

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 10039 Accredited to ISO/IEC 17025:2017	MCS Test Equipment Limited Issue No: 010 Issue date: 23 July 2025	
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Calibration performed at the above address only		

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
Values and uncertainties listed below are applicable for the calibration of both measurement instruments and for instruments with an output. the method used is by direct comparison unless otherwise stated in the remarks column			
ELECTRICAL			
DC Voltage			
Generation	0 V to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1020 V	16 $\mu\text{V/V} + 3.2 \mu\text{V}$ 9 $\mu\text{V/V} + 15 \mu\text{V}$ 9 $\mu\text{V/V} + 180 \mu\text{V}$ 14 $\mu\text{V/V} + 2.4 \text{ mV}$ 14 $\mu\text{V/V} + 8.1 \text{ mV}$	These values can be generated for the calibration of measuring instruments
Measurement	0 V to 202 mV 202 mV to 2.02 V 2.02 V to 20.2 V 20.2 V to 202 V 202 V to 1050 V	0.41 μV 3.14 μV 7.80 μV 1.70 mV 2.0 mV	Outputs of instruments within these values can be measured to the listed uncertainties
Resistance			
Generation	0 Ω to 11 Ω 11 Ω to 33 Ω 33 Ω to 110 Ω 110 Ω to 330 Ω 330 Ω to 1.1 k Ω 1.1 k Ω to 3.3 k Ω 3.3 k Ω to 11 k Ω 11 k Ω to 33 k Ω 33 k Ω to 110 k Ω 110 k Ω to 330 k Ω 330 k Ω to 1.1 M Ω 1.1 M Ω to 3.3 M Ω 3.3 M Ω to 11 M Ω 11 M Ω to 33 M Ω 33 M Ω to 110 M Ω	46 $\mu\Omega/\Omega + 5.6 \text{ m}\Omega$ 35 $\mu\Omega/\Omega + 3.1 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 3.7 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 3.7 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 470 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 670 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 430 \text{ m}\Omega$ 33 $\mu\Omega/\Omega + 1.8 \Omega$ 33 $\mu\Omega/\Omega + 1.7 \Omega$ 37 $\mu\Omega/\Omega + 6.2 \Omega$ 37 $\mu\Omega/\Omega + 2.0 \text{ k}\Omega$ 70 $\mu\Omega/\Omega + 5.7 \text{ k}\Omega$ 151 $\mu\Omega/\Omega + 3.0 \text{ k}\Omega$ 290 $\mu\Omega/\Omega + 7.3 \text{ k}\Omega$ 580 $\mu\Omega/\Omega + 16 \text{ k}\Omega$	These values can be generated for the calibration of measuring instruments



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
Resistance (continued) Measurement	0 Ω to 2.02 Ω 2.02 Ω to 20.2 Ω 20.2 Ω to 202 Ω 202 Ω to 2.02 k Ω 2.02 k Ω to 20.2 k Ω 20.2 k Ω to 202 k Ω 202 k Ω to 2.02 M Ω 2.02 M Ω to 20.2 M Ω 20.2 M Ω to 202 M Ω	14.6 $\mu\Omega$ 38.3 $\mu\Omega$ 216 $\mu\Omega$ 1.50 m Ω 20.0 m Ω 290 m Ω 4.6 Ω 80 Ω 5.1 k Ω	Outputs of instruments within these values can be measured to the listed uncertainties
DC Current Generation	0 A to 330 μ A 330 μ A to 3.3 mA 3.3 mA to 33 mA 33 mA to 330 mA 330 mA to 3.3 A 3.3 A to 11 A 11 A to 20 A	116 μ A/A + 20 nA 78 μ A/A + 90 nA 115 μ A/A + 800 nA 80 μ A/A + 8 μ A 290 μ A/A + 251 μ A 400 μ A/A + 1.0 mA 0.12 % + 2.5 mA	These values can be generated for the calibration of measuring instruments
Measurement	0 A to 1.0 mA 1.0 mA to 10 mA 10 mA to 100 mA 100 mA to 1.0 A 1.0 A to 3.0 A 3.0 A to 10.0 A 10.0 A to 30.0 A	0.30 nA 12.0 nA 55.0 nA 1.3 μ A 201 μ A 496 μ A 649 μ A	Outputs of instruments within these values can be measured to the listed uncertainties
AC Voltage Generation	<i>10 Hz to 45 Hz</i> 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V <i>45 Hz to 1 kHz</i> 33 V to 330 V 330 V to 1 kV <i>45 Hz to 10 kHz</i> 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V <i>1 kHz to 10 kHz</i> 33 V to 330 V	0.060 % + 5.3 μ V 0.023 % + 14 μ V 0.020 % + 103 μ V 0.020 % + 1.3 mV 0.015 % + 12 mV 0.023 % + 30 mV 0.010 % + 5.2 μ V 0.011 % + 12 μ V 0.012 % + 132 μ V 0.012 % + 1.5 mV 0.015 % + 11 mV	These values can be generated for the calibration of measuring instruments



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AC Voltage (continued)	10 kHz to 20 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	10 kHz to 20 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	These values can be generated 0.020 % calibration of measuring 0.012 % + 1 μ V 0.015 % + 100 μ V 0.020 % + 1.1 mV 0.020 % + 10 mV
	20 kHz to 50 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	20 kHz to 50 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	0.080 % + 6.4 μ V 0.030 % + 11 μ V 0.023 % + 96 μ V 0.027 % + 1.0 mV 0.023 % + 10 mV
	50 kHz to 100 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	50 kHz to 100 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V	0.27 % + 10 μ V 0.062 % + 27 μ V 0.054 % + 0.13 mV 0.070 % + 1.7 mV 0.15 % + 41 mV
	100 kHz to 500 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V	100 kHz to 500 kHz 30 μ V to 33 mV 33 mV to 330 mV 330 mV to 3.3 V	0.62 % + 39 μ V 0.15 % + 60 μ V 0.19 % + 0.55 mV
AC Voltage Measurement	1 Hz to 1 kHz 30 μ V to 10 mV 10 mV to 100 mV 100 mV to 1.0 V 1.0 V to 10 V 10 V to 100 V	2.2 μ V 2.5 μ V 67 μ V 182 μ V 2.0 mV	Outputs of instruments within these values can be measured to the listed uncertainties
	1 kHz to 30 kHz 30 μ V to 10 mV 10 mV to 100 mV 100 mV to 1.0 V 1.0 V to 10 V	2.2 μ V 2.7 μ V 211 μ V 283 mV	
	30 kHz to 60 kHz 100 mV to 1 V 1 V to 10 V	554 μ V 844 μ V	
	60 kHz to 100 kHz 100 mV to 1 V	565.2 μ V	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
AC Power Unity PF to 0.25 PF	45 Hz to 65 Hz 10 mV to 1 kV 3.3 mA to 20.5 A	0.50 %	These values can be simulated for the calibration of measuring instruments
Capacitance Sourcing by simulation	1.1 nF to 3.3 nF	0.39 % + 8 pF	
	3.3 nF to 11 nF	0.19 % + 12 pF	
	11 nF to 33 nF	0.19 % + 82 pF	
	33 nF to 110 nF	0.19 % + 112 pF	
	110 nF to 330 nF	0.29 % + 0.40 nF	
	330 nF to 1.1 μ F	0.19 % + 1.0 nF	
	1.1 μ F to 3.3 μ F	0.19 % + 3.3 nF	
	3.3 μ F to 11 μ F	0.19 % + 12 nF	
	11 μ F to 33 μ F	0.31 % + 48 nF	
	33 μ F to 110 μ F	0.35 % + 127 nF	
	110 μ F to 330 μ F	0.35 % + 0.25 μ F	
	330 μ F to 1.1 mF	0.35 % + 0.80 μ F	
	1.1 mF to 3.3 mF	0.35 % + 2.5 μ F	
	3.3 mF to 11 mF	0.52 % + 12 μ F	
	11 mF to 33 mF	0.58 % + 25 μ F	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
Oscilloscope Calibration			
Vertical deflection as a Voltage	0 V to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 11 V 11 V to 130 V	0.040 % + 31 μ V 0.039 % + 31 μ V 0.039 % + 120 μ V 0.039 % + 200 μ V 0.039 % + 2.0 mV	Into 1 M Ω
	0 V to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 6 V	0.19 % + 31 μ V 0.19 % + 33 μ V 0.19 % + 26 μ V 0.19 % + 26 mV	Into 50 Ω
Square wave peak to peak	0 V to 25 mV 25 mV to 110 mV 110 mV to 2.2 V 2.2 V to 6 V	0.19 % + 62 μ V 0.19 % + 224 μ V 0.19 % + 4.4 mV 0.19 % + 9.8 mV	Into 50 Ω
Sine wave level flatness referenced to set point	Ref set point 5 mV to 5.5 V 50 kHz to 300 MHz 100 kHz to 600 MHz	3.9 % 3.9 %	
Rise time	250 ps 5 mV to 2.5 V peak	78 ps	
Resistance	40 Ω to 60 Ω 500 k Ω to 1.5 M Ω	0.077 % + 10 m Ω 0.077 % + 100 m Ω	
Time markers	2 ns to 5 ns 5 ns to 20 ns 20 ns to 50 ns 50 ns to 20 ms 20 ms to 100 ms 100 ms to 1 s 1 s to 5 s	11 fs 44 fs 110 fs 44 ns 12 μ s 0.80 ms 19 ms	
Capacitance	5 pF to 50 pF	3.9 % + 0.47 pF	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
Insulation Testers			
Continuity	0 Ω to 100 m Ω 100 m Ω to 500 m Ω 0.5 Ω to 1 Ω 1 Ω to 5 Ω 5 Ω to 200 Ω 200 Ω to 10 k Ω	4.5 m Ω 6.5 m Ω 8.0 m Ω 25 m Ω 0.80 Ω 8.0 Ω	
High Resistance	10 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 1 G Ω 1 G Ω to 10 G Ω	0.20 % 0.30 % 0.65 % 1.0 %	Uncertainty Increases by 0.10 % per 200 V above 500 V
Test Voltage Measurement	0 V to 2 kV DC 10 k Ω to 1 M Ω 1 M Ω to 10 G Ω	0.8 % + 2.6 V 0.8 % + 4.5 V	
Line / Loop Impedance Testers			
Resistance Nominal values	25 m Ω 50 m Ω 100 m Ω 330 m Ω 500 m Ω 1 Ω 1.8 Ω 5 Ω 10 Ω 18 Ω 50 Ω 100 Ω 180 Ω 500 Ω 1 k Ω 1.8 k Ω 0.05 A 0.5 A 3.2 A 10 A 20 A	4.0 m Ω 4.5 m Ω 4.0 m Ω 5.5 m Ω 6.5 m Ω 8.0 m Ω 15.5 m Ω 25 m Ω 50 m Ω 80 m Ω 0.25 Ω 0.40 Ω 0.80 Ω 2.0 Ω 4.0 Ω 8.0 Ω 1.2 % + 2.0 mA 1.2 % + 11 mA 1.2 % + 55 mA 1.2 % + 0.16 A 1.2 % + 0.30 A	Outputs of instruments within these values can be measured to the listed uncertainties



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RCD Testers			
Timing	10 ms to 5 s	0.02 % + 2.7 ms	
Current			
0.5 x I and 1 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 3000 mA	0.80 % + 60 μ A 0.80 % + 0.60 mA 0.80 % + 6.0 mA	
1.4 x I and 2 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 1500 mA	1.6 % + 60 μ A 1.6 % + 0.60 mA 1.6 % + 6.0 mA	
5 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 600 mA	4.0 % + 60 μ A 4.0 % + 0.60 mA 4.0 % + 6.0 mA	
Leakage Testers			
Current			
Passive/Differential/Substitute Modes	0.1 mA to 30 mA	0.30 % + 2 μ A (ac + dc) rms	
Active Mode	0.1 mA to 30 mA	0.30 % + 1.3 μ A (ac + dc) rms	
Touch Voltage	250 V Range	5.0 % + 3.0 V	
Portable Appliance Testers			
Earth / Ground Bond Resistance. Nominal values At 50 Hz to 60 Hz	25 m Ω 50 m Ω 100 m Ω 330 m Ω 500 m Ω 1 Ω 1.8 Ω 5 Ω 10 Ω 18 Ω 50 Ω 100 Ω 180 Ω 500 Ω 1 k Ω 1.8 k Ω	4.0 m Ω 4.5 m Ω 4.0 m Ω 5.5 m Ω 6.5 m Ω 8.0 m Ω 16 m Ω 25 m Ω 47 m Ω 80 m Ω 0.25 Ω 0.40 Ω 0.80 Ω 2.0 Ω 4.0 Ω 8.0 Ω	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
Earth / Ground Bonding Current At 50 Hz to 60 Hz	0.05 A 0.5 A 3.2 A 10 A 20 A	1.2 % + 1.7 mA 1.2 % + 11 mA 1.2 % + 55 mA 1.2 % + 0.12 A 1.2 % + 0.28 A	
Insulation Resistance	10 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 1 GΩ 1 GΩ to 10 GΩ	0.16 % 0.27 % 0.62 % 0.95 %	Uncertainty Increases by 0.10 % per 200 V above 500 V
Test Voltage	0 V to 2 kV DC 10 kΩ to 1 MΩ 1 MΩ to 10 GΩ	0.80 % + 2.6 V 0.80 % + 4.5 V	
Continuity	100 mΩ to 500 mΩ 0.5 Ω to 1 Ω 1 Ω to 5 Ω 5 Ω to 200 Ω 200 Ω to 10 kΩ	6.5 mΩ 8.0 mΩ 25 mΩ 0.78 Ω 7.8 Ω	
HIPOT/HV TESTERS			
HVDC Voltage	0.1 kV to 1.0 kV	0.23 % + 4.5 V	
HVAC Peak Voltage	50 Hz to 60 Hz 0.1 kV to 1.0 kV	0.40 % + 4 V	
DC Leakage Current	0 A to 300 μA 0.3 mA to 3 mA 3 mA to 30 mA 30 mA to 300 mA	0.23 % + 0.20 μA 0.16 % + 1.3 μA 0.16 % + 12 μA 0.16 % + 120 μA	
AC Leakage Current	20 Hz to 400 Hz 0 A to 300 μA 0.3 mA to 3 mA 3 mA to 30 mA 30 mA to 300 mA	0.23 % + 0.34 μA 0.16 % + 1.5 μA 0.16 % + 18 μA 0.16 % + 130 μA	



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RF MEASUREMENTS			All RF measurements are for a well matched 50 Ω source or load unless otherwise stated.
Voltage Reflection Coefficient	1.0 to 0.1 10 MHz to 6 GHz 6 GHz to 15 GHz 15 GHz to 18 GHz	0.020 0.030 0.040	Uncertainties apply to precision connectors.
Frequency			May be reported as time (1/f) for repetitive events.
Generation			
Specific Value	10 MHz	6.0 in 10^{12}	GPS Time and frequency Reference Receiver
Measurement			
Specific Value	10 MHz	6.9 in 10^{12}	
Other Values	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 100 kHz 100 MHz to 160 MHz 160 MHz to 1.3 GHz 1.3 GHz to 10 GHz 10 GHz to 18 GHz 18 GHz to 26.5 GHz	2.2 in 10^7 1.4 in 10^7 1.5 in 10^8 3.8 in 10^8 3.5 in 10^9 1.0 in 10^{10} 3.0 in 10^{10} 7.5 in 10^{10} 1.4 in 10^9 4.7 in 10^9	
Power			
1 mW reference	1 mW at 50 MHz	0.004 mW	
Ranges	9 kHz to 6 GHz 200 pW to 40 μ W 20 nW to 4 mW 2 μ W to 200 mW 10 MHz to 18 GHz 2 nW to 40 μ W 200 nW to 40 mW 2 μ W to 2 W	1.5 % 1.4 % 1.4 % 5.3 % 2.2 % 2.4 %	
Attenuation	0 dB to 90 dB 50 MHz to 18 GHz	0.10 dB	



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RF MEASUREMENTS Continued			
Calibration Factor	75 % to 110 % 9 kHz to 1 MHz 1 MHz to 1 GHz 1 GHz to 6 GHz	0.62 % (Cal Factor) 0.64 % 0.84 %	For power sensor range of 9 kHz to 6 kHz
	75 % to 110 % 10 MHz to 1 GHz 1 GHz to 6 GHz 6 GHz to 12 GHz 12 GHz to 18 GHz	0.66 % 0.85 % 0.98 % 1.5 %	For power sensor range of 10 MHz to 18 GHz
Amplitude Modulation (AM)	10 Hz to 10 kHz 150 kHz to 10 MHz	2.4 % of reading	
	50 Hz to 50 kHz 10 MHz to 1300 MHz	1.4 % of reading	
AM Distortion	10 Hz to 50 kHz 150 kHz to 1300 MHz	0.50 %	
Frequency Modulation (FM)	20 Hz to 10 kHz 250 kHz to 10 MHz	2.4 % + 40 Hz	Frequency Modulation - Carrier frequency range 10 MHz to 1300 MHz Modulation frequency range 10 Hz to 100 kHz
	50 Hz to 100 kHz 10 MHz to 1300 MHz	1.2 % + 17 Hz	
FM Distortion	20 Hz to 100 kHz 150 kHz to 1300 MHz	0.20 %	
Harmonic Content	Carrier Frequency 1 MHz to 13 GHz Harmonic Frequency 2 MHz to 26 GHz	0.62 dB	Maximum CW amplitude +15 dBm; minimum harmonic level -80 dBc
END			



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Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand. Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where q is the quantity value.

The notation $Q[a, b]$ stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$