

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 ADNA TECHNOLOGY SERVICES

68, Shakti Vihar Rudrapur Udham Singh Nagar (Uttarakhand) -263153, 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- 129

Issue Date: 21.06.2024

Valid Until: 20.06.2026

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 - 129)

Laboratory Name: ADNA Technology Services
68, Shakti Vihar Rudrapur Udham Singh Nagar
(Uttarakhand) -263153, India

Validity: 21.06.2024 to 20.06.2026

Amended on N/A

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

Electro – Technical Calibration (Laboratory Based)

| Group : Direct Current Measure Mode | | | | |
|--|-------------------------|---|-------------------|-------------------|
| 1 | DC Current | Using 6½ Dig. Multimeter by Direct Method | 1 mA to 1 A | 0.17 % to 0.10 % |
| | | | 1 A to 10 A | 0.10 % to 0.19 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mA to 1 A | 0.17 % to 0.21 % |
| | | | 1 A to 10 A | 0.21 % to 0.27 % |
| 2 | DC Voltage | Using 6½ Dig. Multimeter by Direct Method | 1 mV to 100 V | 0.17 % to 0.06 % |
| | | | 100 V to 1000 V | 0.06 % to 0.015 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mV to 100 V | 0.5 % to 0.3 % |
| | | | 100 V to 1000 V | 0.3 % to 0.2 % |
| 3 | DC High Voltage | Using HV Probe with 4½ Dig. Multimeter by Direct Method | 1 kV to 38 kV | 2.36% |
| 4 | Resistance (2 & 4 Wire) | Using 6½ Dig. Multimeter by Direct Method | 1 Ohm to 100 kohm | 0.08 % to 0.40 % |
| 5 | Resistance (2 Wire) | Using 6½ Dig. Multimeter by Direct Method | 100 kohm to 1Gohm | 0.40 % to 2.33 % |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| Group : Alternating Current Measure Mode | | | | |
|--|-------------------------|---|---------------------|--------------------|
| 1 | AC Current @ 50 Hz | Using 6½ Dig. Multimeter by Direct Method | 1 mA to 10 A | 0.44 % to 0.30 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mA to 10 A | 0.44 % to 0.30 % |
| | | Using Portable Energy Meter by Comparison Method | 10 mA to 120 A | 0.069 % to 0.132 % |
| 2 | AC Voltage @ 50 Hz | Using 6½ Dig. Multimeter by Direct Method | 10 mV to 100 V | 0.33 % to 0.17 % |
| | | | 100 V to 1000 V | 0.17 % to 0.15 % |
| | | Using Portable Energy Meter by Direct Method | 30 V to 300 V | 0.059 % to 0.075 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 10 mV to 100 V | 1.2 % to 1.18 % |
| | | 100 V to 1000 V | 1.18% to 1.16% | |
| 3 | AC High Voltage @ 50 Hz | Using HV Probe with 4½ Dig. Multimeter by Direct Method | 1 kV to 28 kV | 3.20 % |
| 4 | Capacitance @ 1 kHz | Using LCR-Q Meter by Direct Method | 1 nF to 1 μ F | 0.69 % to 0.4 % |
| | | Using 6½ Dig. Multimeter by Direct Method | 1 nF to 100 μ F | 0.06 % to 1.3 % |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| | | | | |
|----|--------------------|--|--------------------|-----------------|
| 5. | Inductance @ 1 kHz | Using Dig. LCR-Q Meter by Direct Method | 100 μ H to 1 H | 0.56 % to 1.0 % |
| 6 | Resistance @ 1 kHz | Using Dig. LCR-Q Meter by Direct Method | 1 Ohm to 100 kohm | 0.28% |

Group : Temperature Simulation Measure Mode

| | | | | |
|---|---|---|--------------------|---------|
| 1 | Temperature Source (K Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.45 °C |
| 2 | Temperature Source (B Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 600 °C to 1790 °C | 1.0 °C |
| 3 | Temperature Source (E Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -100 °C to 600 °C | 0.44 °C |
| 4 | Temperature Source (J Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1190 °C | 0.42 °C |
| 5 | Temperature Source (N Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.42 °C |
| 6 | Temperature Source (R Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 0 °C to 1690 °C | 0.6 °C |
| 7 | Temperature Source (S Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 0 °C to 1690 °C | 0.6 °C |
| 8 | Temperature Source (T Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 390 °C | 0.41 °C |
| 9 | Temperature Source - RTD (PT-100) | Using Multi Function Calibrator by Direct Method | -190 °C to 750 °C | 0.44 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| Group : Time (Measure Mode) | | | | |
|---|--|---|-------------------|------------------|
| 1 | Dig./Analog Timer/Stop Watch/Hour Meter | Using Time Calibrator by Direct Method | 0.1 s to 1 s | 0.01 s to 0.02 s |
| | | Using Time Calibrator by Direct Method | 1 s to 60 s | 0.02 s to 0.08 s |
| | | Using Time Calibrator by Direct Method | 60 s to 86400 s | 0.08 s to 2.90 s |
| Group : Frequency(Measure Mode) | | | | |
| 1 | Frequency | Using 6½ Dig. Multimeter by Direct Method | 10 Hz to 1000 kHz | 0.06% |
| | | Using 6½ Dig. Multimeter with Function Generator by Comparison Method | 10 Hz to 1000 kHz | 0.08% |

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|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| Group : Direct Current Source Mode | | | | |
|------------------------------------|------------|---|-----------------|------------------|
| 1 | DC Current | Using 5½ Multifunction calibrators by Direct Method | 1 mA to 10A | 0.16 % to 0.24 % |
| | | Using 5½ Multi-Function Calibrator with Current Coil (1X100) by Direct Method | 10 A to 1000 A | 0.24 % to 0.92 % |
| 2. | DC Voltage | Using 5½ Multi-Function Calibrator by Direct Method | 1 mV to 1000 V | 0.75 % to 0.14 % |
| 3. | Resistance | Using Decade Resistance Box by Direct Method | 1 Ohm to 1 Mohm | 0.77 % to 0.94 % |
| | | Using Megohm Box by Direct Method | 2 Mohm | 1.02% |
| | | Using Megohm Box by Direct Method | 20 Mohm | 1.0 % |
| | | Using Megohm Box by Direct Method | 100 Mohm | 1.81% |
| | | Using Megohm Box by Direct Method | 200 Mohm | 2.43% |
| | | Using Megohm Box by Direct Method | 1 Gohm | 2.48% |
| | | Using Megohm Box by Direct Method | 2 Gohm | 2.45% |

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|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| | | | | |
|----|---------------------|---|---------------|-------|
| | | Using Megohm Box by Direct Method | 20 Gohm | 2.43% |
| | | Using Megohm Box by Direct Method | 200 Gohm | 2.52% |
| | | Using Megohm Box by Direct Method | 1 Tohm | 6.80% |
| 4. | Resistance (4 Wire) | Using Precision Resistance Box by Direct Method | 10 μ ohm | 0.28% |
| | | Using Precision Resistance Box by Direct Method | 100 μ ohm | 0.11% |
| | | Using Precision Resistance Box by Direct Method | 1 mohm | 0.17% |
| | | Using Precision Resistance Box by Direct Method | 10 mohm | 1.29% |
| | | Using Precision Resistance Box by Direct Method | 100 mohm | 0.13% |
| | | Using Standard Resistance Box by Direct Method | 1 mohm | 1.17% |
| | | Using Standard Resistance Box by Direct Method | 10 mohm | 1.29% |
| | | Using Standard Resistance Box by Direct Method | 100 mohm | 1.30% |

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Electro – Technical Calibration (Laboratory Based)

| | | | | |
|--|---------------------|--|--------------------|------------------|
| | | Using Standard Resistance Box by Direct Method | 1 ohm | 1.19% |
| | | Using Standard Resistance Box by Direct Method | 10 ohm | 1.35% |
| | | Using Standard Resistance Box by Direct Method | 100 Ohm | 1.16% |
| | | Using Standard Resistance Box by Direct Method | 1 kohm | 1.36% |
| Group : Alternating Current Source Mode | | | | |
| 1 | AC Current @ 50 Hz | Using 5½ Dig. Multi-Function Calibrator by Direct Method | 1 mA to 10 A | 0.40% |
| | | Using 5½ Dig. Multi-Function Calibrator with Current Coil (1X100) by Direct Method | 10 A to 1000 A | 1.3% |
| 2 | AC Voltage @ 50 Hz | Using 5½ Dig. Multi-Function Calibrator by Direct Method | 10 mV to 1000 V | 1.21 % to 0.24 % |
| 3 | Capacitance @ 1 kHz | Using Decade Capacitance Box by Direct Method | 1 nF to 1 μ F | 0.90% |
| 4 | Inductance @ 1 kHz | Using Decade Inductance Box by Direct Method | 100 μ H to 1 H | 0.71 % to 0.94 % |

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Electro – Technical Calibration (Laboratory Based)

| Group : Temperature Simulation Source Mode | | | | |
|---|---|---|--------------------|---------|
| 1 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder - RTD (PT-100) | Using Multi-function Calibrator by Direct Method | -190 °C to 750 °C | 0.42 °C |
| 2 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (B Type Thermocouple) | Using Multi function Calibrator by Direct Method | 610 °C to 1690 °C | 0.65 °C |
| 3 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (J Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1190 °C | 0.42 °C |
| 4 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (E Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 100 °C to 590 °C | 0.42 °C |

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|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| | | | | |
|---|---|---|--------------------|---------|
| 5 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (K Type Thermocouple) | Using Multi-Function Calibrator by Direct Method | 0 °C to 1290 °C | 0.42 °C |
| 6 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (N Type Thermocouple) | Using Multi-Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.42 °C |
| 7 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (R Type Thermocouple) | Using Multi-Function Calibrator by Direct Method | 610 °C to 1690 °C | 0.6°C |
| 8 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (S Type Thermocouple) | Using Multi-Function Calibrator by Direct Method | 55 °C to 1690 °C | 0.62 °C |

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|-------|-----------|---|-------|---|

Electro – Technical Calibration (Laboratory Based)

| | | | | |
|--|---|--|-------------------|---------|
| 9 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (T Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 390 °C | 0.4 1°C |
| Group : Frequency(Source Mode) | | | | |
| 1 | Frequency | Using Dig. Function Generator by Direct Method | 10 Hz to 1000 kHz | 0.58% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| Group: Dimension | | | | |
|-------------------------|---|--|------------------|--------------|
| 1 | Angle plate/Box Angle Plate (Flatness, Parallelism, Squareness) | Using Dial Gauge, Cylindrical Mandrel & Surface Plate IS – 6232 : 2019, IS-2554: 2020, IS-6973: 2020, IS-6985: 2020, | Up to 300 mm | 4.50 μ m |
| 2 | Bevel Angle Protractor/Combination Set, L.C.- 5min./1min./1degree | Using Angle Gauge Set & IS 4239: 2011, IS 5812:1970 | 0° - 90° - 0° | 3.1 minute |
| 3 | Caliper (Vernier/Dial/Digital), L.C.-0.01 mm | Using Caliper Checker & IS 16491(part-1) -2016 | 0 to 600 mm | 10.6 μ m |
| 4 | Coating Thickness Gauge, L.C.-0.1/1 μ m | Using Standard Thickness Foils | 0.009 mm to 2 mm | 1.4 μ m |
| 5 | Comparator Stand (Base Flatness Only) | Using Dial Gauge & Surface Plate & Precision Level Screw IS 12937: 2020, IS- 2285:2020, IS-7327:2019 | Up to 300x300 mm | 2.5 μ m |
| 6 | Depth Micrometer, L.C.- 0.001 mm and coarser | Using Slip Gauge Set JIS B7544:1994 & BS 6468:2008 | 0 to 300 mm | 4.8 μ m |

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Mechanical Calibration (Laboratory based)

| | | | | |
|----|---|---|----------------|--------------|
| 7 | Depth Vernier Caliper, L.C.-0.01 mm and coarser | Using Slip Gauge Set and Caliper Checker | 0 to 300 mm | 6.9 μ m |
| 8 | Dial Bore Gauge (Travel Only), L.C.-0.001 mm | Using Universal Length Measuring Machine (ULM) | Up to 2 mm | 0.65 μ m |
| 9 | Dial Thickness Gauge, L.C.-0.001 mm | Using Slip Gauge Set JIS B7503:2017 | 0 to 50 mm | 0.61 μ m |
| 10 | Engineering /Try Square (Blade Squareness) | Using Cylindrical Mandrel & Surface Plate & IS 2103 :1980 ,IS 12937 :2020 | Up to 400 mm | 4.5 μ m |
| 11 | Engineering /Try Square (Straightness) | Using Dial Gauge, Cylindrical Mandrel , Surface Plate & IS 2103 :1980 ,IS 12937 :2020 | Up to 400 mm | 3.7 μ m |
| 12 | Feeler Gauge | Using Universal Length Measuring Machine (ULM) & IS 3179 :1990 | Up to 2 mm | 0.57 μ m |
| 13 | Height Gauge (Vernier/Dial/Digital), L.C.-0.01 mm and coarser | Using Caliper Checker, Dial Indicator ,Slip Gauge, Surface Plate & IS 2921: 2016 | 0 to 600 mm | 10.8 μ m |
| 14 | Internal Micrometer (Stick type) L.C.-0.001 mm and coarser | Using Slip Gauge Set , Accessories Set & IS 2966: 2019 | 0 mm to 150 mm | 2.0 μ m |

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Mechanical Calibration (Laboratory based)

| | | | | |
|----|--|---|-----------------|---------------|
| 15 | Lever Type Dial Gauge, L.C.-0.001/ and coarser | Using Universal Length Measuring Machine (ULM) IS 11498:2000 | Up to 1 mm | 0.64 μ m |
| 16 | Measuring Pin | Using Universal Length Measuring Machine (ULM) &IS –11103: 2020 | 0.1 mm to 50 mm | 0.66 μ m |
| 17 | Micrometer (External/Point/Pin/Blade/ Ball/Digital, L.C.-0.001 mm and coarser | Using Slip Gauge Set &IS 2967: 2019 | 0 to 150 mm | 1.3 μ m |
| 18 | Pistol Caliper, L.C.-0.001 mm and coarser | Using Slip Gauge Set | 0 to 100 mm | 60.56 μ m |
| 19 | Plain Plug Gauge/Air Plug Gauge/Cylindrical Setting Master | Using Universal Length Measuring Machine (ULM) With Reference Standard & S-3455:1971, IS 3485: 1983 ,IS-6244 : 2017, IS 6246: 2017 | 1 mm to 300 mm | 2.68 μ m |
| 20 | Plain Ring Gauge/Air Ring Gauge/Setting Ring Gauge | Using Universal Length Measuring Machine (ULM) with Reference Standard & IS-3455: 2020,IS-7876: 2020, IS 3485: 2019, | 3 mm to 300 mm | 3.9 μ m |

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|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----|--|--|-----------------|--------------|
| 21 | Plunger Type Dial Gauge, L.C.-0.001 mm and coarser | Using Universal Length Measuring Machine (ULM) & IS 2092: 2019 | 0 to 50 mm | 0.71 μ m |
| 22 | Setting Rod/Length Bar | Using Universal Length Measuring Machine (ULM) with Reference Standard & IS 7014:-2020 | 25 mm to 325 mm | 3.5 μ m |
| 23 | Snap Gauge | Using Universal Length Measuring Machine (ULM) With Reference Standard & IS 3455:1971 | 3 mm to 150 mm | 1.66 μ m |
| 24 | Standard Foils | Using Universal Length Measuring Machine (ULM) | Up to 2 mm | 0.78 μ m |
| 25 | Taper Plain Plug Gauge (Taper Angle) | Using Universal Length Measuring Machine (ULM) with Reference Standard & IS 9529 : 1980 | 0 ° to 50 ° | 2.9 minute |

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Mechanical Calibration (Laboratory based)

| | | | | |
|----|--|--|--------------------|--------------|
| 26 | Taper Plain Plug Gauge (Taper Length) | Using Universal Length Measuring Machine & IS 9529 : 1980 | 5 mm to 100 mm | 1.0 μ m |
| 27 | Thread Plug Gauge/WCP Gauge (Effective Diameter) | Using Universal Length Measuring Machine (ULM) with Three Measuring Wire and Reference Standard & IS 10685: 2019,IS- 2334:2019, | 2 mm to 150 mm | 3.0 μ m |
| 28 | Thread Ring Gauge/WCR Gauge (Effective Diameter) | Using Universal Length Measuring Machine (ULM) With T Stylus and Reference Standard & IS 10685: 2019,IS-2334:2019, | 3 mm to 100 mm | 1.4 μ m |
| 29 | Three Wire set | Using Universal Length Measuring Machine (ULM) & IS- 11103: 2020, IS 6311:2020 | 0.17 mm to 6.35 mm | 0.56 μ m |

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Amended on N/A

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

Mechanical Calibration (Laboratory based)

| | | | | |
|----|---|---|----------------|---|
| 30 | Ultrasonic Thickness Gauge, L.C.-0.1 mm and coarser | Using Slip auge Set | Up to 100 mm | 91.21 μ m |
| 31 | V-Block (Parallelism) | Using Dial Gauge, Test Mandrel & Surface Plate & IS – 2949: 2017 | Up to 400 mm | 3.0 μ m |
| 32 | V-Block (Squareness) | Using Cylindrical Mandrel, Slip Gauge Set & Surface Plate IS – 2949: 2017 | Up to 400 mm | 4.41 μ m |
| 33 | V-Block (Flatness) | Using Dial Gauge & Surface Plate IS – 2949: 2017 | Up to 400 mm | 3.0 μ m |
| 34 | Width Gauge/Flush Pin | Using Universal Length Measuring Machine (ULM) with Reference Standard | 2 mm to 150 mm | 1.2 μ m |
| 35 | Measuring Scale, L.C.-0.5 and coarser | Using Scale & Tape Calibrator & IS 1481:2014 | Upto 2000 mm | 290 x (Sqrt L) μ m (where L in mtr) |
| 36 | Measuring Tape/Pie Tape/Circumference Tape, L.C.-1 mm and coarser | Using Scale & Tape Calibrator & IS 1269 (Part-1,11) 2018 | Upto 50 m | 294 x (Sqrt L) μ m (where L in mtr) |

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|-------|-----------|---|-------|---|
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Mechanical Calibration (Laboratory based)

| | | | | |
|----|------------------------------------|--|-------------------------------|--------------|
| 37 | Test Sieves | Using Digital Vernier Caliper & IS – 460 (PART 1,2&3):2020 | 2 mm to 200 mm | 15 μ m |
| 38 | Mould/Beam | Using Digital Vernier Caliper & IS 10086:2021 | 50X50X50 mm to 150X150X150 mm | 49 μ m |
| 39 | Cylindrical Mould | Using Bore Gauge & Height gauge & IS 10086:2021 | 50 mm to 300 mm | 42 μ m |
| 40 | Elongation Gauge | Using Digital Vernier Caliper & IS 2386 (part 1): 2021 | 0 mm to 100 mm | 22 μ m |
| 41 | Flakiness Gauge | Using Digital Vernier Caliper & IS 2386 (part 1): 2021 | 0 mm to 100 mm | 22 μ m |
| 42 | Crushing Value Apparatus Cylinder | Using Height Gauge, Caliper, Micrometer & IS 2386 (Part 1): 2021 | 5mm to 200mm | 49 μ m |
| 43 | Small Hole Gauge | Using ULM | Upto 100 mm | 0.67 μ m |
| 44 | Telescopic Gauge | Using ULM | Upto 100 mm | 0.67 μ m |
| 45 | Test Mandrel Variation in Diameter | Using ULM & IS 2063:2016 | Upto 300 mm | 1.04 μ m |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| Group: Pressure & Vacuum | | | | |
|-------------------------------------|--|---|-----------------------|--------------|
| 1 | Hydraulic Pressure: Digital/Analogue Pressure Gauge/Pressure Transmitter/Transducer/ Pressure Switch | Using Digital Pressure Gauge with Hydraulic comparator and Digital Multimeter by Comparison Method as per DKD-R-6-1 : 2014 | 0 to 700 bar | 0.18% of rdg |
| 2 | Pneumatic Pressure: Digital/Analogue Low Pressure Gauge /Manometer/Magneheli c Gauge/Differential Gauge/Transmitter/ Transducer/Pressure Switch | Using Digital Pressure Calibrator and Digital Multimeter by Comparison Method as per DKD-R-6-1: 2014 | (-)2000 Pa to 2000 Pa | 0.16% rdg |
| 3 | Pneumatic Digital /Analogue Pressure Gauge/Pressure Transmitter/Transducer/ Pressure Switch) | Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6- 1:2014 | 0 to 30 bar | 0.084% rdg |

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|-------|-----------|---|-------|---|
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Mechanical Calibration (Laboratory based)

| | | | | |
|--------------------|--|--|-----------------------|--------------|
| 4 | Pneumatic-Digital/Analogue Vacuum Gauge/Transmitter/Transducer | Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6-1:2014 | (-) 0.90 bar to 0 bar | 0.41% of rdg |
| Group: Mass | | | | |
| 1 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1:2004 ABBA method | 1 mg | 0.03 mg |
| 2 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1:2004 ABBA method | 2 mg | 0.03 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|---|---------------------------------------|--|-------|---------|
| 3 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 5 mg | 0.03 mg |
| 4 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111- 1:2004 ABBA method | 10 mg | 0.03 mg |
| 5 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 20 mg | 0.03 mg |
| 6 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 50 mg | 0.03 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----|---------------------------------------|--|--------|---------|
| 7 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 100 mg | 0.03 mg |
| 8 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 200 mg | 0.04 mg |
| 9 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 500 mg | 0.04 mg |
| 10 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 1 g | 0.04 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----|---------------------------------------|--|------|---------|
| 11 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111- 1:2004 ABBA method | 2 g | 0.04 mg |
| 12 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 5 g | 0.04 mg |
| 13 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1 2004 ABBA method | 10 g | 0.04 mg |
| 14 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1 2004 ABBA method | 20 g | 0.04 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----|------------------------------------|--|-------|---------|
| 15 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.01 mg) based on OIML R111-1: 2004 ABBA method | 50 g | 0.05 mg |
| 16 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.1 mg) based on OIML R111-1: 2004 ABBA method | 100 g | 0.13 mg |
| 17 | Weight F1 Accuracy Class & Coarser | Using E1 Accuracy Class Weights & Weighing Balance (Readability: 0.1 mg) based on OIML R111-1: 2004 ABBA method | 200 g | 0.25 mg |
| 18 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1: 2004 ABBA method | 500 g | 1.45 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----|---------------------------------------|--|-------|----------|
| 19 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1: 2004 ABBA method | 1 kg | 1.91 mg |
| 20 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1: 2004 ABBA method | 2 kg | 19.67 mg |
| 21 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1 : 2004 ABBA method | 5 kg | 21.02 mg |
| 22 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1: 2004 ABBA method | 10 kg | 0.083 mg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|----------------------|--|---|------------------------------|--------------|
| 23 | Weight F1 Accuracy Class & Coarser | Using F1 Accuracy Class Weights & Weighing Balance (Readability: 100 mg) based on OIML R111-1: 2004 ABBA method | 20 kg | 93.2 mg |
| Group: Volume | | | | |
| 1 | Micro-Pipette, Pipette (Piston Operated Pipette) Graduated/one mark/Single Volume | Using Distilled Water & Ultra-micro balance($d=0.01$ mg) by Gravimetric method on ISO 8655 (part 6) :2022 | 20 μ l to 100 μ l | 0.41 μ l |
| 2 | Micro-Pipette, Pipette (Piston Operated Pipette) Graduated/one mark/Single Volume | Using Distilled Water & Ultra-micro balance($d=0.01$ mg) by Gravimetric method on ISO 8655 (part 6) :2022 | >100 μ l to 1000 μ l | 2.55 μ l |
| 3 | Volumetric Equipment (Burette, Pipette, Measuring Cylinder, Beaker, Flask, Pyknometer) | Using Weighing Balance LC:0.1 mg & Distiller Water based on IS/ISO 4787:2021 | >0.1 ml to 20 ml | 0.008 ml |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|--------------------------------------|---|---|-------------------------|-----------------|
| 4 | Volumetric Equipment (Burette, Pipette, Measuring Cylinder, Beaker, Flask, Pyknometer) | Using Weighing Balance LC:0.1 mg & Distiller Water based on IS/ISO 4787:2021 | >20 ml to 2000 ml | 0.11 ml |
| 5 | Laboratory Glassware (Volumetric Instruments), Burette, Measuring Cylinder, Flask, Jar, Density Bucket Beaker (Graduated/One Mark type) | Using balance (Cap. 30 kg /d=0.1 g) and using distilled water grade III by Gravimetric method as per IS/ISO 4787:2021 | >2000 ml to 20000 ml | 20 ml |
| Group: speed and acceleration | | | | |
| 1 | Tachometer (Contact Type) | Using Tachometer and RPM Source by Comparison Method | 6 RPM to 8000 RPM | 3.15% to 0.11% |
| 2 | Tachometer (Non- Contact Type) | Using Tachometer and RPM Source by Comparison Method | 6 RPM to 90000 RPM | 3.15% to 0.063% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (Laboratory based)

| | | | | |
|---|---|---|-----------------------|-----------------|
| 3 | Tachometer Calibrator/ Stroboscope/ Centrifuge/ RPM Meter/ Vibrating M/c (Contact Type) | Using Tachometer by Direct/Comparison Method Method | 6 RPM to 8000 RPM | 3.15% to 0.11% |
| 4 | Tachometer Calibrator/ Stroboscope/Centrifuge/ RPM Meter/ Vibrating M/c (Non-Contact Type) | Using Tachometer by Direct/Comparison Method Method | 6 RPM to 90000 RPM | 3.15% to 0.063% |

Group: Acoustics

| | | | | |
|---|-----------------------------|--|--------|---------|
| 1 | Sound Level Meter @ 1kHz | Using Sound Level Calibrator by Direct Method | 94 dB | 0.90 dB |
| 2 | Sound Level Meter @ 1kHz | Using Sound Level Calibrator by Direct Method | 114 dB | 0.90 dB |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (Laboratory Based)

| Group: Humidity | | | | |
|------------------------|---|---|------------------|---------|
| 1 | Humidity Chamber / Conditioning Chamber / Environmental Chamber / Stability Chamber / Humidity Generator (Multi Position Calibration) @ 25°C as per IEC60068-3-5: 2018 | Using Wireless Humidity Data Logger with Inbuilt Sensor (Minimum 9 Sensor) By Comparison Method | 10 %RH to 95 %RH | 1.3% RH |
| 2 | Humidity Chamber / Conditioning Chamber / Environmental Chamber / Stability Chamber / Humidity Generator (Multi Position Calibration) @ 50% RH as per IEC 60068-3- 5:2018 | Using Wireless Temperature Data Logger with Inbuilt Sensor (Minimum 9 Sensor) By Comparison Method | 10 °C to 50 °C | 0.7 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (Laboratory Based)

| | | | | |
|---|---|--|------------------|----------|
| 3 | Humidity Indicator with Sensor of Humidity Chamber / Conditioning Chamber / Environmental Chamber / Humidity Generator (Single Position Calibration) @ 25°C by comparison method | Using Digital RH Indicator with Sensor by Comparison Method as per DKD-R-5-8: 2019 | 10 %RH to 95 %RH | 1.03% RH |
| 4 | Temperature Indicator with Sensor of Humidity Chamber / Conditioning Chamber / Environmental Chamber / Humidity Generator (Single Position Calibration) @ 50% RH by comparison method | Using 4-Wire RTD Sensor with Indicator by Comparison Method | 10 °C to 50 °C | 0.21 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (Laboratory Based)

| | | | | |
|---------------------------|---|---|---------------------------------------|-------------------|
| 5 | RH Sensor with Indicator/Controller, Thermo Hygrometer, Data Logger /Recorder /Scanner with Internal/External Sensor @ (25 \pm 2) $^{\circ}$ C | Using Digital RH Indicator with Sensor, Temperature and Humidity Generator by Comparison Method | 10 %RH to 95 %RH | 1.03% RH |
| 6 | Temperature & RH Sensor with Indicator/Controller, Thermo Hygrometer, Data Logger /Recorder /Scanner with Internal/External Sensor @ (50 \pm 2)% RH | Using 4-Wire RTD Sensor with Indicator, Temperature and Humidity Generator by Comparison Method | 10 $^{\circ}$ C to 50 $^{\circ}$ C | 0.21 $^{\circ}$ C |
| Group: Temperature | | | | |
| 1 | Deep Freezers / Refrigerator/Cold Room (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | (-) 35° C to 10 $^{\circ}$ C | 1.3 $^{\circ}$ C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (Laboratory Based)

| | | | | |
|---|---|--|--------------------|--------|
| 2 | Conditioning Chamber / Environmental Chamber/Environmental Room (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | >10 °C to 50 °C | 1.3 °C |
| 3 | Incubator (Non-Medical Purpose) / Autoclave (Non-Medical Purpose) / Oven / Furnace / Water Bath (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | >50 °C to 250°C °C | 2.5 °C |
| 4 | Furnace / Industrial Furnace / Dry Block Furnace / Heating Chamber (Multi Position Calibration) | Using Data Logger with N- Type Thermocouple (Minimum 9 Sensor) By Comparison Method | >250 °C to 600 °C | 3.2 °C |
| 5 | Furnace / Industrial Furnace / Dry Block Furnace (Multi Position Calibration) | Using Data Logger with N- Type Thermocouple (Minimum 9 Sensor) By Comparison Method | >600 °C to 1200 °C | 3.2 °C |

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Amended on N/A

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

Thermal Calibration (Laboratory Based)

| | | | | |
|---|--|---|-------------------|---------|
| 6 | Temperature Indicator with Sensor of Deep Freezers refrigerator/Cold Room (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | (-)35 °C to 10 °C | 0.21 °C |
| 7 | Temperature Indicator with Sensor of Conditioning Chamber / Environmental Chamber/ Environmental Room (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | >10 °C to 50 °C | 0.21 °C |
| 8 | Temperature Indicator with Sensor of Incubator (Non-Medical Purpose) / Autoclave (Non-Medical Purpose) / Oven / Furnace / Water Bath (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | >50 °C to 250 °C | 0.77 °C |

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68, Shakti Vihar Rudrapur Udham Singh Nagar
(Uttarakhand) -263153, India

Validity: 21.06.2024 to 20.06.2026

Amended on N/A

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

Thermal Calibration (Laboratory Based)

| | | | | |
|----|--|---|--------------------|---------|
| 9 | Temperature Indicator with Sensor of Furnace / Muffle Furnace / Industrial Furnace / Dry Block Furnace / Heating Chamber (Single Position Calibration) | Using S-Type Thermocouple with Indicator By Comparison Method | >250 °C to 600 °C | 2.1 °C |
| 10 | Temperature Indicator with Sensor of Furnace / Muffle Furnace / Industrial Furnace / Dry Block Furnace (Single Position Calibration) | Using S-Type Thermocouple with Indicator By Comparison Method | >600 °C to 1200 °C | 2.5 °C |
| 11 | RTD s, Thermocouples with or without controller/Indicator, Dial Temperature Gauge, Glass Thermometer, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using 4-Wire RTD with Indicator, 6½ Digital Multimeter & Liquid Temperature Bath By Comparison Method | (-)35 °C to 50 °C | 0.21 °C |

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Validity: 21.06.2024 to 20.06.2026

Amended on N/A

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

Thermal Calibration (Laboratory Based)

| | | | | |
|----|--|--|-------------------|---------|
| 12 | RTD s, Thermocouples with or without Controller/Indicator, Dial Temperature Gauge, Glass Thermometer, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using 4-Wire RTD with Indicator, 6½ Digital Multimeter & Oil Temperature Bath By Comparison Method | >50 °C to 250 °C | 0.77 °C |
| 13 | Thermocouples with or without Controller/Indicator, Dial Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >250 °C to 600 °C | 1.94 °C |

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

Thermal Calibration (Laboratory Based)

| | | | | |
|----|---|--|---------------------|---------|
| 14 | Thermocouples with or without Controller/Indicator, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >600 °C to 1000 °C | 2.1 °C |
| 15 | Thermocouples with or without Controller/Indicator, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >1000 °C to 1200 °C | 2.5 °C |
| 16 | IR Thermometer, Non Contact Thermometer, Thermal Imager Camera, Pyrometer (Temperature Only) | Using Infrared Thermometer and Black Body Furnace (Emissivity 0.95) by Comparison Method | 30 °C to 500 °C | 3.73 °C |

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| S.No. | Parameter | Calibration Method/ Procedure & Equipment used as Reference Standard | Range | Uncertainty in Measurement (\pm) * |
|-------|-----------|---|-------|---|
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Thermal Calibration (Laboratory Based)

| | | | | |
|----|---|---|-----------------|---------|
| 17 | Temperature Indicator with Sensor of Black Body Furnace (Single Position Calibration) | Using Infrared Thermometer by Comparison Method | 30 °C to 500 °C | 3.73 °C |
|----|---|---|-----------------|---------|

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

Electro – Technical Calibration (At Site)

| Group : Direct Current Measure Mode | | | | |
|-------------------------------------|-------------------------|---|-------------------|-------------------|
| 1 | DC Current | Using 6½ Dig. Multimeter by Direct Method | 1 mA to 1 A | 0.09 % to 0.10 % |
| | | | 1 A to 10 A | 0.10 % to 0.19 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mA to 1 A | 0.17 % to 0.21 % |
| | | | 1 A to 10 A | 0.21 % to 0.27 % |
| 2 | DC Voltage | Using 6½ Dig. Multimeter by Direct Method | 1 mV to 100 V | 0.17 % to 0.06 % |
| | | | 100 V to 1000 V | 0.06 % to 0.015 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mV to 100 V | 0.5 % to 0.3 % |
| | | | 100 V to 1000 V | 0.3 % to 0.2 % |
| 3 | Resistance (2 & 4 Wire) | Using 6½ Dig. Multimeter by Direct Method | 1 Ohm to 100 kohm | 0.08 % to 0.40 % |
| 4 | Resistance (2 Wire) | Using 6½ Dig. Multimeter by Direct Method | 100 kohm to 1Gohm | 0.40 % to 2.33 % |
| 5 | DC High Voltage | Using HV Probe with 4½ Dig. Multimeter by Direct Method | 1 kV to 38 kV | 2.36% |

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

Electro – Technical Calibration (At Site)

| Group : Alternating Current Measure Mode | | | | |
|--|--------------------|---|-----------------|--------------------|
| 1 | AC Current @ 50 Hz | Using 6½ Dig. Multimeter by Direct Method | 1 mA to 10 A | 0.24% |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 1 mA to 10 A | 0.44% |
| | | Using Portable Energy Meter by Comparison Method | 10 mA to 120 A | 0.069 % to 0.132 % |
| 2. | AC Voltage @ 50 Hz | Using 6½ Dig. Multimeter by Direct Method | 10 mV to 100 V | 0.33 % to 0.17 % |
| | | Using 6½ Dig. Multimeter by Direct Method | 100 V to 1000 V | 0.17 % to 0.15 % |
| | | Using Portable Energy Meter by Direct Method | 30 V to 300 V | 0.059 % to 0.075 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 10 mV to 100 V | 1.2 % to 1.18 % |
| | | Using 6½ Dig. Multimeter with 5½ Multi-Function Calibrator by Comparison Method | 100 V to 1000 V | 1.18 % to 1.16 % |

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

Electro – Technical Calibration (At Site)

| | | | | |
|----|--|--|----------------------|---------------------|
| 3. | Capacitance @ 1 kHz | Using LCR-Q Meter by Direct Method | 1 nF to 1 μ F | 0.69 % to 0.4 % |
| | | Using 6½ Dig. Multimeter by Direct Method | 1 nF to 100 μ F | 0.06 % to 1.3 % |
| 4. | Inductance @ 1 kHz | Using Dig. LCR-Q Meter by Direct Method | 100 μ H to 1 H | 0.56 % to 1.0 % |
| 5. | Resistance @ 1 kHz | Using Dig. LCR-Q Meter by Direct Method | 1 Ohm to 100 kohm | 0.28% |
| 7. | AC Active Energy 3P3W, 3P4W, (45 to 65)Hz (30 to 300)V, (0.05 to 100)A, UPF to 0.1PF (Lag, Lead) | Using Portable Energy Meter by Comparison Method | 1.58Wh to 72 kWh | 0.0146 % to 0.163 % |
| 8 | AC Active Energy 1P2W, (45 to 65)Hz (30 to 300)V, (0.01 to 100)A, UPF to 0.1PF (Lag, Lead) | Using Portable Energy Meter by Comparison Method | 1.2 W to 2.4 kW | 0.0146% 0.163 % |
| 9 | AC Reactive Energy 3P3W, 3P4W, (45 to 65)Hz (30 to 300)V, (0.05 to 100)A, UPF to 0.1PF (Lag, Lead) | Using Portable Energy Meter by Comparison Method | 1.58 kVar to 72 kVar | 0.0146 % to 0.137 % |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (At Site)

| | | | | |
|----|--|--|------------------------|--------------------|
| 10 | Phase Angle (0° to 360°), Power Factor (-1 to 1) | Using Portable Energy Meter by Comparison Method | 0.1 to 1 (Leg/Lead) PF | 0.024 % to 0.028 % |
| 11 | Harmonics in Current (3rd to 40th order) Current at 240V,10A | Using Portable Energy Meter by Direct Method | 10% to 40% | 0.781 % to 0.963 % |
| 12 | Harmonics in Voltage (3rd to 40th order) Current at 240V,10A | Using Portable Energy Meter by Direct Method | 10% to 40% | 0.781 % to 0.963 % |

Group : Temperature Simulation Measure Mode

| | | | | |
|---|---|--|--------------------|---------|
| 1 | Temperature Source (K Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.45 °C |
| 2 | Temperature Source (B Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 600 °C to 1790 °C | 1.0 °C |
| 3 | Temperature Source (E Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -100 °C to 600 °C | 0.44 °C |
| 4 | Temperature Source (J Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1190 °C | 0.42 °C |
| 5 | Temperature Source (N Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.42 °C |

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

Electro – Technical Calibration (At Site)

| | | | | |
|---|---|--|-------------------|---------|
| 6 | Temperature Source (R Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 0 °C to 1690 °C | 0.6°C |
| 7 | Temperature Source (S Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 0 °C to 1690 °C | 0.6 °C |
| 8 | Temperature Source (T Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 390 °C | 0.41 °C |
| 9 | Temperature Source - RTD (PT-100) | Using Multi Function Calibrator by Direct Method | -190 °C to 750 °C | 0.44 °C |

Group : Time Frequency(Measure Mode)

| | | | | |
|---|--|---|-------------------|------------------|
| 1 | Dig./Analog Timer/Stop Watch/Hour Meter | Using Time Calibrator by Direct Method | 0.1 s to 1 s | 0.01 s to 0.02 s |
| | | Using Time Calibrator by Direct Method | 1 s to 60 s | 0.02 s to 0.08 s |
| | | Using Time Calibrator by Direct Method | 60 s to 86400 s | 0.08 s to 2.90 s |
| 2 | Frequency | Using 6½ Dig. Multimeter by Direct Method | 10 Hz to 1000 kHz | 0.06% |
| | | Using 6½ Dig. Multimeter with Function Generator by Comparison Method | 10 Hz to 1000 kHz | 0.06% |

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

Electro – Technical Calibration (At Site)

| Group : Direct Current Source Mode | | | | |
|------------------------------------|------------|---|-----------------|------------------|
| 1 | DC Current | Using 5½ Multifunction calibrators by Direct Method | 1 mA – 10A | 0.16 % to 0.24 % |
| | | Using 5½ Multi-Function Calibrator with Current Coil (1X100) by Direct Method | 10 A to 1000 A | 0.24 % to 0.84 % |
| 2. | DC Voltage | Using 5½ Multi-Function Calibrator by Direct Method | 1 mV to 1000 V | 0.75 % to 0.14 % |
| 3 | Resistance | Using Decade Resistance Box by Direct Method | 1 Ohm to 1 Mohm | 0.77 % to 0.94 % |
| | | Using Megohm Box by Direct Method | 2 Mohm | 1.02% |
| | | Using Megohm Box by Direct Method | 20 Mohm | 1.0 % |
| | | Using Megohm Box by Direct Method | 100 Mohm | 1.81% |
| | | Using Megohm Box by Direct Method | 200 Mohm | 2.43% |
| | | Using Megohm Box by Direct Method | 1 Gohm | 2.48% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (At Site)

| | | | | |
|----|---------------------|--|---------------|-------|
| | | Using Megohm Box by Direct Method | 2 Gohm | 2.45% |
| | | Using Megohm Box by Direct Method | 20 Gohm | 2.43% |
| | | Using Megohm Box by Direct Method | 200 Gohm | 2.52% |
| | | Using Megohm Box by Direct Method | 1 Tohm | 6.80% |
| 4. | Resistance (4 Wire) | Using Precision Resistance Box by Direct Method | 10 μ ohm | 0.28% |
| | | Using Precision Resistance Box by Direct Method | 100 μ ohm | 0.11% |
| | | Using Precision Resistance Box by Direct Method | 1 mohm | 0.10% |
| | | Using Precision Resistance Box by Direct Method | 10 mohm | 0.13% |
| | | Using Precision Resistance Box by Direct Method | 100 mohm | 0.13% |
| | | Using Standard Resistance Box by Direct Method | 1 mohm | 1.17% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (At Site)

| | | | | |
|--|--|--|----------|-------|
| | | Using Standard Resistance Box by Direct Method | 10 mohm | 1.29% |
| | | Using Standard Resistance Box by Direct Method | 100 mohm | 1.30% |
| | | Using Standard Resistance Box by Direct Method | 1 ohm | 1.19% |
| | | Using Standard Resistance Box by Direct Method | 10 ohm | 1.39% |
| | | Using Standard Resistance Box by Direct Method | 100 Ohm | 1.16% |
| | | Using Standard Resistance Box by Direct Method | 1 kohm | 1.36% |

Group : Alternating Current Source Mode

| | | | | |
|---|---------------------|--|-------------------|------------------|
| 1 | AC Current @ 50 Hz | Using 5½ Dig. Multi-Function Calibrator by Direct Method | 1 mA to 10 A | 0.40% |
| | | Using 5½ Dig. Multi-Function Calibrator with Current Coil (1X100) by Direct Method | 10 A to 1000 A | 1.3% |
| 2 | AC Voltage @ 50 Hz | Using 5½ Dig. Multi-Function Calibrator by Direct Method | 10 mV to 1000 V | 1.21 % to 0.24 % |
| 3 | Capacitance @ 1 kHz | Using Decade Capacitance Box by Direct Method | 1 nF to 1 μ F | 0.90% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (At Site)

| | | | | |
|---|--|--|--------------------|------------------|
| 4 | Inductance @ 1 kHz | Using Decade Inductance Box by Direct Method | 100 μ H to 1 H | 0.71 % to 0.94 % |
| Group : Temperature Simulation Source Mode | | | | |
| 1 | Temperature Indicator/Temperature Controller/PID/Temperature Recorder - RTD (PT-100) | Using Multi-function Calibrator by Direct Method | -190 °C to 750 °C | 0.42 °C |
| 2 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (B Type Thermocouple) | Using Multi function Calibrator by Direct Method | 610 °C to 1690 °C | 0.65 °C |
| 3 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (J Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1190 °C | 0.42 °C |
| 4 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (E Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 100 °C to 590 °C | 0.42 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Electro – Technical Calibration (At Site)

| | | | | |
|---|---|---|--------------------|---------|
| 5 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (K Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 0 °C to 1290 °C | 0.42 °C |
| 6 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (N Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 1290 °C | 0.42 °C |
| 7 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (R Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 610 °C to 1690 °C | 0.87°C |
| 8 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (S Type Thermocouple) | Using Multi Function Calibrator by Direct Method | 55 °C to 1690 °C | 0.62 °C |

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

Electro – Technical Calibration (At Site)

| | | | | |
|---|---|--|-------------------|---------|
| 9 | Temperature Indicator /Temperature Controller /PID/Temperature Recorder & Thermocouple Indicator (T Type Thermocouple) | Using Multi Function Calibrator by Direct Method | -190 °C to 390 °C | 0.4 1°C |
| Group : Time Frequency(Source Mode) | | | | |
| 1 | Frequency | Using Dig. Function Generator by Direct Method | 10 Hz to 1000 kHz | 0.58% |

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

Fluid - Flow Calibration (At Site)

| Group: Flow Rate of Volume | | | | |
|-----------------------------------|--|---|---|-------------------|
| 1 | Volume Flow Rate (Flow Elements/ Flow Meter/ Flow Transmitter) – Liquid Medium | Using Ultrasonic Hand held Flow Meter & 6 ^{1/2} Digital Multimeter by Comparison | 0.8m ³ / hr to 350 m ³ / hr | 5.1% rdg to 1.82% |

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Amended on N/A

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (At Site)

| Group: Dimension | | | | |
|-------------------------|---|--|--------------------------|---|
| 1 | Air Gauge Unit | Using Standard Ring & Plug 20 mm Dia. | -0.022 mm to 0.022 mm | 3.9 μ m |
| 2 | Surface Plate | Using Electronic Level IS 12937: 2020 ,IS 2285: 2020 ,IS 7327 2019 | Up to 3000X2000 mm | 1.5sqrt (L+W)/125 μ m to L&W in mm |
| 3 | Profile Projector (Angle Scale L.C. 1") | Using Angle Gauge Set & JIS B 7184:2021 | Upto 360° | 2.47 minute |
| 4 | Profile Projector (Magnification) | Using Glass Scale, Slip Gauge Set, Dig. Vernier & JIS B 7184:2021 | 10X to 100X | 0.40% |
| 5 | Profile Projector Linear Scale L.C.: 0.001mm Linear | Using Glass Scale & Slip Gauge Set & JIS B 7184:2021 | Upto 300 mm | 6.5 μ m |

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|-------|-----------|---|-------|---|

Mechanical Calibration (At Site)

| | | | | |
|---|-----------------|--|----------------|--------------|
| 6 | 2D Height Gauge | Caliper cheker , Master Cylinder | 0 mm to 600 mm | 7 μ m |
| 7 | Bench Center | Using Test Manderl and Dial Indicator & IS 5980:1978 | 200 mm | 7.36 μ m |

Group: Pressure & Vacuum

| | | | | |
|---|---|---|-----------------------|--------------|
| 1 | Hydraulic Pressure: Digital/Analogue Pressure Gauge/Pressure Transmitter/Transducer/ Pressure Switch | Using Digital Pressure Gauge with Hydraulic comparator and Digital Multimeter by Comparison Method as per DKD-R-6-1 : 2014 | 0 to 700 bar | 0.18% of rdg |
| 2 | Pneumatic Pressure: Digital/Analogue Low Pressure Gauge/ Manometer/Magnehelic Gauge/Differential Gauge/Transmitter/ Transducer/Pressure Switch | Using Digital Pressure Calibrator and Digital Multimeter by Comparison Method as per DKD-R-6-1: 2014 | (-)2000 Pa to 2000 Pa | 0.16% rdg |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (At Site)

| | | | | |
|---|---|--|-----------------------|--------------|
| 3 | Pneumatic- (Digital/Analogue Pressure Gauge/Pressure Transmitter/Transducer/ Pressure Switch) | Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6- 1:2014 | 0 to 30 bar | 0.084% rdg |
| 4 | Pneumatic- Digital/Analogue Vacuum Gauge/Transmitter/Tran sducer | Using Digital Pressure Gauge with pneumatic pump and Digital Multimeter by Comparison Method as per DKD-R-6- 1:2014 | (-) 0.90 bar to 0 bar | 0.41% of rdg |

Group: Mass

| | | | | |
|---|--|---|-----------------|-------|
| 1 | Digital/Analog Weighing Balances, Semi Micro Balances d= 0.1 mg Class I and coarser | Using Standard Weight(s) of E1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020 | 0 to 220 g | 0.2mg |
| 2 | Digital/Analog Weighing Balances, d= 1 mg Class II and coarser | Using Standard Weight(s) of E1 and F1 class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020 | >220 g to 500 g | 1.5mg |
| 3 | Digital/Analog Weighing Balances, Mass Comparator, d = 1 g Class III and coarser | Using Standard Weight(s) of F1 Class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020 | >500 g to 50 kg | 3.74g |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (At Site)

| | | | | |
|--------------------------------------|--|---|--------------------|-----------------|
| 4 | Digital/Analog Weighing Balances, Mass Comparator, d = 10 g Class IV and coarser | Using Standard Weight(s) of F1 Class Methods as per OIML R 76-1: 2006 & ASTM E898: 2020 | >50 kg to 300 kg | 73g |
| Group: SPEED AND ACCELARATION | | | | |
| 1 | Tachometer (Contact Type) | Using Tachometer and RPM Source by Comparison Method | 6 RPM to 8000 RPM | 3.15% to 0.11% |
| 2 | Tachometer (Non-Contact Type) | Using Tachometer and RPM Source by Comparison Method | 6 RPM to 90000 RPM | 3.15% to 0.063% |
| 3 | Tachometer Calibrator/ Stroboscope/ Centrifuge/ RPM Meter/ Vibrating M/c (Contact Type) | Using Tachometer by Direct/Comparison Method | 6 RPM to 8000 RPM | 3.15% to 0.11% |
| 4 | Tachometer Calibrator/ Stroboscope/ Centrifuge/ RPM Meter/ Vibrating M/c (Non Contact Type) | Using Tachometer by Direct/Comparison Method | 6 RPM to 90000 RPM | 3.15% to 0.063% |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Mechanical Calibration (At Site)

| Group: Force | | | | |
|-------------------------|--|---|------------------|---------|
| 1 | Tensile/Universal Testing Machine, Load Testing Machine, Spring Testing Machine, Tensometer (Tension Mode) | Using Class "0.5 & 1" Load Cell with Indicator as per IS 1828 (Part 1):2022 | 100 N to 200kN | 0.60% |
| 2 | Universal Testing Machine, Load Testing Machine, Spring Testing Machine, Fluxural Testing Machine (Compression Mode) | Using Class "0.5 & 1" Load Cell with Indicator as per IS 1828 (Part 1):2022 | 100 N to 200kN | 0.60% |
| 3 | Universal Testing Machine, Load Testing Machine, Spring Testing Machine, Fluxural Testing Machine (Compression Mode) | Using Class "1" Force Proving Instruments as per IS 1828 (Part 1):2022 | 200 kN to 2000kN | 0.60% |
| Group: Acoustics | | | | |
| 1 | Sound Level Meter @ 1kHz | Using Sound Level Calibrator by Direct Method | 94 dB | 0.90 dB |
| 2 | Sound Level Meter @ 1kHz | Using Sound Level Calibrator by Direct Method | 114 dB | 0.93 dB |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| Group: Humidity | | | | |
|-----------------|--|---|------------------|----------|
| 1 | Humidity Chamber / Conditioning Chamber / Environmental Chamber / Stability Chamber / Humidity Generator (Multi Position Calibration) @ 25°C as per IEC60068-3-5: 2018 | Using Wireless Humidity Data Logger with Inbuilt Sensor (Minimum 9 Sensor) By Comparison Method | 10 %RH to 95 %RH | 1.3% RH |
| 2 | Humidity Chamber / Conditioning Chamber / Environmental Chamber / Stability Chamber / Humidity Generator (MultiPositionCalibration) @ 50% RH as per IEC 60068-3-5:2018 | Using Wireless Temperature Data Logger with Inbuilt Sensor (Minimum 9 Sensor) By Comparison Method | 10 °C to 50 °C | 0.7 °C |
| 3 | Humidity Indicator with Sensor of Humidity Chamber / Conditioning Chamber/Environmental Chamber / Humidity Generator (Single Position Calibration) @ 25°C by comparison method | Using Digital RH Indicator with Sensor by Comparison Method as per DKD-R-5-8: 2019 | 10 %RH to 95 %RH | 1.03% RH |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| | | | | |
|---|---|---|------------------|----------|
| 4 | Temperature Indicator with Sensor of Humidity Chamber / Conditioning Chamber / Environmental Chamber / Humidity Generator (Single Position Calibration) @ 50% RH by comparison method | Using 4-Wire RTD Sensor with Indicator by Comparison Method | 10 °C to 50 °C | 0.21 °C |
| 5 | RH Sensor with Indicator/Controller, Thermo Hygrometer, Data Logger /Recorder /Scanner with Internal/External Sensor @ (25±2)°C | Using Digital RH Indicator with Sensor, Temperature and Humidity Generator by Comparison Method | 10 %RH to 95 %RH | 1.03% RH |
| 6 | Temperature & RH Sensor with Indicator/Controller, Thermo Hygrometer, Data Logger /Recorder /Scanner with Internal/External Sensor @ (50±2)% RH | Using 4-Wire RTD Sensor with Indicator, Temperature and Humidity Generator by Comparison Method | 10 °C to 50 °C | 0.21 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| Group: Temperature | | | | |
|---------------------------|--|--|--------------------|--------|
| 1 | Deep Freezers / Refrigerator/Cold Room (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | (-)35 °C to 10 °C | 1.3 °C |
| 2 | Conditioning Chamber / Environmental Chamber/ Environmental Room (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | >10 °C to 50 °C | 1.3 °C |
| 3 | Incubator (Non Medical Purpose) / Autoclave (Non Medical Purpose) / Oven / Furnace / Water Bath (Multi Position Calibration) | Using Data Logger with RTD Sensor (Minimum 9 Sensor) By Comparison Method | >50 °C to 250°C °C | 2.5 °C |
| 4 | Furnace / Industrial Furnace / Dry Block Furnace / Heating Chamber (Multi Position Calibration) | Using Data Logger with N-Type Thermocouple (Minimum 9 Sensor) By Comparison Method | >250 °C to 600 °C | 3.2 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| | | | | |
|---|---|--|--------------------|---------|
| 5 | Furnace / Industrial Furnace / Dry Block Furnace (Multi Position Calibration) | Using Data Logger with N- Type Thermocouple (Minimum 9 Sensor) By Comparison Method | >600 °C to 1200 °C | 3.2 °C |
| 6 | Temperature Indicator with Sensor of Deep Freezers / Refrigerator/Cold Room (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | (-)35 °C to 10 °C | 0.21 °C |
| 7 | Temperature Indicator with Sensor of Conditioning Chamber / Environmental Chamber/Environmental Room (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | >10 °C to 50 °C | 0.21 °C |
| 8 | Temperature Indicator with Sensor of Incubator (Non Medical Purpose) / Autoclave (Non Medical Purpose) / Oven / Furnace / Water Bath (Single Position Calibration) | Using 4-Wire RTD Sensor with Indicator By Comparison Method | >50 °C to 250 °C | 0.77 °C |

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|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| | | | | |
|----|--|---|--------------------|---------|
| 9 | Temperature Indicator with Sensor of Furnace / Muffle Furnace / Industrial Furnace / Dry Block Furnace / Heating Chamber (Single Position Calibration) | Using S-Type Thermocouple with Indicator By Comparison Method | >250 °C to 600 °C | 2.1 °C |
| 10 | Temperature Indicator with Sensor of Furnace / Muffle Furnace / Industrial Furnace / Dry Block Furnace (Single Position Calibration) | Using S-Type Thermocouple with Indicator By Comparison Method | >600 °C to 1200 °C | 2.5 °C |
| 11 | RTD s, Thermocouples with or without Controller/Indicator, Dial Temperature Gauge, Glass Thermometer, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using 4-Wire RTD with Indicator, 6½ Digital Multimeter & Liquid Temperature Bath By Comparison Method | (-)35 °C to 50 °C | 0.21 °C |

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|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| | | | | |
|----|--|--|--------------------|---------|
| 12 | RTD s, Thermocouples with or without Controller/Indicator, Dial Temperature Gauge, Glass Thermometer, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using 4-Wire RTD with Indicator, 6½ Digital Multimeter & Oil Temperature Bath By Comparison Method | >50 °C to 250 °C | 0.77 °C |
| 13 | Thermocouples with or without Controller/Indicator, Dial Temperature Gauge, Digital Thermometer, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >250 °C to 600 °C | 1.94 °C |
| 14 | Thermocouples with or without Controller/Indicator, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >600 °C to 1000 °C | 2.1 °C |

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|-------|-----------|---|-------|---|
|-------|-----------|---|-------|---|

Thermal Calibration (At Site)

| | | | | |
|----|---|--|---------------------|---------|
| 15 | Thermocouples with or without Controller/Indicator, Temperature Transmitter, Data Logger/Recorder/Scanner with Sensor | Using S-Type Thermocouple with Indicator, 6½ Digital Multimeter & Dry Block Furnace By Comparison Method | >1000 °C to 1200 °C | 2.5 °C |
| 16 | IR Thermometer, Non Contact Thermometer, Thermal Imager Camera, Pyrometer (Temperature Only) | Using Infrared Thermometer and Black Body Furnace (Emissivity 0.95) by Comparison Method | 30 °C to 500 °C | 3.73 °C |
| 17 | Temperature Indicator with Sensor of Black Body Furnace (Single Position Calibration) | Using Infrared Thermometer by Comparison Method | 30 °C to 500 °C | 3.73 °C |

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

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