Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

4432

Accredited to ISO/IEC 17025:2017

Caltest Instruments Limited

Issue No: 017 **Issue date:** 14 March 2025

Unit 2 Viceroy Court
Bedford Road
Petersfield
Hampshire
GU32 3LJ

Contact: Krzysztof Gawlik
Tel: +44 (0)1483 302700
E-Mail: krzysztof.gawlik@caltest.co.uk
Website: www.caltest.co.uk

Calibration performed by the Organisations at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address Unit 2 Viceroy Court Bedford Road Petersfield Hampshire GU32 3LJ	**Local contact** Krzysztof Gawlik	Electrical	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers premises	Krzysztof Gawlik	Electrical	B

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
DC RESISTANCE	0 Ω 1 mΩ to 10 mΩ 10 mΩ to 100 mΩ 100 mΩ 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 100 GΩ	0.3 µΩ 212 µΩ/Ω 113 µΩ/Ω 19 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 9.0 µΩ/Ω 10 µΩ/Ω 15 µΩ/Ω 14 µΩ/Ω 10 µΩ/Ω 11 µΩ/Ω 16 µΩ/Ω 35 µΩ/Ω 185 µΩ/Ω	Outputs of instruments within these values can be measured to the listed uncertainties.	A & B
Set Values	1.0 mΩ 10 mΩ 0.1 Ω 1 Ω 10 Ω 100 Ω 1.0 kΩ 10 kΩ	114 µΩ/Ω 105 µΩ/Ω 110 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 9.0 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω		A
	1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ	15 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 8.0 µΩ/Ω 15 µΩ/Ω 15 µΩ/Ω	These values can be generated for the calibration of measuring Instruments.	A
DC VOLTAGE	0 V 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 2 kV 2 kV to 10 kV 10 kV to 20 kV	5.0 µV/V + 0.1 µV 3.0 µV/V + 0.4 µV 3.0 µV/V + 4.0 µV 5.0 µV/V + 40 µV 5.0 µV/V + 0.5 mV 0.09 % 0.08 % 0.07 %	These values can be measured and generated for the calibration of sourcing and measuring instruments.	A & B

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
DC CURRENT	0 µA to 200 µA 200 µA to 2 mA 2 mA to 200 mA 200 mA to 2 A 2 A to 20 A 20 A to 1000 A	8.0 µA/A + 0.4 µV 9.0 µA/A + 4.0 nA 10 µA/A + 40 nA 43 µA/A + 0.8 µA 116 µA/A + 0.4 mA 101 µA/A	Measurements only	A & B
	0 µA to 220 µA 220 µA to 2.2 mA 2.2 mA to 220 mA 220 mA to 2.2 A 20 A to 1000 A	11 µA/A + 0.6 nA 6.0 µA/A + 7.0 nA 6.0 µA/A + 40 nA 12 µA/A + 12 µA 101 µA/A	These values can be generated	A & B
DC POWER	1 W to 100 kW	0.012 %	These values can be measured and generated. Limiting Voltage from 1 V to 1000 V. Limiting Current from 1 A to 1000 A	A & B
AC VOLTAGE	2 mV to 200 mV 10 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 30 kHz 30 kHz to 60 kHz 60 kHz to 100 kHz	 0.0098 % + 4.0 µV 0.011 % + 4.0 µV 0.017 % + 8.0 µV 0.032 % + 20 µV 0.067 % + 20 µV	These values can be measured	A & B
	200 mV to 2 V 10 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 30 kHz 30 kHz to 60 kHz 60 kHz to 100 kHz 100 kHz to 500 kHz 500 kHz to 1 MHz	 0.0087 % + 20 µV 0.0096 % + 20 µV 0.013 % % + 40 µV 0.031 % + 200 µV 0.032 % + 200 µV 0.057 % + 20 mV 0.095 % + 20 mV		
	2 V to 20 V 10 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 30 kHz 30 kHz to 60 kHz 60 kHz to 100 kHz 100 kHz to 500 kHz 500 kHz to 1 MHz	 0.0066 % + 200 µV 0.0078 % + 200 µV 0.010 % + 400 µV 0.029 % + 2.0 mV 0.029 % + 2.0 mV 0.18 % + 200 mV 0.46 % + 200 mV		
	20 V to 200 V 10 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 30 kHz 30 kHz to 60 kHz 60 kHz to 100 kHz	 0.0052 % + 2.0 mV 0.0079 % + 2.0 mV 0.011 % + 4.0 mV 0.030 % + 20 mV 0.032 % + 20 mV		
	200 V to 500 V 10 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 30 kHz	 0.0087 % + 20 mV 0.0085 % + 20 mV 0.013 % + 40 mV		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
AC VOLTAGE (cont'd)	500 V to 1000 V		These values can be measured	A & B
	10 Hz to 1 kHz	0.025 % + 20 mV		
	1 kHz to 10 kHz	0.026 % + 20 mV		
	50 Hz to 60 Hz			
	1 kV to 2 kV	0.28 %	Measurment only	A & B
	2 kV to 15 kV	0.32 %		
AC VOLTAGE	0.2 mV to 2.2 mV		These values can be generated	A
	10 Hz to 40 Hz	0.078 % + 4 µV		
	40 Hz to 500 Hz	0.054 % + 4 µV		
	500 Hz to 1 kHz	0.093 % + 4 µV		
	1 kHz to 10 kHz	0.085 % + 4 µV		
	10 kHz to 20 kHz	0.11 % + 4 µV		
	20 kHz to 50 kHz	0.11 % + 5 µV		
	50 kHz to 100 kHz	0.067 % + 5 µV		
	100 kHz to 300 kHz	0.11 % + 10 µV		
	300 kHz to 500 kHz	0.24 % + 20 µV		
	500 kHz to 1 MHz	0.45 % + 20 µV		
	2.2 mV to 22 mV			
	10 Hz to 40 Hz	0.032 % + 4 µV		
	40 Hz to 500 Hz	0.019 % + 4 µV		
	500 Hz to 1 kHz	0.020 % + 4 µV		
	1 kHz to 10 kHz	0.0092 % + 4 µV		
	10 kHz to 20 kHz	0.0091 % + 4 µV		
	20 kHz to 50 kHz	0.011 % + 4 µV		
	50 kHz to 100 kHz	0.015 % + 5 µV		
	100 kHz to 300 kHz	0.057 % + 10 µV		
	300 kHz to 500 kHz	0.029 % + 20 µV		
	500 kHz to 1 MHz	0.068 % + 20 µV		
	22 mV to 220 mV			
	10 Hz to 40 Hz	0.017 % + 12 µV		
	40 Hz to 500 Hz	0.0044 % + 7 µV		
	500 Hz to 1 kHz	0.0045 % + 7 µV		
	1 kHz to 10 kHz	0.0045 % + 7 µV		
	10 kHz to 20 kHz	0.0045 % + 7 µV		
	20 kHz to 50 kHz	0.0066 % + 7 µV		
	50 kHz to 100 kHz	0.0067 % + 17 µV		
	100 kHz to 300 kHz	0.019 % + 20 µV		
	300 kHz to 500 kHz	0.022 % + 25 µV		
	500 kHz to 1 MHz	0.060 % + 45 µV		
	220 mV to 2.2 V			
	10 Hz to 40 Hz	0.0081 % + 40 µV		
	40 Hz to 500 Hz	0.0013 % + 8 µV		
	500 Hz to 1 kHz	0.0013 % + 8 µV		
	1 kHz to 10 kHz	0.0013 % + 8 µV		
	10 kHz to 20 kHz	0.0013 % + 8 µV		
	20 kHz to 50 kHz	0.0018 % + 10 µV		
	50 kHz to 100 kHz	0.0034 % + 30 µV		
	100 kHz to 300 kHz	0.0087 % + 80 µV		
	300 kHz to 500 kHz	0.0096 % + 200 µV		
	500 kHz to 1 MHz	0.029% + 300 µV		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
AC VOLTAGE (cont'd)	2.2 V to 22 V		These values can be generated	A
	10 Hz to 40 Hz	0.0080 % + 400 µV		
	40 Hz to 500 Hz	0.0018 % + 50 µV		
	500 Hz to 1 kHz	0.0018 % + 50 µV		
	1 kHz to 10 kHz	0.0018 % + 50 µV		
	10 kHz to 20 kHz	0.0018 % + 50 µV		
	20 kHz to 50 kHz	0.0018 % + 100 µV		
	50 kHz to 100 kHz	0.0026 % + 200 µV		
	100 kHz to 300 kHz	0.013 % + 0.6 mV		
	300 kHz to 500 kHz	0.016 % + 2.0 mV		
	500 kHz to 1 MHz	0.029 % + 3.2 mV		
	22 V to 220 V			
	10 Hz to 40 Hz	0.0091 % + 4.0 mV		
	40 Hz to 500 Hz	0.0022 % + 0.6 mV		
	500 Hz to 1 kHz	0.0023 % + 0.6 mV		
	1 kHz to 10 kHz	0.0023 % + 0.6 mV		
	10 kHz to 20 kHz	0.0037 % + 0.6 mV		
	20 kHz to 50 kHz	0.0029 % + 1.0 mV		
	50 kHz to 100 kHz	0.0099 % + 2.3 mV		
	220 V to 1100 V			
	40 Hz to 500 Hz	0.0054 % + 3.5 mV		
	500 Hz to 1 kHz	0.0056 % + 3.5 mV		
AC CURRENT	40 Hz to 1 kHz		These values can be measured	A & B
	0 µA to 200 µA	0.0099 % + 0.02 µA		
	200 µA to 2 mA	0.010 % + 0.2 µA		
	2 mA to 20 mA	0.0080 % + 2.0 µA		
	20 mA to 200 mA	0.012 % + 20 µA		
	200 mA to 2A	0.014 % +0.2 mA		
	2A to 20A	0.017 % + 2.0 mA		
	1 kHz to 5 kHz			
	Up to 200 µA	0.017 % + 0.02 µA		
	200 µA to 2 mA	0.011 % + 0.2 µA		
	2 mA to 20 mA	0.010 + 2.0 µA		
	20 mA to 200 mA	0.014 % + 20 µA		
	200 mA to 2A	0.044 % +0.2 mA		
	2A to 20A	0.041 % + 2.0 mA		
	5 kHz to 10 kHz			
	Up to 200 µA	0.041 % + 0.02 µA		
	200 µA to 2 mA	0.013 % + 0.2 µA		
	2 mA to 20 mA	0.010 % + 2.0 µA		
	20 mA to 200 mA	0.013 % + 20 µA		
	200 mA to 2A	0.035 % + 0.2 mA		
	2A to 20A	0.151 % + 2.0 mA		
	50 Hz to 400 Hz			
	20 A to 1000 A	0.06 %		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
AC CURRENT (cont'd)	40 Hz to 1 kHz		These values can be generated	A
	10 µA to 220 µA	0.016 % + 8.0 nA		
	220 µA to 2.2 mA	0.012 % + 35 nA		
	2.2 mA to 22 mA	0.0022 % + 0.35 µA		
	22 mA to 220 mA	0.0034 % + 2.5 µA		
	220 mA to 2.2 A	0.0041 % + 80 µA		
	1 kHz to 5 kHz			
	10 µA to 220 µA	0.025 % + 12 nA		
	220 µA to 2.2 mA	0.017 % + 110 nA		
	2.2 mA to 22 mA	0.007 % + 0.55 µA		
	22 mA to 220 mA	0.0082 % + 3.5 µA		
	220 mA to 2.2 A	0.014 % +80 µA		
	5 kHz to 10 kHz			
	10 µA to 220 µA	0.065 % + 65 nA		
	220 µA to 2.2 mA	0.052 % + 650 nA		
	2.2 mA to 22 mA	0.015 % +5.0 µA		
	22 mA to 220 mA	0.015 % + 10 µA		
	220 mA to 2.2 A	0.026 % + 160 µA		
	50 Hz to 400 Hz			
	20 A to 360 A	0.06 %		
FREQUENCY	40 Hz to 225 MHz	2.0 parts in 10^8	Frequency results may be expressed in terms of average periodic time.	A & B
TIME PERIOD	10 ms to 100 s	11 parts in 10^6		A & B
ACTIVE POWER				A & B
0.6 W to 48 kW	45 Hz to 65 Hz $0.3 \leq \cos \varphi \leq 1.0$		Limiting Voltage 60 V to 480 V	
	0.005 A to 0.01 A	0.023 %		
	0.01 A to 0.025 A	0.018 %		
	0.025 A to 0.05 A	0.014 %		
	0.05 A to 10 A	0.006 %		
	10 A to 120 A	0.007 %		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location
REACTIVE POWER				A & B
0.6 kVar to 48 kVar	45 Hz to 65 Hz 0.3 ≤ sin φ ≤ 1.0		Limiting Voltage 60 V to 480 V	
	0.05 A to 10 A 10 A to 120 A	0.006 % 0.007 %		
PHASE ANGLE	45 Hz to 60 Hz -180 ° to +180 °	0.0048 °	Limiting Voltage 60 V to 480 V Limiting Current 50 mA to 100 A	A & B
END				

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: $Q[a, b] = [a^2 + b^2]^{1/2}$