



(A Constituent Board of Quality Council of India)

NABL/C-0226 18.11.2022

AJAY VEER

QUALITY SOLUTIONS (INDIA) PLOT NO: X-4, BPTP, SECTOR-76 FARIDABAD.HARYANA-121006

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Subject: Renewal of NABL Accreditation

Dear Sir,

NABL is pleased to inform you the renewal of accreditation in accordance with ISO/IEC 17025: 2017 in the disciplines of Electro-technical, Mechanical Thermal and Optical calibration as per the scope as recommended by the assessment team with the changes as mentioned below:

- Accuracy of Weights (as DUC) is given as F2 for 50 g, M1 for 1 mg and M2 for 20 kg & 50 kg in line with OIML R 111 w.r.t the CMC achieved during the assessment and setup available with the laboratory.
- Infrared Temperature Indicator / Pyrometer (10 °C to 50 °C) is given for Non-medical purpose only.
- RTD (as DUC) is removed from Sr. No. 186 as the master used is R type Thermocouple which is not acceptable in Thermal scope.
- Rubber Hardness Tester is given for Shore A and Shore D only as other types are not demonstrated.
- Parameters at Sr. No. 192 and 193 are merged (as 1 kV to 28 kV) with CMC value as 5.81 % in the Electro-technical scope.
- Parameters at Sr. No. 207 and 208 are merged (as 1 kV to 10 kV) with CMC value as 3.74 % in the Electro-technical scope

However, your laboratory is required to address the following within 10 days:

- Review the calibration method for Spring Balance in the Mechanical scope.
- Segregate the CMC for Bench Centre, Straight Edge & V-Block w.r.t the parameters in the scope.
- Mention the readout device for Pressure Transmitter in the Mechanical scope.
- Mention the latest (only) year of publication for UTM & Durometer in the scope.
- Mention the emissivity of IR Thermometer (as DUC) in the Thermal scope.
- $\bullet \;\;$ Mention the range of Energy in terms of Wh / kWh in Electro-technical scope.
- Segregate the Energy parameters for Single Phase and Three Phase in scope.
- Mention the discrete value (wherever applicable) for the Resistance as per the standards used in the Electro-technical scope.

Further, NABL hereby issuing a show cause notice to your laboratory to be replied within 10 days as to why accreditation should not be denied for the following:

- All the DUCs (above 100 mm) using ULM / LMM in view of unavailability of the Metrological Traceability of master (above 100 mm).
- Gauge Block Comparator in view of coarser CMC values as per Euramet cg 2.
- Glassware (at Sr. No. 6) in view of inadequate Weighing Balance used as readability is not appropriate in Mechanical scope.
- Acceleration and Speed 10 rpm to 100 rpm (Contact type) and 10 rpm to 1000 rpm (non-contact type) in view of coarser CMC values.
- Pressure Indicating Devices {(-) 0.8 bar to 0 bar} in view of Inadequate Metrological Traceability as it is not in SI Units.
- Pressure Indicating Devices â€" Pneumatic (0 to 30 bar) as the same master gauge is used in Hydraulic Medium which is not acceptable.
- Torque Measuring Devices in view of inadequate CMC calculations (ref.: NABL 129) as contribution due to Force, Length & Angle is not considered for the standard torque.
- Multi-position Calibration in view of insufficient Calibration Observations & the Stability and Uniformity contribution is not considered as per standard.

Your laboratory is required to participate in next available PT program.

All persons proposed by your laboratory to calibration report, review and authorize the results is accepted.

You may issue reports with NABL symbol w.e.f 09.11.2022 and valid till 08.11.2024 vide Certificate No.: CC-2717

There will be a desktop surveillance within 10 to 12 months from the date of issue of certificate to verify the continued compliance of your laboratory as per ISO/IEC 17025: 2017 and NABL requirements.

You are requested to follow NABL-133 (current issue) for using NABL symbol and for using of NABL Accredited CAB Combined ILAC MRA Mai on your test report.

Further clarification regarding permission from NABL to use NABL Accredited CAB Combined ILAC MRA Mark is given on the NABL Website.

The accredited laboratory shall mention the ULR No. and QR Code on all the test reports. The details for implementation of the same is given on the NABL Website.

Yours Sincerely, **Rajeshwar Kumar** rajeshwar@nabl.qcin.org

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NABI

CERTIFICATE OF ACCREDITATION

QUALITY SOLUTIONS (INDIA)

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

PLOT NO: X-4, BPTP, SECTOR-76, FARIDABAD, HARYANA, INDIA

in the field of

CALIBRATION

Certificate Number:

CC-2717

Issue Date:

09/07/2020

Valid Until:

08/07/2022

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.

(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Name of Legal Identity: QUALITY SOLUTIONS (INDIA)

Signed for and on behalf of NABL



N. Venkateswaran Chief Executive Officer





SCOPE OF ACCREDITATION

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| S.No | Discipline / Group | Measurand or Reference Material/Type of instrument or material to be calibrated or measured / Quantity Measured /Instrument | Calibration or Measurement Method or procedure | Measurement range and additional parameters where applicable(Range and Frequency) | * Calibration and Measurement Capability(CMC)(±) |
|------|--|---|---|--|--|
| | | 2.0 | Permanent Facility | | • |
| 1 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50Hz | Using High voltage probe (Fluke) with DMM /Direct Method | 1 kV to 5 kV | 1.81 % to 0.67 % |
| 2 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50Hz | Using High voltage probe (Fluke) with DMM /Direct Method | 5 kV to 10 kV | 0.93 % to 2.54 % |
| 3 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | CAPACITANCE at 1kHz | Using LCR Q meter ,Model -4910 Make: Aplab ,/direct Method | 1 nF to 1000 nF | 2.31 % to 0.21 % |
| 4 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | INDUCTANCE at 1 kHz | Using LCR -Q METER make: Aplab Model: 4910 / Direct Method | 100 μH to 1 H | 3.47% |
| 5 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC CURRENT@50Hz | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 2 A to 10 A | 2.02 % to 0.33 % |





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| 6 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC CURRENT@50Hz | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 2 mA to 2000 mA | 0.39 % to 1.27 % |
| 7 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC CURRENT@50Hz | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 200 μA to 2 mA | 1.27 % to 0.39 % |
| 8 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC voltage@50Hz | Using 51/2 Multi function calibrator, Zeal Make, Direct Method | 200 mV to 200 V | 0.21 % to 0.33 % |
| 9 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC voltage@50Hz | Using 51/2 Multi function calibrator, Zeal Make, Direct Method | 200 V to 1000 V | 0.33 % to 0.23 % |
| 10 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC VOLTAGE@50Hz | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 5 mV to 200 mV | 1.92 % to 0.21 % |





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| 11 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC- High Current at 50 Hz | Using 5 1/2 Digit , Zeal Make,Multifunction calibrator with current coil / Direct Method | 10 A to 100 A | 1.87 % to 1.75 % |
| 12 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC- High Current at 50 Hz | Using 5 1/2 Digit , Zeal Make,Multifunction calibrator with current coil / Direct Method | 100 A to 1000 A | 1.75 % to 0.64 % |
| 13 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC High Voltage | Using High voltage probe (Fluke) with DMM /Direct Method | 1 kV to 5 kV | 4.37 % to 2.76 % |
| 14 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC High Voltage | Using High voltage probe (Fluke) with DMM /Direct Method | 5 kV to 10 kV | 2.76% |
| 15 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC Resistance (2 Wire) | Using 61/2 DMM, Model- 8846-A, Make : Fluke . Direct Method | 1 ohm to 10 ohm | 0.38 % to 0.05 % |





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| 16 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC Resistance (2 Wire) | Using 6 1/2 DMM, Model : 8846-A , Make: Fluke : / Direct method | 10 ohm to 100 ohm | 0.05% |
| 17 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC Resistance (2 Wire) | Using 6 1/2 DMM, Model : 8846-A , Make: Fluke : / Direct method | 100 kohm to 2 Mohm | 0.05 % to 0.14 % |
| 18 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC Resistance (2 Wire) | Using 6 1/2 DMM, Model : 8846-A , Make: Fluke : / Direct method | 100 ohm to 100 kohm | 0.05% |
| 19 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC Resistance (2 Wire) | Using 6 1/2 DMM, Model : 8846-A , Make: Fluke : / Direct method | 2 Mohm to 200 Mohm | 0.14 % to 2.40 % |
| 20 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | Capacitance @1kHz | Using std. capacitance box(Discrete Method) / Direct Method | 1 nF to 1 μF | 6.18 % to 5.91 % |
| 21 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC CURRENT | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 2 A to 9 A | 1.27 % to 0.24 % |





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| 22 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC CURRENT | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 2 mA to 2000 mA | 0.22 % to 0.66 % |
| 23 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC CURRENT | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 200 μA to 2 mA | 1.87 % to 0.22 % |
| 24 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC Resistance | Using Std. Resistance Box (Discrete value) / Direct Method | 0.001 ohm to 200 Mohm | 4.06 % to 4.58 % |
| 25 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC Voltage | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 1 mV to 200 mV | 1.12 % to 0.12 % |
| 26 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC Voltage | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 200 mV to 200 V | 0.12 % to 0.13 % |
| 27 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC Voltage | Using 51/2, Multifunction calibrator , Make : Zeal , Direct Method | 200 V to 1000 V | 0.13% |





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| 28 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC- High Current | Using 5 1/2 Digit , Zeal Make,Multifunction calibrator with current coil / Direct Method | 10 A to 100 A | 2.84 % to 1.18 % |
| 29 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | DC- High Current | Using 5 1/2 Digit , Zeal Make,Multifunction calibrator with current coil / Direct Method | 100 A to 900 A | 1.18 % to 0.62 % |
| 30 | ELECTRO- TECHNICAL- DIRECT CURRENT (Source) | Inductance @1kHz | Using Std. Inductance decade box (Discrete values) By Direct Method | 1 mH to 1 H | 6.12% |
| 31 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | J-Type | Using Universal calibrator by simulation method | -100 °C to 750 °C | 1.33°C |
| 32 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | К-Туре | Using Universal calibrator by simulation method | -200 °C to 1350 °C | 1.2°C |





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| 33 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | PT-100/ RTD | Using Universal calibration by simulation method | 50 °C to 490 °C | 1.30°C |
| 34 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | R-Type | Using universal calibrator by simulation method | 200 °C to 1700 °C | 1.63°C |
| 35 | ELECTRO- TECHNICAL- TIME & FREQUENCY (Measure) | Frequency | Using 6 1/2, DMM, Model : 8846 A, Make: Fluke / Direct Method | 50 Hz to 200 kHz | 0.01 % to 0.006 % |
| 36 | ELECTRO- TECHNICAL- TIME & FREQUENCY (Source) | Time Interval | Using Time calibrator / Direct Method: | 1 s to 999 s | 6.62 % to 0.07 % |
| 37 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 10 RPM to 100 RPM | 2.0RPM |





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| 38 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 100 RPM to 1000 RPM | 2.4RPM |
| 39 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 1000 RPM to 8000 RPM | 4.0RPM |
| 40 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - Non contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 10 rpm to 1000 rpm | 2.3rpm |
| 41 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - Non contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 1000 RPM to 10000 RPM | 4.9RPM |





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| 42 | MECHANICAL- ACCELERATION AND SPEED | Tachometer / RPM measurement - Non contact Type | Using Digital Tachometer (Non contact Tachometer with RPM source) by Comparison method / By Using SANAS TR45-02 | 10000 RPM to 50000 RPM | 6.2RPM |
| 43 | MECHANICAL- ACOUSTICS | Sound Level meter@1kHz | USing sound level calibrator , direct method | 114 @1kHz dB | 0.43dB |
| 44 | MECHANICAL- ACOUSTICS | Sound Level meter@1kHz | Using Sound calibrator by comparison method | 94 @1kHz dB | 0.43dB |
| 45 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Air Ring Gauge | Using LMM | 100 mm to 180 mm | 2.49μm |
| 46 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Air Ring Gauge | Using Length measuring M/C | 3 mm to 100 mm | 2.7μm |





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| 47 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Angle Gauges | Using Sine bar , Electronics Probe, Lever dial , Surface plate , Gauge Block(0-Grade) | 0 ° to 180 ° | 10 sec of arc |
| 48 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Angle Plate / Box Angle Plate (Flatness , Parallelism, Sqaureness) | Using Surface plate , Master cylinder , Lever Dial , Height gauge , Jacks | Upto 450 mm | 13.0µm |
| 49 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Bevel / Degree Protectors LC= 0.01°/ 5 minutes | Using Angle gauges set,Dial indicator, Height Gauge, Master Cylinder and surface plate | 0° to 180 degree | 3.8minutes of arc |
| 50 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Bore Gauges (2 Point) Transmission Accuracy Check) LC=0.001 mm | Using Length measuring M/C | upto 2 mm | 0.81µm |
| 51 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier , Dial , Digital) LC=0.01 mm | Using Length Bar , Gauge Block(0- Grade) , Digital Micrometer | 0 to 1000 mm | 14.43μm |





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| 52 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier , Dial , Digital) LC=0.01 mm | Using Caliper checker , Gauge Block(0-Grade) | 0 to 300 mm | 10.18μm |
| 53 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier , Dial , Digital) LC=0.01 mm | Using Caliper checker , Gauge Block(0-Grade) , Digital Micrometer | 0 to 600 mm | 13.2µm |
| 54 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier , Dial , Digital) LC=0.02 mm | Using Length Bar , Gauge Block(0- Grade) , Digital Micrometer | 0 to 1000 mm | 17.0µm |
| 55 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier , Dial , Digital) LC=0.02 mm | Using Length Bar , Gauge Block(0- Grade) , Digital Micrometer | 0 to 1800 mm | 28.4µm |
| 56 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Coating Thickness Gauge LC=0.1/1 micron | Using Coating/ Master Foils | 0 to 0.8 mm | 4.0μm |





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| 57 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Combination set LC= 1° | Using Angle Gauges | 0 degree to 180 degree | 36minutes of arc |
| 58 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Cylindrical Setting Standard | Using Length measuring M/C | 0.5 mm to 100 mm | 1.3μm |
| 59 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Cylindrical Setting Standard | Using Length measuring M/C , Gauge Block (0 Grade) | 100 mm to 150 mm | 1.62µm |
| 60 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Cylindrical Setting Standard | Using Length measuring M/C , Setting Plug | 100 mm to 200 mm | 2.0μm |
| 61 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Depth Micrometer L.C =0.001 mm | Using Gauge Blocks (0-Grade), Surface Plate | 0 to 150 mm | 3.9µm |





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|------|---|---|---|--|--|
| 62 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Depth Micrometer L.C =0.001 mm | Using Gauge Blocks (0-Grade),Surface Plate | 0 to 25 mm | 2.5µm |
| 63 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Caliper - External , LC= 0.01 mm | Using Gauge Block (0- Garde) | 0 to 50 mm | 1.4μm |
| 64 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial caliper- Internal | Using Digital Micrometer | 10 mm to 150 mm | 8.3μm |
| 65 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Lever Type)) L.C =0.001 mm | Using Length Measuring M/C | 0 to 0.14 mm | 0.99µm |
| 66 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Lever Type)) L.C =0.002 mm | Using Length Measuring M/C | 0 to 0.60 mm | 2.0μm |





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| 67 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Lever Type)) L.C =0.01 mm | Using Length Measuring M/C | 0 to 1.0 mm | 1.41μm |
| 68 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Plunger type) L.C =0.01 mm | Using Length Measuring M/C | 0 to 100 mm | 1.67µm |
| 69 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Plunger) L.C =0.001 mm | Using Length Measuring M/C | 0 to 50 mm | 1.1µm |
| 70 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Indicator (Plunger) L.C =0.001 mm | Using Length Measuring M/C | 0 to 25 mm | 1.4μm |
| 71 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Thickness Gauge LC=0.01 mm | Using Gauge Blocks (0- Grade) | 0 to 50 mm | 7.0µm |





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| 72 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Thickness Gauge LC=0.1 mm | Using Gauge blocks (0-Garde) | 0 to 100 mm | 11.5μm |
| 73 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial Thickness Gauge / Dial Caliper LC=0.001 mm | Using Gauge blocks (0-Garde) | 0 to 12 mm | 0.8μm |
| 74 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Electronics Level LC= 0.01 mm/mtr | Using Robust Tilting Table , Electronics level | upto 10 mm/mtr | 7.75μm/mtr |
| 75 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Engineer Square/ Cylindrical Square - Squareness | Using Surface plate , Master cylinder , Gauge Block (0- Grade) | upto 600 mm | 11.30μm |
| 76 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (Digital/Plain/Analog/ Blade/Pitch/Pointed Flange/ Groove) L.C =0.001 mm | Using Gauge Blocks (0-Grade) , Optical flat, Set of Optical Parallels | 0 to 150 mm | 1.60µm |





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| 77 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (Digital/Plain/Analog/ Blade/Pitch/Pointed Flange/ Groove) L.C =0.001 mm | Using Gauge Blocks (0-Grade) , Optical flat, set of 4 Optical Parallels | 0 to 25 mm | 1.27μm |
| 78 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (Digital/Plain/Analog/ Blade/Pitch/Pointed Flange/ Groove) L.C =0.01 mm | Using Length Bar , Gauge Blocks (0- Grade) , Optical flat, set of 4 Parallels | 1000 mm to 1800 mm | 26.0μm |
| 79 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (Digital/Plain/Analog/ Blade/Pitch/Pointed Flange/ Groove) L.C =0.01 mm | Using Length Bar , Gauge Blocks (0- Grade) , Optical flat, set of 4 Optical Parallels | 150 mm to 1000 mm | 10.70μm |
| 80 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Feeler gauge/ Coating Foils | Using Length measuring M/C | Up to 3 mm | 0.80μm |
| 81 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Hegman Gauge | Using Electronics Probe , Surface plate | Upto 100 μm | 2.3µm |





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| 82 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Gauge (Vernier , Dial , Digital) 0.01 mm | Using Caliper checker , Surface plate , Lever Dial | 0 to 300 mm | 7.9µm |
| 83 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Gauge (Vernier , Dial , Digital) 0.01 mm | Using Caliper checker , Surface plate , Lever Dial | 0 to 600 mm | 9.2μm |
| 84 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Gauge (Vernier , Dial , Digital) 0.02 mm | Using Length , Surface plate , Lever Dial | 0 to 1000 mm | 13.63μm |
| 85 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Master (Pitch Block Accuracy) | Using Linear height 2d , Surface plate , Gauge block (0- Grade) | 0 to 600 mm | 7.7μm |
| 86 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Internal /Stick Micrometer L.C =0.001 mm | Using Gauge block-O grade with accessories and Caliper checker | 50 mm to 500 mm | 7.0μm |





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| 87 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Internal /Stick Micrometer L.C =0.01 mm | Using G blocks (0- Grade)with acc.+ Caliper checker | 5 mm to 500 mm | 8.80mm |
| 88 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Linear / Electronics-2 D Height Gauge (LC=0.0001 mm) | Using Length Bar, Gauge Block (0 Grade) , Surface plate, Master Cylinder | 0 to 600 mm | 5.90μm |
| 89 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Measuring Pins | Using Length measuring M/C | 0.1 mm to 20 mm | 0.82μm |
| 90 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Metric Steel scales | Using Scale & Tape calibration unit | 0 to 2000 mm | 200 sqrt L/1000 (Where L is in mm)μm |
| 91 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Metric Steels/ Woven Metallic / Fiber Tapes | Using Scale & Tape calibration unit | 0 to 50 meter | 200 sqrt L/1000 (Where L is in mm)µm |





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| 92 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Head L.C =0.001 mm | Using LMM | 0 to 50 mm | 1.1μm |
| 93 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Rod /Length Bar | Using Length Measuring M/C, 0- Grade slip gauges , Setting Plug | 100 mm to 200 mm | 2.97μm |
| 94 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Rod /Length Bar | Using Length Bar ,Plunger Dial with Comparator stand | 200 mm to 500 mm | 7.07μm |
| 95 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Rod /Length Bar | Using Length Measuring M/C | 25 mm to 100 mm | 1.3μm |
| 96 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Rod /Length Bar | Using Length Bar ,Plunger Dial with Comparator stand | 500 mm to 1000 mm | 12.75μm |





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| 97 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Pie Tape | Using Scale & Tape calibration unit | 15 mm to 320 mm | 117 L/1000 (L is in mm)μm |
| 98 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Ring Gauge(Setting /Master) | Using LMM | 100 mm to 180 mm | 2.9μm |
| 99 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Ring Gauge(Setting /Master) | Using Length measuring M/C | 3 mm to 100 mm | 1.67µm |
| 100 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Plug Gauge | Using Length measuring M/C | 1 mm to 100 mm | 1.1µm |
| 101 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Plug Gauge | Using LMM | 100 mm to 270 mm | 2.8µm |





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| 102 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain/ Magnetic V Block (Flatness , Perpendicularity) | Using Surface plate , Lever dial , Test Mandrels , Cylindrical Work piece, Height gauge for Holding | Upto 200 mm | 8.0μm |
| 103 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain/ Magnetic V Block (Parallelism) | Using Surface plate, Lever dial, Test Mandrels, Cylindrical Work piece, Height gauge for Holding | Upto 200 mm | 5.0μm |
| 104 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Profiel / Form Gauges (Linear Dim.) | Using Profile Projector | Upto 200 mm | 5.8μm |
| 105 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Profile / Form Gauges (Angle measurement) | Using Profile Projector | Upto 60 deg. | 2.4min.of arc |
| 106 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Radius Gauge | Using Profile Projector | 0.6 mm to 100 mm | 4.72μm |





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| 107 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Sine Bar -Angular Measuremnets | Using Angle Gauges , Electronics Probe, Lever dial , Surface plate , Height gauge, Gauge Block(0- Grade) | upto 300 mm | 13.8sec. of arc |
| 108 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Snap Gauge | Using LMM | 100 mm to 180 mm | 2.8µm |
| 109 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Snap Gauge | Using Length measuring M/C | 3 mm to 100 mm | 1.82μm |
| 110 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Spirit Level LC (0.02 mm/mtr) | Using Robust Tilting Table , Electronics level , Dial indicator(lever) , Height gauge, surface plate | Upto 300 mm (Base length) mm | 7.90μm/mtr |
| 111 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Straight Edge (I- Section) - Straightness, Parallelism | Using Electronics Level | Upto 6000 X 50 mm | 0.7 sqrt L+W/125 (L & W is in mm)μm |





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| 112 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Surface Plate , Comparator Stand (Granite & Cast Iron) -Flatness Deviation | Using Electronics level | Up to 6000 X 6000 mm | 0.7 sqrt L+W /125 (L ,W is in mm)μm |
| 113 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Mandrels- Straight (Straightness & Run out) | Using Bench Center ,Dial Indicator (Lever) | upto 500 mm | 8.4µm |
| 114 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieves - Aperture size | Using Profile projector | 0.04 mm to 4.0 mm | 2.52μm |
| 115 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieves - Aperture size | Using Digital caliper | 4.0 mm to 125 mm | 23.0µm |
| 116 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Pitch Gauge/ Micrometer- Flank Angle | Using Profile Projector | UPTO 60 degree | 0.2min.of arc |





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| 117 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Pitch Gauge/ Micrometer- Pitch accuracy | Using Profile Projector | 0.25 mm to 6.0 mm | 2.80µm |
| 118 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread plug/ WCP Gauge-Effective Diameter | Using Length measuring M/C , | 1 mm to 100 mm | 1.68µm |
| 119 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread plug/ WCP Gauge-Effective Diameter | Usimh LMM | 100 mm to 180 mm | 2.39µm |
| 120 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Ring/ Wear checking Ring Gauge-Effective Dia. | Using Length measuring M/C. | 3 mm to 100 mm | 1.86µm |
| 121 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Three Pin Micrometer LC=0.001 mm | Using set of Ring gauges | 15 mm to 65 mm | 3.9µm |





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| 122 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Ultrasonic Thickness Gauge LC= 0.001 mm | Using Gauge Block- 0-Grade | 1.2 mm to 100 mm | 70.4μm |
| 123 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Vernier Depth Gauge LC=0.001 mm | Using Length Bar Grade -0 Gauge Block ,Lever dial Surface plate , Holding fixture | 0 to 200 mm | 9.2μm |
| 124 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Caliper Checker /Check Master | Using Caliper checker / Length Bar (As a comparator ,Linear height 2D)+, Surface Plate | 0 to 600 mm | 8.0μm |
| 125 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Dial calibration Tester LC=0.001 mm | Using Electronics Probe , Gauge Block (0-Grade) | 0 to 25 mm | 2.15µm |
| 126 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Electronics Probe LC= 0.01/0.1 micron | Using Gauge Block, Slip Gauges (0- Grade) . Surface Plate | 0 to 25 mm | 1.33µm |
| 127 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block Comparators LC=0.01 micron | Using Gauge Block set -Slip gauges (K- Grade) , | 0 to 100 mm | 0.10μm |





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| 128 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block Accessories - Flatness | Using Optical Flat, Surface Plate , Electronics probe | Upto 250 mm | 0.3 μm |
| 129 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block Accessories - Parallelism | Using Optical Flat, Surface Plate , Electronics probe | Upto 250 mm | 2.6μm |
| 130 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block- Slip gauges | Using Gauge Block set (K-Grade)& Gauge Block Calibrator | 0.5 mm to 10 mm | 0.13μm |
| 131 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block- Slip gauges | Using Gauge Block set (K-Grade)& Gauge Block Calibrator | 25 mm to 50 mm | 0.27μm |
| 132 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block- Slip gauges | Using Gauge Block set (K-Grade)& Gauge Block Calibrator | 50 mm to 100 mm | 0.49µm |
| 133 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Blocks- Slip gauges | Using Gauge Block set (K-Grade)& Gauge Block Calibrator | 10 mm to 25 mm | 0.16μm |
| 134 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Optical Flat Type A - Flatness | Using Master Optical Flat, Monochromatic light source | UPTO 50 mm | 0.11μm |





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| 135 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Optical Parallel - Flatness , Parallelism | Using Master Flat, Monochromatic light source , Two Probe comparator | Upto 50 mm | 0.11μm |
| 136 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Roughness Master (Ra value) | Using Surface Roughness Tester | Ra-2.92 μm | 0.18μm |
| 137 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Spline Plug . Ring Gauge - Diameter over pin | Using Length measuring M/C+Measuring Pins | 10 mm to 100 mm | 3.50µm |
| 138 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Surface Roughness Tester(Portable) (Ra = 3.20,2.9 value) Two Point only | Using Roughness Master | Ra-2.94 ,3.20 μm | 0.42μm |
| 139 | MECHANICAL- DUROMETER | Rubber Hardness Tester 100 shore A , LC=1 shore A | Using Weighing balance having d=0.1 g (for Spring Balance) | Upto 100 Shore A | 1.5Shore A |
| 140 | MECHANICAL- DUROMETER | Rubber Hardness Tester 100 shore D , LC=1 shore D | Using Weighing balance having d=0.1 g (for Spring Balance) | Upto 100 shore D | 1.2shore D |
| 141 | MECHANICAL- MOBILE FORCE MEASURING SYSTEM | Push Pull gauge/ Force gauge (In Push Pull mode) | Using Dead weight and loading hangers as per VDI/VDE-2624 | 5 N to 1000 N PULL Mode 500 N PUSH Mode | 1N |





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|------|--|---|--|--|--|
| 142 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 1000 bar | 3.79bar |
| 143 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 200 bar | 1.25bar |
| 144 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 30 bar | 0.35bar |
| 145 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Test Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 4 bar | 0.29bar |
| 146 | MECHANICAL- PRESSURE INDICATING DEVICES | Negative Pressure- Vacuum gauges | Using Digital pressure gauge/ Vacuum pump By comparison method as per DKDR6-1 | (-) 0.8 bar to 0 | 0.012bar |





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| 147 | MECHANICAL- PRESSURE INDICATING DEVICES | Pneumatic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Pneumatic comparator by comparison method , as per DKDR6-1 | 0 to 30 bar | 0.35bar |
| 148 | MECHANICAL- PRESSURE INDICATING DEVICES | Pneumatic Pressure gauges/ Switches /Transmitters/ Transducers/Magneh elic gauge/ Manometers | Using Digital manometer by comparison method , as per DKDR6-1 | 0 to 0.34 bar | 0.016bar |
| 149 | MECHANICAL- TORQUE GENERATING DEVICES | Torque Wrench Type 1 , Class B,C,D,E & Type 2, Class A,B,D,E | Using Torque transducers and indicator , Using Digital torque wrench calibration system as per ISO 6789:2017 | 1 Nm to 10 Nm | 3.45% |
| 150 | MECHANICAL- TORQUE GENERATING DEVICES | Torque Wrench Type 1, Class B,C,D,E & Type 2, Class A,B,D,E | Using Torque transducers and indicator , Using Digital torque wrench calibration system as per ISO 6789:2017 | 10 Nm to 1000 Nm | 1.89% |





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|------|---|---|---|--|--|
| 151 | MECHANICAL- TORQUE MEASURING DEVICES | Torque Calibrator/Torque Transducers/Torque meter /Torque Tester , Class 0.5 and coarser | Using Dead weight torque calibration system consisting of lever arm and Dead weight as per BS-7882:2017 | 10 Nm to 50 Nm | 0.10% |
| 152 | MECHANICAL- TORQUE MEASURING DEVICES | Torque Calibrator/Torque Transducers/Torque meter /Torque Tester , Class 0.5 and coarser | Using Dead weight torque calibration system consisting of lever arm and Dead weight as per BS-7882:2017 | 2 Nm to 10 Nm | 0.10% |
| 153 | MECHANICAL- TORQUE MEASURING DEVICES | Torque Calibrator/Torque Transducers/Torque meter /Torque Tester , Class 0.5 and coarser | Using Dead weight torque calibration system consisting of lever arm and Dead weight as per BS-7882:2017 | 200 Nm to 1000 Nm | 0.10% |
| 154 | MECHANICAL- TORQUE MEASURING DEVICES | Torque Calibrator/Torque Transducers/Torque meter /Torque Tester , Class 0.5 and coarser | Using Dead weight torque calibration system consisting of lever arm and Dead weight as per BS-7882:2017 | 50 Nm to 200 Nm | 0.10% |
| 155 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=0.01mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 1 ml to 10 ml | 0.03ml |





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|------|-----------------------|---|--|--|--|
| 156 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=0.1mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 10 ml to 100 ml | 1.2ml |
| 157 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=1mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 100 ml to 500 ml | 2.90ml |
| 158 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=10mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 1000 ml to 2000 ml | 11.55ml |
| 159 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=100mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 2000 ml to 10000 ml | 50.25ml |





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|------|---|---|---|--|--|
| 160 | MECHANICAL- VOLUME | Glass ware (Pipettes/ Burette/Measuring cylinder/Volumetric flask/ Beaker/Jar/Conical flask) | Using Weighing balance of LC=10mg and distilled water of known density as per ISO 4787,ISO /TR20461 | 500 ml to 1000 ml | 5.77ml |
| 161 | MECHANICAL- VOLUME | Micro-Pipettes | Using weighing balance LC=0.01 mg and distilled water of known density as per ISO 8655-6, ISO/TR 20461 | 100 µI to 1000 µI | 6µІ |
| 162 | MECHANICAL- VOLUME | Micro-Pipettes | Using weighing balance LC=0.01 mg and distilled water of known density as per ISO 8655-6, ISO/TR 20461 | 1000 μl to 5000 μl | 9.4 _μ ι |
| 163 | MECHANICAL- WEIGHING SCALE AND BALANCE | Spring Balance 0 to 100 kg , d= 100 g | Using F1 class weights as per OIML R-76 | 0 to 100 kg | 80g |
| 164 | MECHANICAL- WEIGHING SCALE AND BALANCE | Spring Balance 0 to 50 kg , d= 10 g | Using F1& M1 class weights as per OIML R-76 | 0 to 50 kg | 8g |





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|------|---|---|---|--|--|
| 165 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 200 kg ,Readability d= 20 g (Accuracy class =Ordinary -1111) | Using Standard weights F1 , M1 class | 0 to 200 kg | 19g |
| 166 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 1 mg to 42 g , Readability d=0.01mg (Accuracy class =Special (1) | Using Standard weights E1 class (1 mg to 200 g) | 1 mg to 42 g | 0.06mg |
| 167 | MECHANICAL- WEIGHTS | Calibration of weight of Accuracy Class M1 and coarser -5kg | Using standard weights of class F1, weighing balance with LC=0.1g | 5 kg | 115mg |
| 168 | MECHANICAL- WEIGHTS | Calibration of weight sof M1 Class and coarser-1 kg | Using standard weights of class F1, weighing balance with LC=10mg | 1 kg | 12mg |
| 169 | MECHANICAL- WEIGHTS | Calibration of weights Class M1 and coarser -50 kg | Using standard weights of class F1, weighing balance with LC=1g | 50 kg | 1.0g |
| 170 | MECHANICAL- WEIGHTS | Calibration of weights of Accuracy Class M1 and coarser -10 kg | Using standard weights of class F1, weighing balance with LC=0.1g | 10 kg | 100mg |





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|------|------------------------|---|--|--|--|
| 171 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser-100mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 100 mg | 0.01mg |
| 172 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser-200mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 200 mg | 0.01mg |
| 173 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser-20mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 20 mg | 0.01mg |
| 174 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser-50mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 50 mg | 0.01mg |
| 175 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=1 g | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 1 g | 0.03mg |
| 176 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=10 g | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 10 g | 0.01mg |
| 177 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=100 g | Using standard weights of E1 class & weighing balance of LC=0.1mg. | 100 g | 0.09mg |





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|------|------------------------|---|--|--|--|
| 178 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=2 g | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 2 g | 0.02mg |
| 179 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=20 g | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 20 g | 0.11mg |
| 180 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=200 g | Using standard weights of E1 class & weighing balance of LC=0.1mg. | 200 g | 0.15mg |
| 181 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=5 g | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 5 g | 0.01mg |
| 182 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=50 g | Using standard weights of E1 class & weighing balance of LC=0.1mg. | 50 g | 0.14mg |
| 183 | MECHANICAL- WEIGHTS | Weight of F1 class and coarser=500 mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 500 mg | 0.09mg |
| 184 | MECHANICAL- WEIGHTS | Weight of F2 class and coarser-10mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 10 mg | 0.01mg |





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|------|---|---|---|--|--|
| 185 | MECHANICAL- WEIGHTS | Weight of F2 class and coarser-1mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 1 mg | 0.01mg |
| 186 | MECHANICAL- WEIGHTS | Weight of F2 class and coarser-2mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 2 mg | 0.01mg |
| 187 | MECHANICAL- WEIGHTS | Weight of F2 class and coarser-5mg | Using standard weights of E1 class & weighing balance of LC=0.01mg. | 5 mg | 0.01mg |
| 188 | MECHANICAL- WEIGHTS | Weight of M1 class and coarser=2kg | Using standard weights of F1 class & weighing balance of LC=0.01g. | 2 kg | 10mg |
| 189 | MECHANICAL- WEIGHTS | Weight of M1 class and coarser=500 g | Using standard weights of F1 class & weighing balance of LC=0.01g. | 500 g | 2mg |
| 190 | OPTICAL- OPTICAL | LUX/LIGHT METER | Illuminance/ /Lux meter | 1 lx to 10000 lx | 4.0% |
| 191 | THERMAL- SPECIFIC HEAT & HUMIDITY | Humidity controller/ Indicator with sensor/ Thermo Hygrometer | USing Digital Temp RH indicator with sensor & Humidity chamber | 30 % RH@25°C to 90%RH@25°C | 2.1 %RH @25°C |





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| 192 | THERMAL- SPECIFIC HEAT & HUMIDITY | Temperature of Humidity controller/ Indicator with sensor/ Thermo Hygrometer | Using Digital Temp/ RH Indicator with sensor & Humidity Chamber (By Comparison Method) | 15 °c to 45 °c | 1.2°c |
| 193 | THERMAL- TEMPERATURE | RTD / Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Glass Thermometer, Digital Thermometer | Using RTD with indicator Oil bath (By Comparison Method) | > 50 °c to 200 °c | 0.7°C |
| 194 | THERMAL- TEMPERATURE | RTD/ Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Digital Thermometer | Using R type thermocouple with indicator /Dry Block Furnace (By Comparison Method) | > 200 °c to 600 °c | 1.9°c |





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|------|-------------------------|---|--|---|--|
| 195 | THERMAL- TEMPERATURE | RTD/ Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Glass Thermometer, Digital Thermometer | Usinf RTD with indicator/ methanol liquid bath/oil bath - by comparison method | -30 °c to 50 °c | 0.4°c |
| 196 | THERMAL- TEMPERATURE | Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, | Using R , Type thermocouple with indicator(Dry block furnace)-By comparison method | > 600 °C to 1200 °C | 2.4°C |





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|------|--|---|---|--|--|
| | | 3.0 | Site Facility | | |
| 1 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50Hz | Using High voltage probe (Fluke) with DMM /Direct Method | 1 kV to 5 kV | 1.81 % to 0.67 % |
| 2 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50Hz | Using High voltage probe (Fluke) with DMM /Direct Method | 5 kV to 10 kV | 0.93 % to 2.54 % |
| 3 | ELECTRO- TECHNICAL- Alternating Current (< 1 GHz) (Measure) | Energy meter | Using Accu-check Calibrator | 1 x240V, 3X240 V. 50Hz Ba to Vref= 240 V, 50 Hz (3 p4w | 0.30% |
| 4 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC High Voltage | Using High voltage probe (Fluke) with DMM /Direct Method | 1 kV to 5 kV | 4.37 % to 2.76 % |
| 5 | ELECTRO- TECHNICAL- DIRECT CURRENT (Measure) | DC High Voltage | Using High voltage probe (Fluke) with DMM /Direct Method | 5 kV to 10 kV | 2.76% |





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| 6 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | Ј-Туре | Using Universal calibrator by simulation method | -100 °C to 750 °C | 1.33°C |
| 7 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | K-Type | Using Universal calibrator by simulation method | -200 °C to 1350 °C | 1.2°C |
| 8 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | PT-100/ RTD | Using Universal calibration by simulation method | 50 °C to 490 °C | 1.30°C |
| 9 | ELECTRO- TECHNICAL- TEMPERATURE SIMULATION (Source) | R-Type | Using universal calibrator by simulation method | 200 °C to 1700 °C | 1.63°C |
| 10 | ELECTRO- TECHNICAL- TIME & FREQUENCY (Source) | Time Interval | Using Time calibrator / Direct Method: | 1 s to 999 s | 6.62 % to 0.07 % |





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| 11 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Air Gauge Unit | Using Setting Ring gauge | Upto +/-100 μm | 2.1μm |
| 12 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Bench Center (Coaxiality / Run out , Parallelism | Using Test Mandrel (Taper / Straight) , Lever dial | Upto 3000 mm | 8.3μm |
| 13 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Gear Rolling Tester | Using Gauge Block (0- Grade)+ Plunger Dial | Upto 500 mm | 3.7µm |
| 14 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Linear / Electronics-2 D Height Gauge (LC=0.0001 mm) | Using Length Bar, Gauge Block (0 Grade) , Surface plate, Master Cylinder | 0 to 600 mm | 5.90µm |
| 15 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Microscope (LC 0.1/0.01 mm) | Using Glass scale | 0 to 1 mm | 7.9μm |





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| 16 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Straight Edge (I- Section) - Straightness, Parallelism | Using Electronics Level | Upto 6000 X 50 mm | 0.7 sqrt L+W/125 (L & W is in mm)μm |
| 17 | MECHANICAL- DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Surface Plate , Comparator Stand (Granite & Cast Iron) -Flatness Deviation | Using Electronics level | Up to 6000 X 6000 mm | 0.7 sqrt L+W /125 (L ,W is in mm)μm |
| 18 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Dial calibration Tester LC=0.001 mm | Using Electronics Probe , Gauge Block (0-Grade) | 0 to 25 mm | 2.15μm |
| 19 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Electronics Probe LC= 0.01/0.1 micron | Using Gauge Block, Slip Gauges (0- Grade) . Surface Plate | 0 to 25 mm | 1.33µm |
| 20 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Gauge Block Comparators LC=0.01 micron | Using Gauge Block set -Slip gauges (K- Grade) , | 0 to 100 mm | 0.10μm |
| 21 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Profile Projector - Angle , LC=1 sec. | Using Angle gauges | 0 degree to 360 degree | 6.1sec. |





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|------|--|---|--|--|--|
| 22 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Profile Projector - Linear . LC=0.001 mm | Using Glass scale | 0 to 200 mm | 1.90µm |
| 23 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Profile Projector - Magnification | Using Gauge Block (0-Grade) , Digital Caliper | 10 X % to 100X % | 0.02% |
| 24 | MECHANICAL- DIMENSION (PRECISION INSTRUMENTS) | Universal / Length measuring M/C , LC=0.1micron | Using Gauge Block (K- Grade) | 0 to 100 mm | 0.33μm |
| 25 | MECHANICAL- HARDNESS TESTING MACHINES | Rockwell Hardness Tester | Standard Hardness Block / Indirect method as per IS 1586 PART 1 to 3: 2018 | HRA | 1.0 HRA |
| 26 | MECHANICAL- HARDNESS TESTING MACHINES | Rockwell Hardness Tester | Standard Hardness Block / Indirect method as per IS 1586 PART 1 to 3: 2018 | HRBW | 1.0 HRBW |
| 27 | MECHANICAL- HARDNESS TESTING MACHINES | Rockwell Hardness Tester | Standard Hardness Block/ Indirect method as per IS 1586 PART 1 to 3: 2018 | HRC | 1.0 HRC |





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|------|--|---|--|--|--|
| 28 | MECHANICAL- HARDNESS TESTING MACHINES | Verification of Brinell Hardness Tester - HBW 10/3000 | Using Hardness Blocks IS1500-2013-2 | HBW 10/3000 | 2.0% |
| 29 | MECHANICAL- HARDNESS TESTING MACHINES | Verification of Vickers Hardness Tester -HV 5 | Using Hardness Blocks | HV-5 HV | 4.2% |
| 30 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 1000 bar | 3.79bar |
| 31 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 200 bar | 1.25bar |
| 32 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 30 bar | 0.35bar |





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| 33 | MECHANICAL- PRESSURE INDICATING DEVICES | Hydraulic Pressure gauges/ Switches /Transmitters/ Transducers | Using Test Gauge with Hydraulic comparator by comparison method , as per DKDR6-1 | 0 to 4 bar | 0.29bar |
| 34 | MECHANICAL- PRESSURE INDICATING DEVICES | Negative Pressure- Vacuum gauges | Using Digital pressure gauge/ Vacuum pump By comparison method as per DKDR6-1 | (-) 0.8 bar to 0 | 0.012bar |
| 35 | MECHANICAL- PRESSURE INDICATING DEVICES | Pneumatic Pressure gauges/ Switches /Transmitters/ Transducers | Using Digital Pressure Gauge with Pneumatic comparator by comparison method , as per DKDR6-1 | 0 to 30 bar | 0.35bar |
| 36 | MECHANICAL- PRESSURE INDICATING DEVICES | Pneumatic Pressure gauges/ Switches /Transmitters/ Transducers/Magneh elic gauge/ Manometers | Using Digital manometer by comparison method , as per DKDR6-1 | 0 to 0.34 bar | 0.016bar |
| 37 | MECHANICAL- UTM, TENSION CREEP AND TORSION TESTING MACHINE | Uniaxial Static Testing M/C - Compression Mode | Using Force proving instruments . Load cell | 5 kN to 1000 kN | 0.77% |





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|------|---|---|---|--|--|
| 38 | MECHANICAL- UTM, TENSION CREEP AND TORSION TESTING MACHINE | Uniaxial Static Testing M/C -Tension Mode | Using Load cell. | 1 kN to 10 kN | 0.77% |
| 39 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 1000 g ,Readability d= 1 mg (Accuracy class =Ordinary -1111) | Using Standard weights F1 class | 0 to 1000 g | 3.4mg |
| 40 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 200 kg ,Readability d= 20 g (Accuracy class =Ordinary -1111) | Using Standard weights F1 , M1 class | 0 to 200 kg | 19g |
| 41 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 3200 g ,Readability d= 10 mg (Accuracy class = Ordinary -1111) | Using Standard weights of F1 class | 0 to 3200 g | 12.60mg |
| 42 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 50 kg , Readability d= 1 g (Accuracy class =High(11) | Using Standard weights F1 class | 0 to 50 kg | 1.4g |





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|------|---|---|--|--|--|
| 43 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 1200 g , Readability d= 10mg (Accuracy class =High(11) | Using Standard weights F1 class | 0 to 1200 g | 12.6mg |
| 44 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 0 to 15 kg ,Readability d= 0.1 g (Accuracy class =Ordinary -1111) | Using Standard weights F1 class | 0 to 15 kg | 0.20g |
| 45 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances > 42 g to 200 g , Readability, d=0.1 mg , Accuracy class- Special-1 | Using Standard weights E1 class (1 mg to 200 g) | 42 g to 200 g | 0.13mg |
| 46 | MECHANICAL- WEIGHING SCALE AND BALANCE | Weighing Balances 1 mg to 42 g , Readability d=0.01mg (Accuracy class =Special (1) | Using Standard weights E1 class (1 mg to 200 g) | 1 mg to 42 g | 0.06mg |
| 47 | THERMAL- SPECIFIC HEAT & HUMIDITY | Humidity Chamber/ Environmental Chamber | Using Digital Hygrometer (Single Position Calibration) | 30% RH @25°C to 90% RH @25°C | 2.8% RH @25°C |
| 48 | THERMAL- TEMPERATURE | Dry block Furnace / Muffle / Industrial Furnace-Single Position | Using R , Type Thermocouple with Indicator- Single Position | 200 °C to 1200 °C | 2.4°C |





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|------|-------------------------|--|---|--|--|
| 49 | THERMAL- TEMPERATURE | Dry Block Furnace/ Muffle Furnace/ Industrial Furnace -Thermal Mapping -9 Point (Multi position) | Using Data logger with N-Type Thermocouple -9 point. | > 600 °C to 1200 °C | 5.8°C |
| 50 | THERMAL- TEMPERATURE | Dry Block Furnace/ Muffle Furnace/ Industrial Furnace -Thermal Mapping -9 Point (Multi position) | Using Data Logger With N Type Thermocouple-9 Point | >300 °C to 600 °C | 3.8°C |
| 51 | THERMAL- TEMPERATURE | Environment Chamber, Furnaces, Freezers, Oven, Vacuum Oven, BOD Incubator, Incubator, Centrifuge Chamber, Cold Room, Hot Room, Autoclave, Aging Oven-Single Position | Using PT-100X1 Simplex , 4 Wire RTD sensor with indicator-Single Position | (-)80 °C to 300 °C | 1.3°C |





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|------|-------------------------|---|--|--|--|
| 52 | THERMAL- TEMPERATURE | Environment Chamber, Furnaces, Freezers, Oven, Vacuum Oven, BOD Incubator, Incubator, Centrifuge Chamber, Cold Room, Hot Room, Autoclave, Aging Oven-Thermal Mapping 9 Points | Data logger with RTD sensors (Multi position -9 Points) | -30 °C to 300 °C | 1.3°C |
| 53 | THERMAL- TEMPERATURE | RTD / Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Glass Thermometer, Digital Thermometer | Using RTD with indicator Oil bath (By Comparison Method) | > 50 °c to 200 °c | 0.7°C |
| 54 | THERMAL- TEMPERATURE | RTD/ Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Digital Thermometer | Using R type thermocouple with indicator /Dry Block Furnace (By Comparison Method) | > 200 °c to 600 °c | 1.9°c |





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|------|-------------------------|---|--|--|--|
| 55 | THERMAL- TEMPERATURE | RTD/ Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, Glass Thermometer, Digital Thermometer | Usinf RTD with indicator/ methanol liquid bath/oil bath - by comparison method | -30 °c to 50 °c | 0.4°c |
| 56 | THERMAL- TEMPERATURE | Thermocouples With or without Controller / Indicator/ Data Logger / Recorder, Temperature Transmitter, Temperature Gauge, | Using R , Type thermocouple with indicator(Dry block furnace)-By comparison method | > 600 °C to 1200 °C | 2.4°C |

^{*} CMCs represent expanded uncertainties expressed at approximately the 95% level of confidence, using a coverage factor of k = 2.