


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>0822</p> <p>Accredited to ISO/IEC 17025:2017</p>	<h3>Chamois Metrology Limited</h3> <p>Issue No: 084 Issue date: 29 July 2021</p>	
	<p>Unit 8 The Centre Holywell Business Park Northfield Road Southam Warwickshire CV47 0FP</p>	<p>Contact: Mr A Garthwaite Tel: +44 (0)1926 812066 Fax: +44 (0)1926 813569 E-Mail: lab@chamois.net Website: www.chamois.net</p>

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
<p>Address Unit 8 The Centre Holywell Business Park Northfield Road Southam Warwickshire CV47 0FP</p>	<p>Local contact Mr A Garthwaite</p>	<p><u>Mass calibration</u> <u>Electrical calibration</u> <u>Pressure calibration</u> <u>Temperature calibration</u> <u>Dimensional calibration</u></p>	UK
<p>Address Metrology division Unit K2 M7 Business Park Newhall Naas County Kildare Ireland</p>	<p>Local contact Mr P Kinsella Tel. +353 (0) 45 896660 Fax. +353 (0) 45 896713 Email : info@classictechnology.ie</p>	<p><u>Pressure calibration</u> <u>Electrical calibration</u> <u>Temperature calibration</u> <u>Mass calibration</u> <u>Humidity calibration</u></p>	IRE

Site activities performed away from the locations listed above:

Location details		Activity	Location code
<p>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</p>	<p>Local contact Mr A Garthwaite</p>	<p><u>Pressure calibration</u></p>	Site



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Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
<p>PRESSURE</p> <p>Gas pressure (absolute)</p> <p>Calibration of pressure measuring instruments and gauges</p> <p>Gas pressure (gauge)</p> <p>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</p> <p>Gas pressure (differential)</p> <p>Calibrations of differential pressure devices with low and high pressure ports at a common mode pressure of 3.5kPa</p> <p>Calibration of pressure indicating instruments and gauges</p>	<p>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</p> <p>- 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</p> <p>6 Pa to 10 kPa (Line pressure 3.5 kPa)</p> <p>0 Pa to (7 - line pressure) MPa (Line pressure 200 kPa to 7 MPa)</p> <p>7 MPa to (27.6 - line pressure) MPa (Line pressure 7 MPa to 27.6 MPa)</p> <p>0 Pa to (41.4 - line pressure) MPa (Line pressure 27.6 MPa to 41.4 MPa)</p>	<p>10 % 0.0040 % + 32 Pa 0.0030 % + 1.0 Pa 0.0025 % + 1.0 Pa 0.0025 % + 10 Pa 0.0045 % + 10 Pa</p> <p>0.0035 % 0.0095 % + 0.60 Pa 0.0040 % + 0.50 Pa 0.0022 % + 0.030 Pa 0.0017 % 0.0025 % 0.0045 %</p> <p>0.010 % + 0.060 Pa</p> <p>0.000060 % of line pressure, plus 0.0035 % of differential pressure, plus 5.0 Pa</p> <p>0.000060 % of line pressure, plus 0.0035 % of differential pressure, plus 10 Pa</p> <p>0.000065 % of line pressure, plus 0.0060 % of differential pressure, plus 16 Pa</p>	<p>Methods consistent with EURAMET CG3 and CG17 Including cold set pressure determination of pressure relief valves</p> <p>Calibration of pressure measuring devices with an electrical output may be undertaken.</p> <p>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 $\pm (0.0030 \% + 0.030 \text{ Pa})$.</p> <p>Differential pressure cells may be calibrated using digital communications protocols</p> <p>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.</p>	<p>UK & Site</p>



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
<p>PRESSURE (cont'd)</p> <p>Hydraulic pressure (gauge)</p> <p>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. Hydraulic pressure (absolute)</p> <p>Calibration of pressure measuring instruments and gauges.</p> <p>Hydraulic pressure (differential)</p> <p>Calibration of pressure indicating instruments and gauges</p>	<p>137 kPa to 200 kPa 200 kPa to 7 MPa 7 MPa to 172 MPa</p> <p>172 MPa to 345 MPa 345 MPa to 500 MPa</p> <p>200 kPa to 7 MPa 7 MPa to 172 MPa</p> <p>172 MPa to 345 MPa 345 MPa to 500 MPa</p> <p>0 Pa to (172 - line pressure) MPa (Line pressure 1.7 MPa to 172 MPa)</p>	<p>0.0040 % + 14 Pa 0.0035 % + 14 Pa 0.0035 % + 2.4E-13p² 0.0080 % 0.015 %</p> <p>0.0040 % + 28 Pa 0.0035 % + 2.4E-13p² + 15 Pa 0.0080 % 0.015 %</p> <p>0.000060 % of line pressure plus 0.0055 % of differential pressure plus 20 Pa</p>	<p>Including cold set pressure determination of pressure relief valves p pressure in Pa</p> <p>p pressure in Pa</p>	<p>UK & Site</p>
<p>MASS</p>	<p>Nominal value (g)</p> <p>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</p>	<p>(mg)</p> <p>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</p>	<p>Intermediate values can be calibrated with an uncertainty not less than that interpolated from the next higher and lower nominal value in the table.</p> <p>Calibrations can be given in other units as required.</p> <p>Calibration by substitution</p>	<p>UK</p>



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
ELECTRICAL				UK
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	10 μ V/V + 0.5 μ V 10 μ V/V + 1.0 μ V 10 μ V/V + 10 μ V 10 μ V/V + 200 μ V 10 μ V/V + 2.0 mV	All electrical values can be sourced or measured by comparison unless otherwise stated	
DC Current	0 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 100 mA	20 μ A/A + 1.0 nA 20 μ A/A + 10 nA 20 μ A/A + 75 nA 40 μ A/A + 150 nA	Using nominal 10 Ω shunt	UK
DC Current	100 mA to 200 mA 200 mA to 2 A 2 A to 20 A	35 μ A/A + 0.70 μ A 250 μ A/A + 30 μ A 500 μ A/A + 1.0 mA		
DC Current	100 mA to 202 mA 202 mA to 2.02 A 2.02 A to 20 A	62 μ A/A + 5.5 μ A 90 μ A/A + 72 μ A 330 μ A/A + 8.0 mA	These values can be sourced	
DC Resistance	20 A to 1000 A	0.22 % + 100 mA	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 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 1 G Ω	15 μ Ω / Ω + 20 μ Ω 15 μ Ω / Ω + 20 μ Ω 15 μ Ω / Ω + 150 μ Ω 15 μ Ω / Ω + 1.0 m Ω 15 μ Ω / Ω + 15 m Ω 15 μ Ω / Ω + 100 m Ω 15 μ Ω / Ω + 1.5 Ω 20 μ Ω / Ω + 20 Ω 400 μ Ω / Ω + 500 Ω 0.35 % + 12 k Ω		
AC VOLTAGE	1 mV to 200 mV 20 Hz to 55 Hz 55 Hz to 10 kHz 10 kHz to 30 kHz 30 kHz to 100 kHz	150 μ V/V + 15 μ V 120 μ V/V + 15 μ V 350 μ V/V + 16 μ V 600 μ V/V + 20 μ V		UK
	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	140 μ V/V + 40 μ V 120 μ V/V + 40 μ V 260 μ V/V + 40 μ V 350 μ V/V + 100 μ V 0.65 % + 15 mV		
	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	150 μ V/V + 260 μ V 140 μ V/V + 260 μ V 260 μ V/V + 330 μ V 550 μ V/V + 1.2 mV 0.65 % + 120 mV		



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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 10 kHz to 30 kHz 30 kHz to 100 kHz	140 μ V/V + 7.0 mV 260 μ V/V + 7.0 mV 600 μ V/V + 15 mV		
AC CURRENT	200 V to 1 kV 45 Hz to 10 kHz 10 kHz to 30 kHz 20 μ A to 200 μ A 55 Hz to 5 kHz 5 kHz to 10 kHz	200 μ V/V + 25 mV 380 μ V/V + 30 mV 0.050 % + 50 nA 0.060 % + 50 nA		
	200 μ A to 2 mA 55 Hz to 10 kHz	0.050 % + 500 nA		
	2 mA to 20 mA 55 Hz to 10 kHz	0.050 % + 5.0 μ A		
	20 mA to 200 mA 55 Hz to 10 kHz	0.050 % + 50 μ A		
	200 mA to 2 A 55 Hz to 1 kHz	0.060 % + 500 μ A		
AC CURRENT	2 A to 20 A 55 Hz to 1 kHz	0.060 % + 4.0 mA		
	25 μ A to 200 μ A 40 Hz to 45 Hz 45 Hz to 1 kHz	0.17 % + 410 nA 0.080 % + 390 nA	These values can be sourced	UK
	200 μ A to 2 mA 40 Hz to 45 Hz 45 Hz to 1 kHz	0.18 % + 1.0 μ A 0.075 % + 0.70 μ A		
	2 mA to 20 mA 40 Hz to 45 Hz 45 Hz to 1 kHz	0.18 % + 1.1 μ A 0.073 % + 7.4 μ A		
	20 mA to 200 mA 40 Hz to 45 Hz 45 Hz to 1 kHz	0.18 % + 120 μ A 0.077 % + 86 μ A		
	200 mA to 2 A 40 Hz to 45 Hz 45 Hz to 1 kHz	0.18 % + 1.1 mA 0.085 % + 770 μ A		
	2 A to 20 A 40 Hz to 45 Hz 45 Hz to 100 Hz	0.16 % + 11 mA 0.037 % + 6.6 mA		
	20 A to 100 A at 50 Hz	0.22 % + 100 mA	Simulation using a multi turn coil	
	100 A to 1000 A at 50 Hz	0.22 % + 400 mA		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
AC RESISTANCE <i>55 Hz to 1 kHz</i>	30 $\mu\Omega$ to 10 m Ω 10 m Ω to 100 m Ω 100 m Ω to 1 Ω 1 Ω to 10 10 Ω to 100 Ω 100 Ω to 1 k Ω	26 $\mu\Omega$ 0.26 % 0.26 % 0.16 % 0.16 % 0.16 %		UK
CAPACITANCE	1 nF 10 nF 20 nF 50 nF 100 nF 1 μ F 10 μ F	29 pF 61 pF 99 pF 220 pF 370 pF 5.1 nF 78 nF	For the calibration of measuring devices	
FREQUENCY	10 MHz Clock frequency 10 mHz to 80 MHz 1 mHz to 80 MHz	1.0 parts in 10^8 5.0 parts in 10^8 5.0 parts in $10^8 + 5.0 \mu$ Hz	Frequency may also be expressed in terms of time; 1/f, for repetitive signals or in other units such as revolutions per minute. Calibration of measuring devices Calibration of sources	UK
TIME INTERVAL	0 s to 1 day	100 ms	Manually triggered single events.	UK
RPM	60 RPM to 60000 RPM	0.0050 % + 0.01 RPM	Generate	UK
OSCILLOSCOPES				
Vertical deflection coefficients				UK
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 <i>1 kHz</i>	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.	



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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				UK
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	-200 °C to +1400 °C 0 °C to 500 °C 500 °C to 1800 °C	0.17 °C 0.26 °C 0.25 °C	Including automatic CJC	
Cold Junction Compensation	0 °C to 30 °C	0.15 °C		
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)				UK
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	Fixed point Calibrations within both metal and liquid media	
Thermocouples Base Metal	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	
Noble Metal Type R and S Type B	-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	
Metal Block Calibrators and portable liquid baths	0 °C to 660 °C 0 °C to 660 °C	0.40 °C 0.70 °C	Calibrations within both metal and liquid media	
	-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	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
LENGTH				
Orifice plates	BS EN ISO 5167-2:2003 Bore diameter 10 to 700	8	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.	UK
Micrometers, External	BS 870:2008 0 to 125	Heads:2.0 between any two points		
Calliper gauges (inc. Vernier, dial and digital)	BS 887:2008 0 to 300	Overall performance 20		
Dial gauges and dial test indicators	BS 907:2008 and BS 2795:1981 0 to 100	1.0		
Length gauges, flat and spherical ended	0 to 100 BS 870:2008	1.0 + (8.0 x length in m)		
ANGLE				
Squares, blade type	BS 939:2007 50 to 300	3.0 (see note)		
Spirit levels	BS 3509:1962 and BS 958:1968 5 seconds of arc to 60 minutes of arc nominal sensitivity	Mean sensitivity 10 % of nominal Minimum 1.5 seconds of arc		
FORM				
Straightedges Cast iron, Steel and Granite	BS 5204:Part 1:1975 BS 5204:Part 2:1977 0 to 1800	3.0 + (2.0 x length in m) (see note)		UK
PRESSURE				
Gas pressure (absolute)			Calibration of pressure measuring devices with an electrical output may be undertaken. Methods consistent with EURAMET CG17	IRE
Calibration of pressure measuring instruments and gauges	1.4 kPa to 710 kPa 710 kPa to 10.1 MPa	0.0050 % + 2.0 Pa 0.0050 % + 20 Pa		
Gas pressure (gauge)				
Calibration of pressure measuring instruments and gauges	-100 kPa to -1.4 kPa 1.4 kPa to 10 MPa	0.0050 % 0.0050 %		
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)	0.010 % + 0.060 Pa		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Hydraulic pressure (gauge) Calibration of pressure measuring instruments and gauges	358 kPa to 3.5 MPa 3.5 MPa to 111.5 MPa	0.0090 % + 30 Pa 0.0075 %		IRE
Hydraulic pressure (absolute) Calibration of pressure measuring instruments and gauges	458 kPa to 3.6 MPa 3.6 MPa to 111.6 MPa	0.0090 % + 50 Pa 0.0075 % + 20 Pa		
MASS	Nominal value (g)	(mg)		IRE
	20 000	10	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	
	10 000	5.3		
	5 000	2.7		
	2 000	1.0		
	1 000	0.53		
	500	0.27		
	200	0.10		
	100	0.053		
	50	0.033		
	20	0.027		
	10	0.020		
	5	0.017		
	2	0.013		
	1	0.010		
	0.5	0.0083		
	0.2	0.0067		
	0.1	0.0053		
	0.05	0.0040		
	0.02	0.0033		
	0.01	0.0027		
	0.005	0.0020		
	0.002	0.0020		
	0.001	0.0020		
ELECTRICAL				
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 1 kV	10 μ V/V + 1.5 μ V 10 μ V/V + 1.5 μ V 10 μ V/V + 10 μ V 10 μ V/V + 200 μ V 10 μ V/V + 2.0 mV		IRE
DC CURRENT	0 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 40 mA 40 mA to 200 mA 200 mA to 2 A 2 A to 20 A	20 μ A/A + 1 nA 20 μ A/A + 10 nA 20 μ A/A + 75 nA 50 μ A/A + 150 nA 35 μ A/A + 700 nA 250 μ A/A + 30 μ A 500 μ A/A + 1.0 mA	Using nominal 10 Ω shunt	IRE



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
DC CURRENT (continued)	100 mA to 202 mA 202 mA to 2.02 A 2.02 A to 20 A	130 μ A/A + 6.6 μ A 150 μ A/A + 180 μ A 420 μ A/A + 1.5 mA	Calibration of measuring devices by comparison	IRE
	20 A to 1500 A	0.22 % + 100 mA	Simulation using a multi turn coil	
DC RESISTANCE	0 Ω to 2 Ω	15 $\mu\Omega/\Omega$ + 20 $\mu\Omega$	AC Values can be sourced or measured by comparison up to 1 kHz, above that frequency is for measurement only.	IRE
	2 Ω to 20 Ω	15 $\mu\Omega/\Omega$ + 20 $\mu\Omega$		
	20 Ω to 200 Ω	15 $\mu\Omega/\Omega$ + 150 $\mu\Omega$		
	200 Ω to 2 k Ω	15 $\mu\Omega/\Omega$ + 1.0 m Ω		
	2 k Ω to 20 k Ω	15 $\mu\Omega/\Omega$ + 15 m Ω		
	20 k Ω to 200 k Ω	15 $\mu\Omega/\Omega$ + 100 m Ω		
	200 k Ω to 2 M Ω	15 $\mu\Omega/\Omega$ + 1.5 Ω		
	2 M Ω to 20 M Ω	20 $\mu\Omega/\Omega$ + 20 Ω		
	20 M Ω to 200 M Ω	400 $\mu\Omega/\Omega$ + 500 Ω		
	200 M Ω to 1 G Ω	0.35 % + 12 k Ω		
AC VOLTAGE	1 mV to 200 mV	150 μ V/V + 15 μ V 120 μ V/V + 15 μ V 350 μ V/V + 16 μ V 600 μ V/V + 20 μ V	AC Values can be sourced or measured by comparison up to 1 kHz, above that frequency is for measurement only.	IRE
	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	140 μ V/V + 40 μ V 120 μ V/V + 40 μ V 260 μ V/V + 40 μ V 350 μ V/V + 100 μ V 0.65 % + 15 mV		
	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	150 μ V/V + 260 μ V 140 μ V/V + 260 μ V 260 μ V/V + 330 μ V 550 μ V/V + 1.2 mV 0.75 % + 120 mV		
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				
20 V to 200 V	140 μ V/V + 7 mV 260 μ V/V + 7 mV 600 μ V/V + 15 mV			
20 Hz to 10 kHz				
10 kHz to 30 kHz				
30 kHz to 100 kHz				
200 V to 1 kV	200 μ V/V + 25 mV 380 μ V/V + 30 mV			
50 Hz to 10 kHz				
10 kHz to 30 kHz				
AC CURRENT	10 μ A to 200 μ A	0.050 % + 50 nA 0.060 % + 50 nA 0.050 % + 500 nA	AC Values can be sourced or measured by comparison up to 1 kHz, above that frequency is for measurement only.	IRE
	55 Hz to 5 kHz			
	5 kHz to 10 kHz			
	200 μ A to 2 mA			
55 Hz to 10 kHz				



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AC CURRENT (cont'd)	2 mA to 20 mA 55 Hz to 10 kHz	0.050 % + 5.0 μ A		IRE	
	20 mA to 200 mA 55 Hz to 10 kHz	0.050 % + 50 μ A			
CAPACITANCE	200 mA to 2 A 55 Hz to 10 kHz	0.085 % + 500 μ A	Calibration of measuring devices by comparison	IRE	
	2 A to 20 A 55 Hz to 5 kHz	0.20 % + 5.0 mA			
	25 μ A to 202 μ A 40 Hz to 45 Hz 45 Hz to 999 Hz	0.28 % + 420 nA 0.099 % + 390 nA			
	202 μ A to 2.02 mA 40 Hz to 45 Hz 45 Hz to 999 Hz	0.22 % + 1.2 μ A 0.094 % + 0.80 μ A			
	2.02 mA to 20.2 mA 40 Hz to 45 Hz 45 Hz to 999 Hz	0.23 % + 12 μ A 0.094 % + 7.9 μ A			
	20.2 mA to 202 mA 40 Hz to 45 Hz 45 Hz to 999 Hz	0.22 % + 120 μ A 0.94 % + 90 μ A			
	202 mA to 2.02 A 40 Hz to 45 Hz 45 Hz to 999 Hz	0.25 % + 1.2 mA 0.11 % + 0.11 mA			
	2.02 A to 20 A 40 Hz to 45 Hz 45 Hz to 999 Hz	0.34 % + 13 mA 0.073 % + 4.4 mA			
	20 A to 100 A, 40 Hz to 60 Hz 100 A to 1500 A, 40 Hz to 60 Hz	0.25 % + 100 mA 0.25 % + 400 mA			Simulation using a multi turn coil
	1 nF 10 nF 20 nF 50 nF 100 nF 1 μ F 10 μ F 100 μ F 1 mF 10 mF	29 pF 58 pF 92 pF 190 pF 360 pF 5.1 nF 74 nF 840 nF 13 μ F 130 μ F			Calibration of measuring devices by comparison
FREQUENCY	0.01 Hz to 50 MHz	5.0 parts in 10^8	Frequency may also be expressed in terms of time; $1/f$, for repetitive signals or in other units such as revolutions per minute.	IRE	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
RPM (Revolutions per minute)	2 rpm to 10 rpm 10 rpm to 100 rpm 100 rpm to 1000 rpm 1 000 rpm to 10 000 rpm 10 000 rpm to 100 000 rpm	0.0010 % + 0.00050 rpm 0.0010 % + 0.0020 rpm 0.0010 % + 0.020 rpm 0.0010 % + 0.20 rpm 0.0010 % + 2.0 rpm		IRE
TIME INTERVAL	Longer than 100 ms	2.0 μ s/s + 20 ms	Manually triggered single events. Electronically triggered single events	IRE
	Longer than 80 ns	2.0 μ s/s + 80 ns		IRE
RCD				
Trip current	2 mA to 3 A 20 ms to 190 ms	5.8 % + 240 μ A	Laboratory loop 0.20 Ω	IRE
	2 mA to 3 A 190 ms to 5 s	1.4 % + 80 μ A		
Trip time	20 ms to 400 ms	1.0 ms		
	400 ms to 5 s	10 ms		
AC resistance for Loop 50 Hz				IRE
Nominal Ranges	0.2 Ω to 10 Ω	0.6% + 4.8 m Ω		
	10 Ω to 100 Ω	0.6% + 19 m Ω		
	100 Ω to 1 k Ω	0.6% + 36 m Ω		
Earth Bond Resistance	0 Ω to 10 Ω	0.60 % + 4.8 m Ω		IRE
	10 Ω to 100 Ω	0.60 % + 19 m Ω		
	100 Ω to 1 k Ω	0.60 % + 36m Ω		
Earth bond current 50 Hz	10 mA to 500 mA	1.8 % + 7.0 mA		
	100 mA to 10 A	1.8 % + 70 mA		
	10 A to 30 A	1.8 % + 70 mA		
Load	0.13 kVA	6.0 %		
Leakage Current At nominal 240 V 50 Hz	2 mA to 8 mA	1.8 % + 11 μ A		IRE
Insulation Test Voltage	50 V to 1000 V	1.2 % + 950 mV		
Insulation Resistance	10 k Ω to 100 k Ω	0.12 % + 200 m Ω		
	101 k Ω to 1 M Ω	0.12 %		
	1.01 M Ω to 10 M Ω	1.2 %		
	10.1 M Ω to 100 M Ω	1.2 %		
	101 M Ω to 1 G Ω	1.4 %		
	1.01 G Ω to 10 G Ω	7.0 %		
AC Voltage				
Nominal 50 Hz	100 V to 400 V	0.25 % + 160 mV		IRE



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Continuity Resistance	20 mΩ to 1000 Ω	0.30 % + 30 mΩ		IRE
Continuity Current At a nominal 1 Ω	10 mA to 300 mA	1.6 % + 0.80 mA		
ELECTRICAL SIMULATION OF TEMPERATURE				
Thermocouple capabilities listed below are given for type T Base and Type C 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				
Base Metal Thermocouples	-200 °C to +1400 °C	0.10 °C	Excluding automatic CJC	IRE
Noble Metal Thermocouples	0 °C to 2315 °C	0.10 °C		
Base Metal Thermocouples	-200 °C to +1400 °C	0.25 °C	Including automatic CJC	
Noble Metal Thermocouples	500 °C to 1800 °C	0.26 °C		
Cold Junction Compensation	0 °C to 30 °C	0.15 °C		
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 840 °C	0.0050 °C		IRE
TEMPERATURE				
Temperature indicators and recorders, with temperature sensor(s)	0.01 °C (Water Triple Point) -196 °C (LN2) -95 °C to -80 °C -80 °C to +300 °C 300 °C to 450 °C 450 °C to 650 °C	0.0030 °C 0.015 °C 0.025 °C 0.015 °C 0.027 °C 0.094 °C	In a range of liquid and metal media baths	IRE
Platinum Resistance Thermometers (4 wire)	0.01 °C (Water Triple Point) -196 °C (LN2) -95 °C to -80 °C -80 °C to +300 °C 300 °C to 450 °C 450 °C to 650 °C	0.0030 °C 0.015 °C 0.025 °C 0.015 °C 0.027 °C 0.094 °C	In a range of liquid and metal media baths	
Metal Block Calibrators and portable liquid baths	-100 °C to +100 °C 100 °C to 300 °C 300 °C to 420 °C 420 °C to 650 °C 0 °C	0.030 °C 0.038 °C 0.15 °C 0.16 °C 0.020 °C	Method consistent with Euramet CG 13 Suitable zero reference baths	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
HUMIDITY				
Dew-point	-25 °C to +60 °C	0.17 °C	Calibrations undertaken in an air chamber	IRE
Temperature sensors in air	0 °C to 60 °C	0.10 °C		
Relative humidity	Example conditions	Corresponding to above dew-point and temperature uncertainties		
	At 0 °C: 10 %rh to 90 %rh	0.20 %rh to 1.1 %rh		
	At 23 °C: 5 %rh to 95 %rh	0.20 %rh to 1.1 %rh		
	At 60 °C: 5 %rh to 90 %rh	0.20 %rh to 0.80 %rh		
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: $Q[a, b] = [a^2 + b^2]^{1/2}$