



International Quality And Accreditation Services Pvt.Ltd.
(Formerly International Quality And Accreditation Services LLP)
 25/33, 2nd Floor, East Patel Nagar New Delhi, 110008

Scope of Accreditation for Calibration

As per ISO/IEC 17025:2017

CAB Name: Metrological Testing and Calibration Centre LLP
Address: # 1303, 1st C Main, 9th Block, II Stage,
 Nagarabhavi, Bengaluru-560072, Karnataka
Certificate No.: C-0014

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Amendment date: 06.10.2025

| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC± | Remarks/Method used | Facility | |
|-------------------------------------|---|------------------------|-------------------|---|---|------------------|
| Electro-Technical Discipline | | | | | | |
| 1 | DC Voltage (MEASURE) | 1 µV to 10 µV | 7.9nV to 2.5nV | Using Precision Potential Divider & 8½ / 7½ Nano Volt / Multimeter by Direct Method | Permanent & Site | |
| 2 | | 10 µV to 100 µV | 2.5nV to 12 nV | | | |
| 3 | | 100 µV to 1mV | 12 nV to 2µV | | | |
| 4 | | 1 mV to 10 mV | 2 µV to 2.1 µV | | | |
| 5 | | 10 mV to 100 mV | 2.1µV to 2.9 µV | | | |
| 6 | | 100 mV to 1 V | 2.9µV to 9µV | | | |
| 7 | | 1 V to 10 V | 9µV to 71µV | | | |
| 8 | | 10 V to 100 V | 71µV to 1mV | | | |
| 9 | | 100 V to 1000 V | 1mV to 11mV | | | |
| 10 | | | 0.1 kV to 1 kV | 1.3V to 13V | Using Differential HV Probe with Scope by direct method | Permanent & Site |
| 11 | | | 1 kV to 10 kV | 13V to 130V | | |
| 12 | | | 1 kV to 40 kV | 20V to 0.2kV | | |
| 13 | DC Current (MEASURE) | 1nA to 10nA | 2.9pA to 45 pA | Using 8½ Multimeter and >30A Current Used VIR Method by Direct Method | Permanent & Site | |
| 14 | | 10nA to 100nA | 45pA to 15pA | | | |
| 15 | | 100nA to 1 µA | 15pA to 1 nA | | | |
| 16 | | 1 µA to 10 µA | 1 nA to 5.2 nA | | | |
| 17 | | 10 µA to 100 µA | 5.2nA to 4.3 nA | | | |
| 18 | | 100 µA to 1 mA | 4.3nA to 4.6 nA | | | |
| 19 | | 1 mA to 10 mA | 4.6µA to 4.9 µA | | | |
| 20 | | 10mA to 100 mA | 4.9µA to 13 µA | | | |
| 21 | | 100 mA to 1 A | 13µA to 0.35 mA | | | |
| 22 | | 1A to 10A | 0.35 mA to 5.3 mA | | | |
| 23 | | 10A to 30A | 5.3mA to 30 mA | | | |
| 24 | | 30A to 50A | 30mA to 310mA | | | |
| 25 | | | 50A to 500A | | | 310mA to 7.9 A |
| 26 | | | 500A to 2500A | 7.9 A to 36.5 A | | |
| 27 | AC Voltage (Measure) | 1 mV to 1V | | | | |



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|---------|---|----------------------------------|-----------------|--|------------------|
| | | (10Hz to 50kHz) | | | |
| 28 | AC Voltage (Measure) | 1V to 2V (10Hz to 50kHz) | 21 µV to 33 µV | Using Coaxial Thermal Voltage Converter with Nano Voltmeter (Holt/ Keysight-34420) by Transfer STD Method & 8.5digit Multimeter 3458A/T-8081 Option II Using Coaxial Thermal Voltage Converter with Nano Voltmeter (Holt/ Keysight-34420) by Transfer STD Method & 8.5digit Multimeter 3458A/T-8081 Option II | Permanent & Site |
| 29 | | 2V to 4V (10Hz to 50kHz) | | | |
| 30 | | 4V to 10V (10Hz to 50kHz) | 190 µV | | |
| 31 | | 10V to 40V (10Hz to 50kHz) | 190 µV | | |
| 32 | | 40V to 120V (10Hz to 50kHz) | 190 µV | | |
| 33 | | 120V to 400V (10Hz to 50kHz) | 190 µV | | |
| 34 | | 400V to 1000V (10Hz to 50kHz) | 190 µV | | |
| 35 | | 1000 V (10Hz to 50kHz) | 190 µV | | |
| 36 | | 1 mV to 1V 50kHz to 100kHz | 5 µV to 6.5 µV | | |
| 37 | | 1V to 2V (50kHz to 100kHz) | | | |
| 38 | | 2V to 4V (50kHz to 100kHz) | 44 µV to 190 µV | | |
| 39 | | 4V to 10V (50kHz to 100kHz) | 190 µV | | |
| | | 10V to 40V | 190 µV | | |



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| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC± | Remarks/Method used | Facility |
|---------|---|------------------------------------|-----------------|---------------------|----------|
| 40 | | (50kHz to 100kHz) | | | |
| | | 40V to 120V | | | |
| 41 | | (50kHz to 100kHz) | 190 µV | | |
| | | 120V to 400V | | | |
| | | (50kHz to 100kHz) | 190 µV | | |
| 42 | | 400V to 1000V (50kHz to 100kHz) | 190 µV | | |
| | | 1000 V | | | |
| 43 | | (50kHz to 100kHz) | 190 µV | | |
| | | 1 mV to 1V | | | |
| 44 | | (100kHz to 1MHz) | 33 µV to 190 µV | | |
| | | 1V to 2V | | | |
| 45 | | (100kHz to 1MHz) | 44 µV to 190 µV | | |
| | | 2V to 4V | | | |
| 46 | | (100kHz to 1MHz) | 190 µV | | |
| | | 4V to 10V | | | |
| 47 | | (100kHz to 1MHz) | 190 µV | | |
| | | 10V to 40V | | | |
| 48 | | (100kHz to 1MHz) | 190 µV | | |
| | | 40V to 120V | | | |
| 49 | | (100kHz to 1MHz) | 190 µV | | |
| | | 120V to 400V | | | |
| 50 | | (100kHz to 1MHz) | 190 µV | | |

Using Coaxial Thermal Voltage Converter with Nano Voltmeter (Holt/ Keysight-34420) by Transfer STD Method & 8.5digit Multimeter 3458A/T-8081 Option II



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|---------|---|------------------------------------|------------------|---------------------------------------|------------------|
| 51 | | 400V to 1000V (100kHz to 1MHz) | 190 µV | | |
| | | 1000 V (100kHz to 1MHz) | 190 µV | | |
| 52 | AC Voltage (Measure) | 1 mV to 10 mV (10Hz to 1kHz) | 8.1 µV to 6.6 µV | Using 8 ½ Multimeter by direct Method | Permanent & Site |
| 53 | | 10 mV to 100 mV (10Hz to 1kHz) | 6.5 µV to 33 µV | | |
| 54 | | 100 mV to 1 V (10Hz to 1kHz) | 33 µV to 190 µV | | |
| 55 | | 1 V to 10 V (10Hz to 100kHz) | 190 µV to 9.5 mV | | |
| 56 | | 1 V to 10 V (100kHz to 500kHz) | 3.6 mV to 12 V | | |
| 57 | | 10 V to 100 V (10Hz to 100kHz) | 12 mV to 0.14 V | | |
| | | 10 V to 100 V (100kHz to 1MHz) | 36 mV to 0.14 V | | |
| 58 | | 100 V to 700 V (20Hz to 20kHz) | 29 mV to 0.51 V | | |
| | | 700 V to 1000 V (50Hz to 20kHz) | 0.51 V to 0.77 V | | |
| 59 | | 1000 V (40Hz to 1kHz) | 0.77 V | | |
| | | 1 kV to 10 kV (50 Hz) | 61 V to 600 V | | |
| 60 | | 10 kV to 28 kV (50 Hz) | 600 V to 1.68 kV | | |
| 61 | | 0.1 kV to 1 kV (50 Hz) | 2.3 V to 38 V | | |
| | | | | | |



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|---------|---|--------------------------------------|-----------------------------------|--|------------------|
| 62 | | 1 kV to 10 kV (50 Hz) | 38 V to 380 V | Probe with Scope by direct method | |
| 63 | AC Current @ (MEASURE) | 10 µA to 100 µA (10 Hz to 1 kHz) | 13 nA to 56 nA | Using 8 ½ Multimeter by direct method | Permanent & Site |
| 64 | | 100 µA to 1 mA (10 Hz to 1 kHz) | 56 nA to 0.55 µA | | |
| 65 | | 1 mA to 10 mA (40 Hz to 5 kHz) | 0.55 µA to 14 µA | | |
| 66 | | 10 mA to 100 mA (40 Hz to 10 kHz) | 14 µA to 120 µA | | |
| 67 | | 100 mA to 1 A (40 Hz to 10 kHz) | 120 µA to 1.5 mA | | |
| 68 | | 1 A to 2 A (20 Hz to 10 kHz) | 1.5 mA to 8.4 mA | | |
| 69 | | 2 A to 10 A (50 Hz to 5 kHz) | 8.4 mA to 12 mA | | |
| 70 | | 10 A to 20 A (50 Hz to 5 kHz) | 12 mA to 24 mA | | |
| 71 | 20 A to 30 A (50 Hz to 1 kHz) | 24 mA to 39mA | 2/10/50T-AC DC Clamp Coil Adapter | Permanent & Site | |
| 72 | 30 A (50 Hz to 1 kHz) | 40 mA | | | |
| 72 | | 50 A to 1500 A (50 Hz) | 33 mA to 7.92 A | Multi Product Calibrator, Clamp Meter | Permanent & Site |
| 73 | Resistance (4W) (MEASURE) | 1500 A to 2500 A (50 Hz) | 7.92 A to 12.43 A | | |
| 73 | | 0.000001Ω to 0.00001Ω | 12 nΩ to 120 nΩ | Using STD 4W Resistor, 0.01A to 1000A-High Current Source with | Permanent & Site |
| | | 0.00001Ω to 0.0001Ω | 120 nΩ to 580 nΩ | | |



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|---------|---|------------------------------|-------------------|--|------------------|
| 74 | | 0.0001Ω to 0.001Ω | 580 nΩ to 130 nΩ | DMM by Comparison Method VIR Using 8 ½ Precision Multimeter/Micro ohm meter by direct method | |
| | | 0.001Ω to 0.01Ω | 130 nΩ to 1.2 μΩ | | |
| 75 | | 0.01Ω to 0.1Ω | 1.2 μΩ to 12 μΩ | | |
| | | 0.1Ω to 1Ω | 12 μΩ to 120 μΩ | | |
| 76 | | 1Ω to 1kΩ | 1.84 mΩ to 213 mΩ | | |
| | | 1kΩ to 10kΩ | 213 mΩ to 1.4 mΩ | | |
| | | 10kΩ to 100kΩ | 1.4 mΩ to 2.5 Ω | | |
| 77 | Resistance (2W) (MEASURE) | 1Ω to 10 MΩ | 0.75 mΩ to 610 Ω | Using 8 ½ Multimeter / High Precision Resistance meter/HV Insulation Tester by direct method(10V-10kVdc) | Permanent & Site |
| 78 | | 10 MΩ to 100 MΩ | 610 Ω to 59 kΩ | | |
| | | 100 MΩ to 1 GΩ | 59 kΩ to 5.9 MΩ | | |
| 79 | | 1 GΩ to 10 GΩ | 5.9 MΩ to 41 MΩ | | |
| | | 10 GΩ to 10 TΩ | 41 MΩ to 75 GΩ | | |
| 80 | AC Resistance (MEASURE) | 1 Ω to 10 Ω (100Hz-1kHz) | 0.58 mΩ to 4.3 mΩ | Using RLC Digi bridge by direct method | Permanent & Site |
| 81 | | 10 Ω to 100 Ω (100Hz-1kHz) | 4.3 mΩ to 32 mΩ | | |
| 82 | | 100 Ω to 1 kΩ (100Hz-1kHz) | 32 mΩ to 1.7 Ω | | |
| 83 | | 1 kΩ to 10 kΩ (100Hz-1kHz) | 1.7 Ω to 4.5 Ω | | |
| 84 | | 10 kΩ to 100 kΩ (100Hz-1kHz) | 4.5 Ω | | |
| 85 | AC Capacitance | 1 pF to 10 pF | 3 fF to 16 fF | | |



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|---------|---|--|----------------------------|--|------------------|
| | (MEASURE) | (100Hz to 1kHz) | | | |
| 86 | | 10 pF to 100 pF (100Hz to 1kHz) | 16 fF to 42 fF | | |
| 87 | | 100 pF to 1nF (100Hz to 1kHz) | 42 fF to 2.5 pF | | |
| 88 | | 1nF to 10nF (100Hz to 1kHz) | 2.5 pF to 6.7 pF | | |
| 89 | | 10nF to 100nF (100Hz to 1kHz) | 6.7 pF to 42 pF | | |
| 90 | | 100nF to 1 μ F (100Hz to 1kHz) | 42 pF to 2.2 nF | Using RLC Digi bridge by Direct method | Permanent & Site |
| 91 | | 1 μ F to 10 μ F (100Hz to 1kHz) | 2.2 nF to 5.2 nF | | |
| 92 | | 10 μ F to 100 μ F (100Hz to 1kHz) | 5.2 nF to 53 nF | | |
| 93 | | 100 μ F to 1mF (100Hz to 1kHz) | 53 nF to 1.5 μ F | | |
| 94 | | 1mF to 1000mF (100Hz to 1kHz) | 1.5 μ F to 200 μ F | | |
| 95 | | 10 μ H to 100 μ H (100Hz-1kHz) | 5.4 nH to 35 nH | | |
| 96 | | 100 μ H to 1 mH (100Hz-1kHz) | 35 nH to 1.4 μ H | | |
| 97 | AC Inductance (Measure) | 1mH to 10 mH (100Hz-1kHz) | 1.4 μ H to 5.3 μ H | Using RLC Digi bridge by direct method | Permanent & Site |
| 98 | | 10 mH to 100 mH (100Hz-1kHz) | 5.3 μ H to 33 μ H | | |
| 99 | | 100 mH to 1 H (100Hz-1kHz) | 33 μ H to 1.4 mH | | |



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|---------|---|--|-------------------|--|------------------|
| 100 | | 1H to 10 H (100Hz-1kHz) | 1.4 mH to 5.6 mH | | |
| 101 | DC Power (1V to 1000V) & (0.3A to30 & 50 A) (Measure) | 0.3 W to 30 kW | 0.32 mW | Using 8 ½ Precision Multi Product Calibrator Power Mode by direct Method | Permanent & Site |
| 102 | | 30 kW to 1500 kW | 4.58 kW | | |
| 103 | AC Power @ 50Hz (40V to 300V) (0.3A to 20A),0.1 (Lead/Lag) to UPF (Measure) | 1.2 W to 1000 W @50Hz | 1.8 mW to 38 mW | Using Precision ACDC Watt converter- 6½ Multimeter by Direct method | Permanent & Site |
| 104 | | 1000 W to 6000 W @50Hz | 38 mW to 1.65 W | | |
| 105 | | 0.1PF to 0.9 PF (lead) | 0.90 % to 0.42 % | | |
| 106 | AC Power Factor @ 50Hz (Measure) | 0.1PF to 0.9 PF (lag) | 0.42 % to 0.21 % | Using Precision ACDC Watt converter- 6½ Multimeter by Direct method | Permanent & Site |
| 107 | | 1.0 PF (UPF) | 0.21 % to 0.14 % | | |
| 108 | (1V to 500V,50Hz) AC Power Mode (Measure) | 0 ° to 180 ° | 0.01% | Using Precision Watt-Converter by direct Method | Permanent & Site |
| 109 | LF-Frequency (MEASURE) | 0.1 Hz to 1000 MHz (@-70dBm to 15dBm) <10Vpp | 8.5 nHz to 1.4 Hz | Using Universal Frequency counter by direct method | Permanent & Site |
| 110 | RF & Microwave Frequency (MEASURE) | 1000 MHz to 40 GHz (@-70dBm to 15dBm) | 1.4 Hz to 0.57 Hz | | |
| 111 | RF Microwave Power (MEASURE) | (-)-70dBm to (-) 60dBm (9 kHz to 18GHz) | 0.16 dB | Using Average RF Power Sensor direct method | Permanent & Site |
| 112 | | (-)-60dBm to 15dBm | 0.16 dB | | |



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| | | (9 kHz to 40GHz) | | | |
| 113 | RF Power Gain (MEASURE) | 15 dBm to 60 dBm (9kHz to 40GHz) | 0.26 dB to 0.38 dB | Using RF Amplifier/Sensor/with 30dB Attenuator Direct Method | Permanent & Site |
| 114 | Amplitude Modulation, Mode rate @1kHz Range (50Hz-10kHz) (Measure) | 5 % to 99 % CW (10MHz to 1.3GHz) | 0.13 % to 2.43 % | Using AM/FM/φM Measuring Receiver by direct method | Permanent & Site |
| 115 | Frequency Modulation Mode rate @1kHz (Measure) | 5 kHz to 400 kHz CW(10MHz to 1.3GHz) | 0.13 kHz to 9.99 kHz | | |
| 116 | Phase Modulation Mod rate@1kHz (Measure) | 1 rad | 0.047 rad | | |
| | | 10 rad | 0.47 rad | | |
| 117 | | 100 rad | 4.67 rad | | |
| | | 400 rad | 18.4 rad | | |
| 118 | | CW (10MHz to 1.3GHz) | | | |
| 119 | V-Harmonic @40Hz to 70Hz (Fundamental) (Measure) | 10 V 440 V 1 kV | 0.37 V 15.5 V 37 V | Using Multi Product Calibrator by Direct Method | Permanent & Site |
| 120 | V-Harmonic @50Hz (2 to 31st harmonic) (Measure) | 10 V 440 V 1 kV | 0.61 V 25.8 V 61 V | | |
| 121 | V-Harmonic @50Hz (32 to 51st harmonic) (Measure) | 10 V 440 V 1 kV | 1.79 V 76.9 V 179 V | | |
| 122 | A-Harmonic @40Hz to 70Hz | 0.1 A | 0.03 A | | |
| | | 10 A | 0.58 A | | |



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| 123 | (Fundamental) (Measure) | 30 A | 1.07 A | Using Multi Product Calibrator with 50 Turn Coil by Direct Method | Permanent & Site |
| | | 1500 A | 54.4 A | | |
| | A-Harmonic @50Hz (2 to 31st harmonic) (Measure) | 0.1 A | 0.04 A | | |
| | | 10 A | 0.92 A | | |
| 30 A | | 1.75 A | | | |
| 124 | A-Harmonic @50Hz (32 to 51st harmonic) (Measure) | 1500 A | 90.15 A | | |
| | | 0.1 A | 0.075 A | | |
| | | 10 A | 2.31 A | | |
| | | 30 A | 5.2 A | | |
| 125 | P-Harmonic @40Hz to 70Hz (Fundamental) (Measure) | 1500 A | 265.6 A | | |
| | | 0.1 W | 0.03 W | | |
| | | 10 W | 1.0 W | | |
| | | 100 W | 8.12 W | | |
| | | 1 kW | 81 W | | |
| | | 10 kW | 810 W | | |
| 126 | P-Harmonic @50Hz (2 to 31st harmonic) (Measure) | 30 kW | 1.96 kW | | |
| | | 0.1 W | 0.13 W | | |
| | | 10 W | 1.5 W | | |
| | | 100 W | 23.1 W | | |
| | | 1 kW | 230 W | | |
| 127 | P-Harmonic @50Hz (32 to 51st harmonic) (Measure) | 10 kW | 1.27 kW | | |
| | | 30 kW | 3.58 kW | | |
| | | 0.1 W | 0.06 W | | |
| | | 10 W | 1.09 W | | |
| | | 100 W | 22.27 W | | |
| | | 1 kW | 93 W | | |
| 128 | | 10 kW | 9.40 W | | |
| | | 30 kW | 1.62 kW | | |
| | | 0 dB to 90 dB | | | |
| | | | | | |
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| 129 | RF Microwave Power Loss, Attenuation @ 9kHz- 40 GHz | (9kHz- 10 GHz) | 0.16 dB | Using Spectrum/Network/ average Power sensor, Power meter, by direct/Comparison method | Permanent & Site |
| | | 0 dB to 90 dB | | | |
| 130 | Attenuation, Insertion Loss, Return Loss, Coupling Loss, Decoupling Loss, Isolation Loss, Voltage | (10GHz- 25 GHz) | 0.20 dB | | |
| | | 0 dB to 90 dB | | | |
| 131 | Division Factor, VSWR, Harmonics (MEASURE) | (26GHz- 39 GHz) | 0.25 dB | | |
| | | 0 dB to 90 dB | | | |
| | | (40GHz) | 0.28 dB | | |
| 132 | VSWR 9kHz-18GHz-40 GHz (Measure) | 1 (Open Termination) | 0.03 rho | Using Network Analyzer, Cal Kit by Comparison Method | Permanent & Site |
| | | 1 (Short Termination) | 0.03 rho | | |
| | | 1 (Load Termination) | 0.03 rho | | |
| | | 1.05 (Mismatch) | 0.01 rho | | |
| | | 1.2 (Mismatch) | 0.02 rho | | |
| | | 1.5 (Mismatch) | 0.03 rho | | |
| | | 2 (Mismatch) | 0.04 rho | | |
| 133 | Bandwidth up to 40 GHz (Measure) | 1MHz-600MHz | 0.27 dB | Using Signal Generator, Freq Counter 40GHz Power meter with sensors by direct method | Permanent & Site |
| | | @50kHz | | | |
| 134 | | 10MHz to 1.1GHz | 0.27 dB | | |
| | | @50kHz | | | |
| 135 | | 10MHz to 18GHz | 0.27 dB | | |
| | | @10MHz | | | |
| | | 50 MHz to 26.5GHz | | | |
| 136 | | | @ 50 MHz | | |
| | | @ 50 MHz | | | |



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| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC \pm | Remarks/Method used | Facility |
|---------|---|------------------------|---------------------------|---|------------------|
| 137 | Oscilloscope amplitude (1mV/div to 50V/div) DC Amplitude Mode 50 Ohms 1Mohm Impedance (Measure) | 1 mVpp to 300 Vpp | 2.2 μ Vpp to 100 mVpp | Using 8 ½ Precision Multi Product Calibrator & Scope Calibrator, by Comparison Method | Permanent & Site |
| 138 | Oscilloscope amplitude (1mV/div to 50V/div) Sine, Square wave Mode @1kHz Variable Multiplier X1 to X10 to 50 Ohm, 1 Mohm Impedance (Measure) | 1 mVpp to 300 Vpp | 7.1 μ Vpp to 79 mVpp | Using 8 ½ Precision Multi Product Calibrator & Scope Calibrator, by Comparison Method | Permanent & Site |
| 139 | Time base (Measure) | 1000 Ks to 20 ps | 0.023ppm | Using Time Generator by Comparison Method (T=1/F) | Permanent & Site |
| 140 | Time Interval (Measure) | 0.01 s to 9000 s | 73 μ Sec to 0.61Sec | Using Digital Timer Generator/Counters by Comparison Method | Permanent & Site |
| 141 | | 9000 s to 85000 s | 0.61Sec | | |

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|--|---|------------------------|----------------------|---|------------------|
| Temperature Indicator and Controlled - By Simulation (Measure Mode) | | | | | |
| 142 | B-Type | 300 °C to 1800 °C | 0.042 °C | Using 8 ½ Precision Multimeter +5520A Calibrator by direct Method | Permanent & Site |
| | E-Type | 100 °C to 800 °C | 0.046 °C | | |
| | J-Type | (-)200 to 1200 °C | 0.036 °C | | |
| | K-Type | (-)140 °C to 1340 °C | 0.13 °C to 0.073 °C | | |
| | N-Type | (-) 200 °C to 1300°C | 0.14 °C to 0.047 °C | | |
| | R-Type | 0 °C to 1760 °C | 0.043 °C | | |
| | S-Type | 0 °C to 1760 °C | 0.043 °C | | |
| | T-Type | (-) 200 °C to 400 °C | 0.13 °C to 0.095 °C | | |
| | L-Type | (-) 200 °C to 900 °C | 0.12 °C to 0.049 °C | | |
| | C-Type | 10 °C to 2300 °C | 0.043 °C to 0.084 °C | | |
| | U-Type | (-)200 °C to 600 °C | 0.22 °C to 0.054 °C | | |
| | RTD (PT-100) | (-)200 °C to 800 °C | 0.26 °C to 0.031 °C | | |
| 143 | DC Voltage (SOURCE) | 10 µV to 100 µV | 120 nV to 1.16 µV | Using potential 1 µV to 100 µV divider, 8 ½ Precision Multi Product Calibrator by direct Method Using Differential HV Probe with Scope by direct method | Permanent & Site |
| 144 | | | 1.16 µV to 2.3 µV | | |
| 145 | | 100 µV to 1 mV | 2.3 µV to 2.5 µV | | |
| 146 | | 1 mV to 10 mV | 2.5 µV to 3.9 µV | | |
| 147 | | 10 mV to 100 mV | 3.9 µV to 15 µV | | |
| 148 | | 100 mV to 1 V | 15 µV to 140 µV | | |
| 149 | | 1 V to 10 V | 140 µV to 1.8 mV | | |
| 150 | | 10 V to 100 V | 1.8 mV to 18 mV | | |
| 151 | | 100 V to 1000 V | 1.2 V to 13 V | | |
| 152 | | 0.1 kV to 1 kV | | | |



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| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC± | Remarks/Method used | Facility |
|---------|---|------------------------|--------------------------------|---|------------------|
| 153 | | 1 kV to 10 kV | 13 V to 720 V | | Permanent & Site |
| 154 | | 0.1 kV to 1 kV | 2 V to 20 V | | Permanent & Site |
| 155 | | 1 kV to 10 kV | 20 V to 200 V | | |
| 156 | | 10 kV to 40 kV | 200 V to 1.12 kV | | |
| 157 | DC Current (SOURCE) | 1 nA to 100 nA | 2.8 pA to 19 pA | Using 8 ½ Precision Multi Product Calibrator/Transconductance Amplifier and Current Coil by direct method DMB with High Voltage Probe | Permanent & Site |
| 158 | | 100 nA to 1 µA | 19 pA to 12 nA | | |
| 159 | | 1 µA to 100 µA | 12 nA to 23 nA | | |
| 160 | | 100 µA to 1 mA | 23 nA to 0.13 µA | | |
| 162 | | 1 mA to 10 mA | 0.13 µA to 0.91 µA | | |
| 163 | | 10 mA to 100 mA | 0.91 µA to 11 µA | | |
| 164 | | 100 mA to 1 A | 11 µA to 0.33 mA | | |
| 165 | | 1 A to 10 A | 0.33 mA to 5 mA | | |
| 166 | | 10 A to 30 A | 5 mA to 30 mA | | |
| 167 | | 50 A to 1500 A | 450 mA to 86.9 A | | |
| 168 | | 1500 A to 2500 A | 86.9 A to 122.93 A | | |
| 169 | | AC Voltage (SOURCE) | 1mV - 10mV (10Hz to 500kHz) | | |
| 170 | 10 mV - 100mV (10Hz to 500kHz) | | 67 µV to 150 µV | | |
| 171 | 100 mV - 1V (10Hz to 500kHz) | | 150 µV to 340 µV | | |



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| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC± | Remarks/Method used | Facility | | |
|---------|---|-----------------------------------|------------------------------|---|------------------|-----------------|-------------------------|
| 172 | | 1V - 10 V (10Hz to 450kHz) | 0.82 mV to 3.8 mV | | | | |
| 173 | | 10 V - 100V (10Hz to 100kHz) | | | | 8.5 mV to 15 mV | |
| 174 | | 100 V - 1000V (40Hz to 100kHz) | 32 mV to 450 mV | | | | |
| 175 | | 1000 V (40Hz to 10kHz) | | | | 450 mV | |
| 176 | | AC Voltage (SOURCE) | VRMS @50Hz | | | | DP30K Comparison Method |
| 177 | | | 0.1 kV | | | 2.3 V | |
| 178 | 1 kV | | 38 V | | | | |
| 179 | 10 kV | | 380 V | | | | |
| 180 | VRMS @50Hz | | HVP40+ 289 Comparison Method | Permanent & Site | | | |
| 181 | 0.1 kV | | | | 2.3 V | | |
| 182 | 1 kV | | | | 61 V | | |
| 183 | 10 kV | | | | 600 V | | |
| 184 | 28 kV | 1.68 kV | | | | | |
| 185 | AC Current (SOURCE) | 10 µA to 100 µA (40Hz to 5kHz) | 150 nA to 250 nA | Using 8 ½ Precision Multi Product Calibrator with Current Coil by direct method with Fluke Transconductance Amplifier | Permanent & Site | | |
| 186 | | 100 µA to 1 mA (40Hz to 5kHz) | 250 nA to 1.6 µA | | | | |
| 187 | | 1mA to 10 mA (40Hz to 5kHz) | 1.6 µA to 2.4 µA | | | | |
| 188 | | 10 mA to 100 mA (40Hz to 5kHz) | 2.4µA to 130 µA | | | | |
| 189 | | 100 mA to 1 A (40Hz to 5kHz) | 130 µA to 0.65 µA | | | | |
| 190 | | 1A to 20 A | | | | | |



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|---------|---|-------------------------|---|---|------------------|
| 191 | | (50Hz to 5kHz) | 0.65 mA to 34 mA | | |
| | | 20 A to 30 A | 34 mA to 700 mA | | |
| 192 | | (50Hz to 5kHz) | 700 mA to 6.67 A | | |
| | | 30 A to 1500 A (50 Hz) | | | |
| 193 | DC Resistance (4Wire) (SOURCE) | 0.000001 Ω to 0.00001 Ω | 58 nΩ to 120 nΩ | Using 4W STD Resistor by direct Method (0.01A-1000Adc) | Permanent & Site |
| 194 | | 0.00001 Ω to 0.0001 Ω | 120 nΩ to 580 nΩ | | |
| 195 | | 0.0001 Ω to 0.001 Ω | 580 nΩ to 130 nΩ | | |
| 196 | | 0.001 Ω to 0.01 Ω | 130 nΩ to 1.2 μΩ | | |
| 197 | | 0.01 Ω to 0.1 Ω | 1.2 μΩ to 12 μΩ | | |
| 198 | | 0.1 Ω to 1 Ω | 12 μΩ to 0.13 mΩ | | |
| 199 | | 1 Ω to 1.9 Ω | 0.13 mΩ to 0.22 mΩ | | |
| 200 | | 10 Ω to 19 Ω | 0.45 mΩ to 0.72 mΩ | Using DC Resistance STD-5450A Calibrator by Direct Method | Permanent & Site |
| 201 | | 100 Ω to 190 Ω | 3.3 mΩ to 4 mΩ | | |
| 202 | | 1 kΩ to 1.9 kΩ | 40 mΩ | | |
| 203 | | 10 kΩ to 19 kΩ | 0.32 Ω to 0.35 Ω | | |
| 204 | | 100 kΩ to 190 kΩ | 2.3 Ω to 3.74 Ω | | |
| 205 | | 1 MΩ to 1.9 MΩ | 28 Ω to 47 Ω | | |
| 206 | | 10 MΩ to 19 MΩ | 0.61 kΩ to 1.3 kΩ | | |
| 207 | 19 MΩ to 100 MΩ | 1.3 kΩ to 25 kΩ | Resistance Calibrator High Precision Decade Meg ohm Box Dc Voltage (10V-10kVdc) | Permanent & Site | |
| 208 | 100 kΩ to 1 MΩ | 1.8 Ω to 32 Ω | | | |
| 209 | 1 MΩ to 100 MΩ | 32 Ω to 25 kΩ | | | |
| 210 | | 100 MΩ to 1 GΩ | 25 kΩ to 3.5 MΩ | | |



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|---------|---|--------------------------------|-------------------|--|------------------|
| 211 | | 1 GΩ to 100 GΩ | 3.5 MΩ to 1.16 GΩ | Using 8 ½ Precision Multi Product Calibrator by direct Method- 5520A/3010 | Permanent & Site |
| 212 | | 100 GΩ to 1 TΩ | 1.16 GΩ to 12 GΩ | | |
| 213 | | 1 TΩ to 10 TΩ | 12 GΩ to 120 GΩ | | |
| 214 | | 1 Ω to 10 Ω | 5.8 mΩ to 6.1 mΩ | | |
| 215 | | 10 Ω to 1 kΩ | 6.1 mΩ to 37 mΩ | | |
| 216 | | 1 kΩ to 10 kΩ | 37 mΩ to 250 mΩ | | |
| 217 | | 10 kΩ to 100 kΩ | 250 mΩ to 3.3 Ω | | |
| 218 | | 100 kΩ to 1 MΩ | 3.3 Ω to 290 Ω | | |
| 219 | | 1 MΩ to 10 MΩ | 290 Ω to 1.2 kΩ | | |
| 220 | | 10 MΩ to 100 MΩ | 1.2 kΩ to 0.21 MΩ | | |
| 221 | | 100 MΩ to 1 GΩ | 0.21 MΩ to 14 MΩ | | |
| 222 | | AC Resistance @ 1 kHz (SOURCE) | 1 Ω to 1.9 Ω | | |
| 223 | 10 Ω to 19 Ω | | 2.7 mΩ to 4.5 mΩ | | |
| 224 | 100 Ω to 190Ω | | 29 mΩ to 50 mΩ | | |
| 225 | 1 kΩ to 1.9 kΩ | | 1.4 Ω to 0.44 Ω | | |
| 226 | 1.9 kΩ to 10 kΩ | | 0.44 Ω to 3.5 Ω | | |
| 227 | 19 kΩ to 100 kΩ | | 0.44 Ω to 1.8 Ω | | |
| 228 | Capacitance @ 1 kHz (SOURCE) | 1 pF to 10 pF | 1.4 fF to 2.7 fF | Using Precision Decade Capacitance Box and 8 ½ Precision Multi Product Calibrator by direct Method | Permanent & Site |
| 229 | | 10 pF to 100 pF | 2.7 fF to 29 fF | | |
| 230 | | 100 pF to 1 nF | 29 fF to 2 pF | | |
| 231 | | 1 nF to 10 nF | 2 pF to 3.1 pF | | |
| 232 | | 10 nF to 100 nF | 3.1 pF to 33 pF | | |
| 233 | | 100 nF to 1 μF | 33 pF to 0.9 nF | | |
| 234 | | 1 μF to 10 μF | 0.9 nF to 4 nF | | |



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|---------|---|-------------------------|-------------------|--|------------------|
| 235 | | 10 µF to 100 µF | 4 nF to 41 nF | | |
| 236 | Capacitance @ 100 Hz (SOURCE) | 1 mF to 10 mF | 1.3 µF to 4.8 µF | | |
| 238 | Inductance @ 1 kHz (SOURCE) | 10 µH to 100 µH | 2.9 nH to 29 nH | Using Precision Decade Inductance Box by direct Method and 8 ½ Precision Multi Product Calibrator by direct Method | |
| 239 | | 100 µH to 1 mH | 29 nH to 1.4 µH | | |
| 240 | | 1mH to 10 mH | 1.4 µH to 5.2 µH | | |
| 241 | | 10 mH to 100 mH | 5.2 µH to 39 µH | | |
| 242 | | 100 mH to 1 H | 39 µH to 0.82 mH | | |
| 243 | | 1 H to 10 H | 0.82 mH to 4.7mH | | |
| 244 | AC Power@ 50Hz (120V to 240V, 0.3A to 20A, 0.1 PF Lead/Lag to UPF) (SOURCE) | 1.2W to 1000W | 2 mW to 1.18 W | Using 8 ½ Precision Multi Product Calibrator Power Mode by direct Method | Permanent & Site |
| 245 | | 1000 W to 9600W | 1.18 W to 10.53 W | | |
| 246 | DC Power (1V to 1000V) & (0.3A to30 & 50 A) (SOURCE) | 0.3 W to 30 kW | 1.5 mW to 23 W | Using 8 ½ Precision Multi Product Calibrator Power Mode by direct Method | Permanent & Site |
| 247 | | 30 kW to 1500 kW | 23 W to 5.15 kW | | |
| 248 | AC Power Factor @ 50Hz, 120V to 240V (SOURCE) | 0.2 to 0.8 (Lead/Lag) | 0.021 % to 0.02 % | Using 8 ½ Precision Multi Product Calibrator Power Mode Factor /Phase Angle by direct Method | Permanent & Site |
| 249 | Phase angle (1V to 500V), 50Hz AC Power Mode (SOURCE) | 0 ° to 180 ° (Lead/Lag) | 0.01% | Using 8 ½ Precision Multi Product Calibrator by direct Method | Permanent & Site |
| 250 | LF Frequency (SOURCE) | 0.1 Hz to 60 MHz | 580 pHz to 1.7 Hz | Using Wave Form Generator by direct Method | Permanent & Site |



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|---------|--|---------------------------------------|---|--|------------------|
| 251 | RF Microwave Frequency (SOURCE) | 100 kHz to 40 GHz | 580 µHz to 60 Hz | Using LF, RF, Microwave Signal generator by direct method | Permanent & Site |
| 252 | GPS Frequency 10MHz (Sine/Square) | 10MHz | 2.1 mHz | Using GPSDO with Antenna Direct method | |
| 253 | GPS Time 0.1µSec (Sine/Square) | 0.1µSec | 2.6 fs | Using GPSDO with Antenna Direct method | Permanent & Site |
| 254 | RF Microwave Power (SOURCE) | (-)70dBm to (-)60dBm (9 kHz to 18GHz) | 0.38 dB | Using Signal Generator direct Method | Permanent & Site |
| 255 | | (-)60dBm to 15 dBm (9 kHz to 40GHz) | 0.38 dB to 0.26 dB | | |
| 256 | RF Power Gain (SOURCE) | 15dBm to 60 dBm (9kHz to 40GHz) | 0.38 dB | Using RF Amplifier/Sensor/with 30dB Attenuator direct Method | Permanent & Site |
| 257 | Amplitude modulation, Mode rate @1kHz 5% to 99% (CW: 10MHz to 1.3 GHz) SOURCE) | 5 % to 99 % | 2% to 2.72% | Using Signal generator by direct method | Permanent & Site |
| 258 | Frequency Modulation (CW:10MHz to 1.3GHz) (Mod rate: 1 kHz) (SOURCE) | 5 kHz to 400 kHz | 0.18 kHz to 12.31 kHz | | |
| 259 | Phase Modulation (CF:10MHz to 1.3GHz) (Mod rate: 1 kHz) (SOURCE) | 1 rad 10 rad 100 rad 400 rad | 0.04 rad 0.31 rad 3.06 rad 12.22 rad | | |



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| 260 | V-Harmonic @40Hz to 70Hz (Fundamental) (Source) | 10V to 1000V | 14 mV to 312 mV | Using Multi Product Calibrator By Direct Method | Permanent & Site |
| | | | | | |
| | | | 3.1mV to 312 mV | | |
| | | | | | |
| 261 | V-Harmonic @50Hz (2 to 31st harmonic) (Source) | | 3.1mV to 312 mV | | |
| 262 | V-Harmonic @50Hz (32 to 51st harmonic) (Source) | | | | |
| 263 | A-Harmonic @40Hz to 70Hz (Fundamental) (Source) | 0.1 A | 1.4 mA | Using Multi Product Calibrator with 50 Turn Coil By Direct Method | Permanent & Site |
| | | 10A | 59 mA | | |
| | | 30 A | 74 mA | | |
| | | 1500 A | 54.41 A | | |
| 264 | A-Harmonic @50Hz (2 to 31st harmonic) (Source) | | 1.6 mA | | |
| | | | 59 mA | | |
| | | | 74 mA | | |
| 265 | A-Harmonic @50Hz (32 to 51st harmonic) (Source) | | 54.41 A | | |
| | | | 1.7 mA | | |
| | | | 59 mA | | |
| | | | 74 mA | | |
| 266 | P-Harmonic @40Hz to 70Hz | 0.1 W to 30 kW | 0.18 mW to 36 W | Using Multi Product Calibrator By Direct Method | Permanent & Site |
| | | | | | |



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|---------|---|------------------------|--------------------|---|------------------|
| | (Fundamental) (Source) | | | | |
| | | | 0.18 mW to 36 W | | |
| 267 | P-Harmonic @50Hz (2 to 31st harmonic) (Source) | | 0.19 mW to 36 W | | |
| 268 | P-Harmonic @50Hz (32 to 51st harmonic) (Source) | | | | |
| 269 | RF Microwave Power Loss, Attenuation @ 9kHz- 40 GHz Attenuation, | 0 dB to 90 dB | 0.15 dB to 0.16 dB | | |
| | | (9kHz- 10 GHz) | | | |
| 270 | Insertion Loss, Return Loss, Coupling Loss, Decoupling Loss, | 0 dB to 90 dB | 0.20 dB | Using Spectrum/Network/ average Power sensor, Power meter, by direct method | Permanent & Site |
| | | (10GHz- 25 GHz) | | | |
| 271 | Isolation Loss, Voltage Division Factor, VSWR, Harmonics (SOURCE) | 0 dB to 90 dB | 0.25 dB | | |
| | | (26GHz- 39 GHz) | | | |
| 272 | | 0 dB to 90 dB | 0.28 dB | | |
| | | (40GHz) | | | |
| 273 | VSWR 9kHz-18GHz-40 GHz (Measure) | 1 (Open Termination) | 0.03 rho | Using Network Analyzer, Cal Kit by Comparison Method | Permanent & Site |
| | | 1 (Short Termination) | 0.03 rho | | |
| | | 1 (Load Termination) | 0.03 rho | | |
| | | 1.05 (Mismatch) | 0.01 rho | | |
| | | 1.2 (Mismatch) | 0.02 rho | | |
| | | 1.5 (Mismatch) | 0.03 rho | | |



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|---------|--|------------------------|---------------------|--|------------------|
| | | 2 (Mismatch) | 0.04 rho | | |
| 274 | Bandwidth up to 40 GHz (SOURCE) | 1MHz-600MHz | 0.27 dB | Using Signal Generator, Freq Counter 40GHz Power meter with sensors by direct method | Permanent & Site |
| | | @50kHz | | | |
| 275 | | 10MHz to 1.1GHz | 0.27 dB | | |
| | | @50kHz | | | |
| 276 | | 10 MHz to 18GHz | 0.27dB | | |
| | | @10MHz | | | |
| | | 18GHz-26GHz | 0.27 dB | | |
| | | @10MHz | | | |
| 277 | | 50MHz to 26.5GHz | 0.27 dB | | |
| | | @50MHz | | | |
| 278 | Oscilloscope amplitude (1mV/div to 50V/div) DC Amplitude Mode 50 Ohms & 1Mohm Impedance (SOURCE) | 1 mVpp to 300 Vpp | 2.2 µVpp to | Using 8 ½ Precision Multi Product Calibrator & Scope Calibrator, by direct Method | Permanent & Site |
| | | | 100 mVpp | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 279 | Oscilloscope amplitude (1mV/div to 50V/div) Sine, Square wave Mode @1kHz Variable Multiplier X1 to X10 to 50 Ohm, 1 Mohm Impedance (SOURCE) | 1 mVpp to 300 Vpp | 7.1 µVpp to 79 mVpp | Using 8 ½ Precision Multi Product Calibrator & Scope Calibrator, by direct Method | Permanent & Site |
| 280 | Time base (SOURCE) | 1000 Ks to 20 ps | 0.023ppm | Using Time Generator by direct Method (T=1/F) | Permanent & Site |



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| 281 | Time Interval (SOURCE) | 0.01 s to 9000 s | 73 µSec to 0.61 Sec | Using Digital Timer Generator/Counters by direct method | Permanent & Site |
| 282 | | 9000 s to 85000 s | 0.61Sec to 0.58Sec | | |
| Temperature Indicator and Controlled - By Simulation (Source Mode) | | | | | |
| 283 | B-Type | 600 °C to 1820 °C | 0.062 °C | Using 8 ½ Precision Multi Product Calibrator by direct Method | Permanent & Site |
| | E-Type | (-)200 °C to 1000 °C | 0.092 °C | | |
| | J-Type | (-)200 °C to 1200 °C | 0.082 °C | | |
| | K-Type | (-)200 °C to 1350 °C | 0.072 °C | | |
| | N-Type | (-)200 °C to 1300 °C | 0.052 °C | | |
| | R-Type | 0 °C to 1760 °C | 0.076 °C | | |
| | S-Type | 0 °C to 1760 °C | 0.070 °C | | |
| | T-Type | (-)250 to 400 °C | 0.053 °C | | |
| | L-Type | (-) 200 °C to 900 °C | 0.080 °C | | |
| | C-Type | 10 °C to 2300 °C | 0.040 °C to 0.14 °C | | |
| | U-Type | (-)200 °C to 600 °C | 0.034 °C | | |
| PT100 | (-) 200 °C to 800°C | 0.049 °C | | | |
| EMI / EMC As per IEC61000-4,.....29 | | | | | |
| 284 | Automotive Transient Pulses 1, 2a, 2b, 3a, 3b, 4, 5 a) Pulse Width/ Duration (Measure) | 50 ns to 10 s | 0.23% | Using Digital Oscilloscope, Differential Probe, passive voltage probe and load resistors by Direct Method as per ISO 7637-2, SAE J-1113-11 | Permanent & Site |
| | | | | | |
| 285 | Automotive Transient Pulses 1, 2a, 2b,3a, 3b, 4, 5: b) Rise Time/ Fall Time | 1 ns to 100 ms | 2.32% | Using Digital Oscilloscope, Differential Probe, passive voltage probe and load | Permanent & Site |



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| | | | | resistors by Direct Method as per ISO 7637-2, SAE J-1113-11 | |
| 286 | Automotive Transient Pulses 1, 2a, 2b, 3a, 3b, 4, 5 c) Amplitude | -600 V to 400 V | 2.92% | Using Digital Oscilloscope & Differential Probe by Direct Method as per ISO 7637-2, SAE J-1113-11 | Permanent & Site |
| 287 | Capacitive coupling clamp a) Pulse Duration | 150 ns | 0.08% | Using Digital Oscilloscope & Load Resistor as per ISO 7637-3 and IEC 61000-4-5 by Direct Method | Permanent & Site |
| 288 | Capacitive coupling clamp b) Rise Time | 5 ns | 1.62% | Using Digital Oscilloscope & Load Resistor as per ISO 7637-3 and IEC 61000-4-5 by Direct Method | Permanent & Site |
| 289 | Capacitive coupling clamp c) Voltage Amplitude | -400 V to 400 V | 3% | Using Digital Oscilloscope & Load Resistor as per ISO 7637-3 and IEC 61000-4-5 by Direct Method | Permanent & Site |
| 290 | Combination wave surge test system (Generator, CDN output) a) Voltage Amplitude | ±0.25 kV to ± 8.0 kV | 3.84% | Using Digital Storage Oscilloscope, High Voltage Differential Probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 291 | Combination wave surge test system (Generator, CDN output) b) Voltage front time | 1.2 µs | 0.09 µs | Using Digital Storage Oscilloscope, High Voltage Differential Probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |



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|---------|--|-----------------------------|--------------|---|------------------|
| 292 | Combination wave surge test system (Generator, CDN output) c) Voltage Duration | 50 μ s | 0.03 μ s | Using Digital Storage Oscilloscope, High Voltage Differential Probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 293 | Combination wave surge test system (Generator, CDN output) d) Current Amplitude | \pm 20.83 A to \pm 4 kA | 1.96% | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 294 | Combination wave surge test system (Generator, CDN output) e) Current Front Time | 2.5 μ s to 8 μ s | 1.64% | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 295 | Combination wave surge test system (Generator, CDN output) f) Current Duration | 20 μ s to 25 μ s | 0.08% | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 296 | Coupling Factor/ Coupling loss /Decoupling of common mode Disturbance /Insertion loss / RF Attenuation/ Isolation / Voltage Division Factor | 0 dB to 90 dB | 0.28 dB | Using Vector network analyzer by direct method | Permanent & Site |



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|---------|--|------------------------|----------------|--|------------------|
| | (EM Clamp, SWR Bridge, Directional Coupler) 9 kHz to 4.5 kHz | | | | |
| 297 | Damped Oscillatory wave Generator (Voltage Amplitude) (Voltage Decay) a) Decay in Peak 10 to be 50% of peak 1 value | ±0.25kV to ±4.0 kV | 2.81% to 3.9% | Using Voltage Differential Probe & Digital Oscilloscope & Load Resistor VER1K as per IEC 61000-4-18 by Direct Method | Permanent & Site |
| 298 | Damped Oscillatory wave Generator | 40 Hz, 400 Hz, | 0.06% to 0.13% | Using Voltage | Permanent & Site |
| | b) Slow and Fast (Repetition Rate) | 5 kHz | | Differential Probe & Digital Oscilloscope & Load Resistor VER1K as per IEC 61000-4-18 by Direct Method | |
| 299 | Damped Oscillatory wave Generator c) Slow and Fast (Current Amplitude) | ±1.25 A to ±12.5 A | 1.95% | Using Current Probe & Digital Oscilloscope & as per IEC 61000-4-18 by Direct Method | Permanent & Site |
| 300 | Damped Oscillatory wave Generator- d) Slow and Fast (Oscillation Frequency) | | 1.21% to 0.38% | Using Voltage Differential Probe & Digital Oscilloscope & Load Resistor VER1K as per IEC 61000-4-18 by Direct Method | Permanent & Site |
| | | 100 kHz, | | | |
| | | 1 MHz | | | |
| | | 3 MHz | | | |
| | | 10MHz | | | |
| 30 MHz | | | | | |
| 301 | Damped Oscillatory wave Generator- e) Slow and Fast (Rise Time) | 5 ns to 75 ns | 3.31% to 0.23% | Using Voltage Differential Probe & Digital Oscilloscope & Load Resistor VER1K K as per IEC 61000-4-18 by Direct Method | Permanent & Site |
| 302 | Electrical fast transient test system (Generator output) a) Burst Period | 300 ms | 0.19 ms | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm | Permanent & Site |



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|---------|---|------------------------|---------|---|------------------|
| | | | | as per IEC 61000-4-4 by Direct Method | |
| 303 | Electrical fast transient test system (Generator output) b) Burst Duration (2.5 kHz/5 kHz/100 kHz/1000kHz) | 0.75 ms to 15 ms | 0.05 ms | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm as per IEC 61000-4-4 by Direct Method | Permanent & Site |
| 304 | Electrical fast transient test system (Generator output, Capacitive Clamp) c) Repetition frequency (inverse) | 2.5,5,100,1000 kHz | 0.15% | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm as per IEC 61000-4-4 by Direct Method | Permanent & Site |
| 305 | Electrical fast transient test system (Generator output, Capacitive Clamp) d) Pulse Amplitude | ±125 V to ± 6 kV | 3% | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm as per IEC 61000-4-4 by Direct Method | Permanent & Site |
| 306 | Electrical fast transient test system (Generator, CDN output, Capacitive Clamp) e) Pulse Rise time | 5 ns to 5.5 ns | 0.17% | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm as per IEC 61000-4-4 by Direct Method | Permanent & Site |
| 307 | Electrical fast transient test system (Generator, CDN output, Capacitive Clamp) f) Pulse width | 45 ns to 50 ns | 0.17ns | Using Digital Storage Oscilloscope with Load Resistor 50 ohm & 1000 ohm as per IEC 61000-4-4 by Direct Method | Permanent & Site |
| 308 | Electrostatic Discharge Generator a) First peak current (± 2.0 kV TO ±30 kV) | ±6.38A to ±146.25 A | 6.64% | Using Digital Storage Oscilloscope, ESD Target as per IEC 61000-4-2, SAE J1113-13, ISO 10605 | Permanent & Site |
| 309 | Electrostatic Discharge Generator b) Rise time | 0.6 ns to 1 ns | 11.44% | Using Digital Storage Oscilloscope, ESD Target as per IEC 61000-4-2, SAE J1113-13, ISO 10605 | Permanent & Site |

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| 310 | Electrostatic Discharge Generator c) Current @ 30ns/65ns/180ns/400ns (± 2.0 kV to ± 30 kV) | ±0.385 A to ±78 A | 6.27% | Using Digital Storage Oscilloscope, ESD Target as per IEC 61000-4-2, SAE J1113-13, ISO 10605 | Permanent & Site |
| 311 | Electrostatic Discharge Generator d) Current @ 60 ns/130ns/ 360ns/ 800ns (± 2.0 kV TO ±30 kV) | ±0.15 A to ±39 A | 6.23% | Using Digital Storage Oscilloscope, ESD Target as per IEC 61000-4-2, SAE J1113-13, ISO 10605 | Permanent & Site |
| 312 | Electrostatic Discharge Generator e) Generator DC output voltage | ±1 kV to ± 30 kV | 4.15% | Using High voltage Divider with probe, Dual display Multimeter as per IEC 61000- 4-2 , SAE J1113-13 ISO 10605 | Permanent & Site |
| 313 | Impedance 9 kHz to 400 MHz | 1 ohm to 300 ohm | 4% | Using Vector network analyzer by direct method | Permanent & Site |
| 314 | Longitudinal conversion loss (Impedance stabilization Network) 9 kHz to 30 MHz | 0 dB to 90 dB | 0.28 dB | Using Vector network analyzer by direct method AS Per CISPR 22, f shunt CISPR 32 | Permanent & Site |
| 315 | Phase Angle (9 kHz to 400 Hz) | -90 ° to 90 ° | 1.1 ° | Using Vector network analyzer by direct method CISPR 16-1-2 | Permanent & Site |
| 316 | Phase Shifting (Surge/ Ring wave/ Dips Generator) | 0 ° to 360 ° | 0.08 ° to 0.23 ° | Using Voltage Differential Probe & Digital Oscilloscope as per IEC 61000-4-5, IEC 61000-4-12, IEC 61000-4-11 by Direct Method | Permanent & Site |
| 317 | Return loss/ VSWR/ Reflection coefficient | 1 dB to 90 dB | 0.28 dB | Using Vector network analyzer by direct method | Permanent & Site |

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| | (Transient limiter, Directional coupler, Attenuator, Cable, Pre amplifier, Terminator) 9 kHz to 4.5 GHz | | | | |
| 318 | Ring Wave Generator a) Voltage Amplitude (Voltage Decay) Pk2 40% to 110% of Pk1, Pk3 40% to 80% of Pk2, Pk4 40% to 80% of Pk3 | ±0.25kVto ± 8.0 kV | 4% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-12 by Direct Method | Permanent & Site |
| | | | | | |
| | | | | | |
| 319 | Ring Wave Generator b) current amplitude | ±8.33Ato±666.66 A | 1.96% | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-12 by Direct Method | Permanent & Site |
| 320 | Ring Wave Generator c) Voltage Rise time | 0.5 µs | 0.008 µs | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-12 by Direct Method | Permanent & Site |
| 321 | Ring Wave Generator d) Current rise time | 1 µs | 0.008 µs | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-12 by Direct Method | Permanent & Site |
| 322 | Ring Wave Generator e) Oscillation frequency (period) | 100 kHz (10µs) | 1.20% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-12 by Direct Method | Permanent & Site |
| 323 | Telecom surge Generator a) Current Amplitude | ±6.25Ato | 1.90% | Using Current Probe & Digital Oscilloscope as per IEC 61000- 4-5 by Direct Method | Permanent & Site |
| | | ±666.66 A | | | |
| 324 | Telecom surge test system b) Current Front Time | 5 µs | 0.058 µs | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 325 | | 320 µs | 0.58 µs | | |



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| | Telecom surge test system c) current pulse width | | | Using Digital Storage Oscilloscope, Current probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 326 | Telecom surge test system d) Voltage Amplitude | ±0.25kV to ±8.0 kV | 5.68% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 327 | Telecom surge test system e) Voltage front time | 10 µs | 0.058 µs | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 328 | Telecom surge test system f) Voltage pulse width | 700 µs | 0.58 µs | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-5 by Direct Method | Permanent & Site |
| 329 | Voltage Dips & Interruption a) Generator Dips/ Interruption time | 10 ms to 5 s | 0.83% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-11 & IEC 61000-4-29 by Direct Method | Permanent & Site |
| 330 | Voltage Dips & Interruption b) Generator Output voltage at no load | 0 % to 120 % | 1.33% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-11 & IEC 61000-4-29 by Direct Method | Permanent & Site |
| 331 | Voltage Dips & Interruption c) Generator Rise/Fall Time (with Load) | 1 µs to 50 µs | 6.50% | Using Voltage Differential Probe & Digital Oscilloscope & as per IEC 61000-4-11 & IEC 61000-4-29 by Direct Method | Permanent & Site |

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| 332 | Common Mode Disturbance test system. (Generator, CDN output) a) Voltage Amplitude | 1V to 35V | 0.0013 V to 0.030 V | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-16 by Direct Method | Permanent & Site |
| 333 | Common Mode Disturbance test system. (Generator, CDN output) Short Disturbance a) Voltage Amplitude | 30V to 300V | 0.030 V to 0.35 V | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-16 by Direct Method | Permanent & Site |
| 334 | Common Mode Disturbance test system. (Generator, CDN output) Continuous & Short Disturbance a) frequency measurement | DC, 15Hz to 150KHz | 0.10% | Using Digital Storage Oscilloscope, High voltage Differential probe as per IEC 61000-4-16 by Direct Method | Permanent & Site |
| Mechanical Discipline: | | | | | |
| 1 | Contact type: Tachometer, RPM Meter & RPM Source | 10 rpm to 1000 rpm | 1.03 rpm | Using Digital Tachometer along with Tacho-generator Procedure based on SANAS by Comparison Method | Permanent & Site |
| 2 | Contact type: Tachometer, RPM | 1000rpm to 10000rpm | 5.97 rpm | Using Digital Tachometer along with Tacho-generator | Permanent & Site |

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| | Meter & RPM Source | | | Procedure based on SANAS by Comparison Method | |
| 3 | Non-contact: Speed Calibration of Tachometer/ RPM Meter & RPM Source | 10 rpm to 1000 rpm | 0.41 rpm | Using Digital Tacho meter, along with Tacho Generators Procedure based on SANAS by Comparison Method | Permanent & Site |
| 4 | Non-contact: Speed Calibration of Tachometer/ RPM Meter & RPM Source | 1000 rpm to 10000rpm | 5.93 rpm | Using Digital Tacho meter, along with Tacho Generators Procedure based on SANAS by Comparison Method | Permanent & Site |
| 5 | Non-contact: Speed Calibration of Tachometer/ RPM Meter & RPM Source | 10000 rpm to 100000rpm | 58.03 rpm | Using Digital Tacho meter, along with Tacho Generators Procedure based on SANAS by Comparison Method | Permanent & Site |
| 6 | Sound Level Meter | 94 dB 114 dB | 0.34dB 0.34dB | Using Sound Level Calibrator by direct Method | Permanent & Site |
| 7 | Vacuum: Digital/Analogue vacuum Gauges, Meter Transducers / Transmitter, Switches with Readout Indicators | (-) 0.85 bar to 0 bar | 0.012 bar | Using Digital Pressure Gauge with Pneumatic pump and digital multimeter as readout by comparison method based on ISO 3567 and ISO 27893 | Permanent & Site |
| 8 | Pneumatic Pressure: Digital/Analogue Pressure Gauges, Differential Pressure Gauges, Transducers/ Transmitters, | 0 bar to 20 bar | 0.014 bar | Using Digital Pressure Gauge with Pneumatic pump and digital multimeter as readout by comparison method based on DKD R-6-1 | Permanent & Site |

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|---------------------------|---|------------------------|-----------|--|------------------|
| | Switches with Readout Indicators | | | | |
| 9 | Pneumatic Pressure: Digital/Analogue Pressure Gauges, Differential Pressure Gauges, Transducers/ Transmitters, Switches with Readout Indicators | 0 bar to 35 bar | 0.02 bar | Using Digital Pressure Gauge with Pneumatic pump and digital multimeter as readout by comparison method based on DKD R-6-1 | Permanent & Site |
| 10 | Hydraulic Pressure: Dig/Analogue Gauges, Differential Pressure Gauges, Transducers/ Transmitters, Switches with Readout Indicators | 0 bar to 1000 bar | 0.8bar | Using Digital Pressure Gauge with hydraulic comparator pump with Digital Multimeter as readout based on DKD R-6-1 | Permanent & Site |
| Thermal Discipline | | | | | |
| 1 | Humidity and temperature chamber (multi-position) | 10°C to 60°C @50% RH | 0.71 °C | Using Humidity and temperature data logger (Multi Point) by comparison method | Permanent & Site |
| 2 | Humidity and temperature chamber, climatic chamber, Clean Room (Multi-position) | 10 %RH to 95 %RH @25°C | 0.96% RH | Using Humidity and temperature data logger (Multi Point) by comparison method | Permanent & Site |

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International Quality And Accreditation Services Pvt.Ltd.
(Formerly International Quality And Accreditation Services LLP)
25/33, 2nd Floor, East Patel Nagar New Delhi, 110008

Scope of Accreditation for Calibration

As per ISO/IEC 17025:2017

CAB Name: Metrological Testing and Calibration Centre LLP

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Address: # 1303, 1st C Main, 9th Block, II Stage,
Nagarabhavi, Bengaluru-560072, Karnataka

Issue date: 30.09.2025

Validity : 29.09.2029

Certificate No.: C-0014

Amendment date: 06.10.2025

| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC± | Remarks/Method used | Facility |
|---------|---|------------------------|----------|--|------------------|
| 3 | Humidity and temperature chamber, climatic chamber, Clean Room (Multi-position) | 10 %RH to 95 %RH @50°C | 0.96% RH | Using Humidity and temperature data logger (Single & Multi Point) by comparison method | Permanent & Site |
| 4 | Humidity and temperature chamber, climatic chamber, Clean Room (Multi-position) | 10 %RH to 95 %RH @60°C | 0.96% RH | Using Humidity and temperature data logger (Single & Multi Point) by comparison method | Permanent & Site |
| 5 | Temperature & Humidity Transmitters, Dial/ Digital- Meters & Gauges with Readout Indicators | 10 %RH to 95 %RH @25°C | 1.20% RH | Using Paperless recorder with Temperature & Humidity sensors and Humidity chamber by comparison Method | Permanent & Site |
| 7 | Temperature & Humidity Transmitters, Dial/ Digital- Meters & Gauges with Readout Indicators | 10 %RH to 95 %RH @40°C | 1.20% RH | Using Paperless recorder with Temperature & Humidity sensors and Humidity chamber by comparison Method | Permanent & Site |
| 8 | Temperature & Humidity | 10 %RH to 95 %RH | 1.20% RH | Using Paperless recorder with | Permanent & Site |

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|---------|--|------------------------|----------|--|------------------|
| | Transmitters, Dial/ Digital- Meters & Gauges with Readout Indicators | @50°C | | Temperature & Humidity sensors and Humidity chamber by comparison Method | |
| 9 | Temperature & Humidity Transmitters, Dial/ Digital- Meters & Gauges with Readout Indicators | 10 %RH to 95 %RH @60°C | 1.20% RH | Using Paperless recorder with Temperature & Humidity sensors and Humidity chamber by comparison Method | Permanent & Site |
| 10 | Temperature & Humidity Transmitter, Dial/Digital Meters & Gauges with Readout Indicators | 10°C to 60°C @50% RH | 0.31 °C | Using Paperless recorder with Temperature & Humidity sensor and Humidity chamber by comparison | Permanent & Site |
| 11 | Incubators (Non-Medicals Purpose only), Autoclave (Non-Medicals Purpose only), Sub Zero baths, Deepfreezes, Thermal-chambers, Ovens, Muffle furnace (Multi position) | (-)196 °C to 200 °C | 0.92 °C | Using RTDs (Multi Point) with Paperless recorders by comparison Method | Permanent & Site |
| 12 | Incubators (Non-Medicals Purpose only), Autoclave (Non-Medicals Purpose only), Sub Zero baths, Deepfreezes, Thermal-chambers, Ovens, Muffle furnace (Multi position) | >200°C to 600°C | 3.69 °C | Using RTDs (Multi Point) with Paperless recorders by comparison Method | Permanent & Site |
| 14 | IR Thermometer | -20 °C to 100 °C | 3.50 °C | Using STD IR Thermometer with Black body Calibrator (Emissivity of 0.95) by Comparison Method | Permanent & Site |
| 15 | IR Thermometer | >100°C to 500°C | 4.52 °C | | |

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|---------|--|-------------------------|---------|---|------------------|
| | | | | Using STD IR Thermometer with Black body Calibrator (Emissivity of 0.95) by Comparison Method | Permanent & Site |
| 16 | IR Thermometer | >500 °C to 1500 °C | 4.93 °C | Using STD IR Thermometer with Black body Calibrator (Emissivity of 0.95) by Comparison Method | Permanent & Site |
| 17 | RTD, Thermocouples with & without indicators, Temperature gauges, Transmitter Switches | (-)196 °C (Fixed point) | 0.29 °C | Using SSPRT with indicator and Dry bath Temperature by comparison method | Permanent & Site |
| 18 | RTD, Thermocouples with & without indicators, Temperature gauges, Transmitter Switches | -80°C to 0°C | 0.23 °C | Using SSPRT with indicator and Dry bath Temperature by comparison method | Permanent & Site |
| 19 | RTD, Thermocouples with & without indicators, Temperature gauges, Transmitter Switches | >0°C to 100°C | 0.31 °C | Using SSPRT with indicator and Dry bath Temperature by comparison method | Permanent & Site |
| 20 | RTD, Thermocouples with & without indicators, Temperature gauges, Transmitter Switches | >100°C to 600°C | 0.71 °C | Using SSPRT with indicator and Dry bath Temperature by comparison method | Permanent & Site |
| 21 | RTD, Thermocouples with & without indicators, Temperature gauges, Transmitter Switches | >600°C to 1200°C | 4.36 °C | Using SSPRT with indicator and Dry bath Temperature by comparison method | Permanent & Site |
| 22 | Temperature Indicator with sensor of Low & High Temperature | -196°C to 0°C | 0.31 °C | Using SSPRT with Temperature indicator by comparison method | Permanent & Site |

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| Sr. no. | Parameter/Measurand quantity, Instrument or gauge | Range with least count | CMC \pm | Remarks/Method used | Facility |
|---------|---|------------------------|-----------|---|------------------|
| | Bath, Dry Bath, Temperature Chambers, Subzero baths De-Freezer, 2 Autoclave (Non-Medical Purpose Only), Hot Air Ovens, Chambers (Single Position) | | | | |
| 23 | Temperature Indicator with sensor of Low & High Temperature Bath, Dry Bath, Temperature Chambers, Subzero baths De-Freezer, Autoclave (Non-Medical Purpose Only), Hot Air Ovens, Chambers (Single Position) | >0°C to 100°C | 0.72 °C | Using SSPRT with Temperature indicator by comparison method | Permanent & Site |
| 24 | Temperature Indicator with sensor of Low & High Temperature Bath, Dry Bath, Temperature Chambers, Subzero baths De-Freezer, Autoclave (Non-Medical Purpose Only), Hot Air Ovens, Chambers (Single Position) | >100°C to 600°C | 2.98 °C | Using SSPRT with Temperature indicator by comparison method | Permanent & Site |
| 25 | Temperature Indicator with sensor of Low & | >600°C to 1200°C | 3.53 °C | | Permanent & Site |

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|---------|--|------------------------|-----------|---|----------|
| | High Temperature Bath, Dry Bath, Temperature Chambers, Subzero baths De-Freezer, Autoclave (Non-Medical Purpose Only), Hot Air Ovens, Chambers (Single Position) | | | Using SSPRT with Temperature indicator by comparison method | |

Note: CMC in (\pm) at 95% confidence level