Schedule of Accreditation

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United Kingdom Accreditation Service

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0807

Accredited to ISO/IEC 17025:2017

BSRIA Limited

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Calibration performed by the Organisation at the locations specified

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
Address: Old Bracknell Lane West, Bracknell, Berkshire, RG12 7AH **Local contact:** Mr M Trotter	Air velocity, Electrical, Humidity, Pressure, Temperature, Volume flow	Bracknell
Address: 68 Walton Summit Road, Walton Summit Centre, Bamber Bridge, Preston, Lancashire, PR5 8AQ **Local contact:** Mr A Collier	Pressure, Temperature, Volume flow	Preston

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
TEMPERATURE			Unless otherwise stated calibration by comparison with reference standards in a liquid bath	
Resistance thermometers	-80 °C to -38 °C -38 °C to -20 ° C -20 °C to +80 °C 80 °C to 250 °C	0.050 °C 0.030 °C 0.016 °C 0.020 °C		Bracknell
Digital thermometers with Thermocouple sensors	-80 °C to +250 °C	0.15 °C		Bracknell
Digital thermometers with PRT sensors	-80 °C to -20 °C -38 °C to -20 ° C -20 °C to +80 °C 80 °C to 250 °C	0.050 °C 0.030 °C 0.016 °C 0.020 °C		Bracknell
Air Temperature data loggers Calibration performed in an air chamber	-20 to 0 °C 0 °C to 70 °C	0.20 °C 0.060 °C	Calibrations may be undertaken on devices with an electrical output and on data recorders suitable for calibration in a chamber.	Bracknell
Digital thermometers with Thermocouple sensors	-20 °C to +80 °C	0.15 °C		Preston
Digital thermometers with PRT sensors	-20 °C to +80 °C	0.040 °C		Preston
PRESSURE			Methods consistent with EURAMET CG3 and CG17.	
<u>Gas pressure (absolute)</u>				
Calibration of pressure indicating instruments and gauges	80 kPa to 115 kPa	25 Pa	Direct coparison method	Bracknell
	70 kPa to 115 kPa	25 Pa		Preston
<u>Gas pressure (gauge)</u>				
Calibration of pressure indicating instruments and gauges	-7.5 kPa to -3 kPa -3 kPa to 3.5 kPa 3.5 kPa to 100 kPa	0.045 % + 0.50 Pa 0.045 % + 0.10 Pa 0.025 %	Calibration of pressure devices with an electrical output may be undertaken.	Bracknell
Calibration of pressure indicating instruments and gauges	-7.5 kPa to 3 kPa -3 kPa to 3 kPa 3 kPa to 7.5 kPa	0.045 % + 0.50 Pa 0.045 % + 0.10 Pa 0.045 % + 0.50 Pa		Preston

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
AIR VELOCITY				
Calibration of Anemometers and Pitot Tubes against a laser Doppler anemometer	0.15 m/s to 0.3 m/s 0.3 m/s to 2 m/s 2 m/s to 5 m/s 5 m/s to 15 m/s 15 m/s to 30 m/s	0.62 % + 0.030 m/s 0.54 % + 0.025 m/s 0.54 % + 0.045 m/s 0.54 % + 0.075 m/s 0.62 % + 0.12 m/s	Open jet wind tunnel method	Bracknell
Calibration of Anemometers and Pitot Tubes against differential pressure systems	0.15 m/s to 0.3 m/s 0.3 m/s to 2 m/s 2 m/s to 5 m/s 5 m/s to 15 m/s 15 m/s to 30 m/s	0.71 % + 0.030 m/s 0.72 % + 0.060 m/s 0.80 % + 0.080 m/s 0.81 % + 0.20 m/s 0.90 % + 0.40 m/s	Calibration of anemometers up to 120 mm diameter can be undertaken	
VOLUME FLOW - AIR				
Calibration of fans including blower doors and domestic air tightness fans BS EN ISO 5801:2008 method	7.6 l/s to 4000 l/s at fan pressures of 15 Pa to 1000Pa	0.25 l/s + 1.9 % of flow and 1.0 Pa + 0.90 % of pressure	Calibrated in pressurising mode over the static pressure range of 0 to 60 Pa	Bracknell and Preston
	7.6 l/s to 4000 l/s at fan pressures of 15 Pa to 1000Pa	0.50 l/s + 1.9 % of flow and 1.0 Pa + 0.90 % of pressure	Calibrated in pressurising mode over the static pressure range of 60 Pa to 125 Pa	
Calibration of Balometers (capture flow hoods) Supply and extract methods	20 l/s to 60 l/s 60 l/s to 110 l/s 110 l/s to 280 l/s 280 l/s to 450 l/s 450 l/s to 900 l/s (780 l/s for extract)	2.7 % + 3.2 l/s 2.6 % + 3.6 l/s 1.9 % + 4.0 l/s 2.4 % + 7.0 l/s 2.4 % + 8.8 l/s	Calibration of Balometers with Back pressure disabled only	Bracknell
Calibration of low volume flow hoods and cones Supply and extract methods	3.5 l/s to 95 l/s	4.3 % + 0.080 l/s		Bracknell

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
HUMIDITY			Calibration by comparison with a reference hygrometer and reference thermometers	
Relative humidity	*For the range 0 ℃ to 20 ℃* 10 %rh to 30 %rh 30 %rh to 95 %rh	 0.53 %rh 0.92 % of reading + 0.25 %rh	Calibrations may be undertaken on devices with an electrical output and on data recorders suitable for calibration in a chamber.	Bracknell
	For the range 20 ℃ to 30 ℃ 2 %rh to 30 %rh 30 %rh to 98 %rh	 0.35 %rh 0.90 % of reading + 0.080 %rh		
	For the range 30 ℃ to 50 ℃ 10 %rh to 30 %rh 30 %rh to 95 %rh	 0.29 %rh 0.83 % of reading + 0.040 %rh		
	For the range 50 ℃ to 70 ℃ 10 %rh to 30 %rh 30 %rh to 95 %rh	 0.25 %rh 0.71 % of reading + 0.040 %rh		
Frost point	-26 °C to -5 °C	0.14 °C		
Dew point	-8 °C to +69 °C	0.19 °C		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL			Electrical calibrations are performed as a comparison against a reference standard	
DC Resistance Generation and measurement capability for the calibration of resistance instruments	0 Ω to 200 Ω	15 ppm + 400 μΩ		Bracknell
	200 Ω to 2 kΩ 2 kΩ to 20 kΩ 20 kΩ to 200 kΩ	15 ppm + 2.4 mΩ 15 ppm + 24 mΩ 15 ppm + 250 mΩ		
DC Voltage				
	0 V to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200V 200 V to 1000 V	30 ppm + 0.17 μV 30 ppm + 1.7 μV 30 ppm + 17 μV 30 ppm + 170 μV 30 ppm + 1.7 mV		Bracknell
DC Current Generation and measurement capability for the calibration of current instruments	0 A to 200 μA	60 ppm + 1.7 nA		Bracknell
	200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A	50 ppm + 17 nA 50 ppm + 170 nA 50 ppm + 1.7 μA 60 ppm + 17 μA		
Frequency measurement	40 Hz to 1.9 kHz 1.9 kHz to 19 kHz 19 kHz to 190 kHz 190 kHz to 400 kHz	17 ppm + 7 mHz 17 ppm + 10 mHz 17 ppm + 100 mHz 17 ppm + 1 Hz	Calibration by comparison	Bracknell
Tachometer Calibration			Calibration by comparison	Bracknell
Mechanical contact	6 RPM to 6,000 RPM	425 ppm		
Optical	6 RPM to 600,000 RPM	100 ppm		
Stroboscope calibration	6 RPM to 600,000 RPM	100 ppm		
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 uncertainty of measurement 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 CIPM-ILAC definition of the CMC is as follows:

A CMC is a calibration and measurement capability available to customers under normal conditions:
(a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or
(b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement.

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 CMC is calculated according to the procedures given in M3003 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 CMC in certificates issued under its accreditation.

The CMC may be described using various methods in the Schedule of Accreditation:

As a single value that is valid throughout the range.
As an explicit function of the measurand or of a parameter (see below).
As a range of values. The range is stated such that the customer can make a reasonable estimate of the likely uncertainty at any point within the range.
As a matrix or table where the CMCs depend on the values of the measurand and a further quantity.
In graphical form, providing there is sufficient resolution on each axis to obtain at least two significant figures for the CMC.

Expression of CMCs - symbols and units

In general, only units of the SI and those units recognised for use with the SI are used to express the values of quantities and of the associated CMCs. Nevertheless, other commonly used units may be used where considered appropriate for the intended audience. For example, the term "ppm" (part per million) is frequently used by manufacturers of test and measurement equipment to specify the performance of their products. Terms like this may be used in Schedules of Accreditation where they are in common use and understood by the users of such equipment, providing their use does not introduce any ambiguity in the capability that is being described.

When the CMC is expressed as an explicit function of the measurand or of a parameter, this often comprises a relative term (e.g., percentage) and an absolute term, i.e. one expressed in the same units as those of the measurand. This form of expression is used to describe the capability that can be achieved over a range of values. Some examples are shown below. It should be noted that these expressions are *not* mathematical formulae but are instead written in a commonly used shorthand for expressing uncertainties - therefore, for purposes of clarity, an indication of how they are to be interpreted is also provided below.

DC voltage, 100 mV to 1 V: 0.0025 % + 5.0 µV

Over the range 100 mV to 1 V, the CMC is 0.0025 %·V + 5.0 µV, where V is the measured voltage.

Hydraulic pressure, 0.5 MPa to 140 MPa: 0.0036 % + 0.12 ppm/MPa + 4.0 Pa

Over the range 0.5 MPa to 140 MPa, the CMC is $0.0036\ \%\cdot p + (0.12\cdot 10^{-6}\cdot p\cdot 10^{-6}) + 4.0$ Pa, where p is the measured pressure in Pa.

It should be noted that the percentage symbol (%) simply represents the number 0.01. In cases where the CMC is stated only as a percentage, this is to be interpreted as meaning percentage of the measured value or indication.

Thus, for example, a CMC of 1.5 % means $1.5 \cdot 0.01 \cdot i$, where i is the instrument indication.