Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

4021

Accredited to ISO/IEC 17025:2017

ABLE Calibration Services Limited

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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 19 Iris Road Rogerstone South Wales NP10 9LE	**Local contact** Mr Richard Bale Tel: +44 (0)1633 897225 Fax: +44 (0)1633 897225 Email: info@able-calibration.co.uk Website: www.able-calibration.co.uk	Electrical Temperature Pressure Humidity	P

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Customers' sites or premises The customers' site or premises must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer.	Contact as above	Electrical Temperature Pressure Humidity	S

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL			Electrical calibrations are performed as a comparison against a reference standard	
DC VOLTAGE	0 mV to 100 mV 0.1 V to 1000 V	5.0 μV 40 μV/V	These values can be generated or measured	P & S
DC HIGH VOLTAGE Measurement only	1 kV to 3 kV 3 kV to 30 kV	1.7 % + 20 V 0.43 % + 20 V	For the calibration of high voltage sources	
DC CURRENT	1.0 μA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A 3 A to 10 A 10 A to 20 A	500 μA/A + 10 nA 500 μA/A 200 μA/A 200 μA/A 300 μA/A 300 μA/A 0.050 % 0.25 % + 6 mA	These values can be generated or measured	P & S
DC CURRENT Simulation	10 A to 1000 A	0.40 % + 6 mA	50 turn coil – for the calibration of clampmeters	
DC RESISTANCE	0 mΩ 1 mΩ 10 mΩ 100 mΩ 100 mΩ to 100 Ω 100 Ω to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 M Ω to 1000 MΩ	0.03 mΩ 0.03 mΩ 0.02 mΩ 0.2 mΩ 50 μΩ/Ω + 1 mΩ 50 μΩ/Ω 130 μΩ/Ω 0.40 % 0.50 %	These values can be generated or measured, except where stated	P & S
(Specific Value) Generation only	100 Ω	24 μΩ/Ω		
AC RESISTANCE	*1 kHz* 1 Ω to 10 kΩ	0.10 %		P & S
AC VOLTAGE	1 mV to 100 mV *40 Hz to 1 kHz* 0.1 V to 1 V *40 Hz to 1 kHz* *1 kHz to 50 kHz*	500 μV/V 400 μV/V 600 μV/V	These values can be generated or measured	P & S

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL (continued)				
AC VOLTAGE (continued)	1 V to 10 V *40 Hz to 1 kHz* *1 kHz to 50 kHz* 10 V to 100 V *40 Hz to 1 kHz* *1 kHz to 50 kHz* 100 V to 750 V *40 Hz to 1 kHz*	 400 μV/V 600 μV/V 400 μV/V 600 μV/V 500 μV/V		P & S
AC HIGH VOLTAGE Measurement only	*50 Hz* 750 V to 10 kV	 1.2 % + 20 V	For the calibration of high voltage sources	P & S
AC CURRENT	*40 Hz to 1 kHz* 1 μA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A *40 Hz to 100 Hz* 3 A to 10 A 10 A to 20 A	 0.16 % 0.11 % 0.11 % 0.11 % 0.10 % 0.14 % 0.10 % 0.43 % + 10 mA	These values can be generated or measured	P & S
Simulation	*40 to 50 Hz* 10 A to 1000 A	 0.50 % + 10 mA	50 turn coil – for the calibration of clampmeters	P & S
FREQUENCY				P & S
Measurement	5 Hz to 25 MHz 25 MHz to 1.3 GHz	2.8 μHz/Hz + 16 μHz 2.8 μHz/Hz + 160 mHz	Generation up to 15 MHz May be expressed as events per unit time for devices such as Tachometers and 1/f for oscilloscope period calibration	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
TIME INTERVAL	1.0 s to 6 Hours	70 ms	For the calibration of stopwatches and timing devices	P & S
Revolutions Per Minute	3 RPM to 90 000 RPM	1.0 RPM	For the calibration of Optical Tachometers	
CAPACITANCE	*1 kHz* 100 pF to 100 μF	 0.10 %		
INDUCTANCE	*1 kHz* *10.* μF to 1 H 1 H to 10 H	 0.10 % 0.30 %		
SIMULATION Thermocouple simulators and indicators, calibration by electrical simulation				P & S
Noble metal thermocouples Type R & S	-50 °C to +1768 °C -50 °C to +200 °C 200 °C to 1768 °C	1.0 °C 1.0 °C 0.50 °C	With cold junction compensation Without cold junction compensation	
Base metal thermocouples Type K, J, T & N	-200 °C to +1372 °C -200 °C to 0 °C 0 °C 1372 °C	0.70 °C 0.30 °C 0.15 °C	With cold junction compensation Without cold junction compensation	
Cold junction compensation	At ambient temperature	0.32 °C		
Resistance thermometers (PT100)	-200 °C to +800 °C	0.10 °C		
PRESSURE Gas pressure (gauge)			Methods consistent with EURAMET CG3.	
Calibration of pressure indicating instruments and gauges	-90 kPa to 200 kPa 200 kPa to 700 kPa 700 kPa to 3.5 MPa	0.24 kPa 0.60 kPa 2.3 kPa	Instruments with an electrical output can be calibrated. Absolute pressures can be generated across these gauge ranges which will attract an additional uncertainty of 0.33 kPa.	P & S

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Gas pressure (absolute) Calibration of pressure indicating instruments and gauges	10 kPa to 200 kPa	0.33 kPa	Instruments with an electrical output can be calibrated.	P & S
PRESSURE (continued) Hydraulic pressure (gauge) Calibration of pressure indicating instruments and gauges	0 MPa to 40 MPa	46 kPa	Instruments with an electrical output can be calibrated. Absolute pressures can be generated across this gauge range which will attract an additional uncertainty of 0.33 kPa.	P & S
TEMPERATURE Temperature indicators and recorders, with temperature sensor(s)	-90 °C to -70 °C -70 °C to -50 °C -50 °C to +140 °C 140 °C to 200 °C 200 °C to 400 °C 400 °C to 600 °C	0.31 °C 0.15 °C 0.080 °C 0.15 °C 0.80 °C 0.90 °C	Instruments with an electrical output can be calibrated. Calibrations performed within Dry media	P & S
Resistance thermometers	-90 °C to -50 °C -50 °C to +140 °C 140 °C to 200 °C 200 °C to 400 °C 400 °C to 600 °C	0.32 °C 0.13 °C 0.15 °C 0.80 °C 0.90 °C	Calibrations performed within dry media	
Calibration in ambient air	10 °C to 30 °C	0.40 °C		
Temperature controlled chambers, fridges, freezers, ovens, furnaces and liquid baths (inclusive of associated indicators, controllers and recorders, all with sensors, within the specified parameters and ranges)	-90 °C to -70 °C -70 °C to -50 °C -50 °C to +200 °C 200 °C to 400 °C 400 °C to 600 °C	0.30 °C 0.15 °C 0.050 °C 0.80 °C 1.5 °C	Single or dual monitoring probes. Time dependent temperature profiling, also referred to as spatial temperature surveying or mapping	S
	-80 °C to -50 °C -50 °C to +200 °C 200 °C to 400 °C 400 °C to 600 °C	1.3 °C 1.2 °C 1.4 °C 1.8 °C	Multipoint monitoring probes. Time dependent temperature profiling, also referred to as spatial temperature surveying or mapping	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature block calibrators	-90 °C to -70 °C -70 °C to -50 °C -50 °C to +200 °C 200 °C to 400 °C 400 °C to 600 °C	0.30 °C 0.15 °C 0.040 °C 0.50 °C 0.60 °C	Method consistant with Euramet CG13	P & S
HUMIDITY				P & S
Relative humidity instruments in ambient air	11 %rh to 50 %rh 50 %rh to 95 %rh *at 15 °C to 30 °C*	1.5 %rh 2.0 %rh	Single point calibration in prevailing conditions using reference instrument.	
Relative humidity instruments at ambient temperature	11 %rh 35 %rh 50 %rh 80 %rh *at 15 °C to 30 °C*	0.39 %rh 0.68 %rh 1.0 %rh 1.4 %rh	Calibration using reference salts.	
Temperature probes built into humidity instruments	15 °C to 30 °C	0.40 °C	Comparison with reference device.	
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: $Q[a, b] = [a^2 + b^2]^{1/2}$