



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

| | | | |
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| Laboratory Name : | HI-TECH LABORATORY & SERVICES, SHIVANI COMPLEX, C-4, 7 VIDYA VIHAR, BHOPAL, MADHYA PRADESH, INDIA | | |
| Accreditation Standard | ISO/IEC 17025:2017 | | |
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| Validity | 20/12/2022 to 19/12/2024 | Last Amended on | 05/02/2023 |

| 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)(±) |
|--------------------|---|---|---|---|--|
| Permanent Facility | | | | | |
| 1 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 1 A to 10 A | 0.10 % to 0.35 % |
| 2 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 100 µA to 100 mA | 0.3 % to 0.05 % |
| 3 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50 Hz | Using HV Probe with Digital Multimeter by Comparison Method | 1 kV to 27 kV | 4% |
| 4 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 1 V to 1000 V | 0.20 % to 0.10 % |



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| 5 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 10 mV to 100 mV | 0.15 % to 0.05 % |
| 6 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 100 Ohm to 10 Mohm | 0.5 % to 0.6 % |
| 7 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz | Using Multi Product Calibrator & Current Coil by Direct Method | 1 A to 20 A | 0.15 % to 0.25 % |
| 8 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz | Using Multi Product Calibrator & Current Coil by Direct Method | 30 µA to 1 A | 0.6 % to 0.15 % |
| 9 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC High Current @ 50 Hz | Using Multi Product Calibrator & Current Coil by Direct Method | 50 A to 995 A | 0.65 % to 1.00 % |



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| 10 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz | Using Multi Product Calibrator by Direct Method | 1 mV to 1 V | 2.6 % to 0.15 % |
| 11 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz | Using Multi Product Calibrator by Direct Method | 1 V to 1000 V | 0.15 % to 0.20 % |
| 12 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Capacitance Box by Direct Method | 10 nF to 10 µF | 2 % to 1.6 % |
| 13 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | Inductance @ 1 kHz | Using Inductance Box by Direct Method | 100 µH to 10 H | 1.3 % to 1.2 % |
| 14 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 6½ Multi Product Calibrator & Current Coil by Direct Method | 1 A to 10 A | 0.10 % to 0.2 % |
| 15 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 6½ Digital Precision Multimeter by Direct Method | 1 mA to 1 A | 0.06 % to 0.10 % |



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| 16 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Current | Using 6½ Digital Precision Multimeter by Direct Method | 10 µA to 1 mA | 0.9 % to 0.06 % |
| 17 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage | Using HV Probe with Digital Multimeter by Comparison Method | 1.0 kV to 39 kV | 3% |
| 18 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 1 mV to 10 mV | 0.06 % to 0.05 % |
| 19 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 1 V to 1000 V | 0.014 % to 0.05 % |
| 20 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 10 mV to 1 V | 0.08 % to 0.1 % |
| 21 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 10 Mohm to 1 Gohm | 0.1 % to 3 % |



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| 22 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 100 mohm to 10 Mohm | 0.1% |
| 23 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using Multi Product Calibrator & Current Coil by Direct Method | 1 A to 20 A | 0.15 % to 0.10 % |
| 24 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using Multi Product Calibrator & Current Coil by Direct Method | 10 µA to 1 A | 0.3 % to 0.10 % |
| 25 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC High Current | Using Multi Product Calibrator & Current Coil by Direct Method | 50 A to 995 A | 0.80 % to 1.00 % |
| 26 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Resistance Box by Direct Method | 1 mohm to 1 Ohm | 0.90 % to 0.1 % |
| 27 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Resistance Box by Direct Method | 1 Ohm to 100 Ohm | 0.1 % to 0.01 % |



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| 28 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Multi Product Calibrator by Direct Method | 100 Ohm to 1 Gohm | 0.07 % to 1.9 % |
| 29 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Multi Product Calibrator by Direct Method | 100 Ohm to 10 Mohm | 0.07 % to 0.7 % |
| 30 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using Multi Product Calibrator by Direct Method | 1 mV to 1 V | 0.7 % to 0.1 % |
| 31 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using Multi Product Calibrator by Direct Method | 1 V to 1000 V | 0.1 % to 0.01 % |
| 32 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | High Resistance @ 5 kV | Using Mega Ohm Resistance Box up to 5 kV by Direct Method | 1 Gohm to 10 Gohm | 2 % to 2.5 % |
| 33 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: J-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 600 °C | 0.52°C |



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| 34 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: K-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 1200 °C | 0.9°C |
| 35 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: R-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | 300 °C to 1600 °C | 1.1°C |
| 36 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: RTD | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 200 °C to 800 °C | 0.45°C |
| 37 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: S-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | 100 °C to 1600 °C | 1.2°C |
| 38 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: T-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 390 °C | 0.52°C |
| 39 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: T-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 400 °C | 0.75°C |



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| 40 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: J-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 1200 °C | 0.5°C |
| 41 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: K-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 1370 °C | 0.6°C |
| 42 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: R-Type Thermocouple | Using Multifunction Calibrator by Direct Method | 0 °C to 1700 °C | 1.6°C |
| 43 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: RTD | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 800 °C | 0.4°C |
| 44 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: S-Type Thermocouple | Using Multifunction Calibrator by Direct Method | 0 °C to 1700 °C | 1.2°C |
| 45 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Digital Time Interval Meter / Counter | Using Digital Time Interval meter by Comparison Method | 10 s to 2 hr | 0.78 s to 2 s |



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| 46 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency | Using Multi Product Calibrator by Direct Method | 50 Hz to 100 kHz | 0.05 % to 0.1 % |
| 47 | MECHANICAL-ACCELERATION AND SPEED | RPM Meter, Speed Indicator, Tachometer (Contact Type) | Using Tachometer & RPM Calibrator by Comparison Method SANAS TR45-01 | 100 rpm to 10000 rpm | 10rpm |
| 48 | MECHANICAL-ACCELERATION AND SPEED | RPM Meter, Speed Indicator, Tachometer (Contact Type) | Using Tachometer & RPM Calibrator by Comparison Method SANAS TR45-01 | 50 rpm to 100 rpm | 3.47rpm |
| 49 | MECHANICAL-ACCELERATION AND SPEED | RPM, Centrifuge Machine, RPM Meter, Speed Indicator, Stroboscope, Tachometer (Non-contact) | Using Tachometer by Comparison Method SANAS TR45-01 | 100 rpm to 20000 rpm | 5.94rpm |
| 50 | MECHANICAL-ACCELERATION AND SPEED | RPM, Centrifuge Machine, RPM Meter, Speed Indicator, Stroboscope, Tachometer (Non-contact) | Using Tachometer by Comparison Method SANAS TR45-01 | 50 rpm to 100 rpm | 3.05rpm |
| 51 | MECHANICAL-ACOUSTICS | Sound Level Meter | Using Acoustic Calibrator by Comparison Method as per IS 15575 | 114 dB @ 1kHz | 1dB |



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| 52 | MECHANICAL-ACOUSTICS | Sound Level Meter | Using Acoustic Calibrator by Comparison Method as per IS 15575 | 94 dB @ 1 kHz | 1dB |
| 53 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Bevel Protector / Angle Protector / Combination Square Set (L.C.: 5' & coarser) | Using Angle Gauges by Comparison Method | 0° to 360° | 4minute of arc |
| 54 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Bore Gauge (Transmission) L.C: 1.0 µm & Coarser | Using Length Measuring Machine & Plunger Dial by Comparison Method | 0 to 1 mm | 3.0µm |
| 55 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper (Vernier/ Dial/ Digital) L.C: 0.01 mm & Coarser | Using Slip Gauge, Caliper Checker and Length Bar by Comparison Method | 0 to 2000 mm | 42µm |
| 56 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Caliper - Vernier / Dial / Digital (L.C.: 0.01 mm & Coarser) | Using Slip Gauge, Caliper Checker & Length Bar by Comparison Method | 0 to 1000 mm | 25µm |



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| 57 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Coating Thickness Foil | Using Universal Length Measuring Machine by Comparison Method | 0.01 mm to 2 mm | 2.2µm |
| 58 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Coating Thickness Gauge / DFT Meter L.C: 0.1 µm & Coarser | Using Coating Thickness Foils by Comparison Method | 0 to 714 µm | 4.0µm |
| 59 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Cylindrical Measuring Pin | Using Length Measuring Machine by Comparison Method | 0.5 mm to 20 mm | 2.0µm |
| 60 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Depth Gauge (Vernier/ Dial/ Digital) L.C. 0.01 mm & Coarser | Using Slip Gauges, Caliper Checker, Length Bar & Surface Plate by Comparison Method | 0 to 600 mm | 22.0µm |
| 61 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Depth Micrometer (L.C. 0.01 mm & Coarser) | Using Slip Gauge Block, Length Bars, Caliper Checker & Surface Plate by Comparison Method | 0 to 300 mm | 12.20µm |



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| 62 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Dial & Digital step Thickness Gauge (L.C. 0.01 mm & Coarser) | Using Slip Gauges by Comparison Method | 0 to 10 mm | 7.0µm |
| 63 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (L.C. 0.001 mm & Coarser) | Using Slip Gauge Block, Length Bars, Plunger Dial & Comparator Stand by Comparison Method | 0 to 100 mm | 3.0µm |
| 64 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | External Micrometer (L.C. 0.01mm & Coarser) | Using Slip Gauge Block, Length Bars, Plunger Dial & Comparator Stand by Comparison Method | >100 mm to 1000 mm | 16.7µm |
| 65 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Feeler Gauge | Using Universal Length Measuring machine / Digital Micrometer by Comparison Method | 0.01 mm to 1 mm | 2.0µm |
| 66 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Gauge (Vernier/ Dial/ Digital L.C. 0.01 mm & Coarser) | Using Slip Gauges, Caliper Checker and Length Bar & Surface Plate by Comparison Method | 0 to 600 mm | 15.0µm |



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| 67 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Height Gauge (Vernier/ Dial/ Digital L.C. 0.01 mm & Coarser) | Using Slip Gauges, Caliper Checker and Length Bar & Surface Plate by Comparison Method | 600 mm to 1000 mm | 20.0µm |
| 68 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Industrial Templates, Fixture / moulds, Cube Moulds / Le Chatelier Moulds / Vicat Needle / Test Block, Flakiness & Elongation Gauge, Slump Cone, Core Cutter, Width Gauge (ID, OD, Height, Thickness | Using Digital Caliper by Comparison Method | Up to 300 mm | 230µm |
| 69 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Internal Micrometer (L.C. 0.01 mm) | Using Slip Gauge Block, Length Bars, Plunger Dial, Comparator Stand & Surface Plate by Comparison Method | 50 mm to 2000 mm | 30.50µm |
| 70 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Level Type Dial Gauge & Digital Dial Gauge (L.C. 0.001 mm & Coarser) | Using Universal Length measuring machine / Slip Gauges & Comparator Stand by Comparison Method | 0 to 1 mm | 2.0µm |



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| 71 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Measuring Scale (L.C. 0.5 mm & Coarser) | Using Tape & Scale Measuring Machine by Comparison Method | 0 to 1000 mm | 122µm |
| 72 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Measuring Tape L.C: 0.1mm / 1mm | Using Tape & Scale Measuring Machine by Comparison Method | 0 to 50 m | 122xSQRT(L)µm, where L in m |
| 73 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Piece/ Length Bar/ Height Blocks/ Riser Block | Using Slip Gauge Block, Length Bars, Plunger Dial & Comparator Stand by Comparison Method | >25 mm to 300 mm | 4.0µm |
| 74 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Piece/ Length Bar/ Height Blocks/ Riser Block | Using Slip Gauge Block, Length Bars, Plunger Dial & Comparator Stand by Comparison Method | >300 mm to 700 mm | 8.0µm |
| 75 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Piece/ Length Bar/ Height Blocks/ Riser Block | Using Slip Gauge Block, Length Bars, Plunger Dial & Comparator Stand by Comparison Method | >700 mm to 1000 mm | 13.3µm |



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| 76 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Micrometer Setting Piece/ Length Bar/Height Block | Using Length Measuring Machine by Comparison Method | 25 mm to 200 mm | 2.0µm |
| 77 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Pi-Tape L.C: 0.01mm / 0.1mm | Using Tape & Scale Measuring Machine by Comparison Method | 0 to 50 m | 69.7xSQRT(L)µm, where L in m |
| 78 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Pistol Caliper (L.C. 0.1 mm) | Using Slip Gauges & Comparator Stand by Comparison Method | 0 to 100 mm | 52.0µm |
| 79 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Plug Gauge / Width Gauge / Setting Master | Using Length Measuring Machine & Slip Gauge by Comparison Method | >50 mm to 200 mm | 2.5µm |
| 80 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Plug Gauge / Width Gauge / Setting Master | Using Length Measuring Machine & Slip Gauge by Comparison Method | 0.5 mm to 50 mm | 2.0µm |



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| 81 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Plug Gauge/ OD Master/ Height Block/ Width Gauge/ Measuring | Using Universal Length Measuring Machine / Slip Gauges, Comparator Stand & Plunger Dial Gauge by Comparison Method | 0.5 mm to 100 mm | 2.0µm |
| 82 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Ring Gauge / Setting Ring Gauge | Universal Length Measuring machine, Master Setting Ring Gauge & Slip Gauge by Comparison Method | >100 mm to 300 mm | 3.5µm |
| 83 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plain Ring Gauge / Setting Ring Gauge | Universal Length Measuring machine, Master Setting Ring Gauge & by Comparison Method | 3 mm to 100 mm | 2.0µm |
| 84 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Plunger Dial Gauge & Digital Indicator (L.C. 0.001 mm & Coarser) | Using Universal Length Measuring Machine / Slip Gauges & Comparator Stand by Comparison Method | Up to 50 mm | 2.0µm |



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| 85 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Snap Gauge / Gap Gauge / Templates | Using Slip Gauge by Comparison Method | 3 mm to 100 mm | 3.0µm |
| 86 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Straight Edge (Straightness / Flatness / Parallelism) | Using Plunger Dial, Surface Plate and Slip Gauge by Comparison Method | 0 to 1000 mm | 15.70µm |
| 87 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieve | Using Digital Caliper by Comparison Method | 4 mm to 125 mm | 38µm |
| 88 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Measuring Wire | Using Length Measuring Machine by Comparison Method | 0.17 mm to 6.35 mm | 1.0µm |
| 89 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Plug Gauge (Major & Effective Diameter) | Using Length Measuring Machine, Slip Gauge & Thread Measuring Wires by Comparison Method | >100 mm to 200 mm | 4.0µm |



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| 90 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Plug Gauge (Major & Effective Diameter) | Using Length Measuring Machine, Slip Gauge & Thread Measuring Wires by Comparison Method | 3 mm to 100 mm | 2.5µm |
| 91 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Thread Ring Gauge - Effective Diameter | Using Length Measuring Machine & Master Setting Ring Gauge by Comparison Method | 3 mm to 100 mm | 2µm |
| 92 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Ultrasonic Thickness Gauge / D Meter (L.C.:0.1 mm & Coarser) | Using Slip Gauge and Length Bar by Comparison Method | 0 to 200 mm | 61.0µm |
| 93 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Gauge, Manometer Differential Gauge, Pressure Transmitter, Analog / Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | (-) 100 mbar to 100 mbar | 0.22mbar |



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| 94 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Gauge, Pressure Transmitter, Analog & Digital Pressure Indicating Device - Hydraulic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | 0 bar to 700 bar | 0.25bar |
| 95 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Indicating Device / Pressure Transmitter / Switch / Indicator / Controller / Recorder / Logger / Manometer / Differential Gauge, Level Gauge - Pneumatic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | 0 bar to 25 bar | 0.010bar |
| 96 | MECHANICAL-PRESSURE INDICATING DEVICES | RPM Meter, Speed Indicator, Tachometer (Contact Type) | Using Tachometer & RPM Calibrator by Comparison Method | 12 rpm to 100 rpm | 5rpm |
| 97 | MECHANICAL-PRESSURE INDICATING DEVICES | Vacuum Gauge, Analog & Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure & Pressure Comparator by Comparison Method as per DKD R-6-1, ISO 3567 & ISO 27893 | (-) 0.95 bar to 0 bar | 0.007bar |



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|------|--|---|---|---|--|
| 98 | MECHANICAL-PRESSURE INDICATING DEVICES | Vacuum Gauge, Analog & Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure & Pressure Comparator by Comparison Method as per DKD R-6-1, ISO 3567 & ISO 27893 | 0 bar to 1 bar | 0.007bar |
| 99 | MECHANICAL-VOLUME | Glass Ware - Pipette, Burette, Measuring Cylinder, Flask, Volumetric Flask, Glass Tube, Density Bottle & Beaker | Using Weighing balance of 2kg capacity and 1mg readability and distilled water by Gravimetric method based on IS/ISO 4787 :2021 | (>200 ml to 2000 ml) @ 27°C | 0.21ml |
| 100 | MECHANICAL-VOLUME | Glass Ware- Pipette, Burette, Measuring Cylinder, Flask, Volumetric Flask, Glass Tube, Density Bottle & Beaker | Using Weighing balance of 220g capacity and 0.01mg readability and distilled water by Gravimetric method based on IS/ISO 4787 :2021 | (0.1 ml to 1 ml) @ 27°C | 41µl |
| 101 | MECHANICAL-VOLUME | Glass Ware- Pipette, Burette, Measuring Cylinder, Flask, Volumetric Flask, Glass Tube, Density Bottle, Beaker | Using Weighing balance of 220g capacity and 0.01mg readability and distilled water by Gravimetric method based on IS/ISO 4787 :2021 | (>1 ml to 10 ml) @ 27°C | 99µl |



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| 102 | MECHANICAL-VOLUME | Glass Ware- Pipette, Burette, Measuring Cylinder, Flask, Volumetric Flask, Glass Tube, Density Bottle, Beaker | Using Weighing balance of 220g capacity and 0.01mg readability and distilled water by Gravimetric method based on IS/ISO 4787 :2021 | (>10 ml to 200 ml) @ 27°C | 0.21ml |
| 103 | MECHANICAL-VOLUME | Micro- Pipettes, Syringe (Fixed, Variable & Multi Channel) | Using Weighing balance of 80g capacity and 0.00001mg readability and distilled water by Gravimetric method based on ISO 8655 part6: 2022 | (>50 µl to 1000 µl) @ 27°C | 3.12µl |
| 104 | MECHANICAL-VOLUME | Micro- Pipettes, Syringe (Fixed, Variable & Multi Channel) | Using Weighing balance of 80g capacity and 0.00001mg readability and distilled water by Gravimetric method based on ISO 8655 part6: 2022 | (10 µl to 50 µl) @ 27°C | 0.2µl |



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| 105 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarse | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 2 g | 0.40mg |
| 106 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 1 g | 0.30mg |
| 107 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 1 mg | 0.06mg |
| 108 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 10 g | 0.60mg |
| 109 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 10 mg | 0.06mg |



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| 110 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 100 g | 1.6mg |
| 111 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 100 mg | 0.16mg |
| 112 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 2 mg | 0.06mg |
| 113 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 20 g | 0.80mg |
| 114 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 20 mg | 0.08mg |



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| 115 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 200 g | 3.0mg |
| 116 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 200 mg | 0.20mg |
| 117 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 5 g | 0.50mg |
| 118 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 5 mg | 0.06mg |
| 119 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 50 g | 1.00mg |



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| 120 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 50 mg | 0.10mg |
| 121 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using F2 class weights and balance of readability 10mg as per OIML R-111-2004 [E] | 500 g | 10mg |
| 122 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M1 & Coarser | Using E2 class weights and balance of readability 0.01mg and 0.1mg as per OIML R-111-2004 [E] | 500 mg | 0.25mg |
| 123 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M2 & Coarser | Using F2 class weights and balance of readability 10mg as per OIML R-111-2004 [E] | 1 kg | 28mg |
| 124 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M2 & Coarser | Using F2 class weights and balance of readability 10mg as per OIML R-111-2004 [E] | 2 kg | 40mg |



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| 125 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M3 & Coarser | Using F2 class weights and balance of readability 10mg as per OIML R-111-2004 [E] | 10 kg | 1.15g |
| 126 | MECHANICAL-WEIGHTS | Mass- Weights Accuracy Class M3 & Coarser | Using F2 class weights and balance of readability 10mg as per OIML R-111-2004 [E] | 20 kg | 2.2g |
| 127 | THERMAL-SPECIFIC HEAT & HUMIDITY | Environment Chamber, Humidity Chamber & Climate Chamber | Using Digital Thermo - Hygrometer & RTD 4 Wire with Digital High Precision Thermometer by Comparison Method | (20 °C to 45 °C) @ 50%rh | 0.55°C |
| 128 | THERMAL-SPECIFIC HEAT & HUMIDITY | Environment Chamber, Humidity Chamber & Climate Chamber | Using Digital Thermo - Hygrometer by Comparison Method | (30 %rh to 95 %rh) @25°C | 2.2%rh |
| 129 | THERMAL-SPECIFIC HEAT & HUMIDITY | Thermo - hygrometer, RH Sensor with Data Logger, Indicator of Humidity | Using Digital Thermo-hygrometer, RTD 4 Wire with Digital High Precision Thermometer, Humidity & Temperature Generator Chamber by Comparison Method | (30 %rh to 90 %rh) @ 25°C | 2.2%rh |



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| 130 | THERMAL-SPECIFIC HEAT & HUMIDITY | Thermo - hygrometer, RH Sensor with Data Logger, Indicator of Humidity | Using Digital Thermo-hygrometer & RTD 4 Wire with Digital High Precision Thermometer & Temperature Generator Chamber by Comparison Method | (20 °C to 40 °C) @ 50 %rh | 0.55°C |
| 131 | THERMAL-TEMPERATURE | IR Thermometer, Pyrometer | Using IR Thermometer & Black Body Source Target Emissivity:0.95 by Comparison Method | 250 °C to 500 °C | 4.1°C |
| 132 | THERMAL-TEMPERATURE | IR Thermometer, Pyrometer | Using IR Thermometer & Black Body Source Target Emissivity:0.95 by Comparison Method | 50 °C to 250 °C | 3.1°C |
| 133 | THERMAL-TEMPERATURE | Liquid in Glass Thermometer | Using RTD 4 Wire with Digital High Precision Thermometer & Ice Point Temp. Bath by Comparison Method | -40 °C to 0 °C | 0.45°C |



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|------|---------------------|---|--|---|--|
| 134 | THERMAL-TEMPERATURE | RTD (PT-100) / Thermocouples with or without Temperature Indicator / Recorder / Data Logger / Dial /Digital Thermometer /Temperature Switch / Temperature Transmitter | Using Standard High Precision Digital Thermometer with PT100 Sensor & 6½ Digital Multimeter with Dry Temperature Blocks by Comparison Method | 100 °C to 300 °C | 0.72°C |
| 135 | THERMAL-TEMPERATURE | RTD (PT-100) / Thermocouples with or without Indicator / Recorder / Data Logger / Temperature Switch / Dial /Digital Thermometer / Temperature Transmitter | Using Standard High Precision Digital Thermometer with PT100 Sensor & 6½ Digital Multimeter with Dry Temperature Blocks by Comparison Method | (-) 30 °C to 100 °C | 0.70°C |
| 136 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Dry Block Calibrator / Oven / Furnace / Oil Bath / Hot Chamber | Using Standard S-Type Thermocouple, Precision Thermometer & 6½ DMM by Comparison Method | 300 °C to 600 °C | 2.55°C |



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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)(±) |
|------|---------------------|--|---|---|--|
| 137 | THERMAL-TEMPERATURE | Thermocouples with or without Temperature Indicator / Recorder / Data Logger | Using Standard High Precision Digital Thermometer with sensor (R-Type) with Dry Temperature Blocks by Comparison Method | 300 °C to 600 °C | 2.46°C |
| 138 | THERMAL-TEMPERATURE | Thermocouples with or without Temperature Indicator / Recorder / Data Logger / Temperature Switch / Temperature Transmitter | Using Standard High Precision Digital Thermometer with sensor (R-Type) with Dry Temperature Blocks by Comparison Method | 600 °C to 1200 °C | 2.55°C |
| 139 | THERMAL-TEMPERATURE | Thermometer - Digital / Dial / Glass | Using RTD 4 Wire with Digital High Precision Thermometer & Temperature Bath (Liquid Temperature) by Comparison Method | 0 °C to 250 °C | 0.54°C |



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|---------------|---|---|---|---|--|
| Site Facility | | | | | |
| 1 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 1 A to 10 A | 0.10 % to 0.35 % |
| 2 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Current at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 100 µA to 100 mA | 0.3 % to 0.05 % |
| 3 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC High Voltage at 50 Hz | Using HV Probe with Digital Multimeter by Comparison Method | 1 kV to 27 kV | 4% |
| 4 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 1 V to 1000 V | 0.20 % to 0.10 % |



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|------|---|---|--|---|--|
| 5 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | AC Voltage at 50 Hz | Using 6½ Digital Precision Multimeter by Direct Method | 10 mV to 100 mV | 0.15 % to 0.05 % |
| 6 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 100 Ohm to 10 Mohm | 0.5 % to 0.6 % |
| 7 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Current @ 50 Hz | Using Multi Product Calibrator & Current Coil by Direct Method | 30 µA to 1 A | 0.6 % to 0.15 % |
| 8 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC High Current @ 50 Hz | Using Multi Product Calibrator & Current Coil by Direct Method | 50 A to 995 A | 0.65 % to 1.00 % |
| 9 | ELECTRO-TECHNICAL-Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz | Using Multi Product Calibrator by Direct Method | 1 mV to 1 V | 2.6 % to 0.15 % |



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|------|---|--|---|---|--|
| 10 | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | AC Voltage @ 50 Hz | Using Multi Product Calibrator by Direct Method | 1 V to 1000 V | 0.15 % to 0.20 % |
| 11 | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Capacitance @ 1 kHz | Using Capacitance Box by Direct Method | 10 nF to 10 µF | 2 % to 1.6 % |
| 12 | ELECTRO-TECHNICAL- Alternating Current (< 1 GHz) (Source) | Inductance @ 1 kHz | Using Inductance Box by Direct Method | 100 µH to 10 H | 1.3 % to 1.2 % |
| 13 | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure) | DC Current | Using 6½ Multi Product Calibrator & Current Coil by Direct Method | 1 A to 10 A | 0.10 % to 0.2 % |
| 14 | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure) | DC Current | Using 6½ Digital Precision Multimeter by Direct Method | 1 mA to 1 A | 0.06 % to 0.10 % |
| 15 | ELECTRO-TECHNICAL- DIRECT CURRENT (Measure) | DC Current | Using 6½ Digital Precision Multimeter by Direct Method | 10 µA to 1 mA | 0.9 % to 0.06 % |



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|------|--|--|---|---|--|
| 16 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC High Voltage | Using HV Probe with Digital Multimeter by Comparison Method | 1.0 kV to 39 kV | 3% |
| 17 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 1 mV to 10 mV | 0.06 % to 0.05 % |
| 18 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 1 V to 1000 V | 0.014 % to 0.05 % |
| 19 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | DC Voltage | Using 6½ Digital Precision Multimeter by Direct Method | 10 mV to 1 V | 0.08 % to 0.1 % |
| 20 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 10 Mohm to 1 Gohm | 0.1 % to 3 % |
| 21 | ELECTRO-TECHNICAL-DIRECT CURRENT (Measure) | Resistance | Using 6½ Digital Precision Multimeter by Comparison Method | 100 mohm to 10 Mohm | 0.1% |



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|------|---|--|--|---|--|
| 22 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using Multi Product Calibrator & Current Coil by Direct Method | 1 A to 20 A | 0.15 % to 0.10 % |
| 23 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Current | Using Multi Product Calibrator & Current Coil by Direct Method | 10 μ A to 1 A | 0.3 % to 0.10 % |
| 24 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC High Current | Using Multi Product Calibrator & Current Coil by Direct Method | 50 A to 995 A | 0.80 % to 1.00 % |
| 25 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Resistance Box by Direct Method | 1 mohm to 1 Ohm | 0.90 % to 0.1 % |
| 26 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Resistance Box by Direct Method | 1 Ohm to 100 Ohm | 0.1 % to 0.01 % |
| 27 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Multi Product Calibrator by Direct Method | 100 Ohm to 1 Gohm | 0.07 % to 1.9 % |



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|------|--|---|---|---|--|
| 28 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Resistance | Using Multi Product Calibrator by Direct Method | 100 Ohm to 10 Mohm | 0.07 % to 0.7 % |
| 29 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using Multi Product Calibrator by Direct Method | 1 mV to 1 V | 0.7 % to 0.1 % |
| 30 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | DC Voltage | Using Multi Product Calibrator by Direct Method | 1 V to 1000 V | 0.1 % to 0.01 % |
| 31 | ELECTRO-TECHNICAL-DIRECT CURRENT (Source) | High Resistance @ 5 kV | Using Mega Ohm Resistance Box up to 5 kV by Direct Method | 1 Gohm to 10 Gohm | 2 % to 2.5 % |
| 32 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: J-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 600 °C | 0.52°C |
| 33 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: K-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 1200 °C | 0.9°C |



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| 34 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: R-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | 300 °C to 1600 °C | 1.1°C |
| 35 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: RTD | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 200 °C to 800 °C | 0.45°C |
| 36 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: S-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | 100 °C to 1600 °C | 1.2°C |
| 37 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: T-Type Thermocouple | Using High Precision Digital Thermometer PT100 & Thermocouple base by Direct Method | (-) 190 °C to 390 °C | 0.52°C |
| 38 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Measure) | Temperature Indicator / Controller & Recorder: T-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 400 °C | 0.75°C |
| 39 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: J-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 1200 °C | 0.5°C |



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|------|---|--|--|---|--|
| 40 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: K-Type Thermocouple | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 1370 °C | 0.6°C |
| 41 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: R-Type Thermocouple | Using Multifunction Calibrator by Direct Method | 0 °C to 1700 °C | 1.6°C |
| 42 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: RTD | Using Multifunction Calibrator by Direct Method | (-) 200 °C to 800 °C | 0.4°C |
| 43 | ELECTRO-TECHNICAL-TEMPERATURE SIMULATION (Source) | Temperature Indicator / Controller & Recorder: S-Type Thermocouple | Using Multifunction Calibrator by Direct Method | 0 °C to 1700 °C | 1.2°C |
| 44 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Measure) | Digital Time Interval Meter / Counter | Using Digital Time Interval meter by Comparison Method | 10 s to 2 hr | 0.78 s to 2 s |
| 45 | ELECTRO-TECHNICAL-TIME & FREQUENCY (Source) | Frequency | Using Multi Product Calibrator by Direct Method | 50 Hz to 100 kHz | 0.05 % to 0.1 % |



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|------|---|---|---|---|--|
| 46 | MECHANICAL-ACCELERATION AND SPEED | RPM, Centrifuge Machine, RPM Meter, Speed Indicator, Stroboscope, Tachometer (Non-contact) | Using Tachometer by Comparison Method SANAS TR45-01 | 100 rpm to 20000 rpm | 5.94rpm |
| 47 | MECHANICAL-ACCELERATION AND SPEED | RPM, Centrifuge Machine, RPM Meter, Speed Indicator, Stroboscope, Tachometer (Non-contact) | Using Tachometer by Comparison Method SANAS TR45-01 | 50 rpm to 100 rpm | 3.05rpm |
| 48 | MECHANICAL-DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | Test Sieve | Using Digital Caliper by Comparison Method | 4 mm to 125 mm | 38µm |
| 49 | MECHANICAL-HARDNESS TESTING MACHINES | Rockwell Hardness Testing Machine | Using Standard Hardness Blocks as per IS 1586: 2018 by Indirect Method | HRC | 1.1HRC |
| 50 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Gauge, Manometer Differential Gauge, Pressure Transmitter, Analog / Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | (-) 100 mbar to 100 mbar | 0.22mbar |



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|------|--|---|---|---|--|
| 51 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Gauge, Pressure Transmitter, Analog & Digital Pressure Indicating Device - Hydraulic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | 0 bar to 700 bar | 0.25bar |
| 52 | MECHANICAL-PRESSURE INDICATING DEVICES | Dial / Digital Pressure Indicating Device / Pressure Transmitter / Switch / Indicator / Controller / Recorder / Logger / Manometer / Differential Gauge, Level Gauge - Pneumatic Pressure | Using Digital Pressure, 6½ Digital Multimeter & Pressure Comparator by Comparison Method as per DKD R-6-1 | 0 bar to 25 bar | 0.010bar |
| 53 | MECHANICAL-PRESSURE INDICATING DEVICES | Vacuum Gauge, Analog & Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure & Pressure Comparator by Comparison Method as per DKD R-6-1, ISO 3567 & ISO 27893 | (-) 0.95 bar to 0 bar | 0.007bar |



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|------|---|---|--|---|--|
| 54 | MECHANICAL-PRESSURE INDICATING DEVICES | Vacuum Gauge, Analog & Digital Pressure Indicating Device - Pneumatic Pressure | Using Digital Pressure & Pressure Comparator by Comparison Method as per DKD R-6-1, ISO 3567 & ISO 27893 | 0 bar to 1 bar | 0.007bar |
| 55 | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE | Universal Testing Machine (Tension Mode)-Class-I and coarser | Using Force Proving Instruments and Load Cell As per IS 1828 (1) :2022 | 0.5 kN to 5 kN | 0.98% |
| 56 | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE | Universal Testing Machine / Compression Testing Machine (Compression Mode) -Class-I and coarser | Using Force Proving Instruments and Load Cell As per IS 1828 (1) :2022 | 100 N to 100 kN | 0.85% |
| 57 | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE | Universal Testing Machine / Compression Testing Machine (Compression Mode)-Class-I and coarser | Using Force Proving Instruments and Load Cell As per IS 1828 (1) :2022 | 100 kN to 500 kN | 0.85% |



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|------|---|---|---|---|--|
| 58 | MECHANICAL-UTM, TENSION CREEP AND TORSION TESTING MACHINE | Universal Testing Machine / Compression Testing Machine (Compression Mode)-Class-I and coarser | Using Force Proving Instruments and Load Cell As per IS 1828 (1) :2022 | 600 kN to 2000 kN | 0.85% |
| 59 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale & Balance - Accuracy Class I & coarser - Readability: 0.01 mg | Using E2 Class Standard Weight As per OIML R-76-1 Edition 2006 | Up to 220 g | 1mg |
| 60 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class I & coarser - Readability: 0.1 mg | Using E2 Class Standard Weight As per OIML R-76-1 Edition 2006 | Up to 320 g | 1.2mg |
| 61 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class II & coarser - Readability: 1 mg | Using Standard Weight of F1 & F2 Class As per OIML R-76-1 Edition 2006 | Up to 2000 g | 12mg |
| 62 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class II & coarser - Readability: 1 mg | Using Standard Weight of F1 & F2 Class, Procedure based on OIML R-76-1 Edition 2006 | Up to 4000 g | 40mg |



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| 63 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class II & coarser - Readability: 10 mg | Using Standard Weight of F1 & F2 Class, Procedure based on OIML R-76-1 Edition 2006 | Up to 4 kg | 40mg |
| 64 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class II & coarser - Readability: 100 mg | Using Standard Weight of F1 & F2 Class As per OIML R-76-1 Edition 2006 | Up to 20 kg | 1g |
| 65 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class III & coarser - Readability: 1 g | Using Standard Weight of F1 & F2 Class As per OIML R-76-1 Edition 2006 | Up to 60 kg | 2g |
| 66 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class III & coarser - Readability: 10 g | Using Standard Weight of F1 & F2 Class As per OIML R-76-1 Edition 2006 | Up to 100 kg | 22g |
| 67 | MECHANICAL-WEIGHING SCALE AND BALANCE | Mass- Electronic Weighing Scale and Balance Accuracy Class III & coarser - Readability: 100 g | Using Standard Weight of F1 & F2 Class As per OIML R-76-1 Edition 2006 | Up to 100 kg | 55g |



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

| | | | |
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| Laboratory Name : | HI-TECH LABORATORY & SERVICES, SHIVANI COMPLEX, C-4, 7 VIDYA VIHAR, BHOPAL, MADHYA PRADESH, INDIA | | |
| Accreditation Standard | ISO/IEC 17025:2017 | | |
| Certificate Number | CC-2689 | Page No | 43 of 46 |
| Validity | 20/12/2022 to 19/12/2024 | Last Amended on | 05/02/2023 |

| 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)(±) |
|------|----------------------------------|---|--|---|--|
| 68 | THERMAL-SPECIFIC HEAT & HUMIDITY | Environment Chamber, Humidity Chamber & Climate Chamber | Using Digital Thermo - Hygrometer & RTD 4 Wire with Digital High Precision Thermometer by Comparison Method | (20 °C to 45 °C) @ 50%rh | 0.55°C |
| 69 | THERMAL-SPECIFIC HEAT & HUMIDITY | Environment Chamber, Humidity Chamber & Climate Chamber | Using Digital Thermo - Hygrometer by Comparison Method | (30 %rh to 95 %rh) @25°C | 2.2%rh |
| 70 | THERMAL-TEMPERATURE | Refrigerator / Cold Chamber / Deep Freezer | Using Standard PT100 Sensor with Data Logger (minimum 9 sensor) by Comparison Method | -20 °C to 50 °C | 2.12°C |
| 71 | THERMAL-TEMPERATURE | RTD (PT-100) / Thermocouples with or without Temperature Indicator / Recorder / Data Logger / Dial /Digital Thermometer /Temperature Switch / Temperature Transmitter | Using Standard High Precision Digital Thermometer with PT100 Sensor & 6½ Digital Multimeter with Dry Temperature Blocks by Comparison Method | 100 °C to 300 °C | 0.72°C |



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| Accreditation Standard | ISO/IEC 17025:2017 | | |
| Certificate Number | CC-2689 | Page No | 44 of 46 |
| Validity | 20/12/2022 to 19/12/2024 | Last Amended on | 05/02/2023 |

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|------|---------------------|--|--|---|--|
| 72 | THERMAL-TEMPERATURE | RTD (PT-100) / Thermocouples with or without Indicator / Recorder / Data Logger / Temperature Switch / Dial /Digital Thermometer / Temperature Transmitter | Using Standard High Precision Digital Thermometer with PT100 Sensor & 6½ Digital Multimeter with Dry Temperature Blocks by Comparison Method | (-) 30 °C to 100 °C | 0.70°C |
| 73 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Dry Block Calibrator / Oven / Furnace / Oil Bath / Hot Chamber | Using Standard S-Type Thermocouple, Precision Thermometer & 6½ DMM by Comparison Method | 300 °C to 600 °C | 2.55°C |
| 74 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Dry Block Calibrator / Furnace | Using Standard High Precision Thermometer with sensor R Type .with Dry Temperature Blocks by Comparison Method. | 600 °C to 1200 °C | 2.55°C |



National Accreditation Board for Testing and Calibration Laboratories

SCOPE OF ACCREDITATION

Laboratory Name : HI-TECH LABORATORY & SERVICES, SHIVANI COMPLEX, C-4, 7 VIDYA VIHAR, BHOPAL, MADHYA PRADESH, INDIA

Accreditation Standard ISO/IEC 17025:2017

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Validity 20/12/2022 to 19/12/2024 **Last Amended on** 05/02/2023

| 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)(±) |
|------|---------------------|---|--|---|--|
| 75 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Dry Block Calibrator / Oven / Incubator / Freezer / Oil Bath / Autoclave / Melting Point Apparatus / Cold-Hot Chamber/Deep Freezers, Environmental Chambers, Cold Rooms, Storage (Incubator and autoclave for non-medical purpose) | Using High Precision Digital Thermometer with PT100 Sensor by Comparison Method | (-) 80 °C to 100 °C | 0.70°C |
| 76 | THERMAL-TEMPERATURE | Temperature Indicator with sensor of Dry Block Calibrator / Oven / Incubator / Freezer / Oil Bath / Autoclave / Melting Point Apparatus / Cold-Hot Chamber/Deep Freezers, Environmental Chambers, Cold Rooms, Storage (Incubator and autoclave for non-medical purpose) | Using High Precision Digital Thermometer with PT100 Sensor & 6½ DMM by Comparison Method | 0 °C to 300 °C | 2.1°C |



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| Certificate Number | CC-2689 | Page No | 46 of 46 |
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|------|---------------------|--|---|---|--|
| 77 | THERMAL-TEMPERATURE | Temperature Oven / Cold & Heat Chamber / Incubator / Freeze / Furnace | Using Standard PT100 Sensor with Data Logger (minimum 9 sensor) by Comparison Method | 0 °C to 250 °C | 2.39°C |
| 78 | THERMAL-TEMPERATURE | Thermocouples with or without Temperature Indicator / Recorder / Data Logger | Using Standard High Precision Digital Thermometer with sensor (R-Type) with Dry Temperature Blocks by Comparison Method | 300 °C to 600 °C | 2.46°C |
| 79 | THERMAL-TEMPERATURE | Thermocouples with or without Temperature Indicator / Recorder / Data Logger / Temperature Switch / Temperature Transmitter | Using Standard High Precision Digital Thermometer with sensor (R-Type) with Dry Temperature Blocks by Comparison Method | 600 °C to 1200 °C | 2.55°C |

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