

**Laboratory** Flutech Engineering Private Limited, #431/11, Chelikere , Off Glass Factory Road, Kalyan Nagar Post, Bangalore, Karnataka

**Accreditation Standard** ISO/IEC 17025: 2017

**Certificate Number** CC-2891 (In lieu of C-0857, C-0858,C-0859) **Page** 1 of 20

**Validity** 07.11.2018 to 06.11.2020 **Last Amended on** 19.11.2018

Sl.	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>	1 mV to 10mV 10 mV to 100mV 100 mV to 10V 10 V to 100V 100 V to 1000V	0.36% to 0.042% 0.042% to 0.012% 0.012% to 0.0086% 0.0086% to 0.0090% 0.0090% to 0.0087%	Using Fluke 5502A Multiproduct Calibrator By Direct method
2.	DC Current <sup>#</sup>	10 $\mu$ A to 100 $\mu$ A 100 $\mu$ A to 300 $\mu$ A 300 $\mu$ A to 1mA 1mA to 100mA 100mA to 1A 1A to 10A 10A to 20A  20A to 1000A	0.25% to 0.040% 0.040% to 0.025% 0.025% to 0.022% 0.022% to 0.016% 0.016% to 0.050% 0.050% to 0.077% 0.076% to 0.31%  0.48% to 0.32%	Using Fluke 5502A Multiproduct Calibrator By Direct method       Using 50 turns current Coil
3.	AC Voltage <sup>#</sup>	<b>20Hz to 45Hz</b> 1mV to 30mV 30mV to 300mV 300mV to 30V	2.49% to 0.25% 0.25% to 0.067% 0.067% to 0.063%	Using Fluke 5502A Multiproduct Calibrator By Direct method

**Mithilesh Kumar**  
Convenor

**Avijit Das**  
Program Manager

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
		<b>45Hz to 10kHz</b> 30mV to 300mV 300mV to 3V 3V to 30V 30V to 300V 300V to 1000V  <b>10KHz to 100kHz</b> 30mV to 300mV 300mV to 3V 3V to 30V 30V to 100V	0.19% to 0.045% 0.045% to 0.041% 0.041% to 0.089% 0.089% to 0.060% 0.060% to 0.11%  0.25% to 0.36% 0.36% to 0.31% 0.31% to 0.30% 0.30% to 0.38%	Using Fluke 5502A Multiproduct Calibrator By Direct method
4.	AC Current <sup>#</sup>	<b>20Hz to 45Hz</b> 30 $\mu$ A to 300 $\mu$ A 300 $\mu$ A to 1mA 1mA to 300mA 300mA to 3A  <b>45Hz to 1kHz</b> 30 $\mu$ A to 300 $\mu$ A 300 $\mu$ A to 1mA 1mA to 300mA 300mA to 3A 3A to 20A	0.54% to 0.23% 0.23% to 0.17% 0.17% to 0.13% 0.13% to 0.22%  0.61% to 0.26% 0.26% to 0.15% 0.15% to 0.083% 0.083% to 0.16% 0.16% to 0.34%	Using Fluke 5502A Multiproduct Calibrator By Direct method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
		<b>1kHz to 5kHz</b> 30 $\mu$ A to 30mA 30mA to 300mA 300mA to 3A 3A to 10A  <b>50Hz</b> 20 A to 1000A	0.55% to 0.14% 0.14% to 0.15% 0.15% to 0.73% 0.12% to 3.48%  0.55% to 0.36%	Using 50 turns current Coil
5.	Resistance <sup>#</sup>	1 $\Omega$ to 10 $\Omega$ 10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 100k $\Omega$ 100k $\Omega$ to 1M $\Omega$ 1M $\Omega$ to 10M $\Omega$ 10M $\Omega$ to 100M $\Omega$ 100M $\Omega$ to 1000M $\Omega$	0.14% to 0.026% 0.026% to 0.013% 0.013% to 0.014% 0.014% to 0.018% 0.018% to 0.07% 0.07% to 0.58% 0.58 % to 1.79%	Using Fluke 5502A Multiproduct Calibrator By Direct method
6.	Capacitance <sup>#</sup>	<b>1kHz</b> 220pF to 350pF 350pF to 1nF 1nF to 300 nF 300 nF to 1 $\mu$ F  <b>100Hz</b> 10 $\mu$ F to 100 $\mu$ F	5.83% to 3.88% 3.88% to 1.83% 1.83% to 1.18% 1.18% to 1.16%  0.43% to 0.65%	Using Time Electronics 1071 Decade Capacitance BOX by Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
7.	AC Resistance <sup>#</sup>	<b>1kHz</b> 1 $\Omega$ to 10 k $\Omega$	1.15% to 0.13%	Using Time Electronics 1040 Decade Resistance BOX By Direct Method
8.	DC High Resistance <sup>#</sup>	0.1M $\Omega$ to 1 M $\Omega$ 1 M $\Omega$ to 100 M $\Omega$ 100 M $\Omega$ to 10 G $\Omega$	6.10% to 2.38% 2.38% to 2.31% 2.31% to 5.79%	Using Vaiseshika 8400-HV Mega ohm Box by Direct Method
9.	Inductance <sup>#</sup>	<b>1kHz</b> 1mH to 10H	2.31%	Using Time Electronics 1053 Decade inductance BOX Direct Method
10.	DC Power <sup>#</sup>	10 V to 1000 V 10 mA to 20 A 0.1W to 20 kW	0.12%	Using Fluke 5502A Multiproduct Calibrator By Direct Method
11.	AC Power <sup>#</sup>	<b>50Hz @UPF</b> 120V to 240V 0.01A to 20A 1.2W to 4.8 kW  <b>50Hz @0.8 Lead</b> 120V to 240V 0.1A to 20A 4.8W to 3.8 kW	0.093% to 0.25%      0.46%	Using Fluke 5502A Multiproduct Calibrator By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
		<b>50Hz @0.5 Lag</b> 60V to 240V 0.01A to 20A 3W to 2.4 kW	0.61%	
		<b>50Hz @0.2 Lag</b> 120V to 240V 0.01A to 20A 1.2W to 960W	1.80%	
12.	Frequency <sup>#</sup>	10 Hz to 100 Hz 100 Hz to 100 kHz 100 kHz to 500kHz	0.015% to 0.0040% 0.0040% to 0.00058% 0.00058% to 0.0013%	Using Fluke 5502A Multiproduct Calibrator By Direct Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
13.	Temperature Simulation <sup>#</sup>			
	"K" Type Thermocouple	(-)200°C to 100°C 100°C to 1350°C	0.38°C to 0.19°C 0.19°C to 0.46°C	Using Fluke 5502A Multiproduct Calibrator By Electrical simulation direct Method
	"J" Type Thermocouple	(-)200°C to 100°C 100°C to 1200°C	0.31°C to 0.17°C 0.17°C to 0.27°C	
	"B" Type Thermocouple	600°C to 1800°C	0.40°C to 0.39°C	
	"E" Type Thermocouple	(-)200°C to 950°C	0.55°C to 0.25°C	
	"N" Type Thermocouple	(-)200°C to 1300°C	0.47°C to 0.32°C	
	"R" Type Thermocouple	0°C to 800°C 800°C to 1600°C	0.66°C to 0.39°C 0.39°C to 0.47°C	
	"S" Type Thermocouple	0° to 1600°C	0.42°C to 0.54°C	
	"T" Type Thermocouple	(-)200°C to 400°C	0.7°C to 0.17°C	
	RTD's	(-)200°C to 600°C 600°C to 800°C	0.082°C to 0.12°C 0.12°C to 0.27°C	

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b>II.</b>	<b>MEASURE</b>			
<b>1.</b>	DC Voltage <sup>#</sup>	1mV to 10mV 10mV to 100mV 100mV to 1V 1V to 10V 10V to 100V 100V to 1000V	0.41% to 0.045% 0.045% to 0.0084% 0.0084% to 0.0038% 0.0038% to 0.0035% 0.0035% to 0.0052% 0.0052% to 0.0060%	Using Fluke 6 ½ digit 8846A Multimeter By Direct method
	DC High Voltage <sup>#</sup>	1kV to 10kV	2.52%	Using High Voltage Probe with DMM By Ratio Method
<b>2.</b>	DC Current <sup>#</sup>	10 $\mu$ A to 100 $\mu$ A 100 $\mu$ A to 1 mA 1mA to 100 mA 100 mA to 3 A 3A to 10 A	0.36% to 0.088 % 0.088% to 0.087% 0.087% to 0.064% 0.064% to 0.15% 0.15% to 0.19%	Using Fluke 6 ½ digit 8846A Multimeter By Direct method
<b>3.</b>	AC Voltage <sup>#</sup>	<b>20Hz to 20kHz</b> 10mV to 100 mV 100mV to 1V 1V to 10V 10V to 1000V  <b>20Hz to 50kHz</b> 10mV to 1V 1V to 10V 10V to 320V	0.53% to 0.12% 0.12% to 0.10% 0.10% to 0.11% 0.11% to 0.10%  0.58% to 0.10% 0.10% to 0.20% 0.20% to 0.19%	Using Fluke 6 ½ digit 8846A Multimeter By Direct method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
	AC High Voltage <sup>#</sup>	<b>100KHz</b> 100mV to 3V  <b>50Hz</b> 1kV to 5kV	0.25% to 5.2%  3.05%	Using HV Probe with DMM By Ratio Method
4.	AC Current <sup>#</sup>	<b>40Hz to 1kHz</b> 10 $\mu$ A to 100 $\mu$ A 100 $\mu$ A to 100 mA 100mA to 1A 1A to 10 A  <b>1kHz to 5kHz</b> 10 $\mu$ A to 100 $\mu$ A 100 $\mu$ A to 10 mA 10mA to 100mA 100mA to 3A	0.89% to 0.25% 0.25% to 0.16% 0.16% to 0.18% 0.18% to 0.31%  0.21% to 0.20% 0.22% to 0.27% 0.27% to 0.20% 0.20% to 0.26%	Using Fluke 6 ½ digit 8846A Multimeter By Direct method
5.	Resistance <sup>#</sup>	1 $\Omega$ to 10 $\Omega$ 10 $\Omega$ to 100 $\Omega$ 100 $\Omega$ to 10k $\Omega$ 10k $\Omega$ to 1M $\Omega$ 1M $\Omega$ to 10M $\Omega$ 10M $\Omega$ to 100M $\Omega$ 100M $\Omega$ to 1G $\Omega$	0.36% to 0.047% 0.047% to 0.016% 0.016% to 0.013% 0.013% 0.013% to 0.048% 0.048% to 0.93% 0.93% to 2.32%	Using Fluke 6 ½ digit 8846A Multimeter By Direct method



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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
6.	AC Resistance <sup>#</sup>	<b>1 kHz</b> 1 $\Omega$ to 1k $\Omega$ 1 k $\Omega$ to 10 k $\Omega$	0.064% to 0.10% 0.10%	Using Agilent E4980A LCR meter By Direct Method/ Comparison Method
7.	Capacitance <sup>#</sup>	<b>1kHz</b> 10pF to 100pF 100pF to 1nF 1nF to 1 $\mu$ F <b>100Hz</b> 10 $\mu$ F to 100 $\mu$ F	0.072% to 0.10% 0.10% 0.11% 0.58% to 0.59%	Using Agilent E4980A LCR meter By Direct Method / Comparison Method
8.	Inductance <sup>#</sup>	<b>1kHz</b> 1mH to 10H	0.11% to 0.10%	Using Agilent E4980A LCR meter By Direct/ Comparison Method
9.	Frequency <sup>#</sup>	10Hz to 100kHz 100kHz to 1MHz	0.081% to 0.013% 0.013% to 0.042%	Using Fluke 6 1/2 digit 8846A Multimeter By Direct method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
10.	Temperature Simulation <sup>#</sup>			Using Fluke 5502A Multiproduct Calibrator By Electrical simulation direct Method
	"K" Type Thermocouple	(-)200°C to 100°C 100°C to 1350°C	0.38°C to 0.19°C 0.19°C to 0.46°C	
	"J" Type Thermocouple	(-)200°C to 100°C 100°C to 1200°C	0.31°C to 0.17°C 0.17°C to 0.27°C	
	"B" Type Thermocouple	600°C to 1800°C	0.40°C to 0.39°C	
	"E" Type Thermocouple	(-)200°C to 950°C	0.55°C to 0.25°C	
	"N" Type Thermocouple	(-)200°C to 1300°C	0.47°C to 0.32°C	
	"R" Type Thermocouple	0°C to 800°C 800°C to 1600°C	0.66°C to 0.39°C 0.39°C to 0.47°C	
	"S" Type Thermocouple	0° to 1600°C	0.42°C to 0.54°C	
	"T" Type Thermocouple	(-)200°C to 400°C	0.7°C to 0.17°C	
RTD's	(-)200°C to 600°C 600°C to 800°C	0.11°C to 0.15°C 0.15°C to 0.49°C	Using Fluke 8846A Precision Multimeter & Fluke 725 process calibrator by Direct Method	
11.	Time Interval <sup>#</sup>	10 sec to 1000 sec 1000sec to 9000sec	0.82% to 0.058% 0.058% to 0.10%	Using SELEC TT412 Digital Timer By Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>MECHANICAL CALIBRATION</u></b>				
<b>I.</b>	<b>DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)</b>			
1.	Bevel Protractor <sup>§</sup> LC:0.1° (5min) <sup>Φ</sup>	0-360°	2.94 min	Using Angle Gauge Blocks & Accessories By Comparison As per IS Standard IS 4239-1970
2.	Bore Gauge <sup>§</sup> (Transmission only) LC : 0.001mm <sup>Φ</sup>	0 to 2mm	6.89 $\mu$ m	Using Electronic Dial Calibrator. By Comparison As per IS Standard IS 2092
3.	Bore Gauges for extra small holes (without Transmission) LC : 0.001mm <sup>Φ</sup>	3 mm to 10mm	1.96 $\mu$ m	Using Master Plain Ring Gauges. By Comparison As per IS Standard IS 2966
4.	Calipers <sup>§</sup> (Digital/Dial/Vernier) LC:0.01mm <sup>Φ</sup>	0 to 150 mm 0 to 600 mm 0 to 1000mm	13.50 $\mu$ m 7.89 $\mu$ m 17.35 $\mu$ m	Using Gauge Blocks Grade“0”& Vernier Caliper Checker By Comparison As per IS Standard IS 3651
5.	Cylindrical Pins <sup>§</sup>	0.1 mm to 2 mm	1.66 $\mu$ m	Using Gauge Blocks Grade“0” & Mechanical Comparator. By Comparison As per IS Standard IS 11103

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
6.	Depth Micrometer <sup>\$</sup> LC:0.001mm <sup>Ⓟ</sup>	0 to 300mm	3.49 $\mu$ m	Using Gauge Blocks Grade"0" By Comparison As per IS Standard IS 4213
7.	Depth Vernier Gauge <sup>\$</sup> LC:0.01mm LC:0.02mm	0 to 300mm 0 to 300mm	4.32 $\mu$ m 5.20 $\mu$ m	Using Gauge Blocks Grade"0" By Comparison As per IS Standard IS 4213
8.	Dial Comparator <sup>\$</sup> (Millimess) LC:0.001mm	0 to 0.05 mm	3.82 $\mu$ m	Using Electronic Dial Calibrator. By Comparison As per IS Standard IS 2092
9.	External Micrometer <sup>\$</sup> LC:0.001mm <sup>Ⓟ</sup> LC:0.01mm	0 to 150mm 150 mm to 300 mm	1.59 $\mu$ m 7.36 $\mu$ m	Using Gauge blocks Grade"0" Optical Flats & Mechanical Comparator. By Comparison As per IS Standard IS 2967
10.	External Micrometer <sup>\$</sup> Setting rods	0 to 275 mm	1.86 $\mu$ m	Using Gauge blocks Grade"0" & Mechanical Comparator. By Comparison As per IS Standard IS 2967

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
11.	Feeler Gauge <sup>§</sup>	0.03mm to 1mm	2.97 $\mu$ m	Using Digital Micrometer (LC: 0.001mm) by Comparison As per IS Standard IS 3179
12.	Height Gauge <sup>§</sup> (Dial/Digital/ Analog) LC: 0.01mm  LC:0.02mm	0 to 300 mm 0 to 1000mm 0 to 1000mm	6.91 $\mu$ m 9.23 $\mu$ m 15.00 $\mu$ m	Using Gauge Blocks Grade "0" & Vernier Caliper Checker By Comparison As per IS Standard IS 2921
13.	Inside Micrometer <sup>§</sup> (Stick/Tubular) LC:0.001mm <sup>Ⓟ</sup> LC:0.01mm	0 to 275mm	3.73 $\mu$ m	Using Gauge Blocks Grade "0" & Accessories By Comparison As per IS Standard IS 2966
14.	Lever Type dial Gauge <sup>§</sup> LC:0.001mm <sup>Ⓟ</sup>  LC:0.01mm	0 to 0.2 mm  0 to 0.8mm 0 to 1.6 mm	3.89 $\mu$ m  3.93 $\mu$ m 6.90 $\mu$ m	Using Electronic Dial Calibrator. By Comparison As per IS Standard IS 11498
15.	Pistol Caliper <sup>§</sup> LC:0.1mm	0 to 220mm	28.86 $\mu$ m	Using Gauge Blocks Grade "0 " By Comparison As per IS Standard IS 2092
16.	Plain Plug Gauge <sup>§</sup>	2 mm to 150mm	1.66 $\mu$ m	Using Gauge Blocks Grade "0" & Mechanical Comparator. By Comparison As per IS Standard IS 7859

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17.	Plunger Type Dial & Digital Gauge <sup>§</sup> LC:0.001mm LC:0.01mm	0 to 12.7mm 0 to 12.5 mm	3.89 $\mu$ m 3.93 $\mu$ m	Using Electronic Dial Calibrator. By Comparison As per IS Standard IS 2092
18.	Snap Gauge <sup>§</sup>	1m to 150mm	2.20 $\mu$ m	Using Gauge Blocks Grade "0 " By Comparison As per IS Standard IS 3477
19.	Thread Plug Gauge <sup>§</sup>	3 mm to 100mm	2.67 $\mu$ m	Using Floating Carriage & Cylindrical Pins. By Comparison As per IS Standard IS 2334
20.	Three point Micrometer <sup>§</sup> LC:0.001mm LC:0.005mm	6mm to 10mm 10 mm to 100mm	2.13 $\mu$ m 6.11 $\mu$ m	Using Master Plain Ring Gauges. By Comparison As per IS Standard IS 2966

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<b>II.</b>	<b>WEIGHING SCALE AND BALANCE</b>			
<b>1.</b>	Weighing Balances / Machines * LC:0.1 mg $\phi$  LC:1 mg $\phi$ LC:10 mg $\phi$ LC:100 mg $\phi$ LC:1g $\phi$	1 mg to 100 g 100g to 200 g  200g to 1 kg 1kg to 6 kg 6 kg to 20 kg 20 kg to 60 kg	0.11 mg 0.14 mg  1.82 mg 5.51 mg 135 mg 227 mg	Using E2 Class Standard Weights by Comparison Method as per OIML-R76  Using F1 Class Standard Weights by Comparison Method as per OIML-R76
<b>III.</b>	<b>ACCOUSTICS</b>			
<b>1.</b>	Sound Level Meter <sup>s</sup>	94 dB & 114 dB	0.5 dB	Using Sound level calibrator Class 1. By Comparison method @ 1000 Hz frequency $\pm$ 1% as per IS 15575 ( part 1)
<b>V.</b>	<b>PRESSURE INDICATING DEVICES</b>			
<b>1.</b>	Pressure (Hydraulic) <sup>s</sup> Gauges Transducer Recorder/ switches Logger/Modules Manometers Transmitters Calibrators	6 bar to 1600 bar	0.021 % Rdg	Using Hydraulic Dead Weight Tester DH Budenberg 580 EHX. By Comparison Method as per DKD R6-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
2.	Pressure (Hydraulic) # Gauges Transducer Recorder/ switches Logger/Modules Manometers Transmitters Calibrators	0.1 bar to 340 bar  0.1 bar to 700 bar	0.23 % Rdg  0.35 % Rdg	Using Pressure calibrator Fluke7175000G & Digital Pressure Gauge. By Comparison Method as per DKD R6-1
3.	Pressure (Pneumatic) # Gauges Transducer Recorder/ switches Logger/Modules Manometers Transmitters Calibrators	0 bar to 3.5 bar  0.1 bar to 34 bar	0.021 % Rdg  0.17 % Rdg	Using Druck Calibrator DPI802P . By Comparison method as per DKD R 6-1 : 2003 & Using Pressure calibrator Fluke7175000G With Gauge pressure Module 700P07 & Digital Pressure Gauge. By Comparison Method as per DKD R6-1
4.	Differential Pressure # Gauges Transducer Recorder/ switches Logger/Modules Manometers Magnehelic gauges Transmitters Calibrators	0.1 mbar to 100 mbar  100 mbar to 340 mbar	0.28 %rdg  0.42 %rdg	Using Pressure calibrator Fluke 717 5000G with Gauge pressure Module 700P03 by Comparison Method as per DKD R6-1

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
5.	Negative Pressure (Vacuum) # Gauges Transducer Recorder/ switches Logger/Modules Manometers Transmitters Calibrators	(-)0.01 bar to (-)0.8 bar	0.00079 bar	Using Pressure Loop calibrator Druck DP1802P & Pressure calibrator Fluke 717 5000G with Gauge Pressure Module 700PD4 & Digital Pressure Gauge by Comparison Method as per ISO 3567
6.	Pressure (Hydraulic) \$ Dead weight tester	6 bar to 700bar	0.015 %Rdg	Using Hydraulic Dead Weight Tester DH Budenberg 580 EHX. By Comparison with Cross float Method as per Euramet cg-3
<b>V.</b>	<b>TORQUE GENERATING DEVICES</b>			
1.	Torque Screw Driver & Hand Torque Wrenches \$ Type I, Class A, B,C,D,E  Type II, Class A,B,C,D,E,F,G	0.5 Nm to 10 Nm 10Nm to 100 Nm 100 Nm to 500 Nm 500 Nm to 1400 Nm  25 Nm to 250 Nm 25 Nm to 250 Nm	0.30 %Rdg 0.30 %Rdg 0.25 %Rdg 0.24 %Rdg  0.25 %Rdg 0.27 %Rdg	Using Static Torque Transducer with Indicator. By Comparison Method Based on ISO 6789:2003.  Clockwise Direction Counter clock wise direction.

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
2.	Torque Multiplier <sup>\$</sup>	200 Nm to 600 Nm 600 Nm to 6000 Nm	0.67 %Rdg 0.38 %Rdg	Using Static Torque Transducer with Indicator. By Comparison Method Based on ISO 6789
3.	Hydraulic Torque Wrenches <sup>\$</sup>	200 Nm to 2100 Nm 2100 Nm to 9580 Nm	0.49 %Rdg 0.38 %Rdg	Using Static Torque Transducer with Indicator. By Comparison Method Based on ISO 6789
4.	Rotary Torque Tools Pneumatic, Electrical, Oil Pluse Tool, DC Nut runner. <sup>\$</sup>	0.5 Nm to 60 Nm 60 Nm to 150 Nm 150 Nm to 700 Nm	0.84 %Rdg 0.75 %Rdg 0.88 %Rdg	Using Static Torque Transducer with Norbar joint simulation rundown assembly and Indicator By Comparison Method Based on ISO 5393:1994 & ISO 6789

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
<b><u>THERMAL CALIBRATION</u></b>				
<b>I.</b>	<b>TEMPERATURE</b>			
1.	Thermocouples/ RTD's with or without Digital Indicators & Temperature Transducers /Gauges <sup>#</sup>	(-)25°C to 200°C 200°C to 600°C 600°C to 1200°C	0.13°C to 0.21°C 0.21°C to 1.21°C 1.21°C to 1.81°C	Using RTD/R- Type Thermocouple with Multiproduct Calibrator 5502A, 6 ½ DMM 8846A & Dry Block Furnaces by Comparison Method
2.	Glass Thermometer <sup>s</sup>	(-)10°C to 110°C	0.63°C	Using RTD with 6 ½ DMM 8846A & Dry Block furnace with Liquid stirrer by Comparison Method
3.	Dry Block Furnace & Fluid Baths <sup>#</sup>	(-)25°C to 140°C 140°C to 650°C 650°C to 1200°C	0.13°C to 0.22°C 0.22°C to 1.21°C 1.21°C to 1.81°C	Using PRT and R type Thermocouple with Multiproduct Calibrator 5502A & 6 ½ DMM 8846A by Comparison Method

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Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability ( $\pm$ )	Remarks
II.	<b>SPECIFIC HEAT AND HUMIDITY</b>			
1.	Temperature Uniformity mapping of Furnace, Ovens, Environmental Chamber, Freezer, Refrigerators, BOD Incubator (Multi position)*	(-)85°C to 200°C 200°C to 800°C 800°C to 1200°C	0.60°C 2.68°C 5.02°C	Using Calibrated RTDs, N- Type Thermocouples with Paperless Recorder By Comparison Method (Multi position)

\* 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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