1200 Watt)	1.16 %	Using Digital Power Analyzer by Direct Comparison Method
8.	Timer, Stop Watch#	1 Sec to 24 Hours	0.2 sec	Using Digital Stop Watch by Direct Comparison Method
9.	Capacitance #	**1 kHz** 100 pF to 100 nF 100 nF to 1 µF	 0.68 % to 0.31 % 0.31 % to 0.42 %	Using LCR Meter by Direct Comparison Method
10.	Inductance #	**1 kHz** 100 µH to 100 mH 100 mH to 10 H	 0.51 % to 0.42 % 0.42 % to 0.58 %	Using LCR Meter by Direct Comparison Method
11.	Temperature Simulation#			
	RTD (Pt-100) Thermocouple – 'J' Type 'K' Type 'R' Type 'T' Type	(-) 200 °C to 700 °C (-) 100 °C to 500 °C (-) 100 °C to 950 °C 200 °C to 1600 °C (-) 100 °C to 400 °C	0.83 °C 1.2 °C 1.5 °C 3.2 °C 1 °C	Using Digital Process Indicator by Direct Comparison Method
II.	**SOURCE**			
1.	DC Voltage#	1 mV to 1 V 1 V to 1000 V	4.7 % to 0.06 % 0.06 %	Using Universal Calibrator by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
2.	DC Current#	10 µA to 100 mA 100 mA to 1 A 1 A to 20 A 20 A to 1000 A (With Current Coil)	0.65 % to 0.10 % 0.10 % to 0.5 % 0.5 % to 0.12 % 0.2 %	Using Universal Calibrator (with Current Coil) by Direct Method
3.	DC Resistance#	1 m Ω 0.1 Ω 1 Ω 10 Ω to 24 k Ω 24 k Ω to 24 M Ω 24 M Ω to 40 G Ω	2.38 % 2.38 % 0.25 % 1.3 % to 0.26 % 0.26 % 5.15 %	Using Low Resistance Box, Universal Calibrator, High Resistance Box by Direct Method
4.	AC Voltage#	**50 Hz to 400 Hz** 10 mV to 1 V 1 V to1000 V	 0.78 % to 0.46 % 0.46 % to 0.12 %	Using Universal Calibrator by Direct Method
5.	Frequency#	10 Hz to 1 MHz	0.08 % to 0.23 %	Using Function Generator by Direct Method
6.	AC Current #	**50 Hz to 400 Hz** 100 µA to 0.1 A 0.1 A to 1 A 1 A to 20 A	 2.1 % to 0.18 % 0.18 % to 0.18 % 0.18 % to 0.2 %	Using Universal Calibrator by Direct Method
		50 Hz 20 A to 1000 A (With Current Coil)	 1.0 %	Using Universal Calibrator (with current coil) by Direct Method
7.	Capacitance#	**1 kHz** 100 pF to 1 µF@ **100 Hz** 1 µF to 10 µF@	 1.33 % to 1.17 % 1.17 %	Using Capacitance Box by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
8.	Inductance#	**1 kHz** 10 µH to 100 mH 100 mH to 10 H	 1.39 % to 1.17 % 1.17 % to 1.4 %	Using Inductance Box by Direct Method
9.	Temperature Simulation#			Using Temperature Calibrator by Direct Method
	RTD (Pt-100) Thermocouple – 'J' Type 'K' Type 'R' Type 'T' Type	(-)200 °C to 800 °C (-)100 °C to 800 °C (-)100 °C to 1300 °C 200 °C to 1600 °C (-)100 °C to 400 °C	0.5°C 0.71°C 0.94°C 1.42 °C 1 °C	

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	MECHANICAL CALIBRATION			
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)**			
1.	Calipers[$] (Digital/Dial/ Vernier) L.C.: 0.01 mm	 0 to 300 mm 0 to 600 mm	 8.0 µm 10.0 µm	Using Slip Gauge Set & Caliper Checker
2.	Depth Gauge[$] (Digital/Dial/Vernier) L.C.: 0.01 mm	 0 to 150 mm 0 to 300 mm	 6.0 µm 8.0 µm	Using Slip Gauge Set
3.	External Micrometer[$] L.C.: 0.001 mm	 0 to 100 mm	 2.3 µm 8.0 µm	Using Slip Gauge Set & Caliper Checker
4.	Internal Micrometer[$] L.C.: 0.01 mm	 50 mm to 300 mm	 7.2 µm	Using Slip Gauge Set & Caliper Checker
5.	Depth Micrometer[$] L.C.: 0.01 mm	 0 to 100 mm	 8.0 µm	Using Slip Gauge Set
6.	Dial Indicator[$] (Lever Type) L.C.: 0.01 mm	 0 to 0.14 mm 0 to 0.8 mm	 2.2 µm 11.0 µm	Using Dial Calibration Tester
7.	Dial Indicator[$] (Plunger Type) L.C.: 0.01 mm	 0 to 25 mm	 9.3 µm	Using Dial Calibration Tester
8.	Dial Thickness Gauge[$] L.C.: 0.01 mm	 0 to 25 mm	 5.0 µm	Using Slip Gauge Set
9.	Plain Plug Gauge[$]	3 mm to 200 mm	2.7 µm	Using Slip Gauge Set & Electronic Probe

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
10.	Measuring Pin[$]	0.5 mm to 50 mm	2.7 µm	Using Slip Gauge Set & Electronic Probe
11.	Bore Gauge[$] L.C.: 0.001 mm (Transmission only)	1.5 mm Throw	1.4 µm	Using Dial Calibration Tester & Electronic Probe
12.	Bevel Protector[$] L.C.: 5'	0 to 360°	3'	Using Angle Set
13.	Combination Set[$] L.C.: 1°	0 to 180°	35'	Using Angle Set
14.	Feeler Gauge[$]	0.5 mm to 3 mm	3 µm	Using Digital Micrometer
15.	Snap Gauge[$]	1 mm to 250 mm	4 µm	Using Slip Gauge Set & Slip Gauge Ass. Set
16.	V- Block [$] (Parallelism/ Flatness/ Symmertricity)	150 mm X 100 mm X 100mm	4.8 µm	Using Surface Plate, Slip Gauge Set, Lever Type Dial Gauge, Height Gauge & Cylindrical Square)
17.	Try Square/ Engineers Square[$]	0 to 300 mm	5.4 µm	Using Lever Type Dial Gauge, Gauge Block, Cylindrical Square
18.	Sprit Level[$] L.C.: 0.01 mm/m	Base Length Upto 300 mm	20 µm/meter	Using Sine Bar & Slip Gauge, Surface Plate
19.	Steel Scale[$] L.C.: 0.5 mm	Upto 300 mm	120 µm	Using Profile Projector
20.	Sine Bar (Parallelism/ Flatness / Centre Distance, Angle) [$]	Upto 300 mm	20 arc sec	Using Surface Plate, Electronic Probe, Angle Gauge Set, Gauge Block

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
21.	Height Gauge[$] (Vernier/Dial/ Digital) L. C.: 0.01 mm	0 to 300 mm 0 to 600 mm	7.7 µm 10.0 µm	Using Slip Gauge Set & Caliper Checker
22.	Height Master[$] L.C.: 0.001 mm	0 to 300 mm	7.4 µm	Using Gauge Block, Caliper Checker, Electronic Probe
23.	Dial Calibration Tester[$] L.C.: 0.001 mm	Upto 25 mm	1.4 µm	Using Slip Gauge Set & Electronic Probe
24.	Dial Comparator Stand[$] (Flatness of Base)	Upto 300 mm X 300 mm	3.2 µm	Using Height Gauge, Puppy Dial, Surface Plate, Precision Level
25.	Setting Rod[$]	25 mm to 100 mm	1.5 µm	Using Surface Plate, Electronic Probe, Gauge Block
26.	Standard Foils[$]	0.01 mm to 0.6 mm	2.4 µm	Using Digital Micrometer
27.	Coating Thickness Meter[$]	Upto 0.6 mm	9.0 µm	Using Standard Foils
28.	Electronic Probe[$] L.C.: 0.0001 mm	Upto 100 mm	0.6 µm	Using Gauge Block
29.	Inside Dial caliper[$] L.C.: 0.01 mm	4 mm to 100 mm	7.1 µm	Using Gauge Block & Slip Gauge Ass. Set
30.	Straight Edge[$] (other then Bewelled Edge)	Up to 800 mm	9.0 µm	Using Surface Plate & Gauge Block

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
31.	Wire Gauge[$]	0.21 mm to 3 mm	5.2 µm	Using Profile Projector
32.	Angle Gauge[$]	15° to 60°	4 arc min	Using Sine Bar Slip Gauge Set
33.	Pitch Gauge[$]	0.4 mm to 6 mm	12.2 µm	Using Profile Projector
34.	Test Sieves[$] (Aperture & Wire Dia.)	0.02 mm to 25 mm	9.0 µm	Using Profile Projector
35.	Radius Gauge[$]	1 mm to 100 mm	31.0 µm	Using Profile Projector
36.	Micrometer Head[$] L. C.: 0.001 mm	0 to 25 mm	1.5 µm	Using Surface Plate & Electronic Probe
37.	Ultrasonic Thickness Gauge[$] L.C.: 0.01 mm	Up to 100 mm	5.0 µm	Using Gauge Block
38.	Surface Roughness Tester[$]	0.4 µm to 3.2 µm Ra 0.4 µm to 3.2 µm Ry	5.7 %	Using Surface Roughness Specimen
39.	Surface Plate[♣]	Upto (2000 X 2000) mm	$2.3 \times \sqrt{\frac{L+W}{150}}$ µm (L & W in mm)	Using Precision Level Sensitivity 0.01 mm/m
40.	Bench Centre[♣]	Upto 1500 mm	4.0 µm	Using Precision Level, Mandrel, Lever Dial Gauge, Comparator Stand
41.	Tool Maker Microscope[♣] (Linear Scale) L.C.: 0.001 mm	0 to 300 mm (X & Y)	1.4 µm	Using Gauge Block & Angle Gauge

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
II.	**DIMENSION (PRECISION INSTRUMENTS)**			
1.	Profile Projector[$] L.C.: 0.001 mm & 1 Sec. Linear, Angular, Magnification	 Upto 100 Upto 360°, 10 X	 3.4 µm 12 arc Sec. 0.5 %	Using Gauge Block & Angle Gauge
III.	**ACOUSTIC**			
1.	Sound Level Meter[$]	**1000 Hz** 94 db & 114 dB	0.8 dB	Using Sound Level Calibrator by Comparison Method
IV.	**ACCELERATION AND SPEED**			
1.	RPM Meter/ Tachometer/ Pulse Engine Tachometer/ Stroboscope[$]	50 rpm to 25000 rpm	1.2 %	Using Digital Tachometer by Comparison Method
2.	Vibration[$] Acceleration Velocity Displacement	 **50 Hz to 600 Hz** 5 m/s^2 to 25 m/s^2 **35 Hz to 75 Hz** 1 mm/s to 150 mm/s **10 Hz to 70 Hz** 0.1 mm to 1 mm	 9.4 % 4.0 % 12.4 %	Using Vibration Meter by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
V.	**PRESSURE INDICATING DEVICES**			
1.	Pneumatics Pressure (Dial/Digital Pressure Gauge, Pressure Transmitter with Indicator, Pressure Switch, Pressure Valve[#]	0 to 15 bar (g) (-) 0.9 bar to 0.0 bar (g)	0.6 kPa 0.8 kPa	Using Digital Compound Pressure Calibrator Comparison Method as per DKD-R6-1/2
2.	Hydraulic Pressure (Dial/Digital Pressure Gauge, Pressure Transmitter with Indicator , Pressure Switch, Pressure Valve) [#]	0 to 70 bar (g)	12.0 kPa	Using Digital Pressure Calibrator Comparison Method as per DKD-R6-1/2
3.	Hydraulic Pressure (Dial/Digital Pressure Gauge, Pressure Transmitter with Indicator , Pressure Switch, Pressure Valve) [#]	0 to 700 bar (g)	30.0 kPa	Using Digital Pressure Gauge Comparison Method as per DKD-R6-1/2
4.	Pneumatic Pressure (Dial/Digital Pressure Gauge, Pressure Transmitter with Indicator, Pressure Switch, Pressure Valve, Manometer, Magnehelic Gauge) [#]	(-)100 mbar to 0mbar (g) 0 mbar to 100 mbar(g)	35.0 Pa 35.0 Pa	Using Digital Compound Pressure Gauge by Comparison Method as per DKD-R6-1/2

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
VI.	**DUROMETER**			
1.	Rubber Hardness Tester[$] Shore A & D	(0 to 100) Shore Units (A & D)	1.4 Shore A 1.4 Shore D	Using Shore Hardness Tester Calibrator
VII.	**MOBILE FORCE MEASURING SYSTEM**			
1.	Force Gauge (Pull Only) Pull Gauge[$]	0 to 100 N	0.51 N	Using Standard weights
VIII.	**TORQUE GENERATING DEVICES**			
1.	Torque Tools[$] (Type I)	5 Nm to 100 Nm	3.53 %	Using Torque Transducer with Digital Display
2.	Torque Tools[$] (Type II)	5 Nm to 500 Nm	1.8 %	Using Torque Transducer with Digital Display
IX.	**WEIGHTS**			
1.	Mass/Weight[$] (Conventional Mass) M1 Class & 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	0.04 mg 0.04 mg 0.04 mg 0.05 mg 0.05 mg 0.05 mg 0.05 mg 0.05 mg 0.05 mg 0.05 mg 0.05 mg 0.06 mg 0.07 mg 0.09 mg	Using Standard Weights of Accuracy Class F1 and Semi Micro Balance by Substitution Method ABBA Cycle Procedure based on OIML-R-111 (Balance of Readability D=0.01mg/ 0.1 mg)

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		50 g 100 g 200 g	0.10 mg 0.16 mg 0.45 mg	
	Class M2 & Coarser	500 g 1 kg	10 mg 10 mg	Balance of readability D=0.01 g
	Class M3 & Coarser	2 kg 5 kg 10 kg	0.15 g 0.15 g 0.15 g	Balance of readability D=0.1 g
		20 kg 50 kg	4.3 g 4.4 g	Balance of readability D=1 g
X.	**VOLUME**			
1.	Micropipette[$]	> 10 µl to 100 µl > 100 µl to 1 ml > l ml to 10 ml	0.05 µl 0.05 µl 0.05 µl	Using Standard Weight of Accuracy Class F1 and Semi Micro Balance(Readability 0.01 mg & 0.1 mg) with and Distilled Water of Known Density by Gravimetric Method as per ISO 8655-6
2.	Glasswares, Glass Pipette, Burette, Measuring Cylinder, Volume Flask, Beakers[$]	> 1 ml to 50 ml > 50 ml to 250 ml > 250 ml to 1 L > 1 L to 10 L	0.9µl 12.8 µl 0.8 ml 1 ml	Using Standard Weight of Accuracy Class F1 and Semi Micro Balance (Readability 0.1 mg, 0.001 g, 0.01 g, 0.1g) with and Distilled Water of Known Density by Gravimetric Method as per ISO 4787: 2010

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
XI.	**WEIGHING SCALE & BALANCE**			
1.	Weighing Balance[$] Readability: 0.01 mg/0.1 mg 1 mg 10 mg 0.1 g 1 g	 1 mg to 200 g > 200 g to 600 g > 600 g to 1000 g 1 kg to 10 kg 10 kg to 100 kg	 0.23 mg 1 mg 83 mg 0.16 g 5.7 g	Using Standard Weights of Accuracy Class F1 and F2 Class OIMLR76-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	THERMAL CALIBRATION			
I.	**TEMPERATURE**			
1.	Liquid-in Glass Thermometer, RTD, Thermocouple with or without Temperature Indicator/ Data Loggers, Temp. Transmitter with Sensors, Digital Thermometer #	(-) 40 °C to 45 °C	0.16 °C	Using PRT with Temperature Indicator and 6.5 D.M.M. & Low Temperature Liquid Bath By Comparison Method
2.	Liquid-in Glass Thermometer, RTD, Thermocouple with or without Temperature Indicator Data Loggers, Temp. Transmitter with Sensors, Digital Thermometer #	45 °C to 250 °C	0.31 °C	Using PRT with Indicator and 6.5 D.M.M. & Silicon Oil Bath by Comparison Method
3.	RTD, Thermocouple with or without Temperature Indicator Data Loggers, Temp. Transmitter with Sensors, Digital Thermometer#	50 °C to 750 °C >750 °C to 1200 °C	2.1 °C 2.5 °C	Using R-Type Thermocouple and Indicator and 6.5 D.M.M. & Dry Block Bath by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
4.	Digital/ Analog Hygrometer, RH Sensors with Indicator/ Loggers/ Controllers[#]	20% RH to 95% RH @ 25°C	0.92% RH	Using Digital RH Indicator & RH Chamber by Comparison Method
5.	IR Thermometers, Non Contact Thermometer, Radiation Thermometer[$]	50°C to 500°C	2.53°C	Using Digital Temperature Indicator with RTD & Black Body Source by Comparison Method
6.	Temperature Indicator with Sensor of Cold Chambers, Oven, Incubators (for Non-Medical Applications), Furnaces, Bath[♣]	(-) 40°C to 250°C 250°C to 1200°C	0.6°C 2.44 °C	Using PRT with Indicator by Single Position Calibration (at Measuring Location in DUC)
7.	Freezer, Ovens, Incubators (for Non-Medical Applications), Environmental Chambers[♣]	(-) 40°C to 250°C	2.17 °C	Using Temperature Data Logger with RTDs (Minimum Nine) by Multi Position Calibration
8.	Furnaces[♣]	250°C to 1200°C	5.7°C	Using Data Logger with K-type Thermocouples (Minimum Nine) by Multi Position Calibration

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
II.	**SPECIFIC HEAT & HUMIDITY**			
1.	Humidity Indicators with Sensor of Environment Chambers/ RH Chambers/ RH Generators♣	20% RH to 95% RH @ 25°C	1.2 % RH	Using Digital Wireless RH Indicator by Single Position Calibration (at Measuring Location in DUC)
2.	Environment Chambers/ RH Chambers/ RH Generators♣	25% RH to 90% RH @ 25°C	2.8% RH	Using Digital Wireless RH Data Loggers (Minimum Nine) by Multi Position Calibration

*** 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.