Schedule of Accreditation

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Accredited to ISO/IEC 17025:2017

Chamois Metrology 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 Unit 8 The Centre Holywell Business Park Northfield Road Southam Warwickshire CV47 0FP **Local contact** Mr S Kelly	Mass calibration Electrical calibration Pressure calibration Temperature calibration Dimensional calibration	HO

Site activities performed away from the locations listed above:

Location details	Activity	Location code
The location 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 **Local contact** Mr S Kelly	Pressure calibration	Site

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
PRESSURE Gas pressure (absolute)			Methods consistent with EURAMET CG3 and CG17 Including cold set pressure determination of pressure relief valves	HO & Site
Calibration of pressure measuring instruments and gauges	2 Pa to 160 Pa 160 Pa to 1.4 kPa 1.4 kPa to 15.7 kPa 15.7 kPa to 710 kPa 710 kPa to 27.6 MPa 27.6 MPa to 41.4 MPa	10 % Q [0.0040 %, 32 Pa] Q [0.0030 %, 1.0 Pa] Q [0.0025 %, 1.0 Pa] Q [0.0025 %, 10 Pa] Q [0.0045 %, 10 Pa]	Calibration of pressure measuring devices with an electrical output may be undertaken.	
Gas pressure (gauge)				
Calibration of pressure measuring instruments and gauges and “Pressure equivalent” calibration of Dead Weight Testers (pressure balances supplied with an associated mass set) and Effective area calibration of Dead Weight Testers	- 100 kPa to - 3.5 kPa - 3.5 kPa to 0 Pa 0 Pa to 1.4 kPa 1.4 kPa to 15.7 kPa 15.7 kPa to 710 kPa 710 kPa to 27.6 MPa 27.6 MPa to 41.4 MPa	0.0035 % Q [0.0095 %, 0.60 Pa] Q [0.0040 %, 0.50 Pa] Q [0.0022 %, 0.030 Pa] 0.0017 % 0.0025 % 0.0045 %	Calibrations may also be performed over an environmental temperature range of -10 °C to +150 °C, with an uncertainty of ± 1 °C on the reported temperature. There will be an additional pressure uncertainty of Q [0.0030 %, 0.030 Pa].	
Gas pressure (differential)				
Calibrations of differential pressure devices with low and high pressure ports at a common mode pressure of 3.5 kPa	6 Pa to 10 kPa (Line pressure 3.5 kPa)	Q [0.0060 %, 0.030 Pa]		
Calibration of pressure indicating instruments and gauges	0 Pa to (7 - line pressure) MPa (Line pressure 200 kPa to 7 MPa)	Q [0.000060 % of line pressure, 0.0035 % of differential pressure, 5.0 Pa]	Differential pressure cells may be calibrated using digital communications protocols	
	7 MPa to (27.6 - line pressure) MPa (Line pressure 7 MPa to 27.6 MPa)	Q [0.000060 % of line pressure 0.0035 % of differential pressure, 10 Pa]	Calibrations may also be performed over an environmental temperature range of +2 °C to +8 °C with an uncertainty of ± 1 °C on the reported temperature.	
	0 Pa to (41.4 - line pressure) MPa (Line pressure 27.6 MPa to 41.4 MPa)	Q [0.000065 % of line pressure, 0.0060 % of differential pressure, 16 Pa]		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
PRESSURE (cont'd)				
Hydraulic pressure (gauge)				HO & Site
Calibration of pressure measuring instruments and gauges. "Pressure equivalent" calibration of Dead Weight Testers (Pressure balance with associated mass set). Effective area calibration of Dead Weight Testers.	137 kPa to 345 kPa 345 kPa to 7 MPa 7 MPa to 172 MPa 172 MPa to 500 MPa	Q [0.0035 %, 13 Pa] 0.0035 % Q [0.0037 %, 2.4E-13p^2] 0.0080 %	Including cold set pressure determination of pressure relief valves p pressure in Pa Absolute pressure calibrations may be undertaken by associated barometric pressure measurement with an additional uncertainty of 15 Pa	
Hydraulic pressure (differential)				
Calibration of pressure indicating instruments and gauges	0 Pa to (172 - line pressure) MPa (Line pressure 1.7 MPa to 172 MPa)	Q [0.000060 % of line pressure, 0.0055 % of differential pressure, 20 Pa]		
MASS	Nominal value (g) 26 000 20 000 10 000 5 000 2 000 1 000 500 200 100 50 20 10 5 2 1 0.5 0.2 0.1 0.05 0.02 0.01 0.005 0.002 0.001	(mg) 26 20 10 5.0 2.0 1.0 0.50 0.20 0.10 0.060 0.050 0.040 0.032 0.024 0.020 0.016 0.012 0.010 0.0080 0.0060 0.0050 0.0040 0.0040 0.0040	Intermediate values can be calibrated with an uncertainty not less than that interpolated from the next higher and lower nominal value in the table. Calibrations can be given in other units as required. Calibration by substitution	HO

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL				HO
All electrical measurements a carried out using the method of direct comparison or transfer to laboratory reference standards unless otherwise determined in the remark's column.				
DC Voltage	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1050 V	Q [10 μV/V, 0.50 μV] Q [10 μV/V, 1.0 μV] Q [10 μV/V, 10 μV] Q [10 μV/V, 200 μV] Q [10 μV/V, 2.0 mV]	All electrical values can be sourced or measured by comparison unless otherwise stated	
DC Current	0 μA to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 100 mA 100 mA to 200 mA 200 mA to 2 A 2 A to 20 A	Q [20 μA/A,1.0 nA] Q [20 μA/A,10 nA] Q [20 μA/A, 75 nA] Q [40 μA/A, 150 nA] Q [35 μA/A, 0.70 μA] Q [250 μA/A, 30 μA] Q [500 μA/A, 1.0 mA]	 Using nominal 10 Ω shunt	HO
DC Current	100 mA to 202 mA 202 mA to 2.02 A 2.02 A to 20 A 20 A to 1000 A	Q [62 μA/A, 5.5 μA] Q [90 μA/A, 72 μA] Q [330 μA/A, 8.0 mA] Q [0.22 %, 100 mA]	These values can be sourced Simulation using multi turn coil	
DC Resistance	0 Ω to 2 Ω 2 Ω to 20 Ω 20 Ω to 200 Ω 200 Ω to 2 kΩ 2 kΩ to 20 kΩ 20 kΩ to 200 kΩ 200 kΩ to 2 MΩ 2 MΩ to 20 MΩ 20 MΩ to 200 MΩ 200 MΩ to 1 GΩ	Q [15 μΩ/Ω, 20 μΩ] Q [15 μΩ/Ω, 20 μΩ] Q [15 μΩ/Ω, 150 μΩ] Q [15 μΩ/Ω, 1.0 mΩ] Q [15 μΩ/Ω, 15 mΩ] Q [15 μΩ/Ω, 100 mΩ] Q [15 μΩ/Ω, 1.5 Ω] Q [20 μΩ/Ω, 20 Ω] Q [400 μΩ/Ω, 500 Ω] Q [0.35 %, 12 kΩ]		
AC VOLTAGE	60 mV to 200 mV *20 Hz to 55 Hz* *55 Hz to 10 kHz* *10 kHz to 30 kHz* *30 kHz to 100 kHz* 200 mV to 2 V *20 Hz to 55 Hz* *55 Hz to 10 kHz* *10 kHz to 30 kHz* *30 kHz to 100 kHz* *100 kHz to 500 kHz* 2 V to 20 V *20 Hz to 55 Hz* *55 Hz to 10 kHz* *10 kHz to 30 kHz* *30 kHz to 100 kHz* *100 kHz to 500 kHz*	 Q [150 μV/V, 15 μV] Q [120 μV/V, 15 μV] Q [350 μV/V, 16 μV] Q [600 μV/V, 20 μV] Q [140 μV/V, 40 μV] Q [120 μV/V, 40 μV] Q [260 μV/V, 40 μV] Q [350 μV/V, 100 μV] Q [0.65 %, 15 mV] Q [150 μV/V, 260 μV] Q [140 μV/V, 260 μV] Q [260 μV/V, 330 μV] Q [550 μV/V, 1.2 mV] Q [0.65 %, 120 mV]		HO

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
AC VOLTAGE (cont'd)	20 V to 200 V			
	20 Hz to 10 kHz	Q [140 μV/V, 7.0 mV]		
	10 kHz to 30 kHz	Q [260 μV/V, 7.0 mV]		
	30 kHz to 100 kHz	Q [600 μV/V, 15 mV]		
	200 V to 1 kV			
	45 Hz to 10 kHz	Q[200 μV/V, 25 mV]		
	10 kHz to 30 kHz	Q [380 μV/V, 30 mV]		
AC CURRENT	20 μA to 200 μA			
	55 Hz to 5 kHz	Q [0.050 %, 50 nA]		
	5 kHz to 10 kHz	Q [0.060 %, 50 nA]		
	200 μA to 2 mA			
	55 Hz to 10 kHz	Q [0.050 %, 500 nA]		
	2 mA to 20 mA			
	55 Hz to 10 kHz	Q [0.050 %, 5.0 μA]		
	20 mA to 200 mA			
	55 Hz to 10 kHz	Q [0.050 %, 50 μA]		
	200 mA to 2 A			
	55 Hz to 1 kHz	Q [0.060 %, 500 μA]		
	2 A to 20 A			
	55 Hz to 1 kHz	Q [0.060 %, 4.0 mA]		
AC CURRENT	25 μA to 200 μA			HO
	40 Hz to 45 Hz	Q [0.17 %, 410 nA]	These values can be sourced	
	45 Hz to 1 kHz	Q [0.080 %, 390 nA]		
	200 μA to 2 mA			
	40 Hz to 45 Hz	Q [0.18 %, 1.0 μA]		
	45 Hz to 1 kHz	Q [0.075 %, 0.70 μA]		
	2 mA to 20 mA			
	40 Hz to 45 Hz	Q [0.18 %, 1.1 μA]		
	45 Hz to 1 kHz	Q [0.073 %, 7.4 μA]		
	20 mA to 200 mA			
	40 Hz to 45 Hz	Q [0.18 %, 120 μA]		
	45 Hz to 1 kHz	Q [0.077 %, 86 μA]		
	200 mA to 2 A			
	40 Hz to 45 Hz	Q [0.18 %, 1.1 mA]		
	45 Hz to 1 kHz	Q [0.085 %, 770 μA]		
	2 A to 20 A			
	40 Hz to 45 Hz	Q [0.16 %, 11 mA]		
	45 Hz to 100 Hz	Q [0.037 %, 6.6 mA]		
	20 A to 100 A *at 50 Hz*	Q [0.22 %, 100 mA]	Simulation using a multi turn coil	
	100 A to 1000 A *at 50 Hz*	Q [0.22 %, 400 mA]		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
AC RESISTANCE				HO
55 Hz to 1 kHz	30 µΩ to 10 mΩ 10 mΩ to 100 mΩ 100 mΩ to 1 Ω 1 Ω to 10 10 Ω to 100 Ω 100 Ω to 1 k Ω	26 µΩ 0.26 % 0.26 % 0.16 % 0.16 % 0.16 %		
CAPACITANCE				
	1 nF 10 nF 20 nF 50 nF 100 nF 1 µF 10 µF	29 pF 61 pF 99 pF 220 pF 370 pF 5.1 nF 78 nF	For the calibration of measuring devices	
FREQUENCY			Frequency may also be expressed in terms of time; 1/f, for repetitive signals or in other units such as revolutions per minute.	HO
	10 MHz Clock frequency 10 mHz to 80 MHz	1.0 parts in 10^8 5.0 parts in 10^8	Calibration of measuring devices	
	1 mHz to 80 MHz	Q [5.0 parts in 10^8, 5.0 µHz]	Calibration of sources	
TIME INTERVAL	0 s to 1 day	100 ms	Manually triggered single events.	HO
RPM	60 RPM to 60000 RPM	Q [0.0050 %, 0.01 RPM]	Generate	HO
OSCILLOSCOPES				
Vertical deflection coefficients				HO
DC	30 mV to 300 mV 300 mV to 120 V	1.1 % 0.30 %	Square-wave & DC signals appropriate for the calibration of oscilloscope vertical deflection coefficients	
Peak to Peak Voltage *1 kHz*	30 mV to 300 mV 300 mV to 6 V	1.3 % 0.70 %		
Horizontal deflection coefficients				
Time	10 ns to 1 s	0.10 %	Pulse markers The uncertainties quoted above are based on the readout resolution of typical oscilloscopes.	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL SIMULATION OF TEMPERATURE Thermocouple capabilities listed below are given for type T Base and Type S Noble, using EMF sensitivity values as listed in BS EN 60584-1:2013. Other Thermocouple types can be calibrated, the uncertainties will correspond to the appropriate sensitivities listed. Calibrations which include the internal reference junction (CJC) are available for types: J, K, N, T, E, R, S, B & C				HO
Base Metal Thermocouples Noble Metal Thermocouples	-200 °C to +1400 °C 0 °C to 500 °C 500 °C to 1800 °C	0.050 °C 0.080 °C 0.050 °C	Excluding automatic CJC	
Base Metal Thermocouples Noble Metal Thermocouples Cold Junction Compensation	-200 °C to +1400 °C 0 °C to 500 °C 500 °C to 1800 °C 0 °C to 30 °C	0.17 °C 0.26 °C 0.25 °C 0.15 °C	Including automatic CJC	
Resistance thermometers by simulation Values below are based upon a PT100. Other resistance thermometer types, including thermocouples with a defined resistance scale can also be calibrated based on the resistance capabilities listed above.				
Resistance thermometer simulation	-200 °C to + 830 °C	0.0050 °C		
TEMPERATURE Temperature indicators and recorders, with temperature sensor(s)	0.01 °C (Water Triple Point) -95 °C to +140 °C 140 °C to 150 °C 150 °C to 660 °C	0.0050 °C 0.055 °C 0.080 0.10 °C	Fixed point Calibrations within both metal and liquid media	HO
Resistance thermometers	0.01 °C (Water Triple Point) -95 °C to +140 °C 140 °C to 150 °C 150 °C to 660 °C	0.0050 °C 0.055 °C 0.080 °C 0.10 °C	Calibrations within both metal and liquid media	
Thermocouples Base Metal	-95 °C to 0 °C 0 °C to 30 °C 30 °C to 660 °C	0.40 °C 0.10 °C 0.40 °C	Calibrations within both metal and liquid media	
Noble Metal Type R and S Type B	 0 °C to 660 °C 0 °C to 660 °C	 0.40 °C 2.0 °C	 Calibrations within both metal and liquid media	
Metal Block Calibrators and portable liquid baths	-100 °C to +250 °C 250 °C to 660 °C	0.050 °C 0.13 °C	Method consistent with Euramet CG 13 Includes axial, radial and stability information	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
DIMENSIONAL Orifice plates	BS EN ISO 5167-2:2003 (drain hole corrections can be made using equation (1) in PD ISO/TR 15377:2018 when appropriate) 10.0 to 300 bore (d) diameters 300 to 700 bore (d) diameters Perpendicularity of bore Plate thickness (E) Edge thickness (e) Surface roughness - Ra Flatness of face Bevel angle (α) Edge radius (G) Plate eccentricity Drain hole diameter	 12 16 0.20 ° 10 40 0.10 10 1.0 ° 20 10 40	NOTES RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED The uncertainty quoted is for the departure from either flatness, straightness, parallelism, or squareness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration.	HO
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: $Q[a, b] = [a^2 + b^2]^{1/2}$