


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS CALIBRATION</p> <p>0768</p> <p>Accredited to ISO/IEC 17025:2017</p>	<h3>Megger Instruments Limited</h3> <p>Issue No: 031 Issue date: 24 June 2024</p>	
	<p>Standards & Calibration Laboratory Archcliffe Road Dover Kent CT17 9EN</p>	<p>Contact: Mr Gary Potter Tel: +44 (0)1304 502121 Fax: +44 (0)1304 502268 E-Mail: gary.potter@megger.com Website: www.megger.com</p>
<p>Calibration performed at the above address only</p>		

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
<p>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 or ratio-metric comparison unless otherwise described in the remarks column.</p>			
<p>DC RESISTANCE</p> <p>Generation / Sourcing Specific Values</p>	<p>0.0001 Ω 0.001 Ω 0.01 Ω 0.1 Ω 0.2 Ω 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1 GΩ 10 GΩ 100 GΩ 1 TΩ</p>	<p>91 $\mu\Omega/\Omega$ 92 $\mu\Omega/\Omega$ 59 $\mu\Omega/\Omega$ 21 $\mu\Omega/\Omega$ 117 $\mu\Omega/\Omega$ 18 $\mu\Omega/\Omega$ 6.2 $\mu\Omega/\Omega$ 3.3 $\mu\Omega/\Omega$ 3.0 $\mu\Omega/\Omega$ 6.4 $\mu\Omega/\Omega$ 15.2 $\mu\Omega/\Omega + 294$ mΩ 25 $\mu\Omega/\Omega + 4.0$ Ω 82 $\mu\Omega/\Omega + 200$ Ω 389 $\mu\Omega/\Omega$ 0.13 % + 3.0 MΩ 0.13 % + 30 MΩ 0.67 % + 15 MΩ 1.6 % + 6.1 GΩ</p>	<p>Source values for the calibration of ohmmeters.</p>
<p>Other Values</p>	<p>0.1 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ 10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ 1 GΩ to 10 GΩ 10 GΩ to 500 GΩ</p>	<p>52 $\mu\Omega/\Omega + 0.40$ mΩ 500 $\mu\Omega/\Omega + 0.30$ mΩ 510 $\mu\Omega/\Omega + 1.0$ mΩ 500 $\mu\Omega/\Omega + 2.7$ mΩ 500 $\mu\Omega/\Omega + 47$ mΩ 500 $\mu\Omega/\Omega + 830$ mΩ 500 $\mu\Omega/\Omega + 12$ Ω 0.20 % + 690 Ω 0.25 % + 32 kΩ 1.0 % + 59 kΩ 1.0 % + 10 MΩ 2.3 % + 53 MΩ</p>	



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DC RESISTANCE (continued)			
Measurement	100 $\mu\Omega$ to 1 m Ω 1 m Ω to 10 m Ω 10 m Ω to 100 m Ω 100 m Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω	91 $\mu\Omega/\Omega$ 92 $\mu\Omega/\Omega$ 61 $\mu\Omega/\Omega$ 58 $\mu\Omega/\Omega$ 58 $\mu\Omega/\Omega + 14 \mu\Omega$ 59 $\mu\Omega/\Omega + 280 \mu\Omega$	Resistance sources can be calibrated to these uncertainties at currents of up to 100 A
	0 Ω to 20 Ω 20 Ω to 200 Ω 200 Ω to 2 k Ω 2 k Ω to 20 k Ω 20 k Ω to 200 k Ω 200 k Ω to 2 M Ω 2 M Ω to 20 M Ω 20 M Ω to 200 M Ω 200 M Ω to 2 G Ω 2 G Ω to 20 G Ω	11 $\mu\Omega/\Omega + 0.28 \text{ m}\Omega$ 10 $\mu\Omega/\Omega + 0.69 \text{ m}\Omega$ 11 $\mu\Omega/\Omega + 2.2 \text{ m}\Omega$ 9.0 $\mu\Omega/\Omega + 37 \text{ m}\Omega$ 9.7 $\mu\Omega/\Omega + 300 \text{ m}\Omega$ 18 $\mu\Omega/\Omega + 4.0 \Omega$ 26 $\mu\Omega/\Omega + 200 \Omega$ 146 $\mu\Omega/\Omega + 11 \text{ k}\Omega$ 0.24 % + 0.12 M Ω 0.18 % + 12 M Ω	Resistance sources can be calibrated to these uncertainties using a Fluke 8508A
	1 M Ω to 5 T Ω	0.12 % to 0.90 %	The applied voltage depends on the nominal resistance and may be up to 20 kV.
Simulated values to support Megger range of insulation testers	2 T Ω to 12 T Ω 12 T Ω to 35 T Ω	5.0 % 11 %	3 terminal devices
DC VOLTAGE			
Generation	0 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1 kV	70 $\mu\text{V}/\text{V} + 2.0 \mu\text{V}$ 58 $\mu\text{V}/\text{V} + 6.0 \mu\text{V}$ 58 $\mu\text{V}/\text{V} + 61 \mu\text{V}$ 64 $\mu\text{V}/\text{V} + 660 \mu\text{V}$ 64 $\mu\text{V}/\text{V} + 4.0 \text{ mV}$	Source values for the calibration of voltmeters
	1 kV to 20 kV 20 kV to 40 kV	0.10 % + 20 V 0.10 % + 120 V	
Measurement	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV 1 kV to 15 kV 15 kV to 90 kV	7.1 $\mu\text{V}/\text{V} + 1.2 \mu\text{V}$ 4.1 $\mu\text{V}/\text{V} + 1.2 \mu\text{V}$ 4.1 $\mu\text{V}/\text{V} + 4.0 \mu\text{V}$ 6.4 $\mu\text{V}/\text{V} + 39 \mu\text{V}$ 6.5 $\mu\text{V}/\text{V} + 470 \mu\text{V}$ 0.13 % + 0.14 V 1.20 % + 0.9 V	Voltage sources can be calibrated to these uncertainties
Thermocouple Simulation Type K	-25 $^{\circ}\text{C}$ to +120 $^{\circ}\text{C}$	0.19 % + 0.25 $^{\circ}\text{C}$	Simulated using Fluke 550XA inc. reference junction compensation



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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 or ratio-metric comparison unless otherwise described in the remarks column.			
DC CURRENT Generation	0 μ 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 2.2 A 2.2 A to 11 A 11 A to 550 A	0.14 % + 290 nA 0.12 % + 350 nA 157 μ A/A + 60 nA 210 μ A/A + 12 μ A 210 μ A/A + 13 μ A 800 μ A/A + 870 μ A 0.76 % + 50 mA	Ammeters can be calibrated to these uncertainties Simulated current using 50 turn coil, for the calibration of clamp-on ammeters.
Measurement	0 to 20 pA 20 pA to 200 pA 200 pA to 2 nA 2 nA to 20 nA 20 nA to 200 nA 200 nA to 2 μ A 2 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A 20 A to 200 A	1.2 % + 79 fA 1.2 % + 220 fA 0.23 % + 60 fA 0.23 % + 660 fA 0.23 % + 610 fA 0.12 % + 9.0 pA 14 μ A/A + 0.31 nA 14 μ A/A + 3.1 nA 15 μ A/A + 31 nA 47 μ A/A + 620 nA 180 μ A/A + 13 μ A 390 μ A/A + 120 μ A 60 μ A/A + 52 μ A	Current sources can be calibrated to these uncertainties.
AC VOLTAGE Generation	0 mV to 33 mV 40 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 33 mV to 330 mV 40 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 330 mV to 3.3 V 40 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 3.3 V to 33 V 40 Hz to 45 Hz 45 Hz to 10 kHz 10 kHz to 20 kHz 33 V to 330 V 45 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 20 kHz	0.17 % + 23 μ V 0.12 % + 23 μ V 0.20 % + 23 μ V 0.059 % + 26 μ V 0.037 % + 26 μ V 0.11 % + 118 μ V 0.059 % + 135 μ V 0.037 % + 136 μ V 0.11 % + 6 mV 0.059 % + 20 mV 0.037 % + 20 mV 0.11 % + 20 mV 0.060 % + 23 mV 0.094 % + 25 mV 0.13 % + 16 mV	Source values for the calibration of voltmeters



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AC VOLTAGE Generation (continued)	330 V to 1 kV 45 Hz to 1 kHz 1 kHz to 5 kHz 5 kHz to 10 kHz	0.060 % + 34 mV 0.094 % + 33 mV 0.11 % + 34 mV	
	50 Hz 2 kV to 40 kV	1.7 % + 120 V	
AC POWER Generation	45 Hz to 65 Hz 1 VA to 1100VA	0.40 %	
AC VOLTAGE Measurement	1 mV to 200 mV 40 Hz to 10 kHz 10 kHz to 100 kHz	0.017 % + 2.4 μ V 0.089 % + 12 μ V	Voltage sources can be measured to these uncertainties
	200 mV to 2 V 40 Hz to 10 kHz 10 kHz to 100 kHz	0.013 % + 12 μ V 0.066 % + 120 μ V	
	2 V to 20 V 40 Hz to 10 kHz 10 kHz to 100 kHz	0.013 % + 120 μ V 0.066 % + 5.9 mV	
	20 V to 200 V 40 Hz to 10 kHz 10 kHz to 100 kHz	0.014 % + 12 mV 0.066 % + 12 mV	
	200 V to 1 kV 40 Hz to 10 kHz	0.015 % + 23 mV	
	At 50 Hz 1 kV to 50 kV	1.2 % + 51 V	
AC VOLTAGE RATIO	40 Hz to 120 Hz 0.8 to 2000 2000 to 20000	0.011 % 0.038 % + 0.0050	
AC CURRENT Generation	0.03 μ A to 330 μ A 10 Hz to 45 Hz 45 Hz to 1 kHz	0.18 % + 120 nA 0.15 % + 120 nA	Ammeters can be calibrated to these uncertainties
	330 μ A to 3.3 mA 10 Hz to 45 Hz 45 Hz to 1 kHz	0.15 % + 260 nA 0.12 % + 260 nA	
	3.3 mA to 33 mA 10 Hz to 45 Hz 45 Hz to 1 kHz	0.11 % + 19 μ A 0.05 % + 19 μ A	



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AC CURRENT Generation (continued)	33 mA to 330 mA 10 Hz to 45 Hz 45 Hz to 1 kHz 330 mA to 1.1 A 10 Hz to 45 Hz 45 Hz to 1 kHz 1.1 A to 3 A 10 Hz to 45 Hz 45 Hz to 1 kHz 3 A to 11 A 45 Hz to 100 Hz 100 Hz to 1 kHz 11 A to 20 A 45 Hz to 100 Hz 100 Hz to 1 kHz 20 A to 550 A 40 Hz to 400 Hz	0.11 % + 32 μ A 0.05 % + 31 μ A 0.22 % + 230 μ A 0.08 % + 240 μ A 0.22 % + 1.9 mA 0.10 % + 1.9 mA 0.10 % + 3.1 mA 0.14 % + 3.1 mA 0.16 % + 6.2 mA 0.10 % + 6.2 mA 0.31 % + 600 mA	Simulated current using 50 turn coil, for the calibration of clamp-on ammeters.
AC CURRENT Measurement	10 Hz to 5 kHz 0 A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 10 Hz to 5 kHz 200 mA to 2 A 2 A to 20 A 5 kHz 200 mA to 2 A 50 Hz 11 A to 2 kA	510 μ A/A + 19 nA 300 μ A/A + 190 nA 290 μ A/A + 19 μ A 280 μ A/A + 19 μ A 570 μ A/A + 190 μ A 720 μ A/A + 1.9 mA 0.28 % + 650 μ A 0.85 % + 130 mA	Outputs of current sources can be measured with these uncertainties.
FREQUENCY Measurement	1 Hz to 10 MHz	1.0 part in 10^7	These outputs can be measured
FREQUENCY Generation Specific Values	0.1 Hz, 1 Hz, 10 Hz, 100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz, 5 MHz and 10 MHz	1.4 parts in 10^7	Source values for measuring instruments



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PHASE ANGLE	50 Hz and 60 Hz 0° to 360°	70 m°	
CAPACITANCE Generation	10 Hz to 10 kHz 0.4 nF to 1.1 nF	0.58 % + 12 pF	
	10 Hz to 3 kHz 1.1 nF to 3.3 nF	0.58 % + 12 pF	
	10 Hz to 1 kHz 3.3 nF to 11 nF 11 nF to 33 nF 33 nF to 110 nF 110 nF to 330 nF	0.29 % + 14 pF 0.29 % + 120 pF 0.29 % + 140 pF 0.29 % + 400 pF	
	10 Hz to 600 Hz 0.33 μF to 1.0999 μF	0.29 % + 1.2 nF	
	10 Hz to 300 Hz 1.1 μF to 3.3 μF	0.29 % + 4.0 nF	
	10 Hz to 150 Hz 3.3 μF to 11 μF	0.29 % + 14 nF	
	10 Hz to 120 Hz 11 μF to 33 μF	0.46 % + 41 nF	
	10 Hz to 80 Hz 33 μF to 110 μF	0.52 % + 190 nF	
	0 Hz to 50 Hz 110 μF to 330 μF	0.52 % + 370 nF	
	0 Hz to 20 Hz 0.33 mF to 1.1 mF	0.52 % + 1.2 μF	
Specific Values	1 kHz 100 pF 1000 pF, 10 nF, 100 nF and 1 μF 1 μF	0.020 % 0.010 % 0.020 %	Standard capacitors available for the calibration of capacitance bridges, meters etc.
Measurement	1 kHz 100 pF to 10 μF	0.20 % to 0.050 %	Capacitors can be calibrated to these uncertainties.



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INDUCTANCE			
Generation			
Specific Values	1 kHz 100 μH, 1 mH, 10 mH, 100 mH and 1 H	0.010 %	Standard inductors available for the calibration of inductance bridges, meters etc.
Measurement	1 kHz 100 μH to 1 H	0.20 % to 0.050 %	Inductors can be calibrated to these uncertainties.
AC RESISTANCE			
	40 Hz to 1 kHz 1 Ω to 10 kΩ	0.10 %	Sourcing suitable for measuring devices
	50 Hz 0.02 Ω to 5 Ω 5 Ω to 1 kΩ	0.58 % + 36 mΩ 0.58 % + 50 mΩ	Nominal values suitable for the calibration of earth loop testers
	40 Hz to 1592 Hz 1 Ω to 10 kΩ	0.050 % to 0.20 %	Measurement of AC resistors
RCD TRIP TIMES	30 ms to 400 ms	0.010 % + 1.0 ms	Suitable for RCD testers
ELAPSED TIME	Nominal 60 s	5.0 ms	Electronically triggered
To support Megger products: Oil test set & check meters; The OTS range, Oil tan delta test set (otd) and otd cc.			
DC VOLTAGE	0 V to 1 kV	0.030 % + 0.10 V	
AC VOLTAGE	200 mV to 1 kV; 55 Hz 10 kV to 100 kV; 50 Hz to 75 Hz	0.070 % + 0.20 V 0.85 % + 80 V	
DISSIPATION FACTOR			
750 V at 55 Hz	0 nominal 0.003 nominal 0.03 nominal 0.3 nominal 3 nominal 0.003 nominal to 0.3 nominal	0.030 % + 0.00001 0.080 % + 0.00003 0.030 % + 0.00017 0.080 % + 0.0015 0.030 % + 0.015 1.5 % + 0.00030	At temperatures of up to 100 °C
2 kV at 55 Hz	0.003 nominal 0.03 nominal	0.080 % + 0.00003 0.030 % + 0.00017	



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PERMITTIVITY 750 V and 2 kV at 55 Hz 200 pF applied	3 nominal	0.060 %	
RESISTANCE At 500 V	5 M Ω to 5 G Ω	0.15%	
RESISTIVITY At 500 V DC	40 M Ω -m to 40 G Ω -m	0.050 %	
CAPACITANCE 750 V and 2 kV at 55 Hz	200 pF	0.060 %	
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: $Q[a, b] = [a^2 + b^2]^{1/2}$