

Laboratory Belz Calibration Laboratory, Belz Instruments Pvt. Ltd., 5L-123, NIT, Faridabad, Haryana

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2733 (In lieu of C-0100, C-0158, C-0407, C-1424) **Page** 1 of 23

Validity 28.06.2018 to 27.06.2020 **Last Amended on** 25.07.2018

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>ELECTRO-TECHNICAL CALIBRATION</u>				
I.	SOURCE			
1.	DC Voltage [#]	1mV to 300mV 300mV to 300V 300V to 1000V	0.55% to 0.01% 0.01% to 0.03% 0.03% to 0.014%	Using Fluke 9100 MF Calibrator
2.	DC Current [#]	1 μ A to 300mA 300mA to 10A 10A to 1000 A	1.5% to 0.03% 0.03% to 0.12% 0.12% to 0.70%	Using Fluke 9100 MF Calibrator with current Coil
3.	AC Voltage [#]	50 Hz /60 Hz 10mV to 300mV 300mV to 100V 100V to 1000V	1.15 % to 0.2% 0.2% to 0.08% 0.08%	Using Fluke 9100 MF Calibrator
4.	AC Current [#]	50 Hz /60 Hz 100 μ A to 300mA 300mA to 10A 10A to 1000 A	0.45% to 0.13% 0.13% to 0.31% 0.31% to 0.9%	Using Fluke 9100 MF Calibrator with current Coil
5.	Resistance [#] (4 Wire)	50 $\mu\Omega$ 100 $\mu\Omega$ 0.001 Ω 0.01 Ω 0.1 Ω 1 Ω	0.3% to 0.13%	Using Low Resistance box (Fixed Value)

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
6.	Resistance [#] (2 Wire)	1 Ω to 4M Ω 4M Ω to 40M Ω 40M Ω to 400M Ω	1.2% to 0.07% 0.07% to 0.18% 0.18% to 0.32%	Using Fluke 9100 MF Calibrator
	High Resistance (2 Wire) [#]	500 M Ω , 1 G Ω , 2 G Ω , 10 G Ω , 20 G Ω , 100 G Ω , 200 G Ω 500 G Ω , 1T Ω	2.5%	Using High Resistance Box
7.	Frequency [#]	10Hz to 10MHz	0.07% to 0.008%	Using Fluke 9100 MF Calibrator
8.	Capacitance [#]	1kHz 1nF to 100 μ f	7.2% to 2.5%	Using Fluke 9100 MF Calibrator
9.	DC Power [#]	10W to 19 kW 10V to 1000V 1A to 19A	0.31%	Using Fluke 9100 MF Calibrator
10.	AC Power [#] (Active Power 1 ϕ)	10V to 640V 1A to 19A UPF 240 V 0.1 to 1A 0.5 Lead/Lag	0.25% to 0.8%	Using Fluke 9100 MF Calibrator

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
11.	Temperature Simulation [#] (Indicator/controller/Recorder) RTD 'T' Type Thermocouple 'S' Type Thermocouple 'J' Type Thermocouple 'N' Type Thermocouple 'K' Type Thermocouple 'R' Type Thermocouple 'B' Type Thermocouple 'E' Type Thermocouple	(-)200°C to 800°C (-)200°C to 400°C (-)0°C to 1700°C (-)200°C to 1200°C (-)200°C to 1300°C (-)200°C to 1300°C (-)0°C to 1700°C 600°C to 1700°C (-)100°C to 600°C	0.43°C 0.7°C 0.5°C 0.3°C 0.3°C 0.37°C 0.5°C 0.5°C 0.5°C	Using Fluke 9100 MF Calibrator
12.	Oscilloscope [#] Time Base (Marker) Amplitude (Deflection Factor) Sin/Square (DC) Bandwidth	10 ns to 5 sec. 1kHz 1M Ω 5mV to 120V 50kHz to 20MHz 50 Ω 20mV to 2.5V 1kHz to 250MHz	0.63s 1.0% 1.0% 5.0%	Using Fluke 9100 MF Calibrator
13.	Turn Ratio Meter [#]	1.11 1.22 1.44 1.110 1.220	0.65% 0.43% 0.41% 0.31% 0.25%	Using Ratio Calibration Standard

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II.	MEASURE			
1.	DC Voltage [#]	1mV to 100mV 100mV t 10V 10V to 1000V	0.5% to 0.01% 0.01% to 0.06% 0.06% to 0.02%	Using 6½ DMM
2.	DC Current [#]	1µA to 10mA 10mA to 3A 3A to 10 A	3.0%to 0.08% 0.08% to 0.16% 0.16% to 0.2%	Using 6½ DMM
3.	AC Voltage [#]	50 Hz / 60Hz 10mV to 10V 10V to 1000V	0.53% to 0.12% 0.12% to 0.18%	Using 6½ DMM
4.	AC Current [#]	50 Hz / 60Hz 50µA to 100mA 10mA to 10A	0.9% to 0.5% 0.5% to 0.25%	Using 6½ DMM & Current Transformer
5.	Resistance [#] (4 Wire)	100µΩ to 1Ω 1Ω to 10Ω	0.6% to 0.06% 0.06% to 0.05%	Using Microohm meter & Low Resistance Standard
6.	Resistance [#] (2 Wire)	10Ω to 1MΩ 1MΩ to 100MΩ 100MΩ to 1GΩ	0.06% to 0.13% 0.13% to 0.9% 0.9%to 2.36%	Using 6½ DMM & Micro ohm meter
7.	AC Resistance [#]	1 kHz 1Ω to 100kΩ	0.23%	Using LCR Meter
8.	Frequency [#]	10Hz to 1MHz	0.06%	Using 6½ DMM

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
9.	Capacitance [#]	1kHz 1nF to 1 μ F 10kHz 1nF to 1 μ F	0.2% 0.2%	Using LCR Meter
10.	Inductance [#]	1 kHz 100 μ H to 1H	0.45% to 0.8%	Using LCR meter
11.	Power/Energy [#] (1 Φ . 3 Φ .)	50Hz UPF to 0.5 PF (Lag/Lead) Voltage : 240V/63.5V Current: 1A/5A	1.0%	Using Power /Energy Meter Accuchek & Power source
12.	Timer / Stop Watch [#] (Digital/Analog)	100 ms 1s 60s 600 s 1800 s 3600 s (1 hour) 7200 s (2 hour) 14400 s (4 hour) 86400 (24 hour)	0.003s 0.003s 0.03s 0.27s 0.55s 1.3s 2.3s 4.3s 20.5s	Using Digital Timer

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13.	Temperature Simulation [#] (Temperature source, Indicator/Controller/ Recorder) RTD 'T' Type Thermocouple 'S' Type Thermocouple 'J' Type Thermocouple 'N' Type Thermocouple 'K' Type Thermocouple 'R' Type Thermocouple 'B' Type Thermocouple 'E' Type Thermocouple	200°C to 800°C (-)200°C to 400°C 50°C to 1700°C (-)200°C to 1200°C (-)200°C to 1300°C 50°C to 1300°C 600°C to 1700°C 600°C to 1700°C 100°C to 600°C	0.42 °C 0.60 °C 0.63 °C 0.61 °C 0.65 °C 0.66 °C 0.63 °C 0.62 °C 0.61 °C	Using Temperature Indicator
14.	AC High Current [#]	50 Hz 10A to 1000A	1.3% to 0.65%	Using 6½ DMM & Current Transformer
15.	DC High Current [#]	10A to 750A	1.0%	Using 6½ DMM & 900A/75mV Shunt
16.	AC High Voltage [#]	50 kHz 1kV to 28 kV	2.4%	Using HV Probe with DMM
17.	DC High Voltage [#]	1kV to 37 kV	1.7%	Using HV Probe with DMM

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<u>MECHANICAL CALIBRATION</u>				
I. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)				
1.	Vernier/Dial/ Digimatic Caliper ^s L.C.: 0.01 mm L.C.: 0.02 mm	Upto 300mm Upto 1000mm Upto 2000mm	8.0 μ m 14.70 μ m 49.0 μ m	Using Slip Gauge Grade '0', Long Gauge Block & Caliper Checker
2.	External Micrometer ^s L.C.: 0.001 mm	Upto 100mm 100 to 150mm 150 to 300mm	1.50 μ m 2.5 μ m 3.8 μ m	Using Slip Gauge Grade '0' & Long Gauge Block
3.	Internal Micrometer ^s L.C.: 0.001 mm	Upto 300mm	4 μ m	Using Slip Gauge Grade '0' & Accessories Set
4.	Depth Micrometer ^s L.C.: 0.01 mm	Upto 300mm	7 μ m	Using Slip Gauge Grade '0', Long Gauge Block & Caliper Checker
5.	Depth Caliper / Depth Gauge ^s L.C.: 0.01 mm	Upto 300mm	7.5 μ m	Using Slip Gauge Grade '0', Long Gauge Block & Caliper Checker

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
6.	Height Gauge ^s L.C.: 0.001 mm L.C.: 0.01 mm	Upto 600mm Upto 1000mm	6.0 μ m 12.8 μ m	Using Slip Gauge Grade '0' & Caliper Checker
7.	Dial Gauge ^s L.C.: 0.001 mm	Upto 100mm	3.0 μ m	Using Single Axis M/c
8.	Dial Test Indicator ^s L.C.: 0.001 mm	0 to 1.0mm	3.0 μ m	Using Single Axis M/c
9.	Dial Bore Gauge ^s L.C.: 0.001 mm	Upto 1mm Travel	3.0 μ m	Using Single Axis M/c
10.	Plain Plug Gauge ^s L.C.: 0.001 mm	Upto 100mm 100 mm to 185mm	3.0 μ m 3.5 μ m	Using Single Axis M/c
11.	Plain Ring Gauge ^s	3mm to 100mm 100mm to 280mm	1.8 μ m 4.6 μ m	Using Single Axis M/c
12.	Scale & Tape Calibration Unit ^s	Up to 1000mm	60 μ m	Using Slip & Long Gauge Blocks
13.	Radius Gauge ^s	Up to 100mm	96 μ m	Using Profile Projector
14.	Snap Gauge ^s	1mm to 150mm	2.2 μ m	Using Slip Gauge Grade 0
15.	Measuring Pin Gauge ^s	0.5mm to 20mm	1.5 μ m	Using Single Axis M/c
16.	Three Wire Unit ^s	0.17mm to 4 mm	1.5 μ m	Using Single Axis M/c

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
17.	Feeler Gauge/ Foil ^s	Up to 1mm 1.5 mm	1.5 μ m 1.6 μ m	Using Single Axis M/c
18.	Dial Thickness Gauge ^s L.C.: 0.001 mm	Up to 50mm	1 μ m	Using Slip Gauge Grade 0
19.	Thread Plug Gauge ^s	Up to 100mm	5.6 μ m	Using Three Wire set, Micrometer
20.	Thread Pitch Gauge ^s	0.40 to 7.0 mm	7.0 μ m 3.0 min. of arc	Using Profile Projector
21.	Length Gauge / Setting Master ^s	Up to 100mm 100 mm to 280mm	2.0 μ m 2.6 μ m	Using Single Axis M/c
22.	Steel Scale ^s LC: 1mm	Upto 1000mm	154 \sqrt{L} μ m L in meter	Using Standard Scale with DRO
23.	Measuring Tape ^s LC: 1mm	Up to 50 mtr.	154 \sqrt{L} μ m, Where L is in meter	Using Standard Scale with DRO
24.	Bevel Protractor/ Combination ^s	0° - 90° - 0o	5 min. of arc	Using Slip Gauge Grade 0, Sine Bar & Master Cylinder
25.	Electronic Probe ^s	Up to 25 mm	0.6 μ m	Using Slip Gauge Grade 0
26.	Dial Calibration Tester ^s LC: 0.001 mm	Up to 25mm	1.0 μ m	Using Slip Gauge Grade 0 & Electronic Probe

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
27.	Coating Thickness Gauge ^s	Up to 1500 μ m	5 μ m	Using Standard Foils
28.	Angle Plate Squariness ^s	Up to 300mm	10 μ m	Using Slip Gauge Grade '0', Master Cylinder & Dial Test Indicator
29.	Electronic Level ^s Spirit Level	+/-2mm/mtr (Sensitivity 0.001 mm/mtr)	3.7 μ m/mtr	Using Electronic Level Comparison Method
		+/-200mm/mtr (Sensitivity 0.01 mm/mtr)	7.0 μ m/mtr	
		+/-100mm/mtr (Sensitivity 0.02 mm/mtr)	12.0 μ m/mtr	
30.	Test Sieves ^s (Aperture Size)	32 μ m to 4000 μ m 4mm to 50mm 50mm to 125mm	6.2 μ m 20 μ m 30 μ m	Using Profile Projector/ Digital Caliper
31.	Thread Ring Gauge ^s (Effective Dia Only)	4mm to 100mm	3.4 μ m	Using Single Axis M/c.
32.	Sine Bar Flatness / Parallelism / Central Distance ^s Setting Angle ^s	Up to 300 mm	3.80 μ m 3.80 μ m 4.00 μ m 6.2 sec.	Using Elect. Probe & Slip Gauge Grade 0 Using Surface Plate, Angle Gauge, Electronic Probe & Slip Gauge Grade 0

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
33.	Straight Edge Straightness [§]	Up to 1000mm	3.4 μ m	Using Surface Plate & Slip Gauge Grade 0
34.	Engineering Square/Right Angle [§] Flatness Perpendicularity	Up to 500 mm	5.7 μ m 5.0 μ m	Using Dial Test Indicator & Surface Plate Using Slip Gauge Grade 0 & Master Cylinder
35.	Test Mandrel [§] Variation in diameter Lack of trueness of rotation (between centers) Lack of trueness of rotation (between centers)	Up to 300 mm	2.4 μ m 16 μ m	Using Sine Centre & Dial Test Indicator
36.	Magnetic V Block [§] Flatness Parallelism	Up to 150mm	5.7 μ m 8.3 μ m	Using Slip Gauge Set, Dial Test Indicator & Surface Plate
	Parallelism		5.7 μ m	Using Slip Gauge Set, Dial Test Indicator, Test Mandrel & Surface Plate
	Symmetry Error		8.3 μ m	Using Slip Gauge Set, Dial Test Indicator, Test Mandrel & Surface Plate
	Perpendicularity		6.0 μ m	Using Slip Gauge Grade 0, Master Cylinder & Surface Plate

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
37.	Standard Steel Ball ^s	4 mm to 65 mm	2.6 μ m	Using Digital Micrometer
38.	Profile Projector [#]	0-300mm (X,Y Axis)	3.9 μ m	Using Slip Gauge & Long Gauge Block
	Linear Dimension Magnification	50 x	1.00%	Using Slip Gauge Grade 0 & Digital Caliper/Glass Scale
	Angle Measurement	0-360°	75 sec of arc	Using Angle Gauges
39.	Universal Length Measuring Machine [#]	Up to 100 mm Resolution: 0.0001	1.0 μ m	Using Slip Gauge Grade 0
40.	Surface Plate [#]	6000mm x 4000mm	$1.3\sqrt{(L+W)}/125$ where L & W are in mm	Using Electronic Level
41.	Comparator Stand [#]	300 mm x 300 mm	$1.2\sqrt{(L+W)}/150$ Where L & W are in mm	Using Electronic Level
42.	Bench Centre [#] Parallelism Coaxiality	Up to 300mm	10.0 μ m	Using Mandrel & Dial Test Indicator
			10.0 μ m	
43.	Sine Centre [#] Parallelism of working surface Coaxiality of Dead center Central Distance	Up to 300mm	4.0 μ m	Using Test Mandrel & Dial Test Indicator, Electronic Probe & Surface Plate, Electronic Probe, Slip Gauge Grade 0 & Angle Gauge
			4.0 μ m	
			3.8 μ m	

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II.	WEIGHTS			
1.	Mass ^s (Weights)	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	0.01mg 0.010 mg 0.010 mg 0.010 mg 0.010 mg 0.010 mg 0.010 mg 0.010 mg 0.013mg 0.015 mg 0.02 mg 0.02mg 0.023mg 0.042mg	Using E2 Class Weight & Mass Comparator (Readability 0.01 mg) As per OIML R-111 Calibration of Class F2 accuracy and coarser
		50 g 100 g 200 g	0.10mg 0.15mg 0.24mg	Using E2 Class Weight & Mass Comparator (Readability 0.01 mg) As per OIML R-111 Calibration of Class F2 accuracy and coarser
		500 g 1 kg	2mg 10mg	Using F1 Class Weight & Mass Comparator (Readability 0.001 g) As per OIML R-111 Calibration of Class F2 accuracy and coarser

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		2 kg 5 kg	13mg 13mg	Using F1 Class Weight & Mass Comparator (Readability 0.01 g) As per OIML R-111 Calibration of Class F2 accuracy and coarser
		10 kg	89mg	Using F1 Class Weight & Mass Comparator (Readability 0.1 g) As per OIML R-111 Calibration of Class M1 accuracy and coarser
		20 kg 50 kg 100 kg	1.07g 1.27g 1.27	Using M1 Class Weight & Mass Comparator (Readability 0.001 k g) As per OIML R-111 Calibration of Class M2 accuracy and coarser
III.	VOLUME			
1.	Micro Pipette ^s	10 μ l to 100 μ l 100 μ l to 1000 μ l	0.06 μ l 0.10 μ l	Using E2 Class Weight & Precision Weighing Balance (Readability 0.01mg & 0.1 mg) and Distilled Water as per ISO 8655

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
2.	Glassware ^s (Measuring Cylinder / Jar, Volumetric Flask, Beaker, Glass Pipette, Dispenser & Burette)	1 ml to 10 ml 10 ml to 100 ml 100 ml to 200 ml 200 ml to 500 ml 500 ml to 1 Ltr. 1 Ltr to 2 Ltr. 2 Ltr. To 5 Ltr. 5 Ltr to 10 Ltr.	0.5 μ l 8.2 μ l 0.04 ml 0.14 ml 0.2 ml 0.4 ml 0.6 ml 1.1 ml	Using Standard weight & weighing balance (readability 0.1mg) Readability: 0.001g Readability: 0.01g (Readability: 0.1g) with distilled water by gravimetric method as per ISO 4787
IV.	WEIGHING SCALE AND BALANCE			
1.	Spring Balance ^s L.C. 0.1 g	Up to 100 kg	60g	Using F1 & M1 Class weight Comparison Method
2.	Weighing Balance [#] Readability 0.01 mg & Coarser	Up to 30 g	0.06mg	Using E 2 Class Weight As Per OIML R76-1
	Readability 0.1 mg & Coarser	>30g to 220g	0.14mg	
	Readability 1 mg & Coarser	>220g to 1000g	0.006g	Using E2 class weight & F1 Class Weight As Per OIML R76-1
	Readability 0.01 g & Coarser	>1kg to 6kg	0.01g	Using F1 Class Weight As Per OIML R76-1
	Readability 0.1 g & Coarser	>6kg to 12 kg	0.06g	
	Readability 1 g & Coarser	>12 kg to 100 kg	0.8g	Using M1 Class Weight As Per OIML R76-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
V.	DENSITY AND VISCOSITY			
1.	Density / Hydrometers / Lactometers [§]	0.6 g/ml to 1.8 g/ml	0.0015g/ml	Using Hydrometer & Compatible Liquid Comparison Method IS 3104-1 & 2
III.	PRESSURE INDICATING DEVICES			
1.	Vacuum Gauge, Transmitters Digital / Analog [#]	(-)0.95 bar to 0bar	0.0036bar	Using Digital Pressure Gauge
2.	Barometric Pressure Gauge [#]	200 to 1050 mbar	1.32 mbar	Using Pressure Calibrator
3.	Pneumatic Pressure Gauge (Digital / Analog Manometer, Diff. Gauge, Transmitters, Magnehalic Gauge [#]	(-) 1300 to 0 pascal 0 to 2000 pascal 20mbar to 100 mbar	2.0 Pa 2.0 Pa 0.1 mbar	Using Pressure Calibrator & Diff. Pressure Gauge by comparison method
4.	Pressure Gauge , Transmitters Digital/Analog [#] Pneumatic	0 to 3 bar 0 to 30 bar	0.0036 bar 0.036 bar	Using Digital Pressure Gauge & Pressure Comparator by comparison method
5.	Pressure Gauge (Analog/Digital)-Hydraulic [#]	0 to 700 bar	1.15 bar	Using Digital Pressure Gauge & Pressure Comparator by comparison method

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

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
6.	Hydraulic Pressure Digital / Analog Pressure Gauge ^s	1 to 41.1 kg/cm ² 40 to 800 kg/cm ²	0.052% rdg	Using Dead Weight Tester
IV.	ACOUSTICS			
1	Sound Level Meter [#]	94 dB 114 Db	0.55dB	Using Sound Calibrator
V.	DUROMETER			
1.	Rubber Hardness Tester [#]	0 to 100 Shore A 0 to 100 Shore D	0.7 Shore A 0.7 Shore D	Using Weighing Balance, Readability : 1g
VI.	ACCELERATION AND SPEED			
1.	Speed Contact Type RPM /Tachometer / Stroboscope , Centrifuge [#]	10 to 40 rpm 40 to 100 rpm 100 to 1000 rpm 1000 to 9950 rpm	5% 0.35% 0.25% 0.09%	Using RPM Source by Direct Method
2.	Non-Contact Type RPM Stroboscope/Pulse Engine Tachometer/ Digital Tachometer, Centrifuge [#]	10 to 40 rpm 40 to 1000 rpm 1000 to 10000 rpm 10000 to 99000 rpm	5.0 % 1.7 % 0.09 % 0.06 %	Using Tachometer Calibrator by Direct / Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
VII.	TORQUE GENERATING DEVICES			
1.	Torque Wrench [#] Type I: Class B,C,D,E Type II: Class A,B,D,E	Type II 4 to 2000 Nm Type I 4 to 500 Nm	1.3% 1.3%	Using Torque Transducer with indicator
VIII.	MOBILE FORCE MEASURING SYSTEM			
1.	Push Pull Gauge ^{\$}	1N to 100N 100N to 900N	0.1N 1.1N	Using Newtonian Weight & Frame Fixture & Hangers

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>THERMAL CALIBRATION</u>				
1.	Temperature Transmitter RTD's Thermocouples with & without (Controller/Indicator/Data Logger/Recorder), Temperature Gauge, Glass Thermometer & Digital Thermometer [#]	(-)196°C to -40°C	0.32°C	Using RTD (Pt-100) 4 wire Digital Thermometer & Liquid Nitrogen Bath
2.	Temperature Transmitter RTD's Thermocouples with & without (Controller/Indicator/Data Logger/Recorder) Temperature Gauge, Glass Thermometer & Digital Thermometer [#]	(-)40°C to 50°C	0.20°C	Using RTD (Pt-100) 4 wire Digital Thermometer and Low Temp Bath
3.	Temperature Transmitter RTD's Thermocouples with & without (Controller/Indicator/Data Logger/Recorder), Temperature Gauge, Glass Thermometer & Digital Thermometer [#]	>50°C to 200°C	0.20°C	Using RTD (Pt-100) 4 wire Digital Thermometer and Oil Temperature Bath

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
4.	Temperature Transmitter RTD's Thermocouples with & without (Controller/Indicator/ Data Logger/Recorder/), Temperature Gauge, Glass Thermometer & Digital Thermometer [#]	200°C to 300°C	0.80°C	Using RTD (Pt-100) 4 wire Digital Thermometer and Dry Block Bath
5.	Thermocouples, RTD's Temperature Transmitter with & without (Controller/Indicator/ /Recorder), Data Logger & Digital Thermometer [#]	>300°C to 1200°C	1.83°C	Using Thermocouple wire Digital Thermometer and Dry Block Bath
6.	Temperature Indicators of Freezers, Oven, Environment Chamber, Incubator, BOD Incubator, Liquid Bath / Dry Block Furnaces [#]	(-)196°C to -40°C	0.32°C	Using RTD (Pt-100) 4 wire, Digital Thermometer

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
7.	Temperature Indicator of Freezers, Oven, Environment Chamber, Incubator, BOD Incubator, Liquid Bath / Dry Block Furnaces [#]	(-)40°C to 250°C	0.2°C	Using RTD (Pt-100) 4 wire Digital Thermometer and Dry Block Bath
8.	Temperature Indicators of – (Muffle Furnace, Dry Block Furnace) [#]	250°C to 1200°C	1.8°C	Using S Type Thermocouple & Digital Thermometer
9.	Radiation Pyrometer (Non-Contact Type) [#]	50°C to 500°C	3.3°C	Using Radiation Pyrometer, Digital Thermometer & Black Bod Source)
10.	Freezers, Oven, Cold Chamber, Environment Chamber [#]	(-)80°C to 50°C 50°C to 250°C	0.5°C 1.3°C	Using Multi-point Data Logger with RTD (Pt-100) Sensors
11.	Digital & Analog Hygrometer, RH Sensors / Transmitters with controller/Indicator/Recorder/Data Logger [#]	10% - 95% RH @ approx. 25 °C	0.7%RH	Using Std. RH Sensor with Indicator & RH Calibrator

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
II. SPECIFIC HEAT AND HUMIDITY				
1.	(Humidity Calibrator /Generator Chamber) #	10% - 95% RH	1.95%RH	Using STD. RH Sensor with Indicator
2.	Freezers, Oven, Cold Chamber, Environment Chamber, Centrifuged Chamber, Incubator & BOD Incubator*	-80°C to 50°C 50°C to 250°C	0.5°C 1.3°C	Using Multi-point Data Logger with RTD (Pt-100) Sensors
3.	Industrial Furnaces / Spatial Thermal Mapping*	200°C to 1200°C	4.2°C	Using Multi-point Data Logger with N-Type Sensors
4.	Environment Chamber / Humidity Chamber*	15% - 95% RH @ approx. 25°C	1.95%RH	Using Std RH Sensors / Transmitters with Data Logger

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (\pm)	Remarks
<u>FLUID FLOW CALIBRATION</u>				
1.	Rotameter / Flow Meters (Flow Rates) [#]	1 LPM to 5 LPM >5 LPM to 50 LPM	1.40% rdg 0.58% rdg	Using Fluke Flow Meter consist of Molbloc sensor by Comparision method
2.	Volume Flow Rate (Medium of Calibration Liquid-Water) [*]	0.8m ³ /hr to 80 m ³ /hr >80m ³ /hr to 200m ³ /hr >200m ³ /hr to 1450 m ³ /hr	1.98 % rdg 1.18% rdg 0.41 % rdg	Using Transducer based portable Ultrasonic Flow Meter

* 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.

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