



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Micro-Flat Datums Pvt. Ltd., Plot No. 25-28, Zone D-3, GIDC, Vitthal Udyognagar, Anand, Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2378 (in lieu of C-0346) **Page** 1 of 14

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| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|---------------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------|
| <u>ELECTRO-TECHNICAL CALIBRATION</u> | | | | |
| I. | SOURCE | | | |
| 1. | DC Voltage [#] | 1 mV to 33 mV 33 mV to 300 mV 300 mV to 30 V 30 V to 1000 V | 0.36 % to 0.018 % 0.018 % to 0.008 % 0.008 % 0.008 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 2. | AC Voltage [#] | 50 Hz to 1 kHz 3.3 mV to 165 mV 165 mV to 33 V 33 V to 1000 V | 0.85 % to 0.05 % 0.05 % to 0.07 % 0.07 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 3. | DC Current [#] | 10 μ A to 33 μ A 33 μ A to 33 mA 33 mA to 10 A 10 A to 20 A | 0.26 % to 0.10 % 0.10 % to 0.022 % 0.022 % to 0.1 % 0.1 % to 0.12 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| | | 20 A to 1000 A | 0.90 % | Using Multi Product Calibrator Fluke 5502A with 50 Turn Current Coil |
| 4. | AC Current [#] | 50 Hz to 1 kHz 30 μ A to 1.65 mA 1.65 mA to 1 A 1 A to 3 A 3 A to 20 A | 0.6 % to 0.13 % 0.13 % to 0.1 % 0.1 % to 0.15 % 0.15 % to 0.2 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| | | 50 Hz 20 A to 1000 A | 0.81 % | Using Multi Product Calibrator Fluke 5502A with 50 Turn Current Coil |

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|-----|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 5. | Resistance [#] | 1 m Ω to 11 Ω 11 Ω to 110 Ω 110 Ω to 1.1 M Ω 1.1 M Ω to 11 M Ω 11 M Ω to 110 M Ω 110 M Ω to 1 G Ω | 1.36 % to 0.2 % 0.2 % to 0.03 % 0.03 % to 0.034 % 0.034 % to 0.14 % 0.14 % to 0.7 % 0.7 % to 2.0 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 6. | Capacitance [#] | 1 kHz 1 nF to 100 nF 100 nF to 10 μ F 10 μ F to 100 μ F 100 μ F to 1 mF | 1.74 % to 0.42 % 0.42 % 0.42 % to 0.8 % 0.8 % to 1.4 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 7. | Frequency [#] | 50 Hz to 1 kHz 1 kHz to 1 MHz | 0.013 % to 0.031 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 8. | Insulation Resistance [#] | Upto 5 kV 100 k Ω to 100 M Ω 100 M Ω to 10 G Ω | 0.6 % to 1.5 % 1.5 % | Using HV Decade Megohm Box by Direct Method |
| 9. | AC Power/Energy [#] (560V/ 20A) (1 Phase) | 50 Hz 100 mW to 1.2 kW 1.2 kW to 11.2 kW | 0.2 % | Using Multi Product Calibrator Fluke 5502A by Direct Method |
| 10. | Power Factor / Phase Angle [#] | 50 Hz 0.2 lag – 1 – 0.2 lead | 0.003PF | Using Multi Product Calibrator Fluke 5502A by Direct Method |

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| 11. | Temperature Simulation [#] | | | |
| | K Type | (-) 200 °C to 0 °C 0 °C to 1370 °C | 0.4 °C to 0.21 °C 0.21 °C to 0.5 °C | Using Multi Product Calibrator Fluke 5502A as per ITS-90 Scale by Simulation method |
| | J Type | (-) 200 °C to 0 °C 0 °C to 1200 °C | 0.33 °C to 0.2 °C 0.2 °C to 0.3 °C | |
| | E Type | (-) 250 °C to 0 °C 0 °C to 1000 °C | 0.7 °C to 0.31 °C 0.31 °C to 0.25 °C | |
| | N Type | (-) 250 °C to 0 °C 0 °C to 1300 °C | 0.5 °C to 0.25 °C 0.25 °C to 0.33 °C | |
| | L Type | (-) 200 °C to 0 °C 0 °C to 900 °C | 0.44 °C to 0.32 °C 0.32 °C to 0.22 °C | |
| | U Type | (-) 200 °C to 600 °C | 0.7 °C to 0.33 °C | |
| | T Type | (-) 200 °C to 0 °C 0 °C to 400 °C | 0.74 °C to 0.22 °C 0.22 °C to 0.2 °C | |
| | B Type | 600 °C to 1000 °C 1000 °C to 1800 °C | 0.53 °C to 0.4 °C 0.4 °C to 0.40 °C | |
| | R Type | 0 °C to 1000 °C 1000 °C to 1760 °C | 0.7 °C to 0.42 °C 0.42 °C to 0.5 °C | |
| | S Type | 0 °C to 1000 °C 1000 °C to 1760 °C | 0.6 °C to 0.45 °C 0.45 °C to 0.55 °C | |
| | RTD | (-) 200 °C to 0 °C 0 °C to 800 °C | 0.12 °C to 0.11 °C 0.11 °C to 0.3 °C | |
| II. | MEASURE | | | |
| 1. | DC Voltage ^{\$} | 1 mV to 100 mV 100 mV to 10 V 10 V to 1000 V | 0.42 % to 0.01 % 0.01 % to 0.004 % 0.004 % to 0.006 % | Using Fluke 6 ½ Digit DMM by direct method |
| 2. | DC Current ^{\$} | 10 µA to 100 mA 100 mA to 1 A 1 A to 10 A | 0.36 % to 0.064 % 0.064 % to 0.083 % 0.083 % to 0.2 % | Using Fluke 6 ½ Digit DMM by direct method |

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| 3. | AC Voltage ^s | 50 Hz to 1 kHz 1 mV to 10 mV 10 mV to 100 mV 100 mV to 1000 V | 5 % to 0.53 % 0.53 % to 0.12 % 0.12 % | Using Fluke 6½ Digit DMM by direct method |
| 4. | AC High Voltage [#] | 50 Hz 1 kV to 40 kV | 5.34 % to 6.17 % | Using HV Voltage Divider Probe with Multimeter by Direct Method |
| 5. | AC Current ^s | 50 Hz to 1 kHz 50 μ A to 100 μ A 100 μ A to 1 A 1 A to 10 A | 0.31% to 0.25 % 0.25 % | Using Fluke 6½ Digit DMM by direct method |
| 6. | Resistance ^s | 1 Ω to 100 Ω 100 Ω to 10 M Ω 10 M Ω to 100 M Ω | 0.36 % to 0.02 % 0.02 % to 0.05 % 0.05 % to 1.0 % | Using Fluke 6½ Digit DMM by direct method |
| 7. | Frequency ^s | 10 Hz to 1 kHz 1 kHz to 1 MHz | 0.04 % to 0.013 % | Using Fluke 6½ Digit DMM by direct method |
| 8. | Temperature Measurement ^s | | | Using Fluke 6½ Digit DMM as per ITS-90 Scale by Simulation Method |
| | RTD | (-)200 °C to 0 °C 0 °C to 600 °C | 0.10 °C to 0.25 °C | |

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| MECHANICAL CALIBRATION | | | | |
| I. DIMENSION (BASIC MEASURING INSTRUMENT, GAUGE ETC.) | | | | |
| 1. | Calipers ^s L.C.: 0.01 mm L.C.: 0.02 mm | 0 to 1000 mm 0 to 2000 mm | 11.0 μ m 21.0 μ m | Using Slip Gauge Set, Caliper Checker, Length Bar Set & Granite Block by Comparison Method |
| 2. | Height Gauge ^s L.C.: 0.1 μ m L.C.: 0.01 mm L.C.: 0.02 mm | 0 to 600 mm 0 to 1000 mm 0 to 1500 mm | 5.4 μ m 11.0 μ m 17.0 μ m | Using Slip Gauge Set, Length Bar Set & Granite Surface Plate by Comparison Method |
| 3. | Depth Gauge ^s L.C.: 0.01 mm | 0 to 1000 mm | 11.5 μ m | Using Slip Gauge Set, Depth Micro-checker & Length Bar Set by Comparison Method |
| 4. | External Micrometer ^s (with Setting Stick) L.C.: 0.001 mm L.C.: 0.01 mm | 0 to 300 mm 300 to 600 mm 0 to 600 mm 600 mm to 1000 mm 1000 mm to 1500 mm 1500 mm to 2000 mm | 2.4 μ m 6.5 μ m 6.0 μ m 7.3 μ m 9.3 μ m 15.6 μ m | Using Slip Gauge Set, Length Bar Set, Granite Comparator & Electronic Probe with DRO by Comparison Method |
| 5. | Micrometer Setting Stick ^s | 600 mm to 2000 mm | 15.7 μ m | Using Slip Gauge Set, Length Bar Set & Granite Block by Comparison Method |

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| 6. | Inside Micrometer ^s L.C.: 0.01 mm | 5 mm to 250 mm 250 mm to 1500 mm 1500 mm to 3000 mm | 6.8 μ m 17.0 μ m 24.0 μ m | Using Slip Gauge Set, Slip Gauge Accessories, Length Bar Set & Granite Block by Comparison Method |
| 7. | Depth Micrometer ^s L.C.: 0.001 mm | 0 to 300 mm | 4.5 μ m | Using Depth Micro-Checker by Comparison Method |
| 8. | Plunger Type Dial Gauge ^s L.C.: 0.5 μ m L.C.: 1.0 μ m L.C.: 0.01 mm Half Round Dial L.C.: 0.5 μ m | Upto 1 mm Upto 25 mm Upto 100 mm Upto \pm 1 mm | 0.98 μ m 1.1 μ m 6.1 μ m 0.98 μ m | Using ULM by Comparison Method |
| 9. | Plunger Type Dial Gauge ^s L.C.: 0.5 μ m ^o L.C.: 0.01 mm Half Round Dial L.C.: 0.5 μ m | Upto 1 mm Upto 10 mm Upto \pm 1 mm | 2.5 μ m 6.5 μ m 2.5 μ m | Using Electronic Dial Calibration Tester by Comparison Method |
| 10. | Lever Type Dial Gauge ^s L.C.: 0.001 mm L.C.: 0.01 mm | Upto 1 mm Upto 2 mm | 1.8 μ m 5.9 μ m | Using ULM by Comparison Method |
| 11. | Lever Type Dial Gauge ^s L.C.: 0.001 mm L.C.: 0.01 mm | Upto 1 mm Upto 2 mm | 2.5 μ m 6.5 μ m | Using Electronic Dial Calibration Tester by Comparison Method |

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| 12. | Bore Dial Gauge ^s (Transmission Accuracy Check) L.C.: 0.1 μ m | Upto 2 mm | 2.8 μ m | Using Dial Calibration Tester & Electronic Probe with DRO by Comparison Method |
| 13. | Electronic Probe with DRO ^s L.C.: 0.1 μ m | Upto 25 mm | 1.7 μ m | Using Slip Gauge Set & Granite Comparator by Comparison Method |
| 14. | Dial Calibration Tester ^s L.C.: 0.1 μ m | Upto 10 mm | 0.75 μ m | Using Electronic Probe with DRO by Comparison Method |
| 15. | Dial Thickness Gauge ^s L.C.: 0.01 mm | 0 to 30 mm | 7.6 μ m | Using Slip Gauge Set by Comparison Method |
| 16. | Pistol Caliper ^s L.C.: 0.1 mm | Upto 100 mm | 76.0 μ m | Using Slip Gauge Set by Comparison Method |
| 17. | Dial Caliper Gauge ^s (Internal/External) L.C.: 0.01 mm | Upto 100 mm | 8.0 μ m | Using Slip Gauge Set & Slip Gauge Accessories by Comparison Method |
| 18. | Tape & Scale Calibrator ^s L.C.: 0.005 mm | Upto 1000 mm | 19.0 μ m | Using Slip Gauge Set & Length Bar Set by Comparison Method |
| 19. | Measuring Tape ^s | Upto 100 meter | $146 \times \sqrt{\frac{L}{1000}} \mu\text{m}$ (where, L in mm) | Using Tape & Scale Calibrator by Comparison Method |
| 20. | Steel Scale ^s | Upto 1000 mm | 146.0 μ m | Using Tape & Scale Calibrator by Comparison Method |


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| 21. | Feeler Gauge ^s | Upto 2 mm | 1.0 μ m | Using ULM by Comparison Method |
| | | Upto 2 mm | 3.9 μ m | Using Digital External Micrometer by Comparison Method |
| 22. | Thread Pitch Gauge ^s | 0.25 mm to 7.0 mm | 9.0 μ m | Using Profile Projector by Comparison Method |
| 23. | Radius Gauge ^s | Upto 25 mm | 22.80 μ m | Using Profile Projector by Comparison Method |
| 24. | Plain Plug Gauge ^s | Upto 100 mm | 1.1 μ m | Using ULM & Length Bar set by Comparison Method |
| | | 100 mm to 200 mm | 1.6 μ m | |
| | | 200 mm to 300 mm | 2.0 μ m | |
| | | Upto 300 mm | 2.5 μ m | Using Slip Gauge Set, Length Bar set, Granite Comparator & Probe by Comparison Method |
| 25. | Plain Ring Gauge ^s | 3 mm to 150 mm | 1.9 μ m | Using ULM & Master Plain Ring Gauge by Comparison Method |
| | | 150 mm to 300 mm | 2.3 μ m | |
| 26. | Plain Snap Gauge ^s | 3 mm to 150 mm | 1.9 μ m | Using ULM & Master Plain Ring Gauge by Comparison Method |
| | | 150 mm to 300 mm | 2.3 μ m | |
| 27. | Thread Plug Gauge ^s (Effective & Major Dia) | Upto 300 mm | 2.5 μ m | Using ULM, Thread Measuring wire & Length Bar set by Comparison Method |

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| 28. | Taper Thread Plug Gauge (Effective & Major Dia) [§] | Upto 300 mm | 3.5 μ m | Using ULM, Thread Measuring Wire & Length Bar Set by Comparison Method |
| 29. | Thread Ring Gauge [§] (Effective Dia only) | 3 mm to 100 mm | 2.0 μ m | Using ULM & Master Plain Ring Gauge by Comparison Method |
| 30. | Measuring Pin/ Thread Measuring Wire [§] | Upto 20 mm | 1.0 μ m | Using ULM by Comparison Method |
| 31. | Cylindrical Setting Master (Diameter Measurement & Concentricity) [§] | Upto 100 mm | 1.0 μ m | Using ULM, Electronic Probe with DRO by Comparison Method |
| 32. | Bevel Protractor / Combination Set [§] L.C.: 1 minute | 0° to 90° | 0.6' | Using Angle Gauge set by Comparison Method |
| 33. | Engineer's Square [§] Straightness Squareness Parallelism | Upto 600 mm | 2.3 μ m 7.8 μ m 2.4 μ m | Using Granite Square, Slip Gauge Set, Granite Surface Plate & Probe by Comparison Method |
| 34. | Cylindrical Square / Master Cylinder (Squareness Measurement) [§] | Upto 600 mm | 3.7 μ m | Using Granite Square Column & Slip Gauge Set by Comparison Method |
| 35. | Granite Square Column [§] Straightness Squareness Parallelism | Upto 1000 mm | 3.2 μ m 2.6 μ m 3.2 μ m | Using Plunger Dial, Granite Surface Plate, Electronic Level & Probe by Comparison Method |

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| 36. | Granite /Cast Iron Square ^s (Right Angle) Squareness Measurement | Upto 630 mm | 5.4 μ m | Using Slip Gauge Set, Granite Surface Plate, Master Cylinder & Plunger Dial by Comparison Method |
| 37. | Granite / Cast Iron Square / Cube ^s Straightness Flatness Squareness Parallelism | Upto 630 mm | 2.7 μ m 2.8 μ m 5.4 μ m 2.8 μ m | Using Electronic Level, Granite Surface Plate, Master Cylinder, Slip Gauge Set & Plunger Dial by Comparison Method |
| 38. | Sine Bar Angular Error Parallelism ^s | Upto 300 mm | 7.2 " 2.2 μ m | Using Slip Gauge Set, Angle Gauge Set, Electronic Probe by Comparison Method |
| 39. | Bench Center ^s (Co-axiality of Centers) | Upto 1000 mm | 5.6 μ m | Using Master Mandrels, Dial Gauges by Comparison Method |
| 40. | Sine Center Angular Error Co-axiality of Centers ^s | Upto 600 mm | 7.2 " 5.6 μ m | Using Slip Gauge Set, Length Bar Set, Angle Gauge, Master Mandrels, Electronic Probe by Comparison Method |
| 41. | Sine Table Angular Error Parallelism ^s | Upto 200 mm | 7.2 " 2.2 μ m | Using Slip Gauge Set, Angle Gauge, Electronic Probe by Comparison Method |

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| 42. | Parallel Mandrel ^s Variation in Diameter Run-out Taper Mandrel Variation in Diameter Run-out Taper Angle | Upto 1000 mm Upto 500 mm | 5.9 μ m 9.5 μ m 6.1 μ m 10.5 μ m 7.2" | Using Slip Gauge Set, Granite Surface Plate, Bench Center, Sine Center, Electronic Probe by Comparison Method |
| 43. | Spirit Level / Square Frame Type Spirit Level ^s L.C.: 10 μ m/meter (Base Upto 300 mm) | Upto \pm 1 mm/m | 8.5 μ m/m | Using Slip Gauge Set, Granite Square Column, Granite Surface Plate, Electronic Level & Probe by Comparison Method |
| 44. | Angle Plate ^s Flatness Squareness Parallelism | Upto 600 mm | 3.8 μ m 3.8 μ m 4.8 μ m | Using Slip Gauge Set, Granite Square Column, Granite Surface Plate, Electronic Level & Probe by Comparison Method |
| 45. | V-Blocks ^s Parallelism Squareness Symmetricity | Upto 300 mm | 6.6 μ m 5.5 μ m 6.5 μ m | Using Granite Surface Plate, Cylindrical Mandrel, Electronic Probe by Comparison Method |
| 46. | Engineer's Parallel ^s | Upto 300 mm | 6.6 μ m | Using Slip Gauge Set, Granite Surface Plate, Electronic Probe by Comparison Method |
| 47. | Straight Edge ^s (width < 30 mm) Straightness Parallelism | Upto 1200 mm | 3.2 μ m 3.2 μ m | Using Slip Gauge Set, Electronic Probe, Granite Surface Plate, Plunger Dial by Comparison Method |

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| | Straightness Parallelism | Upto 2500 mm | 10.0 μ m 10.0 μ m | |
| 48. | Straight Edge [§] (width > 30 mm) Straightness Parallelism Parallelism | Upto 2500 mm Upto 1200 mm Upto 2500 mm | $1.1 \times \sqrt{\frac{L}{100}}$ μ m (where L in mm) 3.2 μ m 10.0 μ m | Using Electronic Level, Granite Surface Plate, Electronic Probe & Plunger Dial by Comparison Method |
| 49. | Surface Plate [§] (For Flatness Measurement) | Upto 2400 mm x 1100 mm | $1.1 \times \sqrt{\frac{L+W}{100}}$ μ m (where L & W in mm) | Using Electronic Level by Comparison Method |
| 50. | Surface Plate [§] (Flatness Measurement) | Upto 6000 mm x 6000 mm | $1.25 \times \sqrt{\frac{L+W}{100}}$ μ m (where L & W in mm) | Using Electronic Level by Comparison Method |
| 51. | Straight Edge [*] (width > 30 mm) for Straightness Measurement | Upto 6000 mm | $1.25 \times \sqrt{\frac{L}{100}}$ μ m (where, L in mm) | Using Electronic Level, Spirit Level (Temperature Upto 40°C) by Comparison Method |
| 52. | Bench Center [*] (Co-axiality of Centers) | Upto 1000 mm | 5.6 μ m | Using Master Mandrels, Dial Gauges by Comparison Method |
| 53. | Electronic Height Gauge [*] L.C.: 0.1 μ m L.C.: 1.0 μ m | Upto 600 mm | 5.4 μ m | Using Slip Gauge set, Length Bar set by Comparison Method |


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| II. | DIMENSION (PRECISION INSTRUMENTS) | | | |
| 1. | Gauges Blocks / Slip Gauges ^s (Carbide material) (Steel material) | Upto 25 mm > 25 mm to 50 mm > 50 mm to 75 mm > 75 mm to 100 mm Upto 25 mm > 25 mm to 50 mm > 50 mm to 75 mm > 75 mm to 100 mm | 0.12 μ m 0.21 μ m 0.28 μ m 0.33 μ m 0.30 μ m 0.57 μ m 0.85 μ m 1.13 μ m | Using Slip Gauge Calibrator & Slip Gauge Set Grade-K (Carbide Material) by Comparison Method |
| 2. | Length Bar /Long Slip Gauge/ Micrometer Setting Stick ^s | Upto 600 mm | 5.7 μ m | Using Slip Gauge Set, Granite Comparator, Length Bar Set, Electronic Probe with DRO by Comparison Method |
| 3. | Electronic Level ^s L.C.: >1.0 μ m/m (Base Upto 300 mm) | Upto \pm 2 mm/m | 6.9 μ m/m | Using Electronic Level by Comparison Method |
| 4. | Profile Projector ^r X-Y Travel L.C.: 0.005 mm Magnification Angle L.C.: 1' | Upto 100 mm Upto 100 x 0° to 360° | 7.3 μ m 0.13 % 7.2' | Using Glass Scale & Glass Angle Graticule by Comparison Method |

Sangeeta Kunwar
Convenor

Avijit Das
Program Manager



National Accreditation Board for Testing and Calibration Laboratories

(A Constituent Board of Quality Council of India)



SCOPE OF ACCREDITATION

Laboratory Micro-Flat Datums Pvt. Ltd., Plot No. 25-28, Zone D-3, GIDC, Vitthal Udyognagar, Anand, Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number CC-2378 (in lieu of C-0346) **Page** 14 of 14

Validity 26.09.2017 to 25.09.2019 **Last Amended on** 30.08.2018

| Sl. | Quantity Measured / Instrument | Range/Frequency | *Calibration Measurement Capability (\pm) | Remarks |
|------|----------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------|
| III. | PRESSURE INDICATING DEVICE | | | |
| 1. | Hydraulic Pressure [#] (Analog / Digital Pressure Gauge) | 0 to 4 bar 0 to 10 bar 0 to 40 bar 0 to 250 bar 0 to 700 bar | 0.005 bar 0.012 bar 0.05 bar 0.27 bar 0.74 bar | Using Master Digital Pressure Gauge with Pressure Comparator by Comparison Method |

* Measurement Capability is expressed as an uncertainty (\pm) at a confidence probability of 95%

^{\$} Only in Permanent Laboratory

^{*} Only for Site Calibration

[#] The laboratory is also capable for site calibration however, the uncertainty at site depends on the prevailing actual environmental conditions and master equipment used.

^o Laboratory can also calibrate instruments/devices of coarser resolution / least count within the accredited range using same reference standard/ master equipment under the scope of accreditation.

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