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

PRECISION CALIBRATION AND TESTING CENTRE

167/8, First Floor, Sarai Jullena, New Delhi – 110025, 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- 132

Issue Date: 01.08.2024 **Valid Until:** 31.07.2026

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 - 132)

Laboratory Name: Precision Calibration And Testing Centre
167/8, First Floor, Sarai Jullena , New Delhi – 110025 , India.

Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (Laboratory based)		
Group: Direct Current – Source Mode				
1.	DC Voltage	Using Multifunction Calibrator by Direct Method EWI-03	1mV to 1000V	0.39% to 0.007%
2.	DC Current	Using Multifunction Calibrator by Direct Method EWI-04	1µA to 11A	0.70% to 0.07%
		Using Multifunction Calibrator with Current Coil by Direct Method EWI-04	10A to 1000A	1.00% to 0.60%
		Using Current Injection Test Set by Direct Method EWI-04	10A to 1000A	0.80% to 0.60%
3.	DC Power (Voltage10V to 1000V) (Current 0.1 A to 10 A)	Using Multifunction Calibrator by Direct Method EWI-13	1W to 10 kW	0.10% to 0.07%
4.	DC High Voltage	Using DC High Voltage Source Direct Method EWI-11	1kV to 30 kV	2.60% to 2.60 %
5.	DC High Resistance 2Wire	Using Fixed Resistance Box by Comparison Method EWI-06	1MΩ to 200 GΩ	0.80% to 2.40%

Himanshu

Dealing Officer

SCOPE OF ACCREDITATION

(Annexure to Certificate of CL - 132)

Laboratory Name: Precision Calibration And Testing Centre
167/8, First Floor, Sarai Jullena , New Delhi – 110025 , India.

Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (Laboratory based)

6.	DC Low Resistance 4wire	Using Fixed Resistance Box by Comparison Method , EWI-05	1mΩ to 10 kΩ	0.40% to 0.15%
		VI Method Using Multi-Function Calibrator And DMM, EWI-05	1mΩ to 10Ω	0.37% to 0.06%
Group: Alternating Current –Source Mode				
7.	AC Voltage			
	20 Hz	Using Multifunction Calibrator by Direct Method EWI-03	10mV to 1000V	0.06% to 0.04%
	50 Hz		10mV to 1000V	0.06% to 0.04%
	1 kHz		10mV to 1000V	0.06% to 0.04%
	20 kHz		10mV to 200 V	0.4% to 0.05%
	100 kHz		10mV to 33 V	0.4% to 0.08%
8.	AC Current			
	50 Hz	Using Multifunction Calibrator By Direct Method EWI-04	30µA to 11A	0.90%to 0.10%
	5 kHz		30 µ A to 2 A	0.90%to 0.10%
	10 kHz		30µA to 330mA	1.0%to 0.20%
	50 Hz	Using Multifunction Calibrator & Current Coil by Direct Method, EWI-04	10A to 1000A	1.20% to 0.70%
	50 Hz	Using Current Power Supply by Direct Method EWI-04	10A to 1000A	1.80% to 1.70%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (Laboratory based)

9.	AC Power(Active) (Voltage10V to 600V) (Current 0.1mA to 10A) (Power Factor UPF to ±0.1PF) (Frequency 45 Hz to 60 Hz) 1Φ,3Φ Balanced Load	Using Multifunction Calibrator by Direct Method EWI-13	0.1W to 6 kW	0.70% to 0.30%
	AC Power (Active) (Voltage10V to 600V) (Current 0.1A to 1000A) (Power Factor UPF to ±0.1PF) (Frequency 45 Hz to 60 Hz) 1Φ,3Φ Balanced Load	Using Multifunction Calibrator with Current Coil by Direct Method, Clamp Mode EWI-13	1W to 600 kW	0.70%to 0.40%
10.	Power Factor/ Phase Angle	Using Multifunction Calibrator by Direct Method, EWI-14	±0.1to UPF	0.002PF
11.	AC Resistance at 1kHz	Using Fixed Resistance box by Direct Method EWI-10	1Ω,10Ω,100Ω,1 kΩ,10kΩ,100kΩ	0.10%
12.	Resistance Up to 10 kΩ (4Wire) >10 kΩ (2Wire)	Using Multifunction Calibrator by Direct Method EWI-05	1Ω to 330MΩ	0.70% to 0.51%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (Laboratory based)

13.	Inductance at 1kHz	Using Fixed Inductance box by Direct Method EWI-09	100µH to 10H	0.50% to 0.60%
14.	Capacitance at 1kHz	Using Multifunction Calibrator / Capacitance Box by Direct Method EWI-08	0.10nF to 100µF	0.60% to 0.60%
15.	AC Active Power at 50Hz(1p & 3p Balanced Load) ±0.5 to U.P.F. (240V to 600V),(0.1A to 120A)	Direct/ Comparison Method by using Fluke 1732, EWI-13	12W to 86.7 kW	4.50% to 0.12%
16.	AC Reactive Power at 50Hz (1p & 3p Balanced Load) ±0.5 to U.P.F. (240V to600V),(0.1Ato120A)	Direct/ Comparison Method by using Fluke 1732 EWI-13	12VAr to 29.0 kVAr	4.00% to 0.12%
17.	AC Apparent Power at 50Hz (1p & 3p Balanced Load) (240V to 600V),(0.1Ato120A)	Direct/ Comparison Method by using Fluke1732 EWI-13	24 VA to 29.0 kVA	2.60% to 0.12%
18.	AC Active Energy at 50Hz(1p & 3p Balanced Load) ±0.5 to U.P.F. (240V to 600V),(0.1Ato120A)	Direct/ Comparison Method by using Fluke 1732 EWI-27	12Wh to 86.4 kWh	0.50% to 0.12%

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

Electro-Technical Calibration (Laboratory based)

19.	AC High Voltage at 50 Hz	Using AC High Voltage Source Direct Method EWI-11	1 kV to 20 kV	2.50%
20.	RF Voltage			
	(10MHz to 50MHz)	Using Multifunction Calibrator by Direct Method EWI-32	10mVp-p to 5Vp-p	4.0% to 4.0%
	(50MHz to 300MHz)		10mVp-p to 5 Vp-p	4.0% to 4.0%
Group: Frequency –Source Mode				
21.	Frequency	Using Multifunction Calibrator by Direct Method, EWI-07	0.1Hz to 300 MHz	0.15%to 0.003%
22.	Pulse Type Counter Meter/Period Meter	Using Counter Calibrator by Comparison Method EWI-17	5 Pulse Count / Period to 50000 Pulse Count/Period	8.16% to 0.12%
Group: Temperature Simulation - Source Mode				
23.	RTD Pt100, Pt3850, Pt3851, Pt3916, Ni120	Using Multifunction Calibrator by Direct Method EWI-12	-200°C to 800°C	0.10°C to 0.15°C
	Thermocouple J,K,T, D,E,G, M,N		-200°C to 1300°C	0.20°C to 0.35°C
	Thermocouple R,S, B,C		50°C to 1700°C	0.20°C to 0.70°C

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (Laboratory based)		
Group: Direct Current - Measure Mode				
24.	DC Voltage	Using 8.1/2 DMM by Direct Method, EWI-18	10µV to 1000V	4.86% to 0.001%
25.	DC Current	Using 8.1/2 DMM by Direct Method, EWI-19	1µA to 20A	0.71% to 0.05%
		Using 8.1/2 DMM with Shunt by Direct Method EWI-19	10A to 1000A	0.09% to 0.1%
26.	DC High Voltage	Using DC / AC High Voltage Probe with DMM by Comparison Method, EWI-25	Up to 35kV	2.60%
27.	Resistance Up to 10 kΩ (4 Wire) >10 kΩ (2 Wire)	Using 8.1/2 DMM by Direct Method EWI-20	0.01Ω to 1Ω	0.75% to 0.01%
			1Ω to 100 MΩ	0.01% to 0.02%
			100MΩ to 20GΩ	0.02% to 1.10%
Group: Alternating Current - Measure Mode				
28.	AC Voltage			
	(10Hz)	Using 8.1/2 DMM by Direct Method EWI-18	1mV to 1000V	0.60%to 0.01%
	(50Hz)		1mV to 1000V	0.60%to 0.01%
	(1 kHz)		1mV to 1000V	0.60%to 0.01%
	(20 kHz)		1mV to 200V	0.60%to 0.01%
	(100 kHz)		1mV to 20V	0.70%to 0.02%
	(1MHz)		1mV to 20V	2.69% to0.34%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (Laboratory based)

29.	AC Current			
	(10Hz)	Using 8.1/2 DMM by Direct Method EWI-19	9 µA to 200µA	0.46%to 0.10%
	(50Hz)		9 µA to 20A	0.46%to 0.10%
	(1kHz)		9 µA to 20A	0.46%to 0.15%
	(10kHz)		9 µA to 20A	1.10%to 0.35%
	(50Hz)	Using 8.1/2 DMM with Shunt by Direct Method EWI-19	10A to 1000A	0.60%to 0.22%
30.	AC Resistance at 1kHz	Using LCR Meter by Direct Method EWI-23	1Ω to 100kΩ	0.65%
31.	Inductance at 1kHz	Using LCR Meter by Direct Method EWI-22	100µH to 10H	1.70% to 2.40%
32.	Capacitance	Using DMM 6.5 Digit by Direct Method EWI-21	1nF to 100µF	0.20%to 0.40%
33.	Capacitance at 1kHz	Using LCR Meter by Direct Method EWI-21	0.10nF to 100µF	1.20% to 0.2%
34.	AC High Voltage At 50 Hz	Using DC / AC High Voltage Probe with DMM by Comparison Method, EWI-25	Up to 25kV	2.30%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (Laboratory based)		
35.	AC Apparent Power @ 50 Hz (1p Load) (240V to 600V),(1A to 120A)	By Comparison Method Using Fluke 1732 in Direct and Clamp Mode EWI-27	240 VA to29.0kVA	2.60% to 0.12%
36.	Power Factor Measurement at 50 Hz	By Direct/ Comparison Method Using Fluke1732 in Direct and Clamp Mode EWI-28	1 to 0.1 Lag/Lead	0.01PF
37.	AC Active Energy@50Hz (1p, 3p Balanced Load) ±0.5 to U.P.F. (240V to 600V), (1A to 120 A)	Comparison method using Fluke1732 with clamp on CT EWI-27	120 Wh to 86.4 kWh	0.50% to 0.12%
38.	AC Active Power @ 50Hz (1p, 3p Balanced Load) ±U.P.F. to 0.5 lag/lead (240Vto 600V), (1 A to 120 A)	By Comparison Method Using Fluke1732 in Direct and Clamp Mode EWI-27	120 W to 86.7 kW	4.50% to 0.12%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (Laboratory based)		
39.	AC Reactive Power @ 50 Hz (1p Load) (240V to 600V), (1A to 120A)	By Comparison Method Using Fluke 1732 in Direct and Clamp Mode EWI-27	12 VAr to 29.0 kVAr	4.0% to 0.12%
Group: Frequency –Measure Mode				
40.	Frequency	Using 8.1/2 DMM by Direct Method EWI-24	0.1 Hz to 1MHz	0.05% to 0.003%
Group: Time - Measure Mode				
41.	Hour Meter, Time Interval Meter, Timer, Stop Watch, Time Totalizer	Using Timer Calibrator by Comparison Method EWI-16	1sec to 100 sec	0.04 sec to 0.04 sec
			100sec to 9990 sec	0.04 sec to 5.0 sec
			100 sec to 24 Hour	0.04 sec to 6.30 sec
Group: Temperature Simulation - Measure Mode				
42.	RTD (PT 100 Type)	Direct Simulation Method by Using 8.1/2 DMM EWI-26	-200 °C to 800 °C	0.03°C
	Thermocouple (J, K, T, E, N Type)		-200 °C to 1300°C	0.01°C
	Thermocouple (R , S , B, C Type)		-50 °C to 1700°C	0.05°C to 0.57°C

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (Laboratory based)

Group: Electrical Equipments				
43.	Oscilloscope			
	Amplitude1kHZ (Square Wave)	Using Multifunction Calibrator by Direct Method EWI-15	5mV to 100V	2.20% to 0.30%
	Bandwidth		10MHz to 300MHz	3.60%
	Time Base		1nsecond to 5 second	0.57% to 0.28%
44.	Transformer Turns Ratio Meter	Direct Method by using 8.1/2DMM, 6.1/2DMM EWI-33	1turn to 1999 Turns	0.50%
45.	Current Transformer Primary Injection Method (Ratio Error)	Using Precision Current Transformer/6.1/2 DMM with Shunt, and High Current Source by Direct Method, EWI-30	1 A to 5 A (Primary) 1A,5A (Secondary)	1.70%
			5A to 1000A (Primary) 1A,5A (Secondary)	1.70% to 1.80%
46.	Potential Transformer(Ratio Error)	Using HV Divider/HV Probe and High Voltage Source by Direct Method EWI-31	0 kV to 15kV(Primary), 110 V & 110/v3 (Secondary)	3.00%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (At Site)		
Group: Direct Current – Source Mode				
1.	DC Voltage	Using Multifunction Calibrator by Direct Method, EWI-03	1mV to 1000V	0.39% to 0.007%
2.	DC Current	Using Multifunction Calibrator by Direct Method, EWI-04	1µA to 11A	0.70% to 0.07%
		Using Multifunction Calibrator with Current Coil by Direct Method EWI-04	10A to 1000A	1.00% to 0.60%
		Using Current Injection Test Set by Direct Method, EWI-04	10A to 1000A	0.80% to 0.60%
3.	DC Power (Voltage10V to 1000V) (Current 0.1 A to 10 A)	Using Multifunction Calibrator by Direct Method EWI-13	1W to 10 kW	0.10%to 0.07%
4.	DC High Resistance 2Wire	Using Fixed Resistance Box by Comparison Method, EWI-06	1MΩ to 200 GΩ	0.80% to 2.40%
5.	Resistance Upto 10 kΩ (4Wire) >10 kΩ (2Wire)	Using Multifunction Calibrator by Direct Method, EWI-05	1Ω to 330MΩ	0.70% to 0.51%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Electro-Technical Calibration (At Site)

Group: Alternating Current – Source Mode				
6.	AC Voltage			
	20 Hz	Using Multifunction Calibrator by Direct Method EWI-03	10mV to 1000V	0.06% to 0.04%
	50 Hz		10mV to 1000V	0.06% to 0.04%
	1 kHz		10mV to 1000V	0.06% to 0.04%
	20 kHz		10mV to 200 V	0.40% to 0.05%
	100 kHz		10mV to 33 V	0.40% to 0.08%
7.	AC Current			
	50 Hz	Using Multifunction Calibrator By Direct Method EWI-04	30µA to 11A	0.90%to 0.10%
	5 kHz		30 µ A to 2 A	0.90%to 0.10%
	10 kHz		30µA to 330mA	1.00%to 0.20%
	50 Hz	Using Multifunction Calibrator & Current Coil by Direct Method EWI-04	10A to 1000A	1.20%to 0.70%
	50 Hz	Using Current Power Supply by Direct Method EWI-04	10A to 1000A	1.80% to 1.70%
8.	Power Factor/Phase Angle	Using Multifunction Calibrator by Direct Method, EWI-14	±0.1to UPF	0.003PF

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (At Site)		
9.	AC Power(Active) (Voltage10V to 600V) (Current 0.1mA to 10A) (Power Factor UPF to ±0.1PF) (Frequency 45 Hz to 60 Hz) 1Φ,3Φ Balanced Load	Using Multifunction Calibrator by Direct Method EWI-13	0.1W to 6 kW	0.70% to 0.30%
Group: Frequency –Source Mode				
10.	Frequency	Using Multifunction Calibrator by Direct Method, EWI-07	0.1Hz to 300 MHz	0.15%to 0.003%
11.	Pulse Type Counter Meter/Period Meter	Using Counter Calibrator by Comparison Method EWI-17	5 Pulse Count / Period to 50000 Pulse Count/Period	8.16% to 0.12%
Group: Temperature Simulation - Source Mode				
12.	**Temperature Simulation**			
	RTD Pt100,Pt3850,Pt3851, Pt3916, Ni120	Using Portable Multifunction Calibrator by Direct Method, EWI-12	-200oC to 800oC	0.10°C
	Thermocouple J,K,T,D,E,G, M,N	Using Portable Multifunction Calibrator by Direct Method, EWI-12	-200oC to1300oC	0.16°C to 0.30°C
	Thermocouple R,S,B,C		50oC to1700oC	0.50°C to 0.50°C

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

Electro-Technical Calibration (At Site)

Group : Direct Current – Measure Mode				
13.	DC Voltage	Using DMM 6.5 Digit by Direct Method EWI-18	1mV to 1000V	0.07% to 0.003%
14.	DC Current	Using DMM 6.5 Digit by Direct Method EWI-19	1μA to 10A	0.70% to 0.05%
		Using DMM 6.5Digit with Shunt by Direct Method EWI-19	10A to 1000A	0.11%to 0.10%
15.	DC High Voltage	Using DC / AC High Voltage Probe with DMM by Comparison Method, EWI-25	Up to 35kV	2.60%
16.	Resistance	Using DMM6.5 Digit by Direct Method, EWI-20	1Ω to 1GΩ	0.04%to 0.20%
Group : Alternating Current – Measure Mode				
17.	AC Voltage	Using DMM6.5Digit by Direct Method EWI-18	1mV to 1000V (3Hz to 10 kHz)	0.54% to 0.03%
			10mV to 100 V (3Hz to 100kHz)	0.60% to 0.07%
18.	AC Current	Using DMM6.5Digit by Direct Method EWI-19	10μA to 10A (3Hz to 10 kHz)	0.30% to 0.10%
		Using DMM6.5Digit with Shunt by Direct Method EWI-19	10A to 1000A (50 Hz)	0.70% to 0.30%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (At Site)		
19.	AC High Voltage at 50 Hz	Using DC / AC High Voltage Probe with DMM by Comparison Method, EWI-25	Up to 25kV	2.30%
20.	AC High Voltage at 50 Hz	Using AC High Voltage Divider with Display by Direct Method, EWI-25	10kV to 100 kV	2.90%
21.	AC Active Energy @50Hz (1p, 3p Balanced Load) ±0.5 to U.P.F.(240V to 600V),(1A to 120 A)	Comparison method using Fluke1732 with clamp EWI-27	120 Wh to 86.4 kWh	0.50% to 0.12%
22.	AC Active Power @ 50Hz (1p, 3p Balanced Load) ±0.5 to U.P.F. (240V to 600V), (1 A to 120 A)	By Direct/ Comparison Method Using Fluke1732 in Direct and Clamp Mode EWI-27	120 W to 86.7 kW	4.50% to 0.12%
23.	AC Reactive Power @ 50 Hz (1p, 3p Balanced Load) ±0.5 to U.P.F. (240V to 600V),(1A to 120A)	By Comparison Method Using Fluke 1732 in Direct and Clamp Mode EWI-27	120 VAr to 29.0 kVAr	4.0% to 0.12%

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (At Site)		
24.	Power Factor Measurement at 50 Hz	By Direct/ Comparison Method Using Fluke1732 in Direct and Clamp Mode EWI-28	1 to 0.1 Lag/Lead	0.01PF
25.	Capacitance	Using DMM 6.5 Digit by Direct Method EWI-21	1nF to 100µF	0.20%to 0.40%
Group : Frequency – Measure Mode				
26.	Frequency	Using DMM6.5Digit by Direct Method EWI-24	5 Hz to 1 MHz	0.01% to 0.01%
Group : Time – Measure Mode				
27.	Hour Meter, Time Interval Meter, Timer, Stop Watch, Time Totalizer	Using Timer Calibrator by Comparison Method EWI-16	1sec to 24 Hours	0.04sec to 6.30 sec
Group : Equipment				
28.	Current Transformer Primary Injection Method (Ratio Error)	Using Precision Current Transformer/6.1/2 DMM with Shunt, and High Current Source by Direct Method EWI-30	1 A to 5 A (Primary)1A,5A (Secondary)	1.70%
			5A to 1000A (Primary)1A,5A (Secondary)	1.70% to 1.80%

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro-Technical Calibration (At Site)		
29.	Potential Transformer (Ratio Error)	Using HV Divider/HV Probe and High Voltage Source by Direct Method EWI-31	0 kV to 15kV(Primary),11 0 V & 110/v3 (Secondary)	3.00%
30.	Transformer Turns Ratio Meter	Direct Method by using 5.1/2DMM, 6.1/2DMM EWI-33	1turn to 1999 Turns	0.50%
Group: Temperature Simulation - Measure Mode				
31.	**Temperature Simulation**			
	RTD Pt100,Pt3850,Pt3851, Pt3916, Ni120	Using Portable Multifunction Calibrator by Direct Method, EWI-12	-200°C to 800°C	0.10°C
	Thermocouple J,K,T,D,E,G, M,N	Using Portable Multifunction Calibrator by Direct Method, EWI-12	-200°C to1300°C	0.30°C to 0.30°C
	Thermocouple R,S,B,C		50°C to1700°C	0.50°C to 0.90°C

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
Group: Dimension				
1.	Angle Plate / Box Angle Plate Squareness, Parallelism Flatness	Using Slip Gauges, Right Angle Knee, Plunger Dial Gauge IS – 6232: 2019, IS-2554: 2020, IS-6973: 2020, IS-6985: 2020	Up to 300 mm	5.0 µm 4.0 µm
2.	Ball Gauge	Using Digital Micrometer Comparison Method	0.5 mm to 10 mm	2.0 µm
3.	Bevel Protractor / Combination Set/Degree Protractor, L.C.- 1 min./ 5 min./ 1 degree	Using Angle Gauge IS-4239: 2023, IS-5812:1970	$0^o – 90^o – 0^o$ Up to 360 ^{o}	4.0 minute 4.0 minute
4.	Bore Gauge Stroke Length / Transmission	Using Dial Gauge Calibrator comparison method	Upto 2 mm	2.0 µm
5.	Buffer Height Gauge L.C.- 1 mm	Using Slip Gauges, Length Bars with Holders and Digital Probe Comparison method	700 mm to 1100 mm	289.0 µm
6.	Coating Thickness Gauge L.C. : 0.1 µm / 1 µm	Using Standard Thickness Foils Comparison Method	0.01 mm to 1 mm > 1 mm to 3 mm > 3 mm to 5 mm	3.3 µm 6.5 µm 8.0 µm
7.	Cylindrical Pins / Wires Grade 1 & coarser	Using Digital Micrometer/ Digital Probe with Slip Gauges IS:11103-1984	0.005 mm to 5 mm > 5 mm to 20 mm > 20 mm to 50 mm	2.0 µm 2.5 µm 3.0 µm

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

Mechanical Calibration (Laboratory based)

8.	Dial Comparator Stand (Flatness)	Using Slip Gauges & Straight Edge / Lever Dial Gauge/ Spirit Level IS:12937-1990	Up to 300 mm X 300 mm	4.0 µm
9.	Digital / Dial Thickness Gauge L.C. 0.001 mm L.C. 0.01 mm	Using Slip Gauges IS:2092- 1983	Up to 1 mm > 1 mm to 10 mm Up to 10 mm >10 mm to 25 mm	1.0 µm 2.0 µm 6.0 µm 7.0 µm
10.	Digital / Depth Micrometer L.C. 0.001 mm L.C. 0.01 mm	Using Slip Gauges / Length Bars and Surface Plate JIS-B7544:1994	Up to 100 mm >100 mm to 300 mm Up to 300 mm > 300 mm to 600 mm	1.0 µm 2.5 µm 6.0 µm 7.0 µm
11.	Digital / Dial / Vernier Calipers L.C. 0.01 mm L.C. 0.02 mm	Using Slip Gauges / Length Bars / Slip Gauge Accessories IS-16491 (Part 1) : 2021	Up to 300 mm > 300 mm to 1000 mm >1000 mm to 2000 mm	7.0 µm 8.0 µm 20.0 µm
12.	Digital / Dial / Vernier Depth Gauge L.C. 0.01 mm	Using Slip Gauges / Length Bars IS-16491(Part 2):2021	Up to 300 mm >300 mm to 1000 mm	7.0 µm 8.0 µm
13.	Digital / Dial / Vernier Height Gauge L.C. 0.01 mm	Using Slip Gauges / Length Bars IS-2921:2016	Up to 450 mm >450 mm to 1000 mm	8.0 µm 9.0 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
14.	Digital / Dial Lever Gauge L.C. 0.001 mm	Using Dial Gauge Calibrator IS:11498-1985	Up to 1 mm	1.0 µm
15.	Digital / Dial Plunger Gauges L.C. 0.002 mm L.C. 0.01 mm	Using Dial Gauge Calibrator / Using Slip Gauges with Dial Comparator Stand IS:2092-1985	Up to 12.50 mm >12.50 mm to 25.4 mm Up to 25 mm >25 mm to 50 mm >50 mm to 100 mm	1.0 µm 2.0 µm 5.0 µm 6.0 µm 7.0 µm
16.	Digital / External Micrometer L.C. 0.001 mm L.C. 0.01 mm	Using Slip Gauges / Length Bars IS:2967-1983	Up to 50 mm >50 mm to 100 mm >100mm to 300 mm Up to 300 mm >300mm to 600 mm >600 mm to 1000 mm >1000 mm to 2000 mm	1.0 µm 2.0 µm 2.5 µm 5.0 µm 6.0 µm 7.0 µm 10.0 µm
17.	Digital / Internal Micrometer L.C. 0.001 mm L.C. 0.01 mm	Using Slip Gauges / Length Bars / Slip Gauge Accessories IS:2966-1983	Up to 200 mm >200mm to 300 mm Up to 300 mm >300mm to 1000 mm >1000 mm to 2000 mm	2.0 µm 3.0 µm 6.0 µm 7.5 µm 13.0 µm

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

Mechanical Calibration (Laboratory based)

18.	Spirit Level (Analog/Digital) Sensitivity : 0.01 mm / m	Using Slip Gauges Tilting Table with Digital Probe IS-5706:1993	0.01 mm/m to 1 mm/m	3.0 µm/m
19.	Driving Profile / Wheel Profile Gauge	Using Slip Gauges, Length Bars with Holder Comparison method	0 to 100 mm	50 µm
20.	Electronic / Wheel Distance Gauge	Using Slip Gauges, Length Bars with Holder comparison method	1300 mm to 1610 mm	25 µm
21.	Elongation Gauge, Flakiness Gauge, Cube Mould	Using Digital Caliper L.C. 0.01 mm IS:2386(Part1)-1963 IS:10086-2021	Up to 200 mm	9.7 µm
22.	Engineers / Try Square Squareness Flatness	Using Slip Gauges / Right Angle Knee IS:2103-1980	Up to 300 mm	6.0 µm 4.0 µm
23.	Feeler Gauge	Using Digital Micrometer IS:3179-1990	Up to 5 mm	2.0 µm
24.	Hegman Gauge	Using Digital Probe comparison method	Up to 100 µm	1.8 µm
25.	Inside / Outside Caliper / Pistol Caliper	Using Slip gauges / Length Bars / Slip Gauge Accessories comparison method	Up to 300 mm	10.0 µm

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

Mechanical Calibration (Laboratory based)

26.	Internal Micrometer – 3 Points	Using Standard Ring Gauge comparison method	6 mm to 75 mm	3.0 µm
27.	Steel Scale / Scale	Using Tape Calibration Unit IS:1481-1970	Up to 3000 mm	68 √ (L/500) µm Where L is in mm
28.	Measuring Tape / Pie Tape	Using Tape Calibration Unit IS:1269 Part-(1,11)- 1997	Up to 100 meter	68 √ (L/500) µm Where L is in mm
29.	Micrometer Setting Rods	Using Slip gauge / Length Bar with Lever Type Gauge with Stand IS:7014-1973	Up to 100 mm >100 mm to 300 mm >300 mm to 600 mm >600 mm to 1000 mm >1000 mm to 2000 mm	3.0 µm 5.0 µm 7.0 µm 8.0 µm 10.0 µm
30.	Plain Plug Gauge	Using Slip Gauges/ Plunger Dial Gauge IS:3455-1971, IS:3485-1983 , IS:919-2014	Up to 100 mm >100 mm to 200 mm >200 mm to 300 mm	3.0 µm 4.0 µm 5.0 µm
31.	Plain Ring Gauge	Using ULM 100 Using Slip Gauge with Slip Gauge Accessories IS:3455-1971, IS:3485-1983 , IS:919-2014 IS:7876-1975	Ø 3 mm to 100 mm >Ø 100 mm to 200 mm >Ø 200 mm to 300 mm	2.0 µm 3.0 µm 4.0 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
32.	Snap Gauges / Dial / Adjustable	Using Slip Gauges / Long Slip Gauges / Length Bar IS:3477-1975, IS:7876-1975, IS:919-2014 IS:14271-1995	Up to 150 mm >150 mm to 300 mm >300 mm to 450 mm	3.0 µm 6.0 µm 7.5 µm
33.	Straight Edge	Using Lever Gauge and Slip Gauge IS:2220-1990	Up to 1000 mm	2.3 µm
34.	Test Sieves	Using Digital Caliper IS:460-2020	4 mm to 100 mm	10.0 µm
35.	Thickness Foils	Using Digital Probe IS:3179-1990	Up to 5 mm	1.4 µm
36.	Thread Plug Gauge Pitch Dia Major Dia	Using Digital Micrometer Head with Free Float Table Fixture and Three Wire Unit IS:2334-2001 IS:10216-1988 IS:10685-1983	Up to 25 mm >25 mm to 50 mm >50 mm to 100 mm Up to 100 mm	4.0 µm 4.5 µm 5.0 µm 2.0 µm
37.	Thread Ring Gauge Pitch Dia	Using ULM 100 IS:2334-2001 IS:10685-1983 IS:1026-1988	Up to 100 mm	2.5 µm
38.	Ultrasonic Thickness Gauge	Using Slip Gauges comparison method	Up to 300 mm	6.8 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
39.	V – Block Flatness Parallelism Squareness	Using Slip Gauges / Right Angle Knee / Plunger Dial Gauge , / Master Cylinder IS:2949-1992	Up to 300 mm X 100 mm X 100 mm	4.0 µm 5.1 µm 6.0 µm
40.	Weld / Hi – Lo Gauge/ Bridge Cam Gauge / Welding Flet Gauge	Using Slip Gauges / Comparator Stand comparison method	Up to 10 mm >10 to 25 mm >25 mm to 50 mm	2.0 µm 4.0 µm 5.0 µm
41.	Wheel Diameter Gauge	Using Slip Gauges, Length Bars with Holders, Digital Probe with Dial Calibration Tester comparison method	750 mm to 1050 mm	25 µm
42.	Wheel Distance Gauge	Using Slip Gauges, Length Bars with Holders comparison method	1590 mm to 1610 mm	25 µm
43.	Wheel Tread Wear Gauge	Using Slip Gauges, Length Bars with Holders comparison method	Up to 50 mm	50 µm
44.	Width / Gap Gauge	Using Slip Gauges / Comparator Stand Comparison method	Up to 150 mm >150 to 300 mm	2.0 µm 5.5 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
45.	Limit Gauges/CD Gauge/PCD Gauge /Welding Gauge/Width Gauge/ Paddle Gauge/Weld Fillet Gauge/ Flakiness Gauge/ Elongation Gauge/ Receiver Gauge/ Plain Work Piece/ Lever Arm/ Master Connecting Rod/ Inspection JIG And Fixture/ Moulds	Using Digital Micrometer , Digital Caliper, Digital Height Gauge , Slip Gauge & Slip Gauge Accessories , Lever & Plunger Dial Gauge, Digital Bevel Protractor	Length : Up to 600 mm Width : Up to 450 mm Height : Up to 300 mm Depth : Up to 300 mm Diameter : Up to 100 mm Centre Distance: Up to 100 mm Thickness : Up to 50 mm Angle: Up to 360 ° Comparison / Direct Method	12.0 µm 12.0 µm 12.0 µm 10.0 µm 10.0 µm 10.0 µm 6.0 µm 38 second
Group: Acoustic				
1.	Sound Level Meter	Using Sound Level Calibrator comparison method	94 db	1.5 db
			114 db	1.5 db

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory based)		
Group: Speed & Acceleration				
1.	Tachometer / RPM Meter Contact Type	Using Digital Tachometer with RPM Source SANSTR45-II-2017	30 RPM to 50 RPM 50 RPM to 1000 RPM 1000 RPM to 6000 RPM	0.7 RPM 0.9 RPM 1.0 RPM
2.	Tachometer / RPM Meter Non-Contact Type	Using Digital Tachometer with RPM Source SANSTR45-II-2017	30 to 1000 RPM 1000 to 20000 RPM 20000 to 25000 RPM	0.7 RPM 0.9 RPM 1.0 RPM
Group: Pressure & Vacuum				
1.	Differential Pressure Gauge, Pressure Gauges, Digital Pressure Gauges, Pressure Transducer with Indicator / Without Indicator, Magnahelic Gauges, Pressure Transmitter Pressure Valve & Switches, Manometer	Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6-1:2014	(-)20 mbar to 20 mbar	0.02 mbar
			0 to 200 mbar	0.08 % rdg.
			0 to 2 bar	0.08 % rdg.
			0 to 7 bar	0.08 % rdg.
2.	Pressure Gauges, Digital Pressure Gauges, Pressure Transmitter / Transducer with Indicator / Without Indicator, Pressure Valve & Switches.	Using Digital Pressure Gauge with Hydraulic comparator and Digital Multimeter by Comparison Method as per DKD-R-6-1 : 2014	0 to 70 bar	0.08 % rdg.
			0 to 700 bar	0.08 % rdg

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

Mechanical Calibration (Laboratory based)

3.	Vacuum Gauge /Transmitter /Transducer With Indicator / Digital Vacuum Gauge / Switches / Valves	Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6-1:2014	(-) 0.9 bar to 0 bar	0.27 % rdg
Group: Mass & Volume				
1.	Weight F1 Accuracy Class & Coarser	Using E2 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg / 0.1 mg) based OIML R111- 1:2004 ABBA method	1 mg	0.02 mg
			2 mg	0.02 mg
			5 mg	0.02 mg
			10 mg	0.02 mg
			20 mg	0.02 mg
			50 mg	0.02 mg
			100 mg	0.02 mg
			200 mg	0.03 mg
			500 mg	0.03 mg
			1 g	0.03 mg
			2 g	0.03 mg
			5 g	0.03 mg
			10 g	0.05 mg
			20 g	0.05 mg
			50 g	0.08 mg
			100 g	0.10 mg
			200 g	0.15 mg

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

Mechanical Calibration (Laboratory based)

2.	DISCRETE WEIGHT (Conventional Mass) Hook / Disc Type	Using F1 Accuracy Class Standard Weights and Digital Weighing Balance as per OIML R-111-1 MWI/C08	1 g to 200 g	0.3 mg
			200 g to 1 kg	3.0 mg
			1 kg to 30 kg	30.0 mg
3.	Micro-Pipette, Pipette (Piston Operated Pipette) Graduated/one mark/Single Volume	Using Distilled Water & Ultra-micro balance(d=0.01 mg) by Gravimetric method ISO 8655 (part 6) :2022	10 µl to 100 µl	0.10 µl
			100 µl to 1000 µl	0.15 µl
			1000 µl to 5000 µl	0.20 µl
4.	Laboratory Glassware / Volumetric Equipment (Pipette, Burette, Flask, Jar, Pycnometer etc.)	Using Standard Weights, Digital Weighing Balance (with Readability 0.01mg, 0.1 mg, 0.2g, 0.5g and) and distilled water of known density ISO 4787:2021	0.01 ml to 10 ml	0.0003 ml
			10 ml to 100 ml	0.0005 ml
			100 ml to 200 ml	0.0010 ml
			200 ml to 500 ml	0.0050 ml
			500 ml to 1 liter	0.0080 ml
			1 liter to 10 liter	0.05 ml

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

Mechanical Calibration (At Site)

Group: Dimension				
1.	Surface Plate – Cast Iron / Granite Comparator Stand	Using Spirit Level/ Using Slip Gauge with Straight Edge IS:12937	Up to 3000 mm	$3.9\sqrt{L+W}$ µm 150 L & W in mm
2.	Electronic Height Gauge L.C. 0.001 mm L.C. 0.01 mm	Using Slip Gauges / Length Bar IS:13907-1994	Up to 1000 mm Above 1000 mm to 2000 mm	 4.00 µm 8.00 µm
3.	Profile Projector	Using Slip Gauges / Angle Gauge / Pin / Digital Caliper/ Glass Scale JIS B 7184:2021	Linear : Up to 300 mm Angular : Up to 360 degree Magnification : Up to 200 X	2.5 µm 38 second 1%
4.	Traveling Microscope / Microscope	Using Glass Scale / Slip Gauges JIS B 7184:2021	Linear : Up to 200 mm Magnification : Up to 1000 X	3.0 µm 0.5%
Group: Pressure & Vacuum				
1.	Differential Pressure Gauge, Pressure Gauges, Digital Pressure Gauges, Pressure Transducer with Indicator / Without Indicator, Magnahelic Gauges, Pressure Transmitter, Pressure Valve & Switches, Manometer	Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6-1:2014	(-)20 mbar to 20 mbar	0.02 mbar
			0 to 200 mbar	0.08 % rdg.
			0 to 2 bar	0.08 % rdg.
			0 to 7 bar	0.08 % rdg.

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
2.	Pressure Gauges, Digital Pressure Gauges, Pressure Transmitter / Transducer with Indicator / Without Indicator, Pressure Valve & Switches.	Using Digital Pressure Gauge with Hydraulic comparator and Digital Multimeter by Comparison Method as per DKD-R-6-1 : 2014	0 to 70 bar	0.08 % rdg.
			0 to 700 bar	0.08 % rdg
3.	Vacuum Gauge /Transmitter /Transducer With Indicator / Digital Vacuum Gauge / Switches / Valves	Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6-1:2014	(-) 0.9 bar to 0 bar	0.27 % rdg
Group: Speed & Acceleration				
1.	Contact Type-RPM Indicator With Sensor / Centrifuge / Stroboscope / Shaker / Mixer	Using Tachometer by Comparison method SANSTR45-II-2017	30 to 50 RPM 50 to 1000 RPM 1000 to 6000 RPM	0.7 RPM 0.9 RPM 1.0 RPM
2.	Contact Type-RPM Indicator With Sensor / Centrifuge / Stroboscope / Shaker / Mixer	Using Tachometer by Comparison method SANSTR45-II-2017	30 to 1000 RPM 1000 to 20000 RPM 20000 to 25000 RPM	0.7 RPM 0.9 RPM 1.0 RPM
Group: Mass & Volume				
1.	Digital/Analog Weighing Balances, Semi Micro Balances d= 0.01 mg Class I and coarser	Using Standard Weight(s) of E2 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 100 g	0.06 mg

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
2.	Digital/Analog Weighing Balances, Semi Micro Balances d= 0.1 mg Class I and coarser	Using Standard Weight(s) of E2 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 220 g	0.14 mg
3.	Digital/Analog Weighing Balances, d= 0.01 g Class II and coarser	Using Standard Weight(s) of E2 & F1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 2 kg	12 mg
4.	Digital/Analog Weighing Balances, d= 0.1 g Class II and coarser	Using Standard Weight(s) of E2 & F1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 10 kg	0.09 g
5.	Digital/Analog Weighing Balances, d= 0.1 g Class III and coarser	Using Standard Weight(s) of F2 & M1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 60 kg	0.20 g
6.	Digital/Analog Weighing Balances, d= 1 g Class III and coarser	Using Standard Weight(s) of F2 & M1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 100 kg	2 g
7.	Digital/Analog Weighing Balances, d= 10 g Class III and coarser	Using Standard Weight(s) of F2 & M1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020	0 to 200 kg	15 g

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

Thermal Calibration (Laboratory based)

Group: Temperature				
1.	Digital/Dial/Glass Thermometer, RTD & Thermocouple with or without (Controller / Indicator / Data Logger / Temp. Switch/ Recorder / Transmitter)	Comparison Method by Using Standard PRT and 6.1/2,5.1/2 Digit DMM with Dry Bath TWI-03,04	(-)30°C to 50°C	0.21°C
			50°C to 300°C	0.21°C
2.	Digital / Dial Thermometer & Thermocouple with or without (Temperature Controller/Indicator /Data Logger/Recorder/ Transmitter)	Comparison Method by Using R Type Thermocouple and 6.1/2 / 5.1/2 Digit DMM with Dry Block Furnace TWI-04,05	300°C to 600°C	0.80 °C to 1.30°C
3.	Digital / Dial Thermometer & Thermocouple with or without (Temperature Controller/Indicator /Data Logger/Recorder/ Transmitter)	Comparison Method by Using R Type Thermocouple and 6.1/2 / 5.1/2 Digit DMM with Dry Block Furnace TWI-04,05	600°C to 1200°C	1.30°C to 1.86 °C

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Laboratory Name: Precision Calibration And Testing Centre
167/8, First Floor, Sarai Jullena , New Delhi – 110025 , India.

Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory based)		
4.	Thermo-Hygrometer with Sensor and Inbuilt Sensor	Comparison Method by Using Digital Thermo Hygrometer with Sensor and Humidity Chamber or Digital Multi meter with RTD (PT-100) and Humidity Chamber TWI-11	10°C to 50°C	0.21 °C
5.	Temperature Indicator with Sensor of Liquid bath, Dry Block, Furnace Oven , Environmental Chamber, Centrifuge Incubator, BOD Incubator, Freezer & Deep Freezer	Single Point Calibration Comparison Method by Using Std. PRT & 5.1/2Digit DMM TWI-08	(-)80°C to 300°C	0.19°C
6.	Temperature Indicator with Sensor of Dry Block Furnace, Muffle Furnace , Furnace	Single Point Calibration Comparison Method by Using R Type Thermocouple6.1/2 Digit & 5.1/2 Digit DMM TWI-08	300°C to 1200°C	0.20°C to 1.70°C

Dealing Officer

SCOPE OF ACCREDITATION

(Annexure to Certificate of CL - 132)

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory based)		
7.	Non-Contact Thermometry-Optical Pyrometer, IR Thermometer and Thermal Imaging Camera	Comparison Method by Using Digital Pyrometer with Black Body Calibrator Emissivity: 0.95 ±0.01 TWI-09	30°C to 500°C	2.19 °C
Group: Humidity				
8.	Thermo-Hygrometer with Sensor and Inbuilt Sensor	Comparison Method by Using Digital Thermo-Hygrometer with Sensor and Humidity Chamber TWI-11	10%RH to 95%RH @ 25°C	0.83%RH
9.	Indicator with Sensor of Environmental / Conditioning Chamber/Humidity Chamber/ Climate Chamber	Single Point Calibration Comparison Method by Using Digital Thermo Hygrometer with Sensor TWI-10	10 % RH to 95 % RH@20°C to70°C	0.70%RH

Himanshu

Dealing Officer

SCOPE OF ACCREDITATION

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Thermal Calibration (At Site)

Group: Temperature				
1.	Digital/Dial/Glass Thermometer, RTD & Thermocouple with or without (Controller / Indicator / Data Logger / Temp. Switch/ Recorder / Transmitter)	Comparison Method by Using Standard PRT and 6.1/2,5.1/2 Digit DMM with Dry Bath TWI-03,04	(-)30°C to 50°C	0.21°C
			50°C to 300°C	0.21°C
2.	Digital / Dial Thermometer & Thermocouple with or without (Temperature Controller/Indicator /Data Logger/Recorder/ Transmitter)	Comparison Method by Using R Type Thermocouple and 6.1/2 / 5.1/2 Digit DMM with Dry Block Furnace TWI-04,05	300°C to 600°C	0.80°C to 1.30°C
3.	Digital / Dial Thermometer & Thermocouple with or without (Temperature Controller/ Indicator /Data Logger/ Recorder/Transmitter)	Comparison Method by Using R Type Thermocouple and 6.1/2 / 5.1/2 Digit DMM with Dry Block Furnace TWI-04,05	600°C to 1200°C	1.30°C to 1.86 °C

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
4.	Temperature Indicator with Sensor of Liquid bath, Dry Block , Furnace , Oven , Environmental Chamber, Centrifuge Incubator(Non-Medical) , BOD Incubator, Freezer & Deep Freezer	Single Point Calibration Comparison Method by Using Std. PRT & 5.1/2 Digit DMM TWI-08	(-)80°C to 300°C	0.19°C
5.	Temperature Indicator with Sensor of Dry Block Furnace , Muffle Furnace , Furnace	Single Point Calibration Comparison Method by Using R Type Thermocouple 6.1/2 Digit & 5.1/2 Digit MM TWI-08	300°C to 1200°C	0.20°C to 1.70 °C
			1200°C to 1500°C	1.7°C to 2.0 °C
6.	Freezer, Cold Chamber, Centrifuged Chamber, Incubator and BOD Incubator (Non-Medical) , Closed Chamber	16 Point Calibration Comparison Method Using Multi Point Data Logger with RTD (PT-100) Sensors. TWI-12	(-)80°C to 50°C	1.00 °C

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
7.	Oven, Closed Chamber, Water Bath	16 Point Calibration Comparison Method Using Multi Point Data Logger with RTD (PT-100) Sensors. TWI-12	50°C to 300°C	1.80 °C
8.	Oven, Dry Block Furnace, Muffle Furnace, Furnace, Hot Room	16 Point Calibration comparison Method Using Multi Point Data Logger with K type Thermo-couple Sensors TWI-12	50°C to 600°C	2.10 °C
9.	Dry Block Furnace, Muffle Furnace, Furnace, Hot Room	16 Point Calibration comparison Method Using Multi Point Data Logger with K type Thermo-couple Sensors TWI-12	600°C to 1200°C	2.40 °C
10.	Non-Contact Thermometry: Screen Preheater, Hot Plate	Comparison Method by Using Digital Pyrometer Emissivity : 0.95 ±0.01 TWI-14	30°C to 300°C	2.00°C

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SCOPE OF ACCREDITATION

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Validity: 01.08.2024 to 31.07.2026 **Amended on** N/A

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

Thermal Calibration (At Site)

Group: Humidity				
11.	Environmental / Conditioning Chamber/Humidity Chamber/ Climate Chamber	9 Point Calibration, Comparison Method by Using Digital Temperature & Humidity Data Logger TWI-13	10%RH to 95%RH @ 25 °C	3.74%RH
12.	Environmental / Conditioning Chamber/Humidity Chamber/ Climate Chamber	9 Point Calibration, Comparison Method by Using Digital Temperature & Humidity Data Logger TWI-13	10°C to 50°C@50 %RH	0.90°C
13.	Indicator with Sensor of Environmental / Conditioning Chamber/Humidity Chamber/ Climate Chamber	Single Point Calibration Comparison Method by Using Digital Thermo-Hygrometer with Sensor TWI-10	10 % RH to 95 % RH@20°C to 70°C	0.70%RH

*** Expanded uncertainty expressed in coverage probability of approximately 95% (coverage factor K=2)**

Himanshu

Dealing Officer