Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	1 of 13
Validity	19.11.2017 to 18.11.2019	Last Ame	ended on 06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks	
ELECTRO-TECHNICAL CALIBRATION					
1.	SOURCE	****			
1.	DC Voltage ^{\$}	1 mV to 10 mV 10 mV to 100 V 100 V to 1000 V	0.5% to 0.1% 0.1% to 0.015% 0.015% to 0.012%	Using Fluke 9100 Calibrator by Direct Method	
2.	AC Voltage ^{\$}	50 Hz 10 mV to 1 V 1 V to 1000 V	4.5% to 0.075% 0.075% to 0.12%	Using Fluke 9100 Calibrator by Direct Method	
3.	DC Current ^{\$}	1 μA to 100 μA 100 μA to 1 mA 1 mA to 100 m A 100 mA to 20 A 10 A to 1000 A	1.4% to 0.03% 0.03% to 0.1% 0.1% to 0.04% 0.04% to 0.11% 1.62% to 0.81%	Using Fluke 9100 Calibrator by Direct Method Using Fluke 9100 Calibrator & Current Coil by Direct Method	
4.	AC Current ^s	50 Hz 10 μA to 10 mA 10 mA to 20 A 50 Hz 10 A to 1000 A	10.5% to 0.13% 0.13% to 0.3% 1.42%	Using Fluke 9100 Calibrator by Direct Method Using Fluke 9100 Calibrator & Current Coil by Direct Method	
5.	Resistance#	0.01 Ω to 1 Ω 1 Ω to 100 kΩ	6.4 % to 0.1% 0.1%	Using Decade Resistance Box (Vaiseshika) 4 Wire By Direct Method	

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	2 of 13	
Validity	19.11.2017 to 18.11.2019	Last Am	ended on	06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Resistance ^{\$}	100 kΩ to 100 MΩ	0.1% to 0.35%	Using Fluke 9100 Calibrator by Direct Method
	Insulation Resistance ^{\$}	(50 V to 1000 V DC) 100 kΩ to 2 GΩ	5.9 % to 1.72%	Using Fluke 9100 Calibrator by Direct Method
6.	Frequency ^{\$}	1 Hz to 100 kHz 100 kHz to 10 MHz	1.1% to 0.006% 0.006% to 0.4%	Using Fluke 9100 Calibrator by Direct Method
7.	Capacitance [#]	1 kHz 100 pF to 1 μF	2% to 1.22%	Using Capacitance Box Time Electronics by Direct Method
	Capacitance ^{\$}	10 nF to 100 μF	1% to 2%	Using Fluke 9100 Calibrator by Direct Method
8.	Inductance [#]	1 kHz 100 μH to 10 H	4.2%	Using Inductance Box Time Electronics by Direct Method
	Temperature Simulatio	n#		
	Thermocouple J-type K-type R-type S-type RTD / PRT	(-) 200 °C to 1200 °C (-) 200 °C to 1200 °C 200 °C to 1700 °C 200 °C to 1700 °C (-) 200 °C to 790 °C	1.6 °C 1.6 °C 2.7 °C 2.7 °C 1 °C	Using Temperature Calibrator by Direct Method

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	3 of 13
Validity	19.11.2017 to 18.11.2019	Last Am	nended on 06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
10.	DC Power ^{\$}	240 VDC, 1A- 20A 240 W to 4.8 kW	0.3% to 0.7%	Using Fluke 9100 Calibrator by Direct Method
11.	AC Power ^{\$}	240 V 50Hz, 5 mA to 20A At UPF 1.2 W to 4.8 kW 240 V 50Hz, 5 mA to 20A At 0.2PF lead and lag 240 mW to 0.96 kW	1.1 % 3.8% to 1%	Using Fluke 9100 Calibrator by Direct Method
12.	Power Factor ^{\$}	Lead, Lag 0.2 to UPF	3.0% to 0.6%	Using Fluke 9100 Calibrator by Direct Method
13.	Oscilloscope ^{\$} Square Waveform DC Amplitude Sine Amplitude	Load 1 M Ω / 1 kHz 5 mV to 130 V Load 1 M Ω 5 mV to 130 V Load 1M Ω / 1 kHz 5 mV to 130 V Load 1 M Ω / 50 Hz	1.2 % to 0.3 % 1.2 % to 0.7 % 0.85%	Using Fluke 9100 Calibrator by Direct Method
	Time Marker Bandwidth	5 mV to 130 V 5 ns to 5s 50 kHz to 250 MHz	0.85% 0.62% 2.7%	

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	4 of 13	
Validity	19.11.2017 to 18.11.2019	Last Am	ended on	06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
14.	Time Interval [#]	10 s to 1 Hr	1.6% to 0.12%	Using Standard Stop Watch by Comparison Method
11.	MEASURE			
1.	DC Voltage [#]	1 mV to 1 V 1 V to 1000 V	0.42% to 0.07% 0.01%	Using HP 34401 A Digital Multimeter by Direct Method
	DC High Voltage [#]	1 kV to 15 kV	7.48 %	Using HV Probe with Digital Multimeter by Direct Method
2.	AC Voltage#	50 Hz 10 mV to 1 V 1 V to 750 V	0.54% to 0.14% 0.14%	Using HP 34401 A Digital Multimeter by Direct Method
	AC High Voltage [#]	50 Hz 1 kV to 15 kV	7.34 %	Using HV Probe with Digital Multimeter by Direct Method
3.	DC Current [#]	1 mA to 100 mA 100mA to 3 A	0.3% to 0.09% 0.09% to 0.19%	Using HP 34401 A Digital Multimeter by Direct Method
		1 µA to 300 m A 300 mA to 10 A	9.8% to 0.71% 0.71% to 0.64%	Using Rishabh Rish Muti 20 DMM by Direct Method
4.	AC Current#	50 Hz 100mA to 3 A	0.64% to 0.25%	Using HP 34401 A Digital Multimeter by Direct Method
		30 μA to 300 m A 300 mA to 10 A	4% to 0.72% 0.72% to 1%	Using Rishabh Rish Muti 20 DMM by Direct Method

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	5 of 13
Validity	19.11.2017 to 18.11.2019	Last Ame	ended on 06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	Resistance #	10 Ω to 100 kΩ 100 kΩ to 10 MΩ 10 MΩ to 100 MΩ	0.06% to 0.015% 0.015% to 0.05% 0.05% to 1.56%	Using HP 34401 A Digital Multimeter by Direct Method
6.	Frequency ^{\$} Frequency *	10 Hz to 1 MHz 10 Hz to 300 kHz	0.2% to 0.02% 0.2% to 0.06%	Using HP 34401 A Digital Multimeter by Direct Method
7.	Capacitance ^{\$}	1 kHz 10 pF to 1 μF	2.01% to 0.32%	Using Digital LCR Meter 4284 A by Direct Method
8.	Inductance ^{\$}	1 kHz 100 μH to 10 H	0.4% to 0.17%	Using Digital LCR Meter 4284 A by Direct Method
9.	AC Power [#]	240 V 50Hz, 1A- 20A 0.2 to UPF 240 W to 4.8 kW	4.2%	Using Fluke 435-II Power Analyzer by Direct Method

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	6 of 13
Validity	19.11.2017 to 18.11.2019	Last Ame	nded on 06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	<u> </u>			
I.	DIMENSION (BASIC N	IEASURING INSTRUMENT	「, GAUGE ETC.)	
1.	Micrometer ^{\$} L.C. 0.001 mm	0 to 25 mm Up to 300 mm	1.3 μm 4.5 μm	Using Slip Gauge Blocks By Comparison Method
2.	Caliper ^{\$} (Vernier/Dial/Digital) L.C. 0.01mm	0 to 200 mm 0 to 300 mm 0 to 600 mm	8.4 μm 10 μm 12 μm	Using Slip Gauge Blocks & Caliper Checker By Comparison Method
	L.C. 0.02mm	0 to 1000 mm	17 μm	
3.	Height/ Depth Gauge ^{\$} (Vernier/ Dial/ Digital) L.C. 0.01mm	0 to 300 mm 0 to 600 mm	12 μm 12 μm	Using Caliper Checker & Surface Plate by Comparison Method
4.	Dial Thickness Gauge ^{\$} L.C. 0.001 mm	0 to 25 mm	1.2 μm	Using Slip Gauge Blocks by Comparison Method
5.	Dial Indicator ^{\$} L.C. 0.001 mm	0 to 10 mm	1.4 µm	Using Single Axis measuring machine by Comparison Method
6.	Snap Gauge ^{\$}	2 mm to 25 mm 25 mm to 150 mm	1.1 μm 2.7 μm	Using Slip Gauge Blocks by Comparison Method

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	7 of 13	
Validity	19.11.2017 to 18.11.2019	Last An	nended on	06.12.2017

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
7.	Dial Bore Gauge ^{\$}	Up to 1 mm travel	1.1 µm	Using Single Axis Measuring Machine
8.	Plain Plug Gauge ^{\$}	φ1 mm to φ85 mm φ85mm to φ185 mm	1.5 μm 3 μm	Using Single Axis Measuring Machine by Comparison Method
9.	Plain Ring Gauge ^{\$}	φ6.5mm to φ25.4 mm φ25.4mm to φ300 mm	2 μm 4.6 μm	Using Single Axis Measuring Machine by Comparison Method
10.	Measuring Pin ^{\$}	φ1mm to φ 20 mm	1.41 µm	Using Single Axis Measuring Machine by Comparison Method
11.	Thread Plug Gauge ^{\$} (Effective Diameter)	M1 to M100	2 µm	Using Single Axis Measuring Machine by Comparison Method
12.	Thread Ring Gauge ^{\$} (Effective Diameter)	φ6mm to φ100 mm	2.4 µm	Using Single Axis Measuring Machine by Comparison Method
13.	Length Gauge/ Setting Master ^{\$}	Up to 100 mm 100 mm to 185 mm 185 mm to 280 mm	1.7 μm 3.0 μm 4.2 μm	Using Single Axis Measuring Machine by Comparison Method
14.	Feeler Gauge ^{\$}	Up to 1mm	1.3 µm	Using Micrometer
15.	Foils ^{\$}	Up to 1 mm	1.42 μm	Using Single Axis Measuring Machine

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh				
Accreditation Standard	ISO/IEC 17025: 2005				
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	8 of 13		
Validity	19.11.2017 to 18.11.2019	Last Am	ended on 06.12.2017		

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
16.	Coating Thickness Gauge ^{\$}	Up to 1000 μm	3 μm	Using Standard Foils by Comparison Method
17.	Single Axis Measuring Machine ^{\$} L.C.: 0.0001mm	Up to 100 mm	1.4 µm	Using Slip Gauge Grade '0'
18.	Radius Gauge ^{\$}	Up to 100 mm	9 μm	Using Profile Projector
19.	Angle Gauges ^{\$}	0 to 360°	34 sec.	Using Profile Projector
20.	Test Sieves ^{\$} (Aperture Size)	40 μm to 4000 μm 4 mm to 50 mm 50 mm to 125 mm	6.2 μm 20 μm 30 μm	Using Profile Projector and Vernier Caliper
II.	PRESSURE INDICATI	NG DEVICES		
		0 to 2.5 mbar 0 to 10 mbar	0.021 mbar 0.588 mbar	Using Differential Pressure Sensor by Comparison as per DKD R-6-1
		0 to 3 bar 0 to 30 bar	0.0078 bar 0.06 bar	Using Digital Pressure Gauge by Comparison as per DKD R-6-1
2.	Negative Pressure- Analog & Digital Vacuum Gauges & Transmitters [#]	(-) 0.9 bar to 0 bar	0.0059 bar	Using Digital Pressure Gauge by Comparison as per DKD R-6-1
3.	Hydraulic Pressure- Analog & Digital Pressure Gauges, Pressure Transmitters ^{\$}	2.45 bar to 29.42 bar >29.42 bar to 588.399 bar	0.166% of rdg. 0.103 % of rdg.	Using Hydraulic Dead Weight Tester by Comparison as per DKD R-6-1

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	9 of 13	
Validity	19.11.2017 to 18.11.2019	Last Ame	ended on 06.12.2017	

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
4.	Hydraulic Pressure- Analog & Digital Pressure Gauges, Pressure Transmitters, Pressure Switch [#]	0 to 588.399 bar	0.14 % of rdg.	Using Digital Pressure Gauge by Comparison as per DKD R-6-1
III.	ACCOUSTICS			
1.	Sound Level Meter ^{\$}	1 kHz 94.0 dB to 113.6 dB	1.5 dB	Using Standard Sound Level Meter by Comparison Method
IV.	MASS			
	Balance [#] Readability : 1mg	1 mg to 500 mg >500 mg to 50 g >50 g to 100 g	0.85 mg 0.85 mg 0.90 mg	Using Standard Weights of F1 Class as per OIML R-76-1
	Readability : 10 mg	>100 g to 1 kg	13 mg	
	Readability : 100mg	>1 kg to 5 kg	82 mg	
	Readability : 1g	>5 kg to 60 kg	1.11 g	
	Readability : 10 g	>60 kg to 120 kg	8.32 g	Using Standard Weights of F1& M1 Class as per OIML R-76-1

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page 10 of 13		
Validity	19.11.2017 to 18.11.2019	Last Amended on 06.12.2017		

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
V.	WEIGHTS			
		1 mg 2 mg 5 mg 10 mg 20 mg 50 mg 100 mg 200 mg 500 mg 1g 2 g 5 g 10 g 20 g 50 g	0.013 mg 0.013 mg 0.013 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.02 mg 0.03 mg 0.03 mg 0.1 mg 0.1 mg 0.1 mg 0.1 mg 0.1 mg 0.1 mg 0.1 mg	Using Standard Weights F1 Class & Balance (readability 0.01 mg) by Substitution ABA Method as per OIML R-111
		100 g 200 g	0.2 mg 0.3 mg	Using Standard Weights F1 Class & Balance (readability 0.1 mg) by Substitution ABA Method as per OIML R-111
		500 g 1kg 2 kg 5 kg 10 kg 20 kg	0.91 g 0.91 g 0.91 g 0.91 g 0.91 g 0.91 g	Using Standard Weights F1 Class & Balance (readability 1 g) by Substitution ABA Method as per OIML R-111

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	11 of 13	
Validity	19.11.2017 to 18.11.2019	Last Amen	ded on 06.12.2017	

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		50 kg	4.1 g	Using Standard Weights F1 Class & Balance (readability 5 g) by Substitution ABA Method as per OIML R-111
VI.	VOLUME			
		0.1 ml to 5 ml >5 ml to 20ml	0.1μl 0.2 μl	Using Standard Weights F1 Class & Balance Resolution : 0.01 mg and Distilled Water by Gravimetric Method as per ISO 4787
		>20 ml to 50 ml >50 ml to 100 ml >100 ml to 200 ml	0.3 μl 0.65 μl 0.8 μl	Using Standard Weights F1 Class & Balance Resolution : 0.1 mg and Distilled Water by Gravimetric Method as per ISO 4787
		>200 ml to 1000 ml >1l to 10 l	1.0 ml 1.2 ml	Using Standard Weights F1 Class & Balance Resolution : 1g and Distilled Water by Gravimetric Method as per ISO 4787
VII.	ACCELERATION & SI	PEED		
1.	Tachometer ^{\$}	100 RPM to 25000 RPM	1.5 % to 0.18 %	Using Standard Tachometer By Comparison Method

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh			
Accreditation Standard	ISO/IEC 17025: 2005			
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	12 of 13	
Validity	19.11.2017 to 18.11.2019	Last Ame	ended on 06.12.2017	

SI.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks			
	THERMAL CALIBRATION						
1.	TEMPERATURE						
1.	RTD, Thermocouple With Or Without Temperature Indicator/ Data Logger/ Recorder, Temperature Gauge, Glass Thermometer, Digital Thermometer ^{\$}	(-) 40°C to 300°C	0.26°C	Using PRT (PT-100) 4 wire, 6.5 Digital Multimeter, Oil Bath by Comparison Method			
2.	RTD, Thermocouples With Or Without Temperature Indicator/Data Logger/ Recorder, Temperature Gauge, Digital Thermometer ^{\$}	300 °C to 1000 °C	2.3 °C	Using R-type T/C & 6.5 Digital Multimeter, Tubular Furnace by Comparison Method			
3.	Calibration Of Oven, Chamber, Environmental Chamber, Incubator [#]	25°C to 300°C	4.5°C	Using K-type T/C's (Minimum Nine) with Temperature Indicator & Switch, Multi Position Calibration			
4.	Temperature Indicator With Sensor Of Freezer, Chamber, Oven, Liquid Bath, Dry Block Etc. [#]	(-) 40°C to 300°C	0.4°C	Using PRT (PT-100) 4 Wire, 6.5 Digital Multimeter, Single Position Calibration			

Laboratory	National Research & Technology Consortium (C-ACT), Deptt. of Industries Complex, Sector-1, Parwanoo, Himachal Pradesh				
Accreditation Standard	ISO/IEC 17025: 2005				
Certificate Number	CC-2430 (in lieu of C-0456, C-0457 & C-0484)	Page	13 of 13		
Validity	19.11.2017 to 18.11.2019	Last Am	Last Amended on 06.12.2017		

SI.	Quantity Measured /	Range/Frequency	*Calibration Measurement	Remarks
	Instrument		Capability (±)	
5.	Temperature Indicator With Sensor of Oven, Chamber, Muffle Furnace, Furnace Etc. #	300°C to 1000°C	2.6 °C	Using R-type T/C, 6.5 Digital Multimeter, Single Position Calibration
II.	SPECIFIC HEAT & HU	MIDITY		
1.	Thermo-Hygrometer, Humidity Indicator With Inbuilt or	20% RH to 90% RH @≈ 25°C	3% RH	Using Digital Thermo- Hygrometer with Inbuilt Sensor, Environmental
	External Sensors ^{\$}	5°C to 50°C @ ≈50% RH	1.3°C	Chamber by Comparison Method
2.	Humidity Indicator With Sensor of Environmental Chamber, Humidity Chamber [•]	20% RH to 90% RH @ ≈25 °C	3% RH	Using Humidity Indicator with Sensor, Single 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.