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 HARIOM INSTRU-LABS.

Kiosk No.20, Near Plot No.52, Opp SBI Bank (Naroda Ind Branch)
Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, 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-124

Issue Date: 07.05.2024 **Valid Until:** 06.05.2026

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 - 124)

Laboratory Name: M/s Hariom Instru-Labs
Kiosk No.20, Near Plot No.52, Opp SBI Bank (Naroda Ind Branch)
Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, India

Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
ALTERNATING CURRENT (SOURCE MODE)				
1	1 Phase Active AC Power@50 Hz (40 V to 1000 V, 0.1A to 20 A, 0.1 Pf Lag / Lead)	Using Multi-Product Calibrator by Direct Method	0.4 W to 20 kW	1.44 % to 0.177 %
2	1 Phase Active AC Power@50 Hz(40 V to 1000 V, 1A to 1000 A, UPF)	Using Multi-Product Calibrator with Current Coil by Direct Method	40 W to 1 MW	1.73 % to 0.36 %
3	AC Current @ 50 Hz	Using Multi-Product Calibrator with Current Coil by Direct Method	20 A to 1000 A	0.47 % to 0.36 %
4	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	29 µA to 300 µA	0.55 % to 0.18 %
5	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	300 µA to 3 mA	0.18 % to 0.12 %
6	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	3 mA to 30 mA	0.12 % to 0.055 %
7	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	30 mA to 300 mA	0.055 %
8	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	300 mA to 1 A	0.055 % to 0.073 %

Vikendra Parmar
Dealing Officer

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
9	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	1 A to 10 A	0.073 % to 0.095 %
10	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	10 A to 20 A	0.095 % to 0.17 %
11	AC High Voltage @ 50 Hz	Using High Voltage probe with DMM by Direct Method	1 kV to 28 kV	5.998 % to 6.805 %
12	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	1 mV to 300 mV	0.88 % to 0.05 %
13	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	300 mV to 3 V	0.05 %
14	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	3 V to 30 V	0.05 %
15	AC Voltage @ 50 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	30 V to 300 V	0.05 % to 0.024 %
16	AC Voltage @ 50 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	300 V to 1000 V	0.024 % to 0.068 %
17	Capacitance @ 1 kHz	Using Multi-Product Calibrator by Direct Method	220 pF to 3 nF	5.87 % to 0.968 %
18	Capacitance @ 1 kHz	Using Multi-Product Calibrator by Direct Method	3 nF to 100 nF	0.968 % to 0.416 %
19	Capacitance upto 100 nF @ 1kHz & 1uF to 3uF @ 100 Hz	Using Multi-Product Calibrator by Direct Method	100 nF to 3 µF	0.417 %
20	Capacitance @ 100 Hz	Using Multi-Product Calibrator by Direct Method	3 µF to 30 µF	0.417 % to 0.586 %
21	Capacitance @ 100 Hz	Using Multi-Product Calibrator by Direct Method	30 µF to 100 µF	0.586 % to 0.643 %
22	Inductance @ 1kHz	Using Inductance Box by Direct Method	100 µH to 1 H	1.17 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
23	Power Factor @ 50 Hz (40 V to 1000 V, 0.1A to 20 A)	Using Multi-Product Calibrator by Direct Method	0.01 Lag PF to UPF	0.003 PF to 0.002 PF
24	Power Factor @ 50 Hz (40 V to 1000 V, 0.1A to 20 A)	Using Multi-Product Calibrator by Direct Method	UPF to 0.01 Lead PF	0.002 PF to 0.003 PF
ALTERNATING CURRENT (MEASURE MODE)				
1	1 & 3 Phase Active AC Power @40 Hz to 60 Hz(40 V to 600 V, 0.5 A to 80 A,0.1 PF to UPF lead/lag)	Using 3 phase power analyzer by Direct/Comparison Method	2 W to 48000 W	2.32 % to 0.35 %
2	AC Current @50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	30 µA to 1 mA	0.49 % to 0.17 %
3	AC Current @50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 mA to 100 mA	0.17 %
4	AC Current @50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 mA to 1 A	0.17 %
5	AC Current @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 A to 10 A	0.17 % to 0.25 %
6	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 mV to 100 mV	4.73 % to 0.12 %
7	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 mV to 10 V	0.12 % to 0.104 %
8	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	10 V to 100 V	0.104 % to 0.105 %
9	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 V to 1000 V	0.105 % to 0.10 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
10	AC Voltage @ 40 Hz to 60 Hz	Using 3 phase power analyzer by Direct/Comparison Method	40 V to 600 V	0.17 % to 0.18 %
11	AC Current @ 40 Hz to 60 Hz	Using 3 phase power analyzer by Direct/Comparison Method	0.5 A to 80 A	0.18 % to 0.08 %
12	Power Factor @ 50 Hz (40 V to 600 V, 0.5 A to 80 A)	Using 3 phase power analyzer by Direct/Comparison Method	0.1 Lag PF to UPF	0.002 PF to 0.002 PF
13	Power Factor @ 50 Hz (40 V to 600 V, 0.5 A to 80 A)	Using 3 phase power analyzer by Direct/Comparison Method	UPF to 0.1 Lead PF	0.002 PF to 0.002 PF
Direct CURRENT (Source MODE)				
1	DC Current	Using Multi-Product Calibrator by Direct Method	1 µA to 300 µA	2.33 % to 0.026 %
2	DC Current	Using Multi-Product Calibrator by Direct Method	300 µA to 3 mA	0.026 % to 0.014 %
3	DC Current	Using Multi-Product Calibrator by Direct Method	3 mA to 30 mA	0.014 %
4	DC Current	Using Multi-Product Calibrator by Direct Method	30 mA to 300 mA	0.014 % to 0.0129 %
5	DC Current	Using Multi-Product Calibrator by Direct Method	300 mA to 1 A	0.0129 % to 0.028 %
6	DC Current	Using Multi-Product Calibrator by Direct Method	1 A to 10 A	0.028 % to 0.064 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
7	DC Current	Using Multi-Product Calibrator by Direct Method	10 A to 20 A	0.064 % to 0.12 %
8	DC Current	Using Multi-Product Calibrator with Current Coil by Direct Method	20 A to 1000 A	0.59 %
9	DC Power (10 V to 1000 V,1A to 20 A)	Using Multi-Product Calibrator by Direct Method	10 W to 20 kW	0.056 % to 0.114 %
10	DC Voltage	Using Multi-Product Calibrator by Direct Method	1 mV to 300 mV	0.12 % to 0.0029 %
11	DC Voltage	Using Multi-Product Calibrator by Direct Method	300 mV to 3 V	0.0029 % to 0.0015 %
12	DC Voltage	Using Multi-Product Calibrator by Direct Method	3 V to 30 V	0.0015 % to 0.0017 %
13	DC Voltage	Using Multi-Product Calibrator by Direct Method	30 V to 300 V	0.0017 % to 0.0025 %
14	DC Voltage	Using Multi-Product Calibrator by Direct Method	300 V to 1000 V	0.0025 %
15	Low resistance	Using Low Resistance Jig by Direct Method	1 Mohm to1000 ohm	0.74 % to 0.23 %
16	High resistance	Using High Precision Megohm Box by Direct Method	10 Mohm to1 Tohm	0.817 % to 5.862 %
17	Resistance	Using Multi-Product Calibrator by Direct Method	1 ohm to 32.9 ohm	0.0582 % to 0.013 %
18	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 ohm to 32.9 kohm	0.013 % to 0.0038 %
19	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 kohm to 1 Mohm	0.0038 % to 0.0042 %
20	Resistance	Using Multi-Product Calibrator by Direct Method	1 Mohm to 32.9 Mohm	0.0042 % to 0.00577 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
21	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 Mohm to 329 Mohm	0.0577 % to 0.361 %
22	Resistance	Using Multi-Product Calibrator by Direct Method	329 Mohm to 1000 Mohm	0.361 % to 1.758 %
Direct CURRENT (MEASURE MODE)				
1	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	10 µA to 1 mA	0.36 % to 0.07 %
2	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	1 mA to 100 mA	0.07 %
3	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	100 mA to 1 A	0.07 % to 0.08 %
4	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	1 A to 10 A	0.08 % to 0.18 %
5	DC High Current	Using DC shunt with Digital Multimeter by Direct Method	10 A to 600 A	1 % to 1.17 %
6	DC High Voltage	Using High Voltage probe with DMM by Direct Method	1 kV to 40 kV	3.241 % to 3.531 %
7	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	1 mV to 100 mV	0.41 % to 0.008 %
8	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	100 mV to 10 V	0.008 % to 0.004 %
9	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	10 V to 100 V	0.004 % to 0.005 %
10	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	100 V to 1000 V	0.005 % to 0.006 %
11	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 ohm to 1000 Ohm	0.36 % to 0.013 %
12	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 kohm to 100 kohm	0.012 % to 0.013 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
13	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	100 kohm to 1 Mohm	0.012 % to 0.013 %
14	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 Mohm to 100 Mohm	0.013 % to 0.94 %
15	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	100 Mohm to 1 Gohm	0.94 % to 2.394 %
Electrical Equipment (Source Mode)				
1	Oscilloscope (DC Signal)	Using Multi-Product Calibrator by Direct Method	1 mV to 130 V	4.71 % to 0.08 %
2	Oscilloscope, Amplitude, Square Wave Signal @ 1kHz	Using Multi-Product Calibrator by Direct Method	1 mV to 130 V	4.76 % to 0.13 %
3	Oscilloscope, Band Width (100 mV to 5 V)	Using Multi-Product Calibrator by Direct Method	50 kHz to 600 MHz	7.79 %
4	Oscilloscope, Time Marker	Using Multi-Product Calibrator by Direct Method	2 ns to 5 s	0.05 % to 0.59 %
Electrical Equipment (Measure Mode)				
1	1 & 3 Phase Active Energy @50 Hz (240 V, 0.01 A to 100 A, 0.8 PF to UPF lead/lag)	Using Accuchek by Direct & with CT Method	1.34 Wh to 28.8 kWh	0.579 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
Temperature Simulation (Source Mode)				
1	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1 °C to 1000 °C	0.37 °C
2	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to (-)100°C	0.61 °C
3	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) T-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to 0 °C	0.73°C
4	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) J-Type	Using Multi-Product Calibrator by Direct Method	(-)200 to (-)30°C	0.32 °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)

	Thermocouple			
5	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to 1000 °C	0.39 °C
6	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder)L-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to (-)100 °C	0.44 °C
7	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-) 200 °C to (-)100 °C	0.47 °C
8	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) R-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	3 °C to 250 °C	0.66 °C

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		Electro – Technical Calibration (Laboratory based)		
9	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) S-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	3 °C to 1750 °C	0.55 °C
10	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)199 °C to 0 °C	0.06 °C
11	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	601 °C to 1800 °C	0.52 °C to 0.39 °C
13	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1000 °C to 1800 °C	0.59 °C

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		Electro – Technical Calibration (Laboratory based)		
14	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1800 °C to 2300 °C	0.98 °C
15	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 650 °C	0.21 °C
16	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	650 °C to 1000 °C	0.26 °C
17	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)30 to 760 °C	0.22°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)		
18	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	760 °C to 1199 °C	0.28°C
19	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1000 °C to 1370 °C	0.47 °C
20	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) L-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 899 °C	0.31 °C
21	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 410 °C	0.27 °C

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		Electro – Technical Calibration (Laboratory based)		
22	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	410 °C to 1299 °C	0.32 °C
23	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) R-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	250 °C to 1750 °C	0.47 °C
24	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Multi-Product Calibrator by Direct Method	0 °C to 630 °C	0.14 °C
25	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Multi-Product Calibrator by Direct Method	630 °C to 800 °C	0.27 °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)		
26	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) T-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	0 °C to 399 °C	0.19 °C
Temperature Simulation (Measure Mode)				
1	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200°C to 800 °C	0.07 °C
2	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	600 °C to 1200 °C	0.76 °C
3	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.21 °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)		
4	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder)J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.24 °C
5	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.33 °C
6	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) L-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 800 °C	0.18 °C
7	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.49 °C

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Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, India

Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (Laboratory based)		
8	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) R-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0° C to 1750 °C	0.88 °C
9	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) S-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 300 °C	0.86 °C
10	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) T-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 400 °C	0.33 °C
11	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1200 °C to 1800 °C	0.76 °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)		
12	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.12 °C
13	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.14 °C
14	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1000 °C to 1200 °C	0.14 °C
15	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.17 °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)		
16	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1000 °C to 1300 °C	0.17 °C
17	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 500 °C	0.19 °C
18	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	500 °C to 1300 °C	0.18 °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)		
19	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) S-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	300 °C to 1750 °C	0.52 °C
Time & Frequency (SOURCE MODE)				
1	Frequency	Using Multi-Product Calibrator by Direct Method	1 Hz to 1000 Hz	0.116 % to 0.00049%
2	Frequency	Using Multi-Product Calibrator by Direct Method	1000 Hz to 100 kHz	0.00049 % to 0.00061 %
3	Frequency	Using Multi-Product Calibrator by Direct Method	100 kHz to 2 MHz	0.0006 % to 0.065 %
Time & Frequency (MEASURE MODE)				
1	Frequency	Using 3 phase power analyzer by Direct/Comparison Method	40 Hz to 60 Hz	0.08 %
2	Frequency (@ 1 VAC)	Using 6½ Digit Precision Multimeter by Direct Method	10 Hz to 1MHz	0.060 % to 0.016 %
3	Time	Using Digital Time Calibrator by Direct / Comparison method	100 ms to 9999 s	6 ms to 2.303 s
4	Time	Using Digital Time Calibrator by Direct / Comparison method	9999 s to 86400 s	2.303 s to 13.21 s

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
ALTERNATING CURRENT (SOURCE MODE)				
1	1 Phase Active AC Power@50 Hz(40 V to 1000 V, 0.1A to 20 A, 0.1 Pf Lag/Lead to 1UPF)	Using Multi-Product Calibrator by Direct Method	0.4 W to 20 kW	1.44 % to 0.177 %
4	1 Phase Active AC Power@50 Hz(40 V to 1000 V, 1A to 1000 A, UPF)	Using Multi-Product Calibrator with Current Coil by Direct Method	40 W to 1 MW	1.73 % to 0.36 %
6	AC Current @ 50 Hz	Using Multi-Product Calibrator with Current Coil by Direct Method	20 A to 1000 A	0.47 % to 0.36 %
7	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	29 µA to 300 µA	0.55 % to 0.18 %
8	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	300 µA to 3 mA	0.18 % to 0.12 %
9	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	3 mA to 30 mA	0.12 % to 0.055 %
10	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	30 mA to 300 mA	0.055 % to 0.055 %
11	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	300 mA to 1 A	0.055 % to 0.073 %
12	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	1 A to 10 A	0.073 % to 0.095 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
13	AC Current @ 50 Hz to 1 kHz	Using Multi-Product Calibrator by Direct Method	10 A to 20 A	0.095 % to 0.17 %
14	AC High Voltage @ 50 Hz	Using High Voltage probe with DMM by Direct Method	1 kV to 28 kV	5.998 % to 6.805 %
15	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	1 mV to 300 mV	0.88 % to 0.05 %
16	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	300 mV to 3 V	0.05 %
17	AC Voltage @ 10 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	3 V to 30 V	0.05 %
18	AC Voltage @ 50 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	30 V to 300 V	0.05 % to 0.024 %
19	AC Voltage @ 50 Hz to 10 kHz	Using Multi-Product Calibrator by Direct Method	300 V to 1000 V	0.024 % to 0.068 %
20	Capacitance @ 1 kHz	Using Multi-Product Calibrator by Direct Method	220 pF to 3 nF	5.87 % to 0.968 %
21	Capacitance @ 1 kHz	Using Multi-Product Calibrator by Direct Method	3 nF to 100 nF	0.968 % to 0.416 %
22	Capacitance upto 100 nF @ 1kHz & 1uF to 3uF @ 100 Hz	Using Multi-Product Calibrator by Direct Method	100 nF to 3 µF	0.416 % to 0.417 %
23	Capacitance @ 100 Hz	Using Multi-Product Calibrator by Direct Method	3 µF to 30 µF	0.417 % to 0.586 %

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		Electro – Technical Calibration (At Site)		
24	Capacitance @ 100 Hz	Using Multi-Product Calibrator by Direct Method	30 µF to 100 µF	0.586 % to 0.643 %
25	Inductance @ 1kHz	Using Inductance Box by Direct Method	100 µH to 1 H	1.17 %
26	Power Factor @ 50 Hz (40 V to 1000 V,0.1A to20 A)	Using Multi-Product Calibrator by Direct Method	0.01 Lag PF to UPF	0.003 PF to 0.002 PF
27	Power Factor @ 50 Hz (40 V to 1000 V,0.1A to 20 A)	Using Multi-Product Calibrator by Direct Method	UPF to 0.01 Lead PF	0.002 PF to 0.003 PF
ALTERNATING CURRENT (MEASURE MODE)				
1	1 & 3 Phase ActiveAC Power @40 Hz to 60 Hz(40 V to 600 V, 0.5 A to 80 A,0.1 PF to UPF lead/lag)	Using 3 phase power analyzer by Direct/Comparison Method	2 W to 48000 W	2.32 % to 0.35 %
2	AC Current @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	30 µA to 1 mA	0.49 % to 0.17 %
3	AC Current @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 mA to 100 mA	0.17 %
4	AC Current @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 mA to 1 A	0.17 %
5	AC Current @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 A to 10 A	0.17 % to 0.25 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
6	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	1 mV to 100 mV	4.73 % to 0.12 %
7	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 mV to 10 V	0.12 % to 0.104 %
8	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	10 V to 100 V	0.104 % to 0.105 %
9	AC Voltage @ 50 Hz	Using 6½ Digit Precision Multimeter by Direct Method	100 V to 1000 V	0.105 % to 0.10 %
10	AC Voltage @ 40 Hz to 60 Hz	Using 3 phase power analyzer by Direct/Comparison Method	40 V to 600 V	0.17 % to 0.18 %
11	AC Current @ 40 Hz to 60 Hz	Using 3 phase power analyzer by Direct/Comparison Method	0.5 A to 80 A	0.18 % to 0.08 %
12	Power Factor @ 50 Hz(40 V to 600 V, 0.5 A to 80 A)	Using 3 phase power analyzer by Direct/Comparison Method	0.1 Lag PF to UPF	0.002 PF
13	Power Factor @ 50 Hz (40 V to 600 V, 0.5 A to 80 A)	Using 3 phase power analyzer by Direct/Comparison Method	UPF to 0.1 Lead PF	0.002 PF
Direct CURRENT (Source MODE)				
1	DC Current	Using Multi-Product Calibrator by Direct Method	1 µA to 300 µA	2.33 % to 0.026 %
2	DC Current	Using Multi-Product Calibrator by Direct Method	300 µA to 3 mA	0.026 % to 0.014 %
3	DC Current	Using Multi-Product Calibrator by Direct Method	3 mA to 30 mA	0.014 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
4	DC Current	Using Multi-Product Calibrator by Direct Method	30 mA to 300 mA	0.014 % to 0.0129 %
5	DC Current	Using Multi-Product Calibrator by Direct Method	300 mA to 1 A	0.0129 % to 0.028 %
6	DC Current	Using Multi-Product Calibrator by Direct Method	1 A to 10 A	0.028 % to 0.064 %
7	DC Current	Using Multi-Product Calibrator by Direct Method	10 A to 20 A	0.064 % to 0.12 %
8	DC Current	Using Multi-Product Calibrator with Current Coil by Direct Method	20 A to 1000 A	0.59 %
9	DC Power (10 V to 1000 V,1A to 20 A)	Using Multi-Product Calibrator by Direct Method	10 W to 20 kW	0.056 % to 0.114 %
10	DC Voltage	Using Multi-Product Calibrator by Direct Method	1 mV to 300 mV	0.12 % to 0.0029 %
11	DC Voltage	Using Multi-Product Calibrator by Direct Method	300 mV to 3 V	0.0029 % to 0.0015 %
12	DC Voltage	Using Multi-Product Calibrator by Direct Method	3 V to 30 V	0.0015 % to 0.0017 %
13	DC Voltage	Using Multi-Product Calibrator by Direct Method	30 V to 300 V	0.0017 % to 0.0025 %
14	DC Voltage	Using Multi-Product Calibrator by Direct Method	300 V to 1000 V	0.0025 %
15	Low resistance	Using Low Resistance Jig by Direct Method	1 mohm to 1000 ohm	0.74 % to 0.23 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
16	High resistance	Using High Precision Megohm Box by Direct Method	10 Mohm to 1 Tohm	0.816 % to 5.862 %
17	Resistance	Using Multi-Product Calibrator by Direct Method	1 ohm to 32.9 ohm	0.0582 % to 0.013 %
18	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 ohm to 32.9 kohm	0.013 % to 0.0038 %
19	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 kohm to 1 Mohm	0.0038 % to 0.0042 %
20	Resistance	Using Multi-Product Calibrator by Direct Method	1 Mohm to 32.9 Mohm	0.0042 % to 0.0577 %
21	Resistance	Using Multi-Product Calibrator by Direct Method	32.9 Mohm to 329 Mohm	0.0577 % to 0.361 %
22	Resistance	Using Multi-Product Calibrator by Direct Method	329 Mohm to 1000 Mohm	0.361 % to 1.758 %
Direct CURRENT (MEASURE MODE)				
4	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	10 µA to 1 mA	0.36 % to 0.07 %
5	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	1 mA to 100 mA	0.07 %
6	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	100 mA to 1 A	0.07 % to 0.08 %
7	DC Current	Using 6½ Digit Precision Multimeter by Direct Method	1 A to 10 A	0.08 % to 0.18 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Electro – Technical Calibration (At Site)		
8	DC High Current	Using DC shunt with Digital Multimeter by Direct Method	10 A to 600 A	1 % to 1.17 %
9	DC High Voltage	Using High Voltage probe with DMM by Direct Method	1 kV to 40 kV	3.241 % to 3.531 %
10	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	1 mV to 100 mV	0.41 % to 0.008 %
11	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	100 mV to 10 V	0.008 % to 0.004 %
12	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	10 V to 100 V	0.004 % to 0.005 %
13	DC Voltage	Using 6½ Digit Precision Multimeter by Direct Method	100 V to 1000 V	0.005 % to 0.006 %
14	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 ohm to 1000 Ohm	0.36 % to 0.013 %
15	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 kohm to 100 Kohm	0.013 %
16	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	100 kohm to 1 Mohm	0.012 % to 0.013 %
17	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	1 Mohm to 100 Mohm	0.013 % to 0.94 %
18	Resistance	Using 6½ Digit Precision Multimeter by Direct Method	100 Mohm to 1 Gohm	0.94 % to 2.394 %

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		Electro – Technical Calibration (At Site)		
Electrical Equipment (Source Mode)				
1	Oscilloscope (DC Signal)	Using Multi-Product Calibrator by Direct Method	1 mV to 130 V	4.71 % to 0.08 %
2	Oscilloscope, Amplitude, Square Wave Signal @1kHz	Using Multi-Product Calibrator by Direct Method	1 mV to 130 V	4.76 % to 0.13 %
3	Oscilloscope, Band Width (100 mV to 5 V)	Using Multi-Product Calibrator by Direct Method	50 kHz to 600 MHz	7.79 %
4	Oscilloscope, Time Marker	Using Multi-Product Calibrator by Direct Method	2 ns to 5 s	0.05 % to 0.59 %
Electrical Equipment (Measure Mode)				
1	1 & 3 Phase Active Energy @50 Hz (240 V 0.01 A to 100 A, 0.8 PF to UPF lead/lag)	Using Accuchek by Direct & with CT Method	1.34 Wh to 28.8 kWh	0.579 %
Temperature Simulation (Source Mode)				
1	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1 °C to 1000 °C	0.37 °C

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		Electro – Technical Calibration (At Site)		
2	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to (-)100°C	0.61 °C
3	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) T-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to 0 °C	0.73°C
4	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) J-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 to (-)30°C	0.32 °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)		
5	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to 1000 °C	0.39 °C
6	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder)L-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)200 °C to (-)100 °C	0.44 °C
7	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-) 200 °C to (-)100 °C	0.47 °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)		
8	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) R-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	3 °C to 250 °C	0.66 °C
9	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Processmeter & Recorder) S-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	3 °C to 1750 °C	0.55 °C
10	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)199 °C to 0 °C	0.06 °C

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		Electro – Technical Calibration (At Site)		
11	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	601 °C to 1800 °C	0.52 °C to 0.39 °C
13	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1000 °C to 1800 °C	0.59 °C
14	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) C-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1800 °C to 2300 °C	0.98 °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)		
15	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 650 °C	0.21 °C
16	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	650 °C to 1000 °C	0.26 °C
17	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)30 to 760 °C	0.22°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)		
18	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	760 °C to 1199 °C	0.28°C
19	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	1000 °C to 1370 °C	0.47 °C
20	Temperature Simulation (Indicator/Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) L-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 899 °C	0.31 °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)		
21	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	(-)100 °C to 410 °C	0.27 °C
22	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	410 °C to 1299 °C	0.32 °C
23	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) R-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	250 °C to 1750 °C	0.47 °C

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		Electro – Technical Calibration (At Site)		
24	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Multi-Product Calibrator by Direct Method	0 °C to 630 °C	0.14 °C
25	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Multi-Product Calibrator by Direct Method	630 °C to 800 °C	0.27 °C
26	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) T-Type Thermocouple	Using Multi-Product Calibrator by Direct Method	0 °C to 399 °C	0.19 °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)		
Temperature Simulation (Measure Mode)				
1	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) RTD-Type	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200°C to 800 °C	0.07 °C
2	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	600 °C to 1200 °C	0.76 °C
3	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.21 °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)		
4	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder)J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.24 °C
5	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.33 °C
6	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) L-Type,Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 800 °C	0.18 °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)		
7	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 0 °C	0.49 °C
8	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) R-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0°C to 1750 °C	0.88 °C
9	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) S-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 300 °C	0.86 °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)		
10	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) T-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	(-)200 °C to 400 °C	0.33 °C
11	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) B-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1200 °C to 1800 °C	0.76 °C
12	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) E-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.12 °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)		
13	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.14 °C
14	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) J-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1000 °C to 1200 °C	0.14 °C
15	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 1000 °C	0.17 °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)		
16	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) K-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	1000 °C to 1300 °C	0.17 °C
17	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	0 °C to 500 °C	0.19 °C
18	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) N-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	500 °C to 1300 °C	0.18 °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)		
19	Temperature Simulation (Indicator /Controller, PID, Data logger, Scanner, Calibrator, Process meter & Recorder) S-Type Thermocouple	Using Super DAQ Precision Temperature Scanner by Direct Method	300 °C to 1750 °C	0.52°C
Time & Frequency (SOURCE MODE)				
1	Frequency	Using Multi-Product Calibrator by Direct Method	1 Hz to 1000 Hz	0.116 % to 0.00049 %
2	Frequency	Using Multi-Product Calibrator by Direct Method	1000 Hz to 100 kHz	0.00049 % to 0.00061 %
3	Frequency	Using Multi-Product Calibrator by Direct Method	100 kHz to 2 MHz	0.0006 % to 0.065 %
Time & Frequency (Measure Mode)				
1	Frequency	Using 3 phase power analyzer by Direct/Comparison Method	40 Hz to 60 Hz	0.08 %
2	Frequency (@1 VAC)	Using 6½ Digit Precision Mustimeter by Direct Method	10 Hz to 1 MHz	0.060% to 0.016 %
3	Time	Using Digital Time Calibrator By Direct / Comparison method	100 ms to 9999 s	6 ms to 2.303 s
4	Time	Using Digital Time Calibrator By Direct / Comparison method	9999 s to 86400 s	2.303 s to 13.228 s

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Fluid Flow Calibration (At Site)		
1	Digital / Analog Water Flow Meter / Flow Totalizer	Using Ultrasonic Flow Meter by Comparison Method	1.1 m3/hr to 2400 m3/hr	1 %

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
Group : Acceleration And Speed				
1	Tachometer/Stroboscope / Centrifuge / RPM Source / Slip Speed Meter	Using Digital Tachometer by Comparison Method	10 rpm to 15000 rpm	4.30 % to 0.03%
2	Tachometer, RPM Meter & Speed Measurement (Contact Type)	Using RPM source and Master Tachometer by Comparison method	10 rpm to 8000 rpm	4.30 % to 0.03 %
3	Tachometer, RPM Meter (Non-Contact Type)	Using RPM source and Master Tachometer by Comparison Method	10 rpm to 99950 rpm	4.30 % to 0.02 %
Group : Acoustics				
1	Sound Level Meter	Using Sound Level Calibrator by Direct Method	94 dB & 114 dB @ 1 kHz	0.4 dB
Group: Density and Viscosity				
1	Viscosity Cup / Flow Cups	Using Liquid Of Known Kinematic Viscosity & Timer as per IS 3944:1982	30 cst to 240 cst	1.52%
Group: Dimension (Basic Measuring Instrument, Gauge etc.)				
1	Bench Center (Coaxiality of Center)	Using Plunger Dial Indicator & Cylindrical Test Mandrel by Comparison method	200 mm to 600 mm	10 µm
2	Bench Center (Parallelism)	Using Plunger Dial Indicator & Taper Test Mandrel by Comparison method	100 mm to 300 mm	7.2 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
3	Bevel Protractor, L.C. 0.01°	Using Angle Gauge Set by Comparison method	0° - 90° - 0°	1.6'
4	Bore Gauge with Dial (Transmission Error) L.C.:1 µm	Using Length Measuring Machine by Comparison method	0 to 1 mm	1.42 µm
5	Bore Gauge with Dial (Transmission Error) L.C.:1 µm	Using Dial Calibration Tester by Comparison method	0 to 1 mm	3.0 µm
6	Calibration Blocks for use in Ultrasonic Non-Destructive Testing (IIW V1 & V2 BLOCK)(Linear)	Using Vision Measuring Machine by Comparison method	1.5 mm to 206 mm	6.1 µm
7	Calibration Blocks for use in Ultrasonic Non-Destructive Testing(IIW V1 & V2 BLOCK) (Angular)	Using Vision Measuring Machine by Comparison method	20 ° to 60 °	2.2'
8	Calibration Blocks for use in Ultrasonic Non-Destructive Testing(IIW V1 & V2 BLOCK) (Radius)	Using Vision Measuring Machine by Comparison method	25 mm to 100 mm	6.1 µm
9	Caliper Vernier (Dial, Digital) L.C.10µm	Using Caliper Checker, Slip Gauge Set by comparison method	0 to 600 mm	11.3 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
10	CD,PCD Gauge	Using Vision Measuring Machine by Comparison method	20 mm to 150 mm	6.1 µm
11	Chamfer Gauge (Angle)	Using Vision Measuring Machine by Comparison method	0.5 ° to 45 °	2.2'
12	Chamfer Gauge (Length)	Using Vision Measuring Machine by Comparison method	0.5 mm to 5 mm	9.5 µm
13	Coating Thickness Gauge L.C. 0.1µm	Using Master Foils by comparison method	10 µm to 1000 µm	1.12 µm
14	Coating Thickness Gauge L.C. 1µm & Coarser	Using Master Foils by comparison method	0.01 mm to 5 mm	1.8 µm
15	Coating Thickness Gauge L.C.:10 µm & Coarser	Using Master Foils by comparison method	0.01 mm to 5.3 mm	7.5 µm
16	Cross Hatch Cutter (Angle)	Using Vision Measuring Machine by Comparison method	45 °	11.3'
17	Cross Hatch Cutter (Pitch)	Using Vision Measuring Machine by Comparison method	1 mm to 3 mm	9.7 µm
18	Cube Mould (L x W x H)	Using Vision Measuring Machine & Digital Height Gauge by Comparison method	50 x 50 x 50 mm to 150 x 150 x 150 mm	37.85 µm
19	Cylindrical Measuring Pin Gauge set	Using Length Measuring Machine by Comparison method	0 to 20 mm	0.7 µm
20	Degree Protractor / Angle Protractor /	Using Angle Gauge Set by Comparison method	0-90°-0	1.6'

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Mechanical Calibration (Laboratory Based)

	Combination Set L.C. 0.01°			
21	Depth Gauge (Vernier, Dial, Digital) L.C.:10µm	Using Slip Gauge Set, Length Bar Set & Surface Plate by Comparison method	0 to 300 mm	7.10 µm
22	Depth Gauge (Vernier, Dial, Digital)L.C.:10µm	Using Slip Gauge Set, Length Bar Set & Surface Plate by Comparison method	0 to 600 mm	8.2 µm
23	Depth Micrometer L.C.:1µm	Using Slip Gauge Set, Length Bar Set by Comparison method	0 to 300 mm	4.0 µm
24	Dial Indicator - Lever (Dial, Digital) L.C.:1 µm	Using Length Measuring Machine by Comparison method	0 to 0.14 mm	0.9 µm
25	Dial Indicator - Lever (Dial, Digital) L.C.10 µm	Using Length Measuring Machine by Comparison method	0 to 1.4 mm	3.0 µm
26	Dial Indicator - Plunger (Dial, Digital) L.C.:1 µm	Using Length Measuring Machine by Comparison method	0 to 25 mm	0.9 µm
27	Dial Indicator - Plunger (Dial, Digital) L.C.:1 µm	Using Dial Calibration Tester by Comparison method	0 to 25 mm	3.0 µm
28	Dial Indicator -Lever (Dial, Digital) L.C.:10 µm	Using Dial Calibration Tester by Comparison method	0 to 1.4 mm	4.1 µm
29	Engineering Square / Right Angle / Try Square (Parallelism)	Using Surface Plate, Granite Square, Slip Gauge Set & Dial Indicator By Comparison method	50 mm to 300 mm	9.08 µm

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		Mechanical Calibration (Laboratory Based)		
30	Engineering Square / Right Angle / Try Square (Squareness)	Using Surface Plate, Granite Square, Slip Gauge Set & Dial Indicator by Comparison method	50 mm to 300 mm	8.01 µm
31	Engineering Square / Right Angle / Try Square (Straightness)	Using Surface Plate, Granite Square, Slip Gauge Set & Dial Indicator by Comparison method	50 mm to 300 mm	8.01 µm
32	External Micrometer L.C.:10 µm	Using Slip Gauge Set, Length Bar set by Comparison method	300 to 1000 mm	8.5 µm
33	External Micrometer (Digital, Analog) L.C.:1µm	Using Slip Gauge Set, Length Bar set by Comparison method	0 to 300 mm	2.8 µm
34	Feeler Gauge	Using Length Measuring Machine by Comparison method	0.01 mm to 1 mm	0.75 µm
35	Height Gauge (Vernier, Dial, Digital)L.C.:10µm	Using Caliper Checker,Slip Gauge Set,Surface Plate & Length Bar Set by Comparison method	0 to 1000 mm	13.8 µm
36	Height Gauge(Vernier, Dial, Digital)L.C.10µm	Using Caliper Checker,Slip Gauge Set, Surface Plate & Length Bar set by comparison method	0 to 600 mm	11.8 µm
37	Inside Dial Caliper L.C.:10µm	Using Slip Gauge Set by Comparison method	5 mm to 80 mm	6.7 µm

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		Mechanical Calibration (Laboratory Based)		
38	Inspection Jig & Fixture /Receiving Gauge /Moulds/Limit Gauges/ Profile Gauge/Relation Gauge/Concentricity Gauge/Flush Pin Gauge/ weld Fillet Gauge/Width Gauge/Flakiness Gauge/ Elongation Gauge /Plain Work Piece/Templates	Using Vision Measuring Machine, Length Measuring Machine, Digital Height Gauge& Digital Vernier Caliper by Comparison method	upto 250 x 150 mm	7.59 µm
39	Internal Micrometer (Fixed Road / Stick Type)	Using Length Measuring Machine & Slip Gauge Set & Length bars by Comparison method	13 mm to 600 mm	7.4 µm
40	Internal Micrometer (Setting Head)	Using Length Measuring Machine & Slip Gauge Set by Comparison method	Upto 25 mm	6.5 µm
41	Laser Distance Meter L.C.0.10 mm	Using Slip Gauge Set & Length Bar by Comparison Method	60 mm to 600 mm	663.34 µm
42	Measuring Tape, Pie Tape, Circumference Tape	Using Tape & Scale Measuring Machine by Comparison method	0 to 50 m	118.6 (SQRT(L)) µm,L in meter
43	Micrometer Setting Standard	Using Length Measuring Machine & Slip Gauge Set by Comparison method	25 mm to 600 mm	4.0 µm

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		Mechanical Calibration (Laboratory Based)		
44	Outside Dial Caliper, Pistol Caliper L.C.:0.1 mm	Using Slip Gauge Set by Comparison method	10 mm to 100 mm	59.3 µm
45	Plain Plug Gauge, OD Master	Using Length Measuring Machine by Comparison method	2 mm to 225 mm	1.4 µm
46	Plain Ring Gauge	Using Length Measuring Machine & Master Setting Ring by Comparison method	3 mm to 255 mm	2.11 µm
47	Plunger Indicator (Dial, Digital) L.C.10 µm	Using Length Measuring Machine by Comparison method	0 to 50 mm	5.8 µm
48	Radius Gauge (Parameter : Radius)	Using Vision Measuring Machine by Comparison method	0.25 mm to 40 mm	7.2 µm
49	Rail Piece(Angular)	Using Vision Measuring Machine by Comparison method	0 ° to 60 °	9.3 '
50	Rail Piece(Linear)	Using Vision Measuring Machine by Comparison method	0 to 300 mm	7.6 µm
51	Slump Cone (Diameter)	Using Vision Measuring Machine, Digital Vernier Caliper & Digital Height gauge by Comparison method	100 mm to 200 mm	38.96 µm
52	Slump Cone (Height)	Using Vision Measuring Machine & Digital Height Gauge by Comparison method	100 mm to 300	38.85 µm
53	Snap Gauge	Using Slip Gauge Set by Comparison method	2 mm to 300 mm	1.2 µm

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Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
54	Spirit Level / Frame Level (Type 1,2 & 3) L.C.: 0.02 mm/m	Using Sine Bar, Slip Gauge Set & Surface Plate by Comparison Method	100 mm to 300 mm	17.7 µm/m
55	Standard Foils / Thickness Foils / Calibration Foils	Using Length Measuring Machine by Comparison method	10 microns to 6 mm	0.80 µm
56	Standard Wire Gauge	Using Vision Measuring Machine by Comparison method	0.5 mm to 10 mm	6.0 µm
57	Straight Edge (Parallelism)	Using Plunger Dial Indicator, Surface Plate by Comparison Method	50 mm to 300 mm	8.4 µm
58	Straight Edge (Straightness)	Using Plunger Dial Indicator, Surface Plate by Comparison Method	50 mm to 300 mm	7.7 µm
59	Surface Plate (Granite / Cast Iron)	Using Electronic Level by Direct Method	300 X 300 (L x W) mm to 6000 X 6000 (L x W) mm	1.0 (SQRT(L+W)/125) µm (L & W in mm)
60	Taper Plain Plug Gauge: (Diameter)	Using Length Measuring Machine & Cylindrical Measuring Pin by Comparison method	5 mm to 150 mm	2.07 µm
61	Taper Scale	Using Vision Measuring Machine by Comparison method	1 mm to 15 mm	14.3 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
62	Taper Thread Plug Gauge: (Effective Diameter)	Using Length Measuring Machine & Thread Measuring Wire by Comparison Method	8 mm to 200 mm	3.11 µm
63	Test Sieves	Using Vision Measuring Machine by Comparison method	32 µm to 5 mm	7.5 µm
64	Test Sieves	Using Digital Vernier Caliper by Comparison method	5 mm to 125 mm	37.0 µm
65	Thickness Gauge(Dial, Digital)L.C.1 µm	Using Slip Gauge Set by Comparison method	0 mm to 1 mm	1.1 µm
66	Thickness Gauge(Dial, Digital)L.C.1 µm	Using Slip Gauge Set by Comparison method	0 mm to 12.7 mm	6.4 µm
67	Thread Measuring Wire / Cylindrical Measuring Pin	Using Length Measuring Machine by Comparison method	0.17 mm to 6.36 mm	0.7 µm
68	Thread Pitch Gauge (Pitch)	Using Vision Measuring Machine by Comparison Method	0.25 mm to 7 mm	6.3 µm
69	Thread Pitch Gauge (Angle)	Using Vision Measuring Machine by Comparison Method	55° to 60 °	3'
70	Thread Plug Gauge (Effective Diameter)	Using Length Measuring Machine, Thread Measuring Wire by Comparison Method	2 mm to 200 mm	2.47 µm
71	Thread Ring Gauge (Effective Diameter)	Using Length Measuring Machine & Master Setting Ring by Comparison Method	2 mm to 100 mm	2.01 µm

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
72	Three Point Micrometer L.C.1 µm	Using Master Setting Ring Gauge Set by Comparison method	6 mm to 50 mm	6.74 µm
73	Ultrasonic Thickness Gauge L.C.10µm	Using Slip Gauge Set, Length Bar set by comparison method	1 mm to 200 mm	7.3 µm
74	V Block Parallelism	Using Plunger Dial Indicator, Mandrel & Surface Plate by Comparison Method	30 mm to 150 mm	8.3 µm
75	V Block Squareness	Using Slip Gauge Set, Granite Square & Surface Plate by Comparison method	30 mm to 150 mm	8.9 µm
76	V Block Symmetry	Using Plunger Dial Indicator, Mandrel & Surface Plate by Comparison Method	30 mm to 150 mm	8.4 µm
77	Weld Gauge / Bridge Cam Gauge / Hi-Lo Gauge (Angle)	Using Vision Measuring Machine by Comparison method	5 Degree to 60 °	35'
78	Weld Gauge / Bridge Cam Gauge / Hi-Lo Gauge (Length)	Using Vision Measuring Machine by Comparison method	1 mm to 60 mm	115.7 µm
79	Wet Film Thickness Gauge	Using Vision Measuring Machine by Comparison method	25 micron to 3000 µm	6.08 µm

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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 (Precision Instruments)				
1	Surface Roughness Tester(Portable & Standalone)-roughness Measurement	Using Surface Roughness Specimens (3 Nos.) by Comparison Method	Ra 3.35 µm	8.1 %
2	Tape and Scale Calibrator L.C 0.001 mm	Using Slip Gauge Set, Length Bars by Comparison method	0 to 1000 mm	7.8 µm
3	Vision Measuring Machine / Profile Projector / Measuring Microscope (Angular)	Using Angular Glass Scale by Comparison method	0 to 360 °	14.7 "
4	Vision Measuring Machine / Profile Projector / Measuring Microscope (Linear)	Using Glass Scale by Comparison method	0 to 250 mm	2.5 µm
Group: Durometer				
1	Rubber Hardness Tester / Shore Hardness Tester / Durometer (Dial / Digital)	Using Dial Calibration Tester with Fixture by Indentation Depth Method	0 to 100 Shore	0.2 Shore
Group: Hardness Testing machines				
4	Verification of Leeb (Dynamic, Portable) Hardness Testing Machine by Indirect Method	Using Standard Hardness Blocks as per ASTM A-956:2017 by Indirect Verification Method	785 HLD	17 HLD

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
	Mechanical Calibration (Laboratory Based)			
Group: Pressure Balance or Dead Weight Tester				
1	Dead Weight Tester	Using Hydraulic Dead Weight Tester by Cross Float Method, As per Euramet cg-3:2011	20 bar to 700 bar	0.012 %
2	Dead Weight Tester	Using Hydraulic Dead Weight Tester by Cross Float Method, As per Euramet cg-3:2011	6 bar to 35 bar	0.012 %
Group: Pressure Indicating Devices				
1	Hydraulic Pressure Gauge (Digital & Dial),Pressure Calibrator,Pressure Module, Pressure Transmitter, Transducer & Switch,Logger / Recorder with Indicator	Using Standard Dead Weight Tester, Digital Mustimeter by Direct Method as per DKD R-6-1:2014	1 bar to 35 bar	0.012 % of Rdg.
2	Hydraulic Pressure Gauge (Digital & Dial),Pressure Calibrator,Pressure Module, Pressure Transmitter, Transducer & Switch,Logger / Recorder with Indicator	Using Standard Dead Weight Tester, Digital Mustimeter by Direct Method as per DKD R-6-1:2014	35 bar to 700 bar	0.012 % of 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	Hydraulic Pressure Gauge Digital/Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD R-6-1:2014	0 to 1000 bar	0.25 bar
4	Hydraulic Pressure Gauge (Digital/Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD R-6-1:2014	0 to 70 bar	0.02 bar
5	Hydraulic Pressure Gauge(Digital/Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD R-6-1:2014	0 to 700 bar	0.14 bar
6	Pneumatic Pressure Gauge (Digital / Analogue),Transducer,Transmitter,Manometer,Switch,Indicator,Recorder,Differential Pressure Transmitter	Using Digital Pressure Gauge & Calibrator with Pneumatic Comparator Pump, Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD R-6-1:201417.1	0 to 2 bar	0.001 bar

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
7	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter, Differential Pressure Switch, Pressure Transmitter, Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Using Digital Micro manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison method as per DKD R-6-1:2014	10 Pa to 3500 Pa	14.11 Pa
8	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter, Differential Pressure Switch, Pressure Transmitter, Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Using Digital Manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison method per D DKD R-6-1:2014	0 to 98 mbar	0.062 mbar

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
9	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter, Differential Pressure Switch, Pressure Transmitter, Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Using Digital Manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison method as per DKD R-6-1:2014	0 to 980 mbar	0.88 mbar
10	Pressure Gauge (Digital/Analogue), Transducer, Transmitter, Switch, Compound Gauge, Indicator, Recorder, Differential Pressure Transmitter	Using Digital Pressure Gauge & Calibrator with Pneumatic Comparator, Pressure Calibrator, Digital Mustimeter by Comparison Method Pump as per DKD R-6-1:2014	0 to 14 bar	0.0022 bar
11	Pressure Gauge (Digital/Analogue), Transducer, Transmitter, Switch, Compound Gauge, Indicator, Recorder, Differential Pressure Transmitter	Using Portable Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD R-6-1:2014	0 to 20 bar	0.008 bar

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
12	Vacuum Gauge (Digital/Analogue) Differential Pressure Gauge, Transducer, Transmitter & Switch)	Using Digital Pressure Gauge with Pneumatic Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD R-6-1:2014	(-)0.90 bar to 0 bar	0.0011 bar
Group: Torque Generating Devices				
1	Torque Wrench, Torque Screw Driver, Bucking Tool, Nut Runner Type I (class A,B,C,D,E) Type II(class A,B,C,D,E,F,G)	Using Torque Transducer with indicator & Fixture as per IS 16906 : 2018	2 Nm to 2000 Nm	1.40 % of rdg
Group: Volume				
1	Glass Ware (Glass pipettes / Burettes / Conical Flask / beakers / Cylinders / Measuring Jar / Volumetric Appratus)	By Using Weighing Balance (readability : 0.01/0.1 mg) & Distilled Water as per ISO 4787:2010	1 ml to 100 ml	0.05 ml
2	Glass Ware (Glass pipettes / Burettes / Conical Flask / beakers / Cylinders / Measuring Jar / Volumetric Appratus)	By Using Weighing Balance (readability :10 mg) & Distilled Water as per ISO 4787:2010	1000 ml to 4000 ml	0.67 ml

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
3	Micro Pipettes	By Using Weighing Balance (readability : 0.01 mg) & Distilled Water as per ISO 8655-6:2002	20 µl to 100 µl	0.73 µl
4	Micro Pipettes	By Using Weighing Balance (readability : 0.01 mg) & Distilled Water as per ISO 8655-6:2002	100 µl to 1000 µl	3.30 µl
Group: Weighing Scale and Balance				
1	Weighing Balance (Class-1 and Coarser) d = 0.1mg.	By using weights (1 mg to 200 g) E2 class as per OIML R-76-1:2006	82 g to 220 g	0.2 mg
2	Weighing Balance (Class-1 and Coarser) d =0.01mg.	By using weights (1 mg to 200 g) E2 class as per OIML R-76-1:2006	0 to 82 g	0.12 mg
3	Weighing Balance (Class-2 and Coarser) d=0.01 g	By using Weights (500 g to 20 kg) F1 Class as per OIML R-76-1:2006	0 to 5200 g	0.01 g
4	Weighing Balance (Class-2 and Coarser) d=0.1 g	By using weights (500 g to 20 kg) F1 class as per OIML R-76-1:2006	0 to 20 kg	0.2 g
5	Weighing Balance (Class-3 and Coarser) d= 5 g	By using Weights (10 kg to 20 kg) Class F1,F2 & M1 as per OIML R-76-1:2006	0 to 100 kg	5 g
6	Weighing Balance (Class-3 and Coarser) d=10 g	By using weights (10 kg to 20 kg) Class F2 & M1 as per OIML R-76-1:2006	0 to 200 kg	10 g

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
Group: Weights				
1	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	1 mg	0.02 mg
2	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	2 mg	0.02 mg
3.	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	5 mg	0.02 mg
4	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	10 mg	0.02 mg
5	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA	20 mg	0.02 mg

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

Mechanical Calibration (Laboratory Based)

		weighing cycle as per OIML R 111-1:2004		
6	Weights having Accuracy Class F2 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	50 mg	0.02 mg
7	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	100 mg	0.02 mg
8	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	200 mg	0.02 mg
9	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	500 mg	0.02 mg
10	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA	1 g	0.02 mg

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Mechanical Calibration (Laboratory Based)

		weighing cycle as per OIML R 111-1:2004		
11	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	2 g	0.02 mg
12	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	5 g	0.02 mg
13	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	10 g	0.03 mg
14	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA weighing cycle as per OIML R 111-1:2004	20 g	0.03 mg
15	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.01 mg) ABBA	50 g	0.04 mg

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

Mechanical Calibration (Laboratory Based)

		weighing cycle as per OIML R 111-1:2004		
16	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.1 mg) ABBA weighing cycle as per OIML R 111-1:2004	100 g	0.2 mg
17	Weights having Accuracy Class F1 and coarser	By using weights (1 mg to 200 g) E2 class, weighing balance (0 to 82 g / 220 g) (d= 0.1 mg) ABBA weighing cycle as per OIML R 111-1:2004	200 g	0.23 mg
18	Weights having Accuracy Class M1 and coarser	By using weights(500 g to 20 kg) F1 class, weighing balance 0-5.2kg(d=0.01 g) ABBA weighing cycle as per OIML R 111-1:2004	500 g	10 mg
19	Weights having Accuracy Class M1 and coarser	By using weights(500 g to 20 kg) F1 Class, Weighing Balance 0-5.2kg(d=0.01 g) ABBA weighing cycle as per OIML R 111-1:2004	1 kg	20 mg
20	Weights having Accuracy Class M1 and coarser	By using weights(500 g to 20 kg) F1 Class, Weighing Balance 0-5.2kg(d=0.01 g) ABBA weighing cycle as per OIML R 111-1:2004	2 kg	20 mg

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (Laboratory Based)		
21	Weights having Accuracy Class F2 and coarser	By using weights(500 g to 20 kg) F1 Class, Weighing Balance 0-5.2kg(d=0.01 g) ABBA weighing cycle as per OIML R 111-1:2004	5 kg	20 mg
22	Weights having Accuracy Class M1 and coarser	By using weights (500 g to 20 kg) F1 class ,weighing balance 0-20 kg(d=0.1 g) ABBA weighing cycle as per OIML R-111-1:2004	10 kg	0.1 g
23	Weights having Accuracy Class M1 and coarser	By using weights (500 g to 20 kg) F1 class ,weighing balance 0-20 kg(d=0.1 g) ABBA weighing cycle as per OIML R-111-1:2004	20 kg	0.3 g

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
Group: Acceleration and Speed				
1	Tachometer / Stroboscope / Centrifuge / RPM Source / Slip Speed Meter	Using Digital Tachometer by Comparison Method	10 rpm to 15000 rpm	4.30 % to 0.03%
2	Tachometer, RPM Meter & Speed Measurement (Contact Type)	Using RPM source and Master Tachometer by Comparison method	10 rpm to 8000 rpm	4.30 % to 0.03%
3	Tachometer, RPM Meter (Non-Contact Type)	Using RPM source and Master Tachometer by Comparison Method	10 rpm to 99950 rpm	4.30 % to 0.02 %
Group: Dimension (Basic Measuring Instrument, Gauge etc.)				
1	Bench Center (Coaxially of Center)	Using Plunger Dial Indicator & Cylindrical Test Mandrel by Comparison method	200 mm to 600 mm	10 µm
2	Bench Center (Parallelism)	Using Plunger Dial Indicator & Taper Test Mandrel by Comparison method	100 mm to 300 mm	7.2 µm
3	Surface Plate (Granite / Cast Iron)	Using Electronic Level by Direct Method	300 X 300 (L x W) mm to 3000 X 3000 (L x W) mm	1.0 (SQRT(L+W)/150) µm (L & W in mm)

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Laboratory Name: M/s Hariom Instru-Labs
Kiosk No.20, Near Plot No.52, Opp SBI Bank (Naroda Ind Branch)
Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, India

Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
Group: Dimension (Precision Instruments)				
1	Tape and Scale Calibrator L.C 0.001 mm	Using Slip Gauge Set, Length Bars by Comparison method	0 to 1000 mm	7.8 µm
2	Vision Measuring Machine / Profile Projector / Measuring Microscope (Angular)	Using Angular Glass Scale by Comparison method	0 to 360 °	14.7
3	Vision Measuring Machine / Profile Projector / Measuring Microscope (Linear)	Using Glass Scale by Comparison method	0 to 250 mm	2.5 µm
Group: Hardness Testing machines				
1	Rockwell Hardness Testing Machine	Using Standard Hardness Blocks as per IS 1586:2018 (Part 02) By Indirect Verification Method	10 HRBW to 100 HRBW	0.99 HRBW
2	Rockwell Hardness Testing Machine	Using Standard Hardness Blocks as per IS 1586:2018 (Part 02), By Indirect Verification Method	10 HRC to 70 HRC	0.96 HRC
3	Rockwelll Hardness Testing Machine	Using Standard Hardness Blocks as per IS 1586:2018 (Part 02) By Indirect Verification Method	20 HRA to 95 HRA	0.96 HRA

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Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
Group: Pressure Indicating Devices				
1	Hydraulic Pressure Gauge (Digital/ Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD-R-6-1:2014	0 to 1000 bar	0.25 bar
2	Hydraulic Pressure Gauge (Digital/ Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD-R-6-1:2014	0 to 70 bar	0.02 bar
3	Hydraulic Pressure Gauge(Digital/Analogue), Transducer, Transmitter, Switch, Indicator, Recorder	Using Digital Pressure Gauge with Hydraulic Comparator Pump, Digital Mustimeter by Comparison Method as per DKD-R-6-1:2014	0 to 700 bar	0.14 bar
4	Pneumatic Pressure Gauge (Digital/ Analogue), Transducer, Transmitter, Manometer, Switch, Indicator, Recorder, Differential Pressure Transmitter	Using Digital Pressure Gauge & Calibrator with Pneumatic Comparator Pump, Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD-R-6-1:2014	0 to 2 bar	0.001 bar

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Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
5	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter, Differential Pressure Switch, Pressure Transmitter,Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Using Digital Micro manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison method as per DKD-R-6-1:2014	10 Pa to 3500 Pa	17.11 Pa
6	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter, Differential Pressure Switch, Pressure Transmitter,Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Using Digital Manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison method per DKD-R-6-1:2014	0 to 98 mbar	0.062 mbar
7	Pneumatic Pressure: Differential Pressure Gauge, Differential Pressure Transmitter,	Using Digital Manometer with Low Pressure Pump, Pressure Calibrator, Digital Mustimeter by	0 to 980 mbar	0.88 mbar

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Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Mechanical Calibration (At Site)		
	Differential Pressure Switch, Pressure Transmitter,Transducer, Manometer, Low Pressure Gauge, Magnehelic Gauge	Comparison method as per DKD-R-6-1:2014		
8	Pressure Gauge (Digital/Analogue), Transducer,Transmitter, Switch,Compound Gauge,Indicator,Recorder,Differential Pressure Transmitter	Using Digital Pressure Gauge & Calibrator with Pneumatic Comparator, Pressure Calibrator, Digital Mustimeter by Comparison Method Pump as per DKD-R-6-1:2014	0 to 14 bar	0.0022 bar
9	Pressure Gauge (Digital/ Analogue), Transducer, Transmitter, Switch, Compound Gauge, Indicator, Recorder, Differential Pressure Transmitter	Using Portable Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD-R-6-1:2014	0 to 20 bar	0.008 bar
10	Vacuum Gauge (Digital/Analogue) Differential Pressure Gauge, Transducer, Transmitter & Switch)	Using Digital Pressure Gauge with Pneumatic Pressure Pump, Pressure Calibrator, Digital Mustimeter by Comparison Method as per DKD-R 6-1:2014	(-)0.90 bar to 0 bar	0.0011 bar

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Validity: xxxx to xxxx **Amended on** N/A

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

Mechanical Calibration (At Site)

Group: Weighing Scale and Balance				
1	Weighing Balance (Class-1 and Coarser) d = 0.01mg.	By using weights (1 mg to 200 g) E2 class as per OIML R-76-1:2006	0 to 82 g	0.12 mg
2	Weighing Balance (Class-1 and Coarser) d = 0.1mg.	By using weights (1 mg to 200 g) E2 class as per OIML R-76-1:2006	82 g to 220 g	0.2 mg
3	Weighing Balance (Class-2 and Coarser) d=0.01 g	By using Weights (500 g to 20 kg) F1 Class as per OIML R-76-1:2006	0 to 5200 g	0.01 g
4	Weighing Balance (Class-2 and Coarser) d=0.1 g	By using weights (500 g to 20 kg) F1 class as per OIML R-76-1:2006	0 to 20 kg	0.2 g
5	Weighing Balance (Class-3 and Coarser) d= 5 g	By using Weights (10 kg to 20 kg) Class F1,F2 & M1 as per OIML R-76-1:2006	0 to 100 kg	5 g
6	Weighing Balance (Class-3 and Coarser) d=10 g	By using weights (10 kg to 20 kg) Class F2 & M1 as per OIML R-76-1:2006	0 to 200 kg	10 g

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Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, India

Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory Based)		
1	Infrared-Thermometer / Thermal Imager / Thermal Camera (temperature only) @ Emissivity 0.98 ± 0.02	Using RTD Sensor with Indicator & Black Body Source by Comparison Method	0 to 50 °C	0.50 °C
2	Infrared-Thermometer / Thermal Imager / Thermal Camera (temperature only) @ Emissivity 0.98 ± 0.02	Using RTD sensor with Indicator & Black body source by Comparison Method	50 °C to 110 °C	1.00 °C
3	Infrared-Thermometer / Thermal Imager / Thermal Camera @ Emissivity 0.95	Using Pyrometer & Black body source by Comparison Method	300 °C to 500 °C	3.3 °C
4	Infrared-Thermometer / Thermal Imager / Thermal Camera @ Emissivity 0.95	Using Pyrometer & Black body Source by Comparison Method	50 °C to 300 °C	3.0 °C
5	Liquid in Glass Thermometer, Dry & Wet Thermometer	Using SPRT Sensor with Indicator & Liquid Bath by Comparison Method	(-)35 °C to 200 °C	0.68 °C

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Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory Based)		
6	RTD/Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator, Dial Temp	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Liquid Bath by Comparison Method	(-)35 °C to 100 °C	0.41 °C
7	RTD/Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator, Dial Temp	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Dry Block Calibrators by Comparison Method	30 °C to 650 °C	0.2 °C
8	RTD/Thermocouple sensor with or without indicator, Digital Thermometers,	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Liquid Bath by Comparison Method	100 °C to 200 °C	0.87 °C

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Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
	Thermal Calibration (Laboratory Based)			
	Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator,Dial Temp			
9	Thermo Hygrometers / Humidity Data Loggers / Humidity Sensor / Transducer / Transmitter With or Without Indicator @ 25°C	Using Temprature & Humidity Sensor, Humidity Chamber with Indicator by Comparison Method	15 % rh to 95 % rh @ 25°C	3.3 %
10	Thermo Hygrometers / Temperature Data Loggers / Humidity Sensor / Transducer / Transmitter With or Without Indicator @ 50% rh	Using Temprature & Humidity Sensor with Indicator, Humidity Chamber by Comparison Method	5 °C to 50 °C @ 50 % rh	1.5 °C
11	Temperature Indicator with sensor of Dry Well, Dry Block Calibrators (Single Position)	Using SPRT Sensor With Indicator by Comparison Method	(-)35 °C to 650 °C	0.11 °C

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Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory Based)		
12	Temperature Indicator with sensor of Dry Well, Dry Block Calibrators(Single Position)	Using S Type Thermocouple with Indicator by Comparison Method	250 °C to 600 °C	1.55 °C
13	Temperature Indicator with sensor of : Dry Wells, Dry Block Calibrators.	Using 'S' Type Thermocouple With Indicator By Comparison Method (Single Position)	600 °C to 1200 °C	1.94 °C
14	Temperature Indicator with sensor of Liquid Bath, Dry Block.(Single Position)	Using SPRT Sensor With Indicator By Comparison Method	(-)35 °C to 200 °C	0.11 °C
15	Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Dial Temperature Gauge	Using S Type Thermocouple With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Dry Block Calibrators by Comparison Method	250 °C to 600 °C	1.86 °C

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Validity: 07.05.2024 to 06.05.2026 **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (Laboratory Based)		
16	Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Dial Temperature Gauge	Using 'S' Type Thermocouple With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Dry Block Calibrators by Comparison Method	600 °C to 1200 °C	2.2 °C

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Phase 1& 2, GIDC, Naroda, Ahmedabad-382330, Gujarat, India

Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
1	Infrared-Thermometer / Thermal Imager / Thermal Camera (temperature only) @ Emissivity 0.98 ± 0.02	Using RTD Sensor with Indicator & Black Body Source by Comparison Method	0 to 50 °C	0.5 °C
2	Infrared-Thermometer / Thermal Imager / Thermal Camera (temperature only) @ Emissivity 0.98 ± 0.02	Using RTD sensor with Indicator & Black body source by Comparison Method	50 °C to 110 °C	1.00 °C
3	Infrared-Thermometer / Thermal Imager / Thermal Camera @ Emissivity 0.95	Using Pyrometer & Black body source by Comparison Method	300 °C to 500 °C	3.3 °C
4	Infrared-Thermometer / Thermal Imager / Thermal Camera @ Emissivity 0.95	Using Pyrometer & Black body Source by Comparison Method	50 °C to 300 °C	3.0 °C
5	Liquid Bath, Freezer, Cold Room, Environment Chamber, Refrigerator (For Non-Medical Purpose)	Using Minimum Nine RTD Sensors with Data Logger by Multiposition Calibration Method	(-)35 °C to 25 °C	0.85 °C

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Validity: xxxx to xxxx **Amended on** N/A

S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
6	Liquid Bath, Chamber, Oven, Furnace, Environment Chamber, Incubators & Autoclave (For Non-Medical Purpose)	Using Minimum Nine RTD Sensors with Data Logger by Multiposition Calibration Method	25 °C to 200 °C	0.93 °C
7	Liquid in Glass Thermometer, Dry & Wet Thermometer	Using SPRT Sensor with Indicator & Liquid Bath by Comparison Method	(-)35 °C to 200 °C	0.68 °C
8	RTD/Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator, Dial Temp	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Liquid Bath by Comparison Method	(-)35 °C to 100 °C	0.41 °C
9	RTD/Thermocouple sensor with or without indicator, Digital Thermometers,	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator &	30 °C to 650 °C	0.2 °C

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
	Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator, Dial Temp	Dry Block Calibrators by Comparison Method		
10	RTD/Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Thermistor With or without temperature indicator, Dial Temp	Using SPRT Sensor With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Liquid Bath by Comparison Method	100 °C to 200 °C	0.87 °C
11	Temperature Indicator with sensor of Dry Well, Dry Block Calibrators (Single Position)	Using SPRT Sensor With Indicator by Comparison Method	(-)35 °C to 650 °C	0.11 °C
12	Temperature Indicator with sensor of Dry Well, Dry Block Calibrators (Single Position)	Using S Type Thermocouple with Indicator by Comparison Method	250 °C to 600 °C	1.55 °C

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
13	Temperature Indicator with sensor of : Dry Wells, Dry Block Calibrators.	Using 'S' Type Thermocouple With Indicator by Comparison Method (Single Position)	600 °C to 1200 °C	1.94 °C
14	Temperature Indicator with sensor of : Furnace, Oven, Chamber, Dry Block Bath, Environment Chamber	Using 'S' Type Thermocouple With Indicator by Comparison Method (Single Position)	600 °C to 1200 °C	1.94 °C
15	Temperature Indicator with sensor of : Furnace, Oven & Dry Block Bath, Dry Well(Single Position)	Using SPRT Sensor With Indicator by Comparison Method	25 °C to 650 °C	0.11 °C
16	Temperature Indicator with sensor of Freezer, Cold Room, Environment Chamber, Refrigerator (For Non-Medical Purpose)(Single Position)	Using SPRT Sensor With Indicator by Comparison Method	(-)35 °C to 25 °C	0.11 °C

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S.No.	Parameter	Calibration Method/ Procedure & Equipment used as Reference Standard	Range	Uncertainty in Measurement (±) *
		Thermal Calibration (At Site)		
17	Temperature Indicator with sensor of Furnace, Oven, Chamber, Dry Block Bath, Environment Chamber(Single Position)	Using S Type Thermocouple with Indicator by Comparison Method	250 °C to 600 °C	1.55 °C
18	Temperature Indicator with sensor of Liquid Bath, Dry Block.(Single Position)	Using SPRT Sensor With Indicator by Comparison Method	(-)35 °C to 200 °C	0.11 °C
19	Thermocouple sensor with or without indicator, Digital Thermometers, Temperature transmitters with sensor, Recorder with Sensor, Dial Temperature Gauge	Using S Type Thermocouple With Indicator, Super DAQ Precision Temperature Scanner, Universal Calibrator & Dry Block Calibrators by Comparison Method	250 °C to 600 °C	1.86 °C
			600 °C to 1200 °C	2.20 °C

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