Laboratory	**Classic Instrumentation Pvt. Ltd., C-45, Sector-65, Noida, Uttar Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**CC-2798** ***(In lieu of C-0210,C-0211,C-0212)***	**Page**	**1 of 18**
Validity	**01.08.2018 to 31.07.2020**	**Last Amended on**	**30.08.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		ELECTRO TECHNICAL CALIBRATION		
I.	**SOURCE**			
1.	DC Voltage [$]	1 mV to 10 mV 10 mV to 100 mV 100mV to 1V 1V to 100 V 100 V to 1000 V	0.36 to 0.08% 0.08 to 0.02% 0.02% 0.02 to 0.007% 0.007%	Using MFC 5500 Calibrator by Direct Method
2.	AC Voltage[$]	**50 Hz to 1 kHz** 1mV to 10 mV 10 mV to 100 mV 100 mV to 100 V 100 V to 1000 V	 0.42 to 0.20% 0.20% 0.2 to 0.07% 0.07%	Using MFC 5500 Calibrator by Direct Method
3.	DC Current [$]	1µA to 1mA 1mA to 100 mA 100mA to 10A 10A to 1000 A	0.07 to 0.02% 0.02 to 0.01% 0.01 to 1.2% 1.2 to 0.75%	Using Fluke Calibrator 5500& Current Coil by Direct Method
4.	AC Current[$]	**50 Hz to 1 kHz** 1µA to 1mA 1mA to 100 mA 100mA to 10A **50Hz** 10A to 1000 A	 1.3 to 0.18% 0.15 to 0.13% 0.13 to 0.14% 0.14 to 0.9%	Using Fluke Calibrator 5500& Current Coil by Direct Method

Mamta Bharti
Convenor

Avijit Das
Program Manager

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
5.	DC Resistance [$]	0.001Ω to 10 Ω	0.9 to 0.7%	Using Discrete Resistance(0.001 ohm, 0.01 ohm, 0.1 ohm, 1 ohm, 10 ohm, 100 ohm)
		10 Ω to 1MΩ 1 MΩ to 300 MΩ	0.7 to 0.02% 0.02 to 1.5%	Using MFC 5500 Calibrator
		20MΩ, 200 MΩ , 2GΩ, 20GΩ,200 GΩ	1.5 to 3.4%	Using Discrete Resistance
6.	Inductance [$]	**1kHz** 100µH to 10 H	1.5%	Using Std. Inductance Box
7.	Capacitance [$]	**1 kHz** 0.01nF to 1.1 mF	1.2 to 0.6%	Using LCR meter
8.	DC Power [$]	1V to 750 V 300mA to 11A 0.3W to 8k W	0.43 to 0.07%	Using MFC 5500 Calibrator
9.	AC Power [$] 1 Phase 50 Hz UPF to 0.5 PF	1V to 1000 V 300mA to 20A 0.3W to 20kW	6.1 to 0.42%	Using MFC 5500 Calibrator
10.	Stop Watch/ Timer [$] (Digital/Analog)	1s to 24hrs.	0.6 s to 66 s	Using Digital Timer by comparison method
11.	Frequency [$]	1Hz to 200 MHz	1.1 to 0.3%	Using MFC 5080A & function Generator Scientific Make

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks

12.	Simulation For Temp Indicator/ Controller/ Recorder [$] RTD J Type Thermocouple K Type Thermocouple R Type Thermocouple S Type Thermocouple N Type Thermocouple T Type Thermocouple	 (-)200 to 800 ^{0}C (-)200 to 1200 ^{0}C (-)200 to 1300 ^{0}C (-)200 to 1700 ^{0}C 0 to 1700 ^{0}C (-)200 to 1300 ^{0}C (-)250 to 400^{0}C	 0.07 to 0.04^{0}C 0.31 to 0.30 ^{0}C 0.38 to 0.64 ^{0}C 0.66 to 3.4^{0}C 0.55 to 3.3^{0}C 0.48 to 0.76^{0}C 0.72 to 0.48 ^{0}C	Using Fluke Calibrator 5500 +ITS 90 by Direct Method
13.	Power Factor [$]	0.1PF 0.200 PF 0.500 PF 0.800 PF 1.000 PF	7.6 to 1.1%	Using Fluke 5080 calibrator by Direct Method
14.	Oscilloscope [$] Time base(marker) Amplitude(Deflection factor) Sin/Square DC Bandwidth	10 ns to 5s AC(1KHz,1M Ω) 5mV to 100 V Square wave AC (50KHz) 100 mV to 5 V Sine Wave 200MHz	0.6ns 1.7 to 0.4% 1.2% 2%	Using Fluke 5080A calibrator by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
15.	Simulation For Temp Indicator/ Controller/ Recorder♣ RTD J Type Thermocouple K Type Thermocouple R Type Thermocouple S Type Thermocouple N Type Thermocouple T Type Thermocouple	 (-)200 to 800 ^{0}C (-)200 to 1200 ^{0}C (-)200 to 1300 ^{0}C (-)200 to 1700 ^{0}C 0 to 1700 ^{0}C (-)200 to 1300 ^{0}C (-)250 to 400^{0}C	 0.07 to 0.04^{0}C 0.31 to 0.30^{0}C 0.38 to 0.64^{0}C 0.66 to 3.4^{0}C 0.55 to 3.3^{0}C 0.48 to 0.76^{0}C 0.72 to 0.48^{0}C	Using Fluke Calibrator 5500 and ITS 90 by Direct Method
16.	Stop Watch/ Timer♣ (Digital/Analog)	1s to 24 hrs.	0.6 to 66 s	Using Digital Timer
II.	**MEASURE**			
1.	DC Voltage# DC High Voltage	1 mV to 10 mV 10 mV to 100 mV 100mV to 1000V 1kV to 36kV	0.36 to 0.12% 0.12 to 0.01% 0.01% 3.3%	Using Fluke 8845 A &DMM 6 $^{1/2}$ dig. DMM+ Voltage Divider
2.	AC Voltage# AC High Voltage	**50 Hz** 1mV to 1000 V **50 Hz** 1 kV to 100kV	 0.81 to 0.06% 3.5%	Using DMM Using DMM+ Voltage Divider

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
3.	Simulation For Temp Indicator/ Controller/ Recorder # RTD J Type Thermocouple K Type Thermocouple R Type Thermocouple S Type Thermocouple N Type Thermocouple T Type Thermocouple	 (-)200 to 800 ^{0}C (-)200 to 1200 ^{0}C (-)200 to 1372 ^{0}C (-)200 to 1700 ^{0}C 0 to 1700 ^{0}C (-)200 to 1300 ^{0}C (-)250 to 400^{0}C	 0.05^{0}C to 0.09^{0}C 0.31^{0}C to 0.30^{0}C 0.38^{0}C to 0.64^{0}C 0.66^{0}C to 3.4^{0}C 0.55^{0}C to 3.3^{0}C 0.48^{0}C to 0.76^{0}C 0.72^{0}C to 0.48^{0}C	Using Fluke Calibrator 5500 +ITS 90 by Direct Method
4.	DC Current #	1mA to 100 mA 100mA to 10A 10A to 1000 A	0.7 to 0.12% 0.12 to 0.2% 0.2 to 2%	Using Fluke 8845 A DMM with Shunt
5.	AC Current#	**50 Hz** 1mA to 100 mA 100mA to 10A 10A to 2000 A	 0.16 to 0.2% 0.2% 0.2 to 3.5%	Using Fluke 8845 A DMM with CT
6.	DC Resistance #	0.001Ω to 10 Ω 20 Ω to 10MΩ 20MΩ, 200 MΩ , 2 GΩ , 20GΩ	0.5 to 0.71% 0.71 to 0.1% 0.35 to 1.1%	Using Digital Micro ohm meter, Fluke 8808A DMM
7.	AC Resistance #	**1kHz** 10 Ω to 1 MΩ	 1.3 to 0.4%	Using LCR Meter
8.	Inductance #	**1kHz** 1mH to 10 H	 0.5%	Using LCR Meter

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
9.	Capacitance #	**1 kHz** 1nF to 100 µF	0.6 to 0.1%	Using LCR Meter
10.	Frequency #	1Hz to 1MHz	0.9 to 0.02%	Using DMM 6 ½
11.	Current transformer Primary Injection Method Ratio error, phase error #	50 Hz 5A to 2000A(Primary) 1A, 5A(Secondary)	0.70% 3.6min	Using Precision Current transformer, Automatic Inst. Transformer test set(AITTS), High Current Source by Comparison method Using std. current transformer, AITTS, Current Source by Comparison method
12.	Potential Transformer/ Capacitor Voltage Transformer ,Voltage Divider , Primary Injection Method Ratio error, phase error #	50Hz 33kV(Primary) 110V(Secondary)	0.85% 5min	Using Electronic potential divider33kV,Standard transformer/Voltage Capacitor, AITTS, High Voltage Source
13.	Transformer Turn Ratio Error #	1 to 2000 TURNS	0.81%	Using Tr. Ratio Standard by Comparison Method

MECHANICAL CALIBRATION

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
I.	**DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.)**			
1.	Calipers $^{\$}$ L.C. 0.01 mm^{Ø}	0 to 150mm 0 to 450mm 0 to 600mm 0 to 1000 mm	7µm 9 µm 13 µm 15 µm	Using Caliper Checker & Slip gauge set& Length Bars by Comparison Method
2.	External Micrometer$^{\$}$ L.C. 0.001mm^{Ø}	0 to 25mm 0 to 150mm 150 mm to 300mm 300mm to 600mm 600mm to 1000mm	1 µm 3 µm 4 µm 11 µm 14 µm	Using Slip Gauge Set& length bar by Comparison Method
3.	Internal Micrometer $^{\$}$ L.C. 0.01mm^{Ø}	0 to 300 mm	7 µm	Using Gauge block set & Accessories set Caliper Checker & Length Bars by Comparison Method
4.	Depth Micrometer $^{\$}$ L.C. 0.01mm^{Ø}	0 to 100 mm	6 µm	Using Gauge block set by Comparison Method
5.	Depth Caliper $^{\$}$ L.C. 0.01mm^{Ø}	0 to 300 mm	10 µm	Using Gauge block set by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
6.	Height gauges [$] L.C.0.01mm[Ø]	0 to 1000mm	10 µm	Using Caliper Checker& length Bars by Comparison Method
7.	Dial Gauge [$] L.C. 0.0005mm [Ø] L.C.0.001mm	0 to 1mm 0 to 25mm	1 µm 7 µm	Using Dial calibration tester by Comparison Method
8.	Dial Thickness gauge [$] L.C.0.01mm[Ø]	0 to 100mm	6 µm	Using Slip gauge set and Accessories set by Comparison Method
9.	Feeler Gauge [$]	Upto 2mm	2 µm	Using Digital Micrometer by Comparison Method
10.	Snap Gauge [$]	LL to 100mm LL to 300mm	3 µm 4 µm	Using Slip gauge set by Comparison Method
11.	Plain Plug Gauge/Setting Plug Gauge [$]	LL to 100mm 100 to 400mm	4 µm 6 µm	Using Gauge Block, dial gauge, comparator stand by Comparison Method
12.	Surface Plate#	Upto 2000*2000 mm	1.5√L+W/150µm (L & W are in mm)	Using Electronic level by Direct Method
13.	V Block[$] Parallelism Flatness	200 mm	5 µm	Using Test Mandrel & Dial Gauge by Direct Method
14.	Try Square Flatness /Angle [$]	Upto 300 mm	6 µm	Using Profile Projector Surface Plate, Dial Gauge by Direct Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
15.	Spirit Level [$] (Sensitivity)	10µm/m	6 µm/m	Using Electronic level, surface plate by Comparison Method
16.	Bore Gauge [$] Travel Only Up to 1mm	Upto 1mm	7 µm	Using Dial calibration tester by Comparison Method
17.	Comparator Stand[#] (flatness only)	Upto 150*150mm	4 µm	Using Dial gauge, spirit level & surface plate by Comparison Method
18.	Radius gauge [$]	Upto 100 mm	10 µm	Using Profile Projector and Radius chart by Comparison Method
19.	Coating thickness gauge [$] L.C 10 µm	0 to 1 mm	2 µm	Using Master foils by Comparison Method
20.	Straight Edge [$]	Upto 1000 mm	5 µm	Using Dial Gauge & Surface plate by Direct Method
21.	Bevel Protractor [$] L.C. 5’	0-180-0^0	3’	Using Angle Gauge Set by Comparison Method
22.	Combination Set [$] L.C. 30’	0-180-0^0	44’	Using Angle Gauge Set by Comparison Method
23.	Industrial Angle	0-180-0^0	3’	Using Profile Projector by

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Gauge $			Comparison Method
24.	Test Sieves$	40 µm to 4mm 4mm to 125 mm	3 µm 9 µm	Using Profile Projector and Digital Vernier Caliper by Comparison Method
25.	Scale & Measuring Tape $	1 to 30 mts	652 µm	Using MSTC -1000mm by Comparison Method
26.	Pitch Gauge $	0.25mm to 7 mm	3 µm	Using Profile Projector by Comparison Method
II.	**DIMENSION (PRECISION INSTRUMENTS)**			
1.	Profile Projector# L.C. 1 µm	0-360mm 10 to100X magnification Angle 0-360^0	3 µm 3% 2' of arc	Using Slip Gauge ,Digital Vernier Caliper ,Angle Gauge set by Comparison Method
III.	**WEIGHTS**			
1.	Weights of F2 class & Coarser $	1mg 2mg 5mg 10mg 20mg 50mg 100mg 200mg 500mg 1g 2g 5g 10g 20g	0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.02mg 0.03mg 0.03mg	Using Standard weights of E2 Class & Balance of Readability 0.01mg by Substitution Method & ABA weighing cycle as per OIML-R-111-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
		50g	0.03mg	
2	Weights of F2 class & Coarser [$]	100g 200g	0.12mg 0.16mg	Using Standard weights of E2 class & Balance of Readability 0.1mg by Substitution Method & ABA weighing cycle as per OIML-R-111-1
3	Weight M1 Class & Coarser [$]	500g	0.01g	Using Standard weights of F1 class & Balance of Readability 10mg by Substitution Method & ABA weighing cycle as per OIML-R-111-1
		1kg 2kg 5kg 10kg 20kg	0.1g 0.5g 0.5g 0.6g 0.9g	Using Standard weights of F1 class & Balance of Readability 100mg by Substitution Method & ABA weighing cycle as per OIML-R-111-1
		50kg	3.0g	Using standard weights of F1 class & Balance of Readability 5g by Substitution Method & ABA weighing cycle as per OIML-R-111-1

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
IV.	**WEIGHING SCALE AND BALANCE**			
1.	Weighing machine For readability ♣ 0.01mg & Coarser 0.1mg & Coarser	 1mg to 60 g Up to 200 g	 0.05mg 0.30mg	Using Standard weights of accuracy class E2 as per OIML-R-76-1
	For readability 1mg & Coarser	Up to 1000 g	3.0mg	Using Standard weights of accuracy class E2 by Substitution method & ABA weighing cycle (As per OIML-R-76-1)
	For readability 100mg & Coarser	Up to 20kg	0.2g	Using Standard weights of accuracy class E2 & F1 by Substitution method & ABA weighing cycle (As per OIML-R-76-1) by Substitution method & ABA weighing cycle (As per OIML-R-76-1)
	For readability 5g & Coarser	Up to 50kg	3.0g	Using Standard weights of accuracy class F1 & M1 by Substitution method & ABA weighing cycle (As per OIML-R-76-1)
	For readability 10g & Coarser	Up to 100 kg	10g	Using Standard weights of accuracy class F1 & M1 by Substitution method & ABA weighing cycle (As per OIML-R-76-1)

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
V.	**VOLUME**			
1.	Micro Pipette [$]	10 µl to 100 µl >100 µl 1000 µl	1.67 µl 1.67 µl	Using Standard Weights (E2 & F1), balances & pure distilled water of known density by Gravimetric Method based on ISO 8655-6
2.	Volumetric Glasswares[$] (Burette, Pipette, Measuring Flask, Beakers & Measuring Cylinder)	>1 ml to 10 ml >10 ml to 100 ml >100 ml to 200 ml >200 ml to 10000ml	4.63µl 7.0µl 11 µl 4.5 ml	Using Standard Weights (E2 & F1), balances & pure distilled water of known density by Gravimetric Method based on ISO 4787:2010
VI.	**DUROMETER**			
1.	Durometer [$]	10 to 90 shore A 10 to 90 shore D	1.6 shore A 1.6 shore D	Using Spring force calibration only using weighing balance & comparator stand as per ASTM 2240-2015
VII.	**MOBILE FORCE MEASURING SYSTEM**			
1.	Push Pull Gauge/Spring Balances [$]	4N to 500 N	2.5 N	Using dead weights, VDE 2678
VIII.	**TORQUE GENERATING DEVICES**			
1.	Torque Wrenches/Torque Screw Drivers[$]	0 to 6 Nm 0 to 500 Nm	0.15 Nm 0.6%	Using Digital Torque Analyzer as per ISO 6789:2003

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	(Type 1, Type 2)			
IX.	**UTM, TENSION CREEP AND TORSION TESTING MACHINE**			
1.	Force Measurement UTM Compression & Tension ♣	Upto10 kN(T) Upto10 kN(C) 200kN to 1000 kN	0.6% 0.6% 1.7%	Using load cell as per IS 1828 Part 1:2015 Using proving ring as per IS 1828 Part 1:2015
X.	**HARDNESS TESTING MACHINES**			
1.	Verification of Rockwell Hardness Tester ♣	20 HRC to70 HRC 60 HRB to 100 HRB	0.81HRC 1.2HRB	Using Standard Hardness Blocks using Indirect way as per IS 1586:2012
2.	Verification of Vickers Hardness Tester ♣	HV 10 HV 30	@ 1.93%	Using Standard Hardness Blocks using Indirect way as per ISO 1501:2013
XI.	**ACCELERATION AND SPEED**			
1	RPM Measurement, RPM & Tachometer#	25 to 100 RPM 100 to 14000 RPM	5% 2.5 %	Using Non Contact digital Meter
XII.	**ACOUSTICS**			
1.	Sound level meter Single point#	**1 kHz** 94 dB 114 dB	0.7dB	Using Acoustic Calibrator by Comparison Method
XIII.	**PRESSURE INDICATING DEVICES**			
1.	Pressure Gauge, Pressure Transmitters, Pressure Transducers#	1 to 20 bar 20 to 700 bar	0.064Bar 0.32 Bar	Using Digital Pressure Gauge L.C.0.1 bar by

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	(Hydraulic)			Comparison Method as per DKD-R-6-1
2.	Vacuum gauge, Pressure Gauge, Pressure Transmitters, Pressure Transducers[#]	-0.8 Bar to 0 Bar	0.0202Bar	Digital Pressure Gauge L.C.0.1 bar as per DKD-R-6-1

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Validity	**01.08.2018 to 31.07.2020**	**Last Amended on**	**30.08.2018**

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	THERMAL CALIBRATION			
I.	**TEMPERATURE**			
1.	Thermocouples with & without controller/ Indicator/Data logger/Recorder, Temperature transmitter, RTD's, Temperature Gauges, Glass thermometers, Digital thermometer #	(-)40° C to 50° C	0.2°C	Using Low Temperature Bath & Temperature Calibrator with RTD 2 sensors by Comparison Method
2.	Thermocouples with & without controller/ Indicator/Data logger/Recorder, Temperature transmitter, RTD's, Temperature Gauges, Digital thermometer #	50° C to 140° C	0.16°C	Using Temperature Calibrator with RTD 2 sensors & Dry Block Calibrator(Isotech) by Comparison Method
3.	Thermocouples with & without controller/ Indicator/Data logger/Recorder, Temperature transmitter, RTD's, Temperature Gauges,	140° C to 500° C 500° C to 1200° C	3.0°C	Using Temperature Indicator with R-Type sensor & Dry Block Calibrator Calibrator(Divya make) by Comparison Method

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	Digital thermometer [#]			
4.	Temperature Indicator with Sensor of Cooling Chamber /Freezer/ Oven/ Autoclave/ Furnace/ Environmental Chamber/ Temperature Calibrator/ Incubator/ BOD Incubator/Liquid bath/ Dry block furnaces [#] (Single Point Calibration)	(-)45° C to 50° C 50° C to 140° C 140° C to 500° C	0.8° C	Using Temperature Indicator with RTD sensor
5.	Non contact Thermometry : Temperature Gun/ Indicator/ Pyrometer [$]	30° C to 550° C	6.0°C	Using IR Thermometer and Black Body by Comparison Method
6.	Dry block furnaces/Muffle Furnaces[#] (Single Point Calibration)	140° C to 500° C 500° C to 1200° C	0.5°C 3.0° C	Using Temperature Indicator with R-Type sensor
7.	Digital & Analog hygrometers, RH sensors/Transmitters	10% to 95% @ 25°C	1.5% RH	Using Humidity indicator with sensor,Humidity Generator & Chamber by

Sl.	Quantity Measured / Instrument	Range/Frequency	*Calibration Measurement Capability (±)	Remarks
	with controller/ Indicator/ Recorder/ Data logger #			Comparison Method
8.	Freezers, Oven, Cold Chamber, Environment Chamber♣	(–) 45 °C to 50 °C 50 °C to 250 °C	0.99^0 C	Using Multi–Point Data Logger with sensor by Multi point Mapping Method
9.	Industrial Furnaces / Spatial Thermal Mapping♣	200°C to 1200°C	1.9° C	Using Multi–Point Data Logger with Sensors by Multi Point Mapping Method

*** 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.