

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



CERTIFICATE OF ACCREDITATION (AS PER ISO/IEC 17025:2017)

This is to attest that

M/s MODTECH CREATIVE LABS PVT. LTD.

Plot No.-3802, Laxman Vihar-II, Gurgaon-122001, Haryana, India

Calibration Laboratory

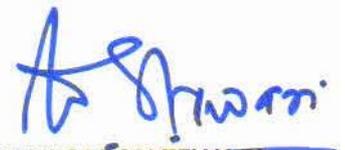
has demonstrated compliance with ISO/IEC Standard 17025:2017, General requirements for the competence of testing and calibration laboratories and supplementary criteria for calibration laboratories.

Certificate Number: CL-117

Issue Date: 09.01.2024

Valid Until: 08.01.2026

The certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard and the relevant requirements of FDAS. (for scope of accreditation visit website www.fdasindia.org).


DEVI SARAN TEWARI
Director

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Validity

09.01.2024 to 08.01.2026

Amended on

N/A

Electro-Technical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Alternating Current (Measure Mode)

1	AC Current @ 50 Hz to 10 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	30 μ A to 3 A	0.44 % to 0.28 %
2	AC Current @ 50 Hz to 5 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	3 A to 10 A	0.28 % to 0.25 %
3	AC Current @ 50 Hz	Energy Data Logger by Direct Method	10 A to 1000 A	2.1 % to 1.8 %
4	AC Voltage @ 50 Hz to 1 kHz	Digital Multimeter (6½ Digits) by Direct Method	100 V to 1000 V	0.14 % to 0.13 %
5	AC Voltage @ 50 Hz to 10 kHz	Digital Multimeter (6½ Digits) by Direct Method	10 mV to 100 V	0.6 % to 0.14 %
6	Active Power (220 V to 600 V, 1 A to 20 A, \pm 0.5 to UPF,50Hz)	Energy Data Logger by Direct Method	0.22 kW to 12 kW	2 % to 1 %
7	Capacitance @1 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 nF to 100 μ F	2.5 % to 2 %
8	Energy(Single/Three Phase) 240V/ 1A to 5A/ 0.5 to UPF	3 Phase Energy Meter by Direct/Comparison Method	1 kWh to 5 kWh	0.5%
9	Power Factor	Energy Data Logger by Direct Method	\pm 0.2 to UPF	0.009 PF

Alternating Current (Source Mode)

1	AC Current @50 Hz	Multi-Product Calibrator & Current Coil by Direct Method	20 A to 1000 A	1.3 % to 0.7 %
2	AC Current @50 Hz to 1 kHz	Multi-Product Calibrator by Direct Method	30 μ A to 3 mA	0.6 % to 0.14 %
3	AC Current @50 Hz to 10 kHz	Multi-Product Calibrator by Direct Method	3 mA to 3 A	0.14 % to 0.15 %
4	AC Current @50 Hz to 5 kHz	Multi-Product Calibrator by Direct Method	3 A to 20 A	0.15 % to 0.18 %

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Electro-Technical Calibration (Laboratory based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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5	AC Voltage @50Hz to 10kHz	Multi-Product Calibrator by Direct Method	100 mV to 1000 V	0.12 % to 0.08 %
6	AC Voltage @50Hz to 1kHz	Multi-Product Calibrator by Direct Method	1 mV to 100 mV	2.7 % to 0.12 %
7	Active Power (120 V to 240 V / 0.1 A to 20 A) @ 50 Hz & ± 0.2 PF to UPF	Multi-Product Calibrator by Direct Method	2.4 W to 4.8 kW	0.63 % to 0.3 %
8	Capacitance @1 kHz	Multi-Product Calibrator by Direct Method	220 pF to 110 mF	2.5 % to 1.46 %
9	Inductance @1 kHz	Decade Inductance Box by direct method	100 μ H to 10 H	1.5 % to 1.6 %
10	Power Factor	Multi-Product Calibrator by Direct Method	± 0.2 PF to UPF	0.001 PF

Direct Current (Measure Mode)

1	DC Current	Shunt & Digital Multimeter (6½ Digits) by Direct Method	10 A to 1000 A	2.3 % to 2.2 %
2	DC Current	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 mA to 10 A	0.15 % to 0.95 %
3	DC Current	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	30 μ A to 100 mA	0.58 % to 0.15 %
4	DC Voltage	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 mV to 100 mV	0.46 % to 0.06 %
5	DC Voltage	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 mV to 1000 V	0.06 % to 0.1 %
6	Resistance (4 Wire)	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 Ω to 100 Ω	0.36 % to 0.05 %
7	Resistance (2 Wire)	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 Ω to 1000 M Ω	0.05 % to 2.5 %

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Electro-Technical Calibration (Laboratory based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Direct Current (Source Mode)

1	DC Current	Multi-Product Calibrator & Current Coil by Direct Method	20 A to 1000 A	1.35 % to 1.2 %
2	DC Current	Multi-Product Calibrator by Direct Method	3 A to 20 A	0.2 % to 0.33 %
3	DC Current	Multi-Product Calibrator by Direct Method	30 μ A to 3 A	0.3 % to 0.2 %
4	DC Power (1 V to 1000 V, 1 mA to 20 A)	Multi-Product Calibrator by Direct Method	1 mW to 20 kW	0.63 % to 0.3 %
5	DC Resistance (4 Wire & 2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	1 Ω to 3 M Ω	1.17 % to 0.03 %
6	DC Resistance (2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	3 M Ω to 300 M Ω	0.03 % to 0.63 %
7	DC Resistance (2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	300 M Ω to 1000 M Ω	0.63 % to 1.79 %
8	DC Resistance (2 Wire)	Standard Resistance Box by direct method	1,10,100,200,500, 1000 G Ω	3.1%
9	DC Resistance (4 Wire)	Standard Resistance Box by Direct Method	0.1, 1, 10, 100 m Ω	2.5%

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Electro-Technical Calibration (Laboratory based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
10	DC Voltage	Multi-Product Calibrator by Direct Method	1 mV to 1000 V	0.36 % to 0.007 %
Electrical Equipment				
1	Oscilloscope - Bandwidth	Multi-Product Calibrator by Direct Method	50 kHz to 300 MHz	1 % to 2 %
2	Oscilloscope - Horizontal Deflection (Time Marker)	Multi-Product Calibrator by Direct Method	2 ns to 5 s	0.3 % to 0.7 %
3	Oscilloscope - Vertical Deflection (Amplitude)-AC	Multi-Product Calibrator by Direct Method	5 mV to 100 V	2.65 % to 0.7 %
4	Oscilloscope - Vertical Deflection (Amplitude)-DC	Multi-Product Calibrator by Direct Method	1 mV to 33 V	0.5 % to 0.3 %
Simulation (Measure Mode)				
1	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - B Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	600 °C to 1800 °C	0.2°C
2	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - J Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1200 °C	0.2°C

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Electro-Technical Calibration (Laboratory based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
3	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - K Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1370 °C	0.3°C
4	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - N Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1300 °C	0.5°C
5	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - R Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	0 to 1750 °C	0.5°C
6	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - RTD	Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 800 °C	0.12°C
7	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - S Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	0 to 1750 °C	0.5°C
8	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 400 °C	0.2°C

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	T Type Thermocouple			
Simulation (Source Mode)				
1	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - B Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	600 °C to 1800 °C	0.6°C
2	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - J Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1200 °C	0.3°C
3	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - K Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1370 °C	0.3°C
4	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - N Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1300 °	0.4°C
5	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 °C to 1750 °C	1°C

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	R Type Thermocouple			
6	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - RTD	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 800 °C	0.3°C
7	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - S Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 °C to 1750 °C	1°C
8	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for - T Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 400 °C	0.73°C
9	pH Meter(without electrode)	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 to 14 pH	0.01 pH
10	TDS Meter(without electrode)	Multi-Product Calibrator/ Resistance Box by Simulation Method	0 to 2000 ppm	0.50%
11	Conductivity Meter(without electrode)	Multi-Product Calibrator/ Resistance Box by Simulation Method	0.5 μ S/cm to 1000 mS/cm	0.50%
Low Frequency (Measure Mode)				

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Electro-Technical Calibration (Laboratory based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
1	Frequency	Digital Multimeter (6½ Digits) by Direct Method	10 Hz to 1000 kHz	0.61 % to 0.06 %
2	Timer, Time Calibrator, Hour Meter, Stop Watch, Time Interval Meter	Digital Time Calibrator by Comparison Method	1 s to 86400 s	0.01 s to 2.6 s
Low Frequency (Source Mode)				
1	Frequency	Multi-Product Calibrator by Direct Method	10 Hz to 100 kHz	0.2 % to 0.08 %

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Alternating Current (Measure Mode)				
1	AC Current @ 50 Hz to 10 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	30 μ A to 3 A	0.44 % to 0.28 %
2	AC Current @ 50 Hz to 5 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	3 A to 10 A	0.28 % to 0.25 %
3	AC Current @ 50 Hz	Energy Data Logger by Direct Method	10 A to 1000 A	2.1 % to 1.8 %
4	AC Voltage @ 50 Hz to 1 kHz	Digital Multimeter (6½ Digits) by Direct Method	100 V to 1000 V	0.14 % to 0.13 %
5	AC Voltage @ 50 Hz to 10 kHz	Digital Multimeter (6½ Digits) by Direct Method	10 mV to 100 V	0.6 % to 0.14 %
6	Active Power (220 V to 600 V, 1 A to 20 A, \pm 0.5 to UPF, 50 Hz)	Energy Data Logger by Direct Method	0.22 kW to 12 kW	2 % to 1 %
7	Capacitance @1 kHz	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 nF to 100 μ F	2.5 % to 2 %
8	Energy (Single/Three Phase) 240V/ 1A to 5A/ 0.5 to UPF	3 Phase Energy Meter by Direct/Comparison Method	1 kWh to 5 kWh	0.5%
9	Power Factor	Energy Data Logger by Direct Method	\pm 0.2 to UPF	0.009 PF

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
10	AC High Voltage @ 50Hz	HV Probe & Digital Multimeter by Direct Method	1 kV to 20 kV	4%
Alternating Current (Source Mode)				
1	AC Current @50 Hz	Multi-Product Calibrator & Current Coil by Direct Method	20 A to 1000 A	1.3 % to 0.7 %
2	AC Current @50 Hz to 1 kHz	Multi-Product Calibrator by Direct Method	30 μ A to 3 mA	0.6 % to 0.14 %
3	AC Current @50 Hz to 10 kHz	Multi-Product Calibrator by Direct Method	3 mA to 3 A	0.14 % to 0.15 %
4	AC Current @50 Hz to 5 kHz	Multi-Product Calibrator by Direct Method	3 A to 20 A	0.15 % to 0.18 %
5	AC Voltage @50Hz to 10kHz	Multi-Product Calibrator by Direct Method	100 mV to 1000 V	0.12 % to 0.08 %
6	AC Voltage @50Hz to 1kHz	Multi-Product Calibrator by Direct Method	1 mV to 100 mV	2.7 % to 0.12 %
7	Active Power (120 V to 240 V / 0.1 A to 20 A) @ 50 Hz & \pm 0.2 PF to UPF	Multi-Product Calibrator by Direct Method	2.4 W to 4.8 kW	0.63 % to 0.3 %
8	Capacitance @1 kHz	Multi-Product Calibrator by Direct Method	220 pF to 110 mF	2.5 % to 1.46 %

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
9	Inductance @1 kHz	Decade Inductance Box by direct method	100 μ H to 10 H	1.5 % to 1.6 %
10	Power Factor	Multi-Product Calibrator by Direct Method	\pm 0.2 PF to UPF	0.001 PF
Direct Current (Measure Mode)				
1	DC Current	Shunt & Digital Multimeter (6½ Digits) by Direct Method	10 A to 1000 A	2.3 % to 2.2 %
2	DC Current	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 mA to 10 A	0.15 % to 0.95 %
3	DC Current	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	30 μ A to 100 mA	0.58 % to 0.15 %
4	DC Voltage	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 mV to 100 mV	0.46 % to 0.06 %
5	DC Voltage	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 mV to 1000 V	0.06 % to 0.1 %
6	Resistance (4 Wire)	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	1 Ω to 100 Ω	0.36 % to 0.05 %
7	Resistance (2 Wire)	Digital Multimeter (6½ Digits) by Direct/ Comparison Method	100 Ω to 1000 M Ω	0.05 % to 2.5 %

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
8	DC High Voltage	HV Probe & Digital Multimeter by Direct Method	1 kV to 20 kV	4%
Direct Current (Source Mode)				
1	DC Current	Multi-Product Calibrator & Current Coil by Direct Method	20 A to 1000 A	1.35 % to 1.2 %
2	DC Current	Multi-Product Calibrator by Direct Method	3 A to 20 A	0.2 % to 0.33 %
3	DC Current	Multi-Product Calibrator by Direct Method	30 μ A to 3 A	0.3 % to 0.2 %
4	DC Power (1 V to 1000 V, 1 mA to 20 A)	Multi-Product Calibrator by Direct Method	1 mW to 20 kW	0.63 % to 0.3 %
5	DC Resistance (4 Wire & 2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	1 Ω to 3 M Ω	1.17 % to 0.03 %
6	DC Resistance (2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	3 M Ω to 300 M Ω	0.03 % to 0.63 %
7	DC Resistance (2 Wire)	Multi-Product Calibrator/ Decade Resistance Box by Direct Method	300 M Ω to 1000 M Ω	0.63 % to 1.79 %
8	DC Resistance (2 Wire)	Standard Resistance Box by direct method	1,10,100,200,500,1000 G Ω	3.1%

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
9	DC Resistance (4 Wire)	Standard Resistance Box by Direct Method	0.1, 1, 10, 100 m Ω	2.5%
10	DC Voltage	Multi-Product Calibrator by Direct Method	1 mV to 1000 V	0.36 % to 0.007 %
Electrical Equipment				
1	Oscilloscope - Bandwidth	Multi-Product Calibrator by Direct Method	50 kHz to 300 MHz	1 % to 2 %
2	Oscilloscope - Horizontal Deflection (Time Marker)	Multi-Product Calibrator by Direct Method	2 ns to 5 s	0.3 % to 0.7 %
3	Oscilloscope - Vertical Deflection (Amplitude)-AC	Multi-Product Calibrator by Direct Method	5 mV to 100 V	2.65 % to 0.7 %
4	Oscilloscope - Vertical Deflection (Amplitude)-DC	Multi-Product Calibrator by Direct Method	1 mV to 33 V	0.5 % to 0.3 %
Simulation (Measure Mode)				
1	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -B Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	600 °C to 1800 °C	0.2°C
2	Temperature Indicator/ Controller/ Data Logger/ Recorder /	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1200 °C	0.2°C

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	Calibrator made for -J Type Thermocouple			
3	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -K Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1370 °C	0.3°C
4	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -N Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 1300 °C	0.5°C
5	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -R Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	0 to 1750 °C	0.5°C
6	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -RTD	Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 800 °C	0.12°C
7	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -S Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	0 to 1750 °C	0.5°C

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
8	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -T Type Thermocouple	Multi-Product Calibrator/ Digital Multimeter (6½ Digits) by Simulation Method	-200 °C to 400 °C	0.2°C
Simulation (Source Mode)				
1	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -B Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	600 °C to 1800 °C	0.6°C
2	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -J Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1200 °C	0.3°C
3	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -K Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1370 °C	0.3°C
4	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -N Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 1300 °	0.4°C

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Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
5	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -R Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 °C to 1750 °C	1°C
6	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -RTD	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 800 °C	0.3°C
7	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -S Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 °C to 1750 °C	1°C
8	Temperature Indicator/ Controller/ Data Logger/ Recorder / Calibrator made for -T Type Thermocouple	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	-200 °C to 400 °C	0.73°C
9	pH Meter (without sensor)	Multi-Product Calibrator/ Universal Calibrator by Simulation Method	0 to 14 pH	0.01 pH
10	TDS Meter (without sensor)	Multi-Product Calibrator/ Resistance Box by Simulation Method	0 to 2000 ppm	0.50%
11	Conductivity Meter (without sensor)	Multi-Product Calibrator/ Resistance Box by Simulation Method	0.5 μ S/cm to 1000 mS/cm	0.50%

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SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Electro-Technical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Low Frequency (Measure Mode)

1	Frequency	Digital Multimeter (6½ Digits) by Direct Method	10 Hz to 1000 kHz	0.61 % to 0.06 %
2	Timer, Time Calibrator, Hour Meter, Stop Watch, Time Interval Meter	Digital Time Calibrator by Comparison Method	1 s to 86400 s	0.01 s to 2.6 s

Low Frequency (Source Mode)

1	Frequency	Multi-Product Calibrator by Direct Method	10 Hz to 100 kHz	0.2 % to 0.08 %
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SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Acceleration & Speed				
1	Tachometer / RPM Meter - Contact Mode	Tachometer & RPM Source (SANASTR45-II-2017)	10 rpm to 6000 rpm	4 % to 0.1 %
2	Tachometer / RPM Meter - Non- Contact Mode	Tachometer & RPM Source (SANASTR45-II-2017)	10 rpm to 99000 rpm	4 % to 0.1 %
3	Tachometer Calibrator / Stroboscope	Tachometer (SANASTR45- II-2017)	10 rpm to 99000 rpm	4 % to 0.1 %
4	Vibration - Acceleration (10 Hz to 300 Hz)	Portable Vibration Calibrator	1 m/s ² to 100 m/s ²	7 % to 4 %
5	Vibration - Displacement (10 Hz to 100 Hz)	Portable Vibration Calibrator	0.01 mm to 2 mm	7 % to 4 %
6	Vibration -Velocity (10 Hz to 500Hz)	Portable Vibration Calibrator	12.5 mm/s to 160 mm/s	7 % to 4 %
Acoustics				
1	Sound Level Meter @ 1 kHz	Sound Level Calibrator	94 dB & 114 dB	0.5 dB
Dimension				
1	Angle Graticule L.C: 1 °	Profile Projector	0 ° to 360 °	2'

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
2	Angle Plate/ Box Plate (Parallelism, Squareness, Flatness)	Lever Dial, Master Cylinder, Granite Square, Slip Gauge Blocks (IS 6232 :1971 RA 2019, IS-2554: 1971 RA 2020, IS-6973: 1973 RA 2020, IS-6985: 1973 RA 2020)	50 mm to 600 mm	Squareness: 4 μ m Parallelism: 4 μ m Flatness: 4 μ m Symmetricity: 4 μ m
3	Bevel Protractor LC:1'	Angle Gauge Set (IS 4239: 2023)	0 to 90 °	2
4	Bore Gauge - Transmission	Universal Length Measuring Machine, Dial Calibration Tester, Digimatic Indicator (JIS B7515:1982)	0 to 2 mm	1.1 μ m
5	Caliper LC: 0.01mm	Slip Gauge Blocks, Caliper Checker (IS 16491(part-1):2016 RA2021)	0 to 300 mm	9 μ m
6	Caliper LC: 0.01mm	Slip Gauge Blocks, Caliper Checker (IS 16491(part-1):2016 RA2021)	0 to 600 mm	12 μ m
7	Caliper LC:0.01mm	Caliper Checker, Long Gauge Blocks (IS 16491(part-1):2016 RA2021)	0 to 1000 mm	15 μ m
8	Caliper LC:0.01 mm	Caliper Checker, Long Gauge Blocks (IS 16491(part-1):2016 RA2021)	0 to 2000 mm	30 μ m
9	Coating Thickness Gauge (Ferrous & Non-Ferrous Type)	Standard Foils (IS 12554 (Part 2):1999 RA 2013)	10 μ m to 1000 μ m	1.5 μ m to 3 μ m

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
10	Combination Set/ Angle Protractor LC:1°	Angle Gauge Set	0 to 180 °	0.6°
11	Comparator Stand - Flatness of Base	Lever Dial (IS 12937:1990 RA 2020)	50x50 mm to 300x300 mm	3 μ m
12	Cube Mould	Digital Caliper (IS 10086:2021)	50 mm to 300 mm	0.043mm
13	Depth Micrometer/ Depth Gauge/ Depth Caliper LC:0.001mm	Slip Gauge Blocks (IS 16491(part-2):2016 RA2021)	0 to 300 mm	8 μ m
14	Dial Snap Gauge/Dial Snap Micrometer LC:0.001mm	Slip Gauge Blocks (IS-3455 (part 1):1985 RA 2020)	0 to 100 mm	1.8 μ m
15	Dial Thickness Gauge LC:0.001mm	Slip Gauge Blocks & Thickness Foils	0 to 100 mm	1.8 μ m
16	External Micrometer LC:0.0001 mm	Slip Gauge Blocks, Optical Parallel Set (IS 2967: 1983 RA 2019 & JIS B 7502:2016)	0 to 25 mm	0.5 μ m
17	External Micrometer LC:0.001 mm	Slip Gauge Blocks, Slip Gauge Accessories, Optical Parallel Set (IS 2967: 1983 RA 2019 & JIS B 7502:2016)	0 to 300 mm	1.8 μ m
18	External Micrometer LC:0.001 mm	Slip Gauge Blocks, Slip Gauge Accessories, Long Gauge Block, Optical Parallel Set (IS 2967: 1983 RA 2019 & JIS B 7502:2016)	0 to 2000 mm	5 μ m

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
19	Eye Piece LC-0.1 mm	Profile Projector	0 to 10 mm	0.01mm
20	Feeler Gauge/ Thickness Foils	Universal Length Measuring Machine (IS – 3179:1990 RA 2020)	0.01 mm to 2 mm	1.2 μ m
21	Flakiness Gauge (Thickness Gauge)/ Elongation Gauge (Length Gauge)	Digital Caliper (IS 2386 (part 1):1963 RA 2021)	4.7 mm to 100.5 mm	0.02mm
22	Flush Pin Gauge	Slip Gauge Blocks, Lever Dial	5 mm to 100 mm	2 μ m
23	Gap Gauge/ Slit Gauge	Universal Length Measuring Machine	1 mm to 100 mm	2.4 μ m
24	Gap Gauge/ Slit Gauge	Universal Length Measuring Machine	100 mm to 200 mm	4 μ m
25	Hegman Gauge	Digimatic Indicator	0 to 100 μ m	2 μ m
26	Height Gauge LC:0.01mm	Slip Gauge Blocks, Caliper Checker, Long Gauge Blocks (IS 2921:2016 RA 2021)	0 to 1000 mm	15 μ m
27	Height Gauge LC:0.01mm	Slip Gauge Blocks, Caliper Checker (IS 2921:2016 RA 2021)	0 to 300 mm	8 μ m
28	Height Gauge LC:0.01mm	Slip Gauge Blocks, Caliper Checker (IS 2921:2016 RA 2021)	0 to 600 mm	12 μ m

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
29	Height Master LC:0.001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial	0 to 310 mm	4 μ m
30	Height Master LC:0.001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial	0 to 610 mm	6 μ m
31	Inclinometer/ Digital Angle Protractor (Meter) L.C: 0.01 °	Angle Gauge Set	0 ° to 360 °	3
32	Inside Caliper Gauge/ Inside Pistol Caliper LC:0.001mm	Slip Gauge Blocks	0 to 100 mm	1.8 μ m
33	Internal Micrometer (2 Points) LC:0.001mm	Slip Gauge Blocks, Long Gauge Blocks & Accessories (IS 2966: 1964 RA 2019)	2 mm to 300 mm	3 μ m
34	Internal Micrometer (2 Points) LC:0.001mm	Slip Gauge Blocks, Accessories & Long Gauge Blocks (IS 2966: 1964 RA 2019)	300 mm to 2000 mm	20 μ m
35	Internal Micrometer/ Bore Micrometer (3 Points) LC:0.001mm	Standard Ring Gauge Set	6 mm to 100 mm	3 μ m
36	Length Bar/ Micrometer Setting Rod / Riser Block/ Height Setting Master/ Micrometer Extension Rod	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial (IS 7014: 1973 RA-2020)	1 mm to 300 mm	4 μ m
37	Length Bar/ Micrometer Setting Rod / Riser Block/ Height Setting Master/ Micrometer Extension Rod	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial (IS 7014: 1973 RA-2020)	300 mm to 600 mm	5 μ m

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
38	Length Bar/ Micrometer Setting Rod / Riser Block/ Height Setting Master/ Micrometer Extension Rod	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial (IS 7014: 1973 RA-2020)	600 mm to 1975 mm	7 μ m
39	Lever Dial (Puppy Dial) LC:0.001mm	Universal Length Measuring Machine, Dial Calibration Tester (IS 11498:1985 RA 2000)	0 to 0.2 mm	1 μ m
40	Lever Dial (Puppy Dial) LC:0.01mm	Universal Length Measuring Machine, Dial Calibration Tester (IS 11498:1985 RA 2000)	0 to 1.6 mm	2.5 μ m
41	Linear Height Gauge/ 2D Height Gauge (Height, Squareness) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial & Master Cylinder	0 to 300 mm	Height: 4 μ m Squareness: 4 μ m
42	Linear Height Gauge/ 2D Height Gauge (Height, Squareness) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial & Master Cylinder	0 to 600 mm	Height: 6 μ m Squareness: 4 μ m
43	Linear Height Gauge/ 2D Height Gauge (Height only) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks & Lever Dial	0 to 1000 mm	8 μ m
44	Master Cylinder, Granite Square, Granite Square Block, Frame Level - Squareness	Master Cylinder & Slip Gauge Blocks (IS 12937:1990 RA 2020)	50 mm to 600 mm	5 μ m
45	Measuring Pin/ Cylindrical Setting Master	Universal Length Measuring Machine (IS –11103:1984 RA 2020)	0.1 mm to 85 mm	1 μ m
46	Measuring Tape, Circumference Tape, PI Tape, Diameter Tape	Measuring Tape & Scale Calibrator (IS 1269 (Part-1,2) :1997 RA 2018)	0 to 200 m	0.02*L ⁻² mm (L in m)

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
47	Outside Pistol Caliper/ Outside Caliper Gauge LC:0.001mm	Slip Gauge Blocks	0 to 100 mm	1.8 μ m
48	Thread Pitch Gauge/ Anvil & Spindle Tip of Thread Pitch Micrometer -Flank Angle	Profile Projector (IS – 4211:1993 RA 2019)	55 ° to 60 °	3'
49	Plain Plug Gauge/ Setting Plug Gauge/ Air Plug Gauge	Universal Length Measuring Machine (IS-3455:1971 RA 2020)	1 mm to 100 mm	2.4 μ m
50	Plain Plug Gauge/ Setting Plug Gauge/ Air Plug Gauge	Universal Length Measuring Machine (IS-3455:1971 RA 2020)	100 mm to 300 mm	4 μ m
51	Plain Ring Gauge/ Setting Ring/ Air Ring Gauge	Universal Length Measuring Machine (IS-3455:1971 RA 2020, IS 3485: 1983 RA 2019)	100 mm to 200 mm	3 μ m
52	Plain Ring Gauge/ Setting Ring/ Air Ring Gauge	Universal Length Measuring Machine (IS-3455:1971 RA 2020, IS 3485: 1983 RA 2019)	3 mm to 100 mm	1.4 μ m
53	Plunger Dial (Dial Indicator) LC:0.001mm	Universal Length Measuring Machine, Dial Calibration Tester (IS 2092:1985 RA 2019)	0 to 50 mm	1 μ m
54	Plunger Dial (Dial Indicator)/LVDT LC:0.01mm	Universal Length Measuring Machine, Dial Calibration Tester (IS 2092:1985 RA 2019)	0 to 100 mm	3 μ m
55	Radius Gauge/ Radius Template/ Radius Chart	Profile Projector (IS – 5273:1969 RA 2019)	0.2 mm to 100 mm	10 μ m

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
56	Receiving Gauge/ Profile Gauge / Profile of Work Piece -Angle	Profile Projector	0 to 360 °	3'
57	Receiving Gauge/ Profile Gauge / Profile of Work Piece -Length	Universal Length Measuring Machine, Profile Projector, Slip Gauge Blocks, Lever Dial, Digital Caliper, Height Gauge	0 to 600 mm	9 μ m
58	Receiving Gauge/ Profile Gauge / Profile of Work Piece -Radius	Profile Projector	0.2 to 100 mm	10 μ m
59	Snap Gauge/ Width Gauge	Universal Length Measuring Machine, Slip Gauge Blocks & Accessories (IS-3455:1971 RA 2020, IS-7876:1975 RA 2020)	1 mm to 100 mm	2 μ m
60	Snap Gauge/ Width Gauge	Universal Length Measuring Machine, Slip Gauge Blocks & Accessories (IS-3455:1971 RA 2020, IS-7876:1975 RA 2020)	100 mm to 300 mm	4 μ m
61	Sphere Ball/ Steel Ball/ Ball Gauge	Universal Length Measuring Machine	0.5 mm to 100 mm	1.30 μ m
62	Spline/ Serration Plug Gauge -Over Pins Diameter	Universal Length Measuring Machine (IS 4966 (Part 2):1969 RA 2019)	3 mm to 100 mm	4 μ m
63	Spline/ Serration Ring Gauge - Between Pins Diameter	Slip Gauge Blocks (IS 4966 (Part 1):1969 RA 2019)	6 mm to 100 mm	3.4 μ m

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
64	Sprit Level/ Frame Level LC:0.01mm/m	Electronic Level and Tilting Table (IS -5706:1993-RA-2022)	0 to ± 2 mm/m	0.007mm/m
65	Steel Scale/ Measuring Scale/ Wooden Scale/ Graduated Scale	Measuring Tape & Scale Calibration System (IS 1481: 1970 RA 2019)	0 to 3000 mm	$0.02 \cdot L^{-2}$ mm (L in m)
66	Surface Plate - Flatness	Electronic Level (IS 12937:1990 RA 2020)	1000x630 mm	$1 \cdot \{(L+W)/125\}^{-2} \mu\text{m}$ (L&W in mm)
67	Taper Scale L.C: 0.1mm	Profile Projector	0.1 mm to 50 mm	7.1 μm
68	Taper Thread Plug Gauge (Effective and Major Dia)	Universal Length Measuring Machine	3 mm to 300 mm	3 μm
69	Taper Thread Ring Gauge (Effective Dia)	Universal Length Measuring Machine	3 mm to 100 mm	3 μm
70	Test Mandrel (Diameter Variation, Total Runout)	Universal Length Measuring Machine, Lever Dial (IS 2063:2016)	10 mm to 100 mm	2.2 μm
71	Test Sieve	Digital Caliper (IS – 460 (PART-1,2&3) : 2020)	>5 mm to 150 mm	15 μm
72	Test Sieve	Profile Projector (IS – 460 (PART-1,2&3) : 2020)	0.025 mm to 5 mm	8.2 μm
73	Thread Measuring Wire/ Three Wire Unit	Universal Length Measuring Machine	0.17 mm to 6.3 mm	1 μm

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
74	Thread Pitch Gauge/ Pitch of Work Piece - Pitch Length	Profile Projector (IS – 4211:1993 RA 2019)	0.2 mm to 20 mm	7 μ m
75	Thread Plug Gauge/ Wear Check Plug - Major Diameter - Effective Diameter	Universal Length Measuring Machine & Thread Measuring Wire Set (IS-2334:2001 RA 2023)	1 mm to 100 mm	3 μ m
76	Thread Plug Gauge/ Wear Check Plug - Major Diameter - Effective Diameter	Universal Length Measuring Machine (IS-2334:2001 RA 2023)	100 mm to 300 mm	4 μ m
77	Thread Ring Gauge / Wear Check Ring - Effective Diameter	Universal Length Measuring Machine (IS-2334:2001 RA 2023)	100 mm to 200 mm	4 μ m
78	Thread Ring Gauge / Wear Check Ring - Effective Diameter	Universal Length Measuring Machine (IS-2334:2001 RA 2023)	3 mm to 100 mm	1.7 μ m
79	Try Square/ Engineer's Square (Parallelism, Squareness)	Lever Dial, Master Cylinder, Granite Square, Slip Gauge Blocks (IS-2103:1980 RA 2017)	50 mm to 300 mm	Parallelism: 4 μ m Squareness: 4 μ m
80	Ultrasonic Thickness Gauge LC:0.01mm	Slip Gauge Blocks	0 to 225 mm	18 μ m
81	V Anvil Micrometer LC:0.001 mm	Measuring Pin	1 mm to 85 mm	2 μ m
82	V Block (Squareness, Parallelism, Flatness, Symmetricity)	Master Cylinder, Granite Square, Slip Gauge Blocks, Lever Dial, Test Mandrel (IS –2949: 1992,RA 2017)	25 mm to 200 mm	Squareness: 4 μ m Parallelism: 4 μ m Flatness: 4 μ m Symmetricity: 4 μ m
83	Weld Fillet Gauge/ Weld Gauge/ Hi-Lo Gauge/ Bridge Cam	Profile Projector	1 ° to 90 °	2'

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	Gauge/ Chamfer Gauge -Angle			
84	Weld Fillet Gauge/ Weld Gauge/Hi-Lo Gauge/ Bridge Cam Gauge/ Chamfer Gauge/ Wet Film Thickness Gauge - Length	Profile Projector	0 to 60 mm	7.1 μ m
85	Wire Gauge	Profile Projector	0.19 mm to 7.82 mm	7 μ m
86	Caliper Checker/ Step Gauge	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial	0 to 660 mm	6 μ m
87	Caliper Checker/ Step Gauge/ Depth Micro- Checker	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial	0 to 300 mm	4 μ m
88	Dial Calibration Tester LC:0.0001 mm	Slip Gauge Blocks	0 to 25 mm	1 μ m
89	Electronic Probe/ Digimatic Indicator/LVDT LC:0.0001 mm	Slip Gauge Blocks	0 to 25 mm	0.8 μ m
90	Measuring Tape & Scale Calibrator LC:0.0001 mm	Slip Gauge Blocks, Long Gauge Blocks	0 to 1000 mm	10 μ m
91	Profile Projector - Angular Scale (L.C: 1")	Angle Gauge Set (JIS B 7184:2021)	0 ° to 360 °	2

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
92	Profile Projector - Linear Scale (L.C: 0.001mm)	Slip Gauge Blocks, Glass Scale Angle Gauge Set (JIS B 7184:2021)	0 to 250 mm	3.1 μ m
93	Profile Projector - Magnification	Glass Scale, Slip Gauge Blocks, Digital Caliper Angle Gauge Set (JIS B 7184:2021)	10 X to 100 X	0.4%
94	Universal Length Measuring Machine/ Universal Length Measuring Machine/ Length Measuring Machine LC:0.0001 mm	Slip Gauge Blocks	0 to 100 mm	0.5 μ m
95	Slip Gauge Blocks	Tungsten Carbide Slip Gauge Set, Slip Gauge Calibrator (IS 2984 : 2003 RA 2019)	0.5 mm to 25 mm	0.10 μ m
96	Slip Gauge Blocks	Tungsten Carbide Slip Gauge Set, Slip Gauge Calibrator (IS 2984 : 2003 RA 2019)	25 mm to 50 mm	0.12 μ m
97	Slip Gauge Blocks	Tungsten Carbide Slip Gauge Set, Slip Gauge Calibrator (IS 2984 : 2003 RA 2019)	50 mm to 75 mm	0.15 μ m
98	Slip Gauge Blocks	Tungsten Carbide Slip Gauge Set, Slip Gauge Calibrator (IS 2984 : 2003 RA 2019)	75 mm to 100 mm	0.30 μ m
99	Surface Roughness Specimen	Surface Roughness Tester	Ra 0.1 μ m to 3.2 μ m	7%
100	Surface Roughness Tester	Roughness Specimen Set (3 Nos.)	Ra 0 to 3.2 μ m	7%

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
101	Laser Distance Meter	Slip Gauge Blocks, Long Gauge Blocks, Accessories	0 to 2000 mm	0.6 mm
Hardness				
1	Durometer/ Rubber Hardness Tester (Shore A, B, C, D, O, DO)	Load Cell with Indicator, Weighing Balance & Fixture based on ASTM D 2240-15:2017 by direct method	0 to 100 Shore Unit	0.3 Shore Unit
2	Rockwell Hardness Tester (Portable)	Reference Hardness Blocks based on IS 1586 Part 2: 2018	10 to 100 HRBW	1.2 HRBW
3	Rockwell Hardness Tester (Portable)	Reference Hardness Blocks based on IS 1586 (Part 2): 2018 by direct methd	10 to 70HRC	1 HRC
Force				
1	Push Pull Gauge, Force Gauge - Push/Pull Mode	Slotted Weights, Hanger Weights & Frame Weights based on VDI/VDE 2624- 2.1 :2008	50 N to 2000 N	0.6%
2	Push Pull Gauge, Force Gauge, Tension Gauge - Push/Pull Mode	Slotted Weights, Hanger Weights & Frame Weights based on VDI/VDE 2624- 2.1 :2008	0.1 N to 50 N	0.6%
Pressure & Vacuum				
1	Hydraulic Pressure - Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 700 bar	0.30 bar
2	Pneumatic Pressure -Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 35 bar	0.02 bar

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
3	Pneumatic Pressure-Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller/ Differential Gauge/ Manometer	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 7 bar	0.004bar
4	Pneumatic Pressure -Low Pressure Gauge, Manometer, Magnehelic Gauge, Differential Gauge/ Controller	Digital Pressure Gauge based on DKD R6-1:2014	0 kPa to 20 kPa	0.02kPa
5	Pneumatic Pressure -Low Pressure Gauge, Manometer, Magnehelic Gauge, Differential Gauge/ Controller	Digital Manometer based on DKD R6-1:2014	0 Pa to 2000 Pa	1 Pa
6	Vacuum -Digital/ Dial Vacuum Gauge, Vacuum Transducer/ Transmitter/ Controller	Digital Pressure Gauge based on DKD R6-1:2014	-0.9 to 0 bar	0.004bar
Torque				
1	Torque Generating Tools (Type I & II), Rotary Torque Tools, Torque Driver, Nut Runner, Torque Gauge	Torque Sensors with Indicator based on (IS 16906:2018)	0.02 Nm to 500 Nm	1.2 % to 0.8 %
2	Torque Transducer, Torque Sensor with/without Indicator, Torque Meter, Torque Wrench Calibrator	Slotted Weights, Lever Arm, Pulley & Digital Multimeter based on BS 7882:2017	0.02 Nm to 50 Nm	0.12%
3	Torque Transducer, Torque Sensor with/without Indicator,	Slotted Weights, Lever Arm & Digital Multimeter based on BS 7882 :2017	10 Nm to 2000 Nm	0.09%

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	Torque Meter, Torque Wrench Calibrator			
Volume				
1	Volumetric Measures(Beaker, Measuring Cylinder, Burette, Pipette, Flask, Bottle, Density Bottle, Density Bucket, Cone, Condenser, Dispenser, Dish, Funnel, Tube, Syringe, Container etc.)	Weighing Balance LC:0.01 mg & Distilled Water based on ISO 4787:2021 by gravimetric method	0.1 ml to 50 ml	0.007 ml
2	Volumetric Measures(Beaker, Measuring Cylinder, Burette, Pipette, Flask, Bottle, Density Bottle, Density Bucket, Cone, Condenser, Dispenser, Dish, Funnel, Tube, Syringe, Container etc.)	Weighing Balance LC:0.1 mg & Distilled Water based on ISO 4787:2021 by gravimetric method	50 ml to 200 ml	0.01 ml
3	Volumetric Measures(Beaker, Measuring Cylinder, Burette, Pipette, Flask, Bottle, Density Bottle, Density Bucket, Cone, Condenser, Dispenser, Dish, Funnel, Tube, Syringe, Container etc.)	Weighing Balance LC:1 mg & Distilled Water based on ISO 4787:2021 by gravimetric method	200 ml to 950 ml	0.05 ml
4	Volumetric Measures(Beaker, Measuring Cylinder,	Weighing Balance LC:10 mg & Distilled Water based on	1000 ml to 5000 ml	0.1 ml

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	Flask, Bottle, Density Bucket, Container etc.)	ISO 4787:2021 by gravimetric method		
5	Volumetric Measures (Measuring Cylinder, Bottle, Density Bucket, Container etc.)	Weighing Balance LC:0.1 g & Distilled Water based on ISO 4787:2021 by gravimetric method	5 l to 15 l	1 ml
6	Volumetric Measures (Density Bucket, Container etc.)	Weighing Balance LC:1 g & Distilled Water based on ISO 4787:2021 by gravimetric method	15 l to 30 l	10 ml
7	Piston Operated Volumetric Apparatus (Micro-pipettes)	Weighing Balance LC:0.01 mg & Distilled Water based on ISO 8655-6: 2022 by gravimetric method	20 μ l to 100 μ l	0.1 μ l
8	Piston Operated Volumetric Apparatus (Micro-pipettes)	Weighing Balance LC:0.01 mg & Distilled Water based on ISO 8655-6: 2022 by gravimetric method	100 μ l to 1000 μ l	1 μ l
9	Piston Operated Volumetric Apparatus (Micro-pipettes)	Weighing Balance LC:0.01 mg & Distilled Water based on ISO 8655-6: 2022 by gravimetric method	1000 μ l to 10000 μ l	10 μ l
Weighing Balance				
1	Weighing Balance/Scale/System, Densitometer Class-I, d=0.01 mg or coarser	E1 Class Weights based on OIML R 76-1 :2006	0 to 60 g	0.004 mg

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
2	Weighing Balance/Scale/System, Densitometer Class-I, d=0.1 mg or coarser	E1 Class Weights based on OIML R 76- 1 :2006	0 to 220 g	0.2 mg
3	Weighing Balance/Scale/System Class- I, d=1 mg or coarser	E1/F1 Class Weights based on OIML R 76- 1 :2006	0 to 1 kg	2 mg
4	Weighing Balance/Scale/System Class- I, d=10 mg or coarser	E1/F1 Class Weights based on OIML R 76- 1 :2006	0 to 6 kg	0.02 g
5	Weighing Balance/Scale/System Class- III, d=0.1 g or coarser	F1 Class Weights based on OIML R 76-1 :2006	0 to 20 kg	0.1 g
6	Weighing Balance/Scale/System Class- III, d=1 g or coarser	F1 Class Weights based on OIML R 76-1 :2006	0 to 50 kg	0.8 g
7	Spring Balance	Slotted & Hanger Weights	0 to 10 kg	5 g
8	Spring Balance	Slotted & Hanger Weights	0 to 50 kg	10 g
9	Spring Balance	Slotted & Hanger Weights	0 to 200 kg	20 g
Mass				
1	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	1 mg	0.02 mg

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
2	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	2 mg	0.02 mg
3	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111-1:2004 by substitution method	5 mg	0.02 mg
4	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	10 mg	0.02 mg
5	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	20 mg	0.02 mg
6	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	50 mg	0.02 mg
7	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	100 mg	0.02 mg
8	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111-	200 mg	0.02 mg

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
		1:2004 by substitution method		
9	Weight-F2 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	500 mg	0.02 mg
10	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	1 g	0.02 mg
11	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	2 g	0.03 mg
12	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	5 g	0.03 mg
13	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	10 g	0.03 mg
14	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111-	20 g	0.03 mg

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
		1:2004 by substitution method		
15	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.01 mg based on OIML R111- 1:2004 by substitution method	50 g	0.04 mg
16	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.1 mg based on OIML R111- 1:2004 by substitution method	100 g	0.2 mg
17	Weight-F1 Class & Coarser	E1 Class Weights & Weighing Balance of LC:0.1 mg based on OIML R111-1:2004 by substitution method	200 g	0.2 mg
18	Weight-F2 Class & Coarser	F1 Class Weights & Weighing Balance of LC:1 mg based on OIML R111- 1:2004 by substitution method	500 g	2 mg
19	Weight-F2 Class & Coarser	F1 Class Weights & Weighing Balance of LC:1 mg based on OIML R111- 1:2004 by substitution method	1 kg	2 mg
20	Weight-M1 Class & Coarser	F1 Class Weights & Weighing Balance of LC:0.01 g based on OIML R111- 1:2004 by substitution method	2 kg	0.02 g

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Mechanical Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
21	Weight-M1 Class & Coarser	F1 Class Weights & Weighing Balance of LC:0.01 g based on OIML R111- 1:2004 by substitution method	5 kg	0.03 g
22	Weight-M1 Class & Coarser	F1 Class Weights & Weighing Balance of LC:0.1 g based on OIML R111- 1:2004 by substitution method	10 kg	0.2 g
23	Weight-M1 Class & Coarser	F1 Class Weights & Weighing Balance of LC:0.1 g based on OIML R111- 1:2004 by substitution method	20 kg	0.2 g
24	Weight-M1 Class & Coarser	F1 Class Weights & Weighing Balance of LC:1 g based on OIML R111- 1:2004 by substitution method	50 kg	1 g
25	Non Standard Weight	E1 Class Weights & Weighing Balance of LC:0.01 mg by substitution method	1g to 50 g	0.1 mg
26	Non Standard Weight	E1 Class Weights & Weighing Balance of LC:0.1 mg by substitution method	>50 g to 200 g	1 mg
27	Non Standard Weight	F1 Class Weights & Weighing Balance of LC:0.001 g by substitution method	>200 g to 1 kg	0.01 g

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
28	Non Standard Weight	F1 Class Weights & Weighing Balance of LC:0.01 g by substitution method	>1 kg to 6 kg	0.02 g
29	Non Standard Weight	F1 Class Weights & Weighing Balance of LC:0.1 g by substitution method	>6 kg to 20 kg	0.2 g
30	Non Standard Weight	F1 Class Weights & Weighing Balance of LC:1 g by substitution method	>20 kg to 50 kg	1 g

A handwritten signature in blue ink, appearing to read 'Anand', with a horizontal line underneath.

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Mechanical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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Acceleration & Speed

1	RPM Meter - Contact Mode	Tachometer (SANASTR45-II-2017)	10 rpm to 3000 rpm	4 % to 0.1 %
2	RPM Meter/ Centrifuge/ RPM measurement of moving object -Non- Contact Mode	Tachometer (SANASTR45-II-2017)	10 rpm to 99999 rpm	4 % to 0.1 %
3	Tachometer Calibrator/ Stroboscope	Tachometer (SANASTR45-II-2017)	10 rpm to 99999 rpm	4 % to 0.1 %
4	RPM Meter -Non- Contact Mode	Stop Watch (SANASTR45-II-2017)	1 rpm to 10 rpm	1% to 0.1 %
5	Vibration - Acceleration (10 Hz to 300 Hz)	Portable Vibration Calibrator	1 m/s ² to 100 m/s ²	7 % to 4 %
6	Vibration - Displacement (10 Hz to 100 Hz)	Portable Vibration Calibrator	0.01 mm to 2 mm	7 % to 4 %
7	Vibration -Velocity (10 Hz to 500 Hz)	Portable Vibration Calibrator	12.5 mm/s to 160 mm/s	7 % to 4 %
8	Speed of Material Testing Machines (UTM, TTM, LTM, CTM)	Digital Height Gauge & Stop Watch	0 to 500 mm/min	0.21%

Dimension

1	Air Gauge Unit	Standard Ring Gauge Set	0 to ± 40 μ m	2 μ m
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Mechanical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
2	Bench Centre – Coaxiality of Centres	Test Mandrel, Lever Dial (IS 5980:1978 RA 2020)	300mm to 500mm	5 μ m
3	Caliper LC:0.01 mm	Slip Gauge Block Set, Caliper Checker, Long Gauge Blocks (IS 16491(part-1):2016 RA2021)	0 to 2000 mm	30 μ m
4	Displacement Measuring Equipment of Testing Machine (LVDT/Actuator/Encoder)	Digital Height Gauge	0 to 600 mm	10 μ m
5	Linear Height Gauge/ 2D Height Gauge/ Height Gauge (Height, Squareness) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial & Master Cylinder	0 to 300 mm	Height: 4 μ m Squareness: 4 μ m
6	Linear Height Gauge/ 2D Height Gauge/ Height Gauge (Height, Squareness) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks, Lever Dial & Master Cylinder	0 to 600 mm	Height: 6 μ m Squareness: 4 μ m
7	Linear Height Gauge/ 2D Height Gauge/ Height Gauge (Height only) LC:0.0001mm	Slip Gauge Blocks, Long Gauge Blocks & Lever Dial	0 to 1000 mm	8 μ m
8	Straight Edge - Straightness	Electronic Level (IS 12937:1990 RA 2020)	200 mm to 3000 mm	$1^*\{(L+W)/125\}^{-2} \mu$ m (L&W in mm)
9	Surface Plate - Flatness	Electronic Level (IS 12937:1990 RA 2020)	300x300 mm to 6000x6000 mm	$1^*\{(L+W)/125\}^{-2} \mu$ m (L&W in mm)
10	Measuring Tape & Scale Calibrator LC:0.0001 mm	Slip Gauge Blocks, Long Gauge Blocks	0 to 1000 mm	10 μ m

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Mechanical Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
11	Optical Microscope/ Metallurgical Microscope - Linear Scale (LC: 0.001 μ m)	Using Glass Scale	0 to 1 mm	3 μ m
12	Optical Microscope/ Metallurgical Microscope - Magnification	Using Glass Scale	2 X to 2000 X	2%
13	Profile Projector/ Measuring Microscope -Angular Scale (LC:1")	Angle Gauge Set (JIS B 7184:2021)	0 ° to 360 °	40"
14	Profile Projector/ Measuring Microscope -Linear Scale (LC: 0.001 mm)	Slip Gauge Blocks, Glass Scale (JIS B 7184:2021)	0 to 400 mm	4 μ m
15	Profile Projector/ Measuring Microscope - Magnification	Slip Gauge Blocks, Glass Scale, Digital Caliper (JIS B 7184:2021)	10 X to 100 X	0.4%
16	Universal Length Measuring Machine/ Universal Length Measuring Machine/ Length Measuring Machine LC:0.0001 mm	Slip Gauge Blocks	0 to 100 mm	0.5 μ m
17	Surface Roughness Tester	Roughness Specimen Set (3 Nos.)	Ra 0 to 3.2 μ m	7%
18	Vision Measuring Machine - Angular Scale (LC:0.01")	Angle Gauge Set	0 ° to 360 °	40"
19	Vision Measuring Machine - Linear Scale (LC: 0.001 μ m)	Glass Scale, Long Gauge Blocks	0 to 600 mm	3 μ m

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
20	Coordinate Measuring Machine (CMM)	Slip Gauge Blocks, Long Gauge Blocks, Test Sphere (IS 15635 (Part 2):2014 RA 2021)	0 to 1000 mm	3+L/500 μ m (L in mm)
Hardness				
1	Rockwell Hardness Tester	Reference Hardness Blocks based on IS 1586 Part 2: 2018	10 to 100 HRBW	1.2 HRBW
2	Rockwell Hardness Tester	Reference Hardness Blocks based on IS 1586 (Part 2): 2018 by direct methd	10 to 70 HRC	1 HRC
Pressure & Vacuum				
1	Hydraulic Pressure - Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 700 bar	0.30 bar
2	Pneumatic Pressure -Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 35 bar	0.02 bar
3	Pneumatic Pressure -Digital/ Dial Pressure Gauge, Pressure Transducer/ Transmitter/ Controller/ Differential Gauge/ Manometer	Digital Pressure Gauge, Digital Multimeter based on DKD R6-1:2014	0 bar to 7 bar	0.004bar
4	Pneumatic Pressure -Low Pressure Gauge, Manometer, Magnehelic Gauge, Differential Gauge/ Controller	Digital Pressure Gauge based on DKD R6- 1:2014	0 kPa to 20 kPa	0.02kPa
5	Pneumatic Pressure -Low Pressure Gauge, Manometer, Magnehelic	Digital Manometer based on DKD R6-1:2014	0 Pa to 2000 Pa	1 Pa

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
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	Gauge, Differential Gauge/ Controller			
6	Vacuum -Digital/ Dial Vacuum Gauge, Vacuum Transducer/ Transmitter/ Controller	Digital Pressure Gauge based on DKD R6- 1:2014	-0.9 to 0 bar	0.004bar

Force

1	Uniaxial Static Testing Machines (Universal Testing Machine, Compression Testing Machine, Load Testing Machine, Force Testing Machine, Spring Testing Machine) - Compression Mode	Force Proving Instruments (Load Cells/ Proving Rings) based on IS 1828 (Part 1) :2022	10N to 600 kN	0.5%
2	Uniaxial Static Testing Machines (Universal Testing Machine, Tensile Testing Machine, Load Testing Machine, Force Testing Machine, Spring Testing Machine) -Tension Mode	Force Proving Instruments (Load Cells/ Proving Rings) based on IS 1828 (Part 1) :2022	10 N to 100 kN	0.4%
3	Uniaxial Static Testing Machines (Universal Testing Machine, Compression Testing Machine, Load Testing Machine, Force Testing Machine, Spring Testing Machine) - Tension/ Compression Mode	Newtonian Weights based on IS 1828 (Part 1) :2022	0.1 to 10 N	0.4%

Weighing Balance

1	Weighing Balance/Scale/System, Densitometer Class-I, d=0.001 mg or coarser	E1 Class Weights based on OIML R 76-1:2006	0 to 21 g	0.004 mg
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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
2	Weighing Balance/Scale/System, Densitometer Class-I, d=0.01 mg or coarser	E1 Class Weights based on OIML R 76-1:2006	0 to 80 g	0.004 mg
3	Weighing Balance/Scale/System, Densitometer Class-I, d=0.01 mg or coarser	E1 Class Weights based on OIML R 76-1:2006	0 to 220 g	0.004
4	Weighing Balance/Scale/System, Densitometer Class-I, d=0.1 mg or coarser	E1 Class Weights based on OIML R 76-1:2006	0 to 320 g	0.2
5	Weighing Balance/Scale/System Class- I, d=1 mg or coarser	E1/F1 Class Weights based on OIML R 76-1:2006	0 to 1 kg	0.002 g
6	Weighing Balance/Scale/System Class- I, d=10 mg or coarser	E1/F1 Class Weights based on OIML R 76-1:2006	0 to 10 kg	0.02 g
7	Weighing Balance/Scale/System Class- III, d=0.1 g or coarser	F1 Class Weights based on OIML R 76-1:2006	0 to 20 kg	0.1 g
8	Weighing Balance/Scale/System Class- III, d=1 g or coarser	F1 Class Weights based on OIML R 76-1:2006	0 to 50 kg	0.8 g
9	Weighing Balance/Scale/System Class- III, d=1 g or coarser	F1 Class Weights based on OIML R 76-1:2006	0 to 100 kg	2 g
10	Weighing Balance/Scale/System Class- III, d=5 g or coarser	F1 Class Weights based on OIML R 76-1:2006	0 to 300 kg	10 g

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S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
11	Weighing Balance/Scale/System Class- III, d=5 g or coarser	F1/M1 Class Weights based on OIML R 76-1:2006	0 to 500 kg	15 g
12	Weighing Balance/Scale/System Class- III, d=10 g or coarser	F1/M1 Class Weights based on OIML R 76-1:2006	0 to 1000 kg	20 g
13	Weighing Balance/Scale/System Class- III, d=20 g or coarser	F1/M1 Class Weights based on OIML R 76-1:2006	0 to 2000 kg	20 g
14	Weighing Balance/Scale/System Class- III, d=50 g or coarser	F1/M1 Class Weights based on OIML R 76-1:2006	0 to 3000 kg	50 g

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Thermal Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
1	Relative Humidity Indicator/ Controller/ Logger/ Recorder with Sensor of Relative Humidity Chamber -Single Position Calibration (@10 to 50°C)	Relative Humidity & Temperature Sensor with Indicator by comparison method	10 % RH to 95 % RH	2% RH
2	Thermo-Hygrometer/ Relative Humidity Sensors/ Transmitter with/ without Indicator/ Controller/ Data Logger/ Recorder (@10°C to 50°C)	Relative Humidity & Temperature Sensor with Indicator, Relative Humidity & Temperature Chamber by comparison method	20 % RH to 95 % RH	1.5% RH
3	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Dry Blocks, Liquid Baths -Single Position Calibration	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer by comparison method	-30 °C to 650 °C	0.2°C
4	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Dry Block -Single Position Calibration	S Type Thermocouple with Precision Temperature Scanner/ Digital Thermometer by comparison method	250 °C to 1200 °C	1.2°C
5	Infrared (IR) Thermometer/ Thermal Imager Camera, Pyrometer Emissivity: 0.95±0.01	Infrared Thermometer with Black Body by comparison method	30 °C to 500 °C	2°C
6	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Blackbody	Infrared Thermometer by comparison method	30 °C to 500 °C	2.2°C
7	Liquid in Glass Thermometer	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer,	-30 °C to 250 °C	0.3°C

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Thermal Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
		Liquid Bath by comparison method		
8	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	-30 °C to 50 °C	0.1°C
9	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	50 °C to 150 °C	0.1°C
10	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	150 °C to 650 °C	0.2°C
11	Thermocouple/ Temperature Transmitter with/without Indicator/ Controller/ Recorder/ Data Logger, Digital Thermometer with Sensor	S Type Thermocouple with Precision Temperature Scanner/ Digital Multimeter, Dry Well/ Dry Block Furnace by comparison method	250 °C to 1200 °C	1.5°C

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Thermal Calibration (Laboratory Based)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
12	Wireless Temperature Indicator/ Data Logger/Thermo-Hygrometer (@50% RH)	Relative Humidity & Temperature Sensor with Indicator, Relative Humidity & Temperature Chamber by comparison method	10 °C to 50 °C	0.3°C
13	Wireless Temperature Indicator/ Data Logger/Thermo-Hygrometer	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer, Relative Humidity & Temperature Chamber by comparison method	-5 °C to 10 °C	0.3°C

A handwritten signature in blue ink, appearing to read 'Anand', with a horizontal line underneath.

Dealing Officer

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Thermal Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
1	Relative Humidity Chamber/ Environmental Chamber -Thermal Mapping (@25°C)	Wireless Data Loggers by comparison method	30 % RH to 95 % RH	3% RH
2	Relative Humidity Indicator/ Controller/ Logger/ Recorder with Sensor of Relative Humidity Chamber/ Environmental Chamber -Single Position Calibration (@10 to 60°C)	Relative Humidity & Temperature Sensor with Indicator by comparison method	10% RH to 95 % RH	2% RH
3	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Environmental/ Climatic Chamber (Deep Freezer, Freezer, Cold Room, Dry Blocks, Liquid Baths) - Single Position Calibration	PRT with Precision Temperature Scanner/ RTD (4W) with Digital Thermometer by comparison method	-80 °C to 30 °C	0.3°C
4	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Environmental/ Climatic Chamber (Dry Block, Liquid Bath, Oven, Furnace, Incubator, BOD Incubator, Autoclave) - Single Position Calibration	PRT with Precision Temperature Scanner/ RTD (4W) with Digital Thermometer by comparison method	30 °C to 400 °C	0.3°C
5	Temperature Indicator/ Controller/ Logger/ Recorder with Sensor of Environmental/ Climatic Chamber (Oven, Furnace, Muffle Furnace,	S Type Thermocouple with Precision Temperature Scanner/ Digital Thermometer by comparison method	250 °C to 1200 °C	1.2°C

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SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Thermal Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
	Dry Blocks) -Single Position Calibration			
6	Environmental/ Climatic Chamber (Deep Freezer, Freezer, Cold Room, Refrigerator) - Thermal Mapping	RTD with Data Logger by comparison method	-80 °C to 30 °C	0.5°C
7	Environmental/ Climatic Chamber (Dry Block, Liquid Bath, Oven, Furnace, Incubator, BOD Incubator, Autoclave) - Thermal Mapping	RTD with Data Logger by comparison method	30 °C to 250 °C	1°C
8	Oven, Furnace -Thermal Mapping	N Type Thermocouples with Data Logger by direct method	250 °C to 1200 °C	3°C
9	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	-30 °C to 50 °C	0.1°C
10	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	50 °C to 150 °C	0.1°C

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SCOPE OF ACCREDITATION

(Annexure to Certificate of CL – 117)

Thermal Calibration (At Site)

S. No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (\pm) *
11	RTD/ Thermocouple/ Temperature Transmitter/ Thermister with/without Indicator/ Controller/ Recorder/ Data Logger, Temperature Gauge, Digital Thermometer with Sensor	PRT/RTD with Precision Temperature Scanner/ Digital Thermometer/ Digital Multimeter, Dry Well/ Liquid Bath/ Dry Block Furnace by comparison method	150 °C to 650 °C	0.2°C
12	Thermocouple/ Temperature Transmitter with/without Indicator/ Controller/ Recorder/ Data Logger, Digital Thermometer with Sensor	S Type Thermocouple with Precision Temperature Scanner/ Digital Multimeter, Dry Well/ Dry Block Furnace by comparison method	250 °C to 1200 °C	1.5°C

Dealing Officer