

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 0164 Accredited to ISO/IEC 17025:2017	Industrial Calibration Ltd Issue No: 037 Issue date: 23 May 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
DC RESISTANCE Measurement and generation	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	30 $\mu\Omega/\Omega$ 14 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 20 $\mu\Omega/\Omega$ 60 $\mu\Omega/\Omega$ 0.065 % 0.65 %	Measurement of resistance values using digital multimeter and application of known values to resistance measuring instruments.
Generation only 4-wire values	10 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω 10 M Ω 100 M Ω	24 $\mu\Omega/\Omega$ 16 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 15 $\mu\Omega/\Omega$ 15 $\mu\Omega/\Omega$ 20 $\mu\Omega/\Omega$ 37 $\mu\Omega/\Omega$ 100 $\mu\Omega/\Omega$	Application of known resistance values to resistance measuring equipment, with two-wire or four-wire configurations as indicated.
2-wire values	10 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω 10 M Ω 100 M Ω	950 $\mu\Omega/\Omega$ 120 $\mu\Omega/\Omega$ 15 $\mu\Omega/\Omega$ 17 $\mu\Omega/\Omega$ 20 $\mu\Omega/\Omega$ 35 $\mu\Omega/\Omega$ 70 $\mu\Omega/\Omega$ 100 $\mu\Omega/\Omega$	
Current carrying resistors Measurement and generation	At 10 A 100 $\mu\Omega$ 1 m Ω 10 m Ω At 1 A 100 m Ω 1 Ω	 0.16 % 0.030 % 0.020 % 80 $\mu\Omega/\Omega$ 70 $\mu\Omega/\Omega$	Resistance measurement calculated using ohms law



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
DC VOLTAGE			
Measurement	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V	10 $\mu\text{V/V} + 1.5 \mu\text{V}$ 10 $\mu\text{V/V}$ 8.0 $\mu\text{V/V}$ 12.0 $\mu\text{V/V}$ 12 $\mu\text{V/V}$	Measurement of DC voltages by comparison with precision digital multimeter.
Generation	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V	10 $\mu\text{V/V} + 1.5 \mu\text{V}$ 11 $\mu\text{V/V}$ 5.0 $\mu\text{V/V}$ 7.0 $\mu\text{V/V}$ 9.0 $\mu\text{V/V}$	Application of known DC voltages to voltage measuring equipment.
DC CURRENT			
Measurement and Generation			
Specific Values	10 μA 100 μA 1 mA 10 mA 100 mA 1 A	30 $\mu\text{A/A}$ 30 $\mu\text{A/A}$ 35 $\mu\text{A/A}$ 40 $\mu\text{A/A}$ 65 $\mu\text{A/A}$ 90 $\mu\text{A/A}$	Using current shunts.
Other Values	0 nA to 10 nA 10 nA to 100 nA 100 nA to 1 μA 1 μA to 10 μA 10 μA to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 10 A 10 A to 20 A 20 A to 50 A	17 pA 20 pA 35 pA 130 pA 35 $\mu\text{A/A} + 1.50 \text{ nA}$ 35 $\mu\text{A/A} + 6.0 \text{ nA}$ 35 $\mu\text{A/A} + 60 \text{ nA}$ 35 $\mu\text{A/A} + 1.2 \mu\text{A}$ 40 $\mu\text{A/A} + 25 \mu\text{A}$ 0.025 % 0.0450 % 0.050 %	Using multimeter (and current shunts above 2 A).
Generation only	0 μA to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 10 A	30 $\mu\text{A/A} + 3.0 \text{ nA}$ 25 $\mu\text{A/A} + 12 \text{ nA}$ 25 $\mu\text{A/A} + 120 \text{ nA}$ 25 $\mu\text{A/A} + 1.2 \mu\text{A}$ 40 $\mu\text{A/A} + 25 \mu\text{A}$ 130 $\mu\text{A/A} = 0.60 \text{ mA}$	Application of known DC currents to current measuring equipment.



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
AC VOLTAGE			
Measurement	<i>40 Hz to 10 kHz</i> 10 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V <i>10 kHz to 30 kHz</i> 10 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V <i>30 kHz to 100 kHz</i> 10 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V	0.016 % + 5.0 μ V 0.016 % 0.016 % 0.016 % 0.016 % 0.025 % 0.030 % + 10 μ V 0.030 % 0.030 % 0.030 % 0.05 % + 25.0 μ V 0.031 % + 0.25 mV 0.031 % + 2.5 mV 0.031 % + 25 mV	Measurement of AC voltage sources using digital multimeter.
Generation	<i>10 mV to 20 mV</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i> <i>100 kHz to 300 kHz</i> <i>20 mV to 200 mV</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i> <i>100 kHz to 300 kHz</i> <i>200 mV to 2 V</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i> <i>100 kHz to 300 kHz</i> <i>2 V to 20 V</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i> <i>100 kHz to 300 kHz</i> <i>20 V to 200 V</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i> <i>100 kHz to 300 kHz</i> <i>200 V to 1000 V</i> <i>40 Hz to 10 kHz</i> <i>10 kHz to 100 kHz</i>	0.070 % + 6.5 μ V 0.095 % + 6.5 μ V 0.20 % + 14.0 μ V 0.011 % + 11.0 μ V 0.040 % + 11.0 μ V 0.095 % + 24.0 μ V 0.014 % 0.017 % 0.062 % 0.014 % 0.023 % 0.069 % 0.014 % 0.026 % 0.31 % 0.019 % 0.045 %	Application of known AC voltages to voltage measuring equipment.



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
AC CURRENT			
Measurement	40 Hz to 1 kHz 10 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 10 A 10 A to 30 A	0.027 % + 25 nA 0.027 % + 0.25 μ A 0.027 % + 2.5 μ A 0.027 % + 25 μ A 0.043 % + 0.50 mA 0.065 % + 4.0 mA 0.065 % + 11 mA	By comparison with precision calibrator.
Generation	40 Hz to 1 kHz 10 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 10 A	0.017 % + 12 nA 0.016 % + 120 nA 0.018 % + 1.2 μ A 0.017 % + 12 μ A 0.032 % + 120 μ A 0.057 % + 1.5 mA	Using precision calibrator. 400 Hz maximum above 2 A.
FREQUENCY			
Measurement	1 mHz to 3 GHz	1.5 in 10^8	Using counter and GPS receiver.
Generation	450 Hz to 800 MHz	5.0 in 10^{10}	
RISETIME	1 ns to 20 ns	90 ps	For oscilloscope risetime calibration, using fast pulse generator. There may be additional uncertainties relating to the screen resolution of the oscilloscope being calibrated.
CAPACITANCE			
Generation, specific values	1 kHz 100 pF 1 nF 10 nF 100 nF 1 μ F	0.050 % + 0.10 pF 0.050 % + 0.10 pF 0.030 % 0.030 % 0.020 %	Known values of capacitance for application to capacitance measuring devices.
Generation, other values	1 kHz 1 nF to 1 μ F	0.050 % + 5.0 pF	
INDUCTANCE			
Generation, specific values	1 kHz 100 μ H to 1 H in decade steps	0.020 % + 0.12 μ H	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks
TEMPERATURE	20 °C nominal	0.040 °C	For verification of thermocouple indicators and simulators (including cold junction compensation) at ambient temperature.
Electrical calibration of temperature indicators			
Indicators for base metal thermocouples	Type Range °C		
	K -100 to +1370	0.10 °C	
	J -100 to +1200	0.040 °C	
	T -100 to +400	0.070 °C	
	E -100 to +1000	0.050 °C	
	N -50 to +1300	0.10 °C	By millivolt injection without cold junction compensation. The cold junction will normally be the subject of a separate calibration.
Indicators for noble metal thermocouples	Type Range °C		
	R +100 to +1750	0.350 °C	
	S +100 to +1750	0.350 °C	
	B +250 to +450	1.3 °C	
	B +450 to +1800	0.70 °C	By millivolt injection without cold junction compensation. The cold junction will normally be the subject of a separate calibration.
Indicators for resistance thermometers	Type Range °C		
	PT100 -200 to +850	0.020 °C	By resistance simulation.
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: $Q[a, b] = [a^2 + b^2]^{1/2}$