Schedule of Accreditation

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Rhopoint 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 Eurolab House Unit 10 Valepits Road Garretts Green Industrial Estate Birmingham B33 0TD	Dean Hughes	Dimensional Electrical Mass Pressure Gloss	BHM

Location details		Activity	Location code
Address Unit 28 Old Mills Industrial Estate Paulton Bristol BS39 7SU	Dean Hughes	Dimensional Temperature Electrical	BRS

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers premises	Dean Hughes	Dimensional Electrical Mass Pressure	Site

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH			NOTES	
Gauge blocks		Class (see footnote)		BHM
Inch (Steel and tungsten carbide)	BS 4311:2007 0.01 in to 0.4 in 0.4 in up to 1 in Size 2 in 3 in 4 in Variation	C D 3.0 4.0 4.0 5.0 5.0 7.0 µ in 6.0 8.0 7.0 10 3.0	By comparison with reference end standards	
Millimetre (Steel and tungsten carbide)	BS EN ISO 3650:1999 0.5 to 10 10 up to 25 Size 30, 40, 50 60, 70, 75 80, 90, 100 Variation	C D 0.080 0.10 0.10 0.13 0.12 0.17 0.15 0.21 0.18 0.25 0.08		

Footnote
Class C uncertainties apply to the measurement of length of steel and tungsten carbide gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to grade 0, 1 and 2 gauges to BS EN ISO 3650:1999 and BS 4311:2007.

Class D uncertainties represent the best capability for the measurement of length of gauges by comparison with grade K standards of length of a dissimilar material.

Notes

1 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.

2. Single start, symmetrical thread forms only.

3. Single and multi-start symmetrical and asymmetrical thread forms

4. Functional test of size using setting plugs calibrated with a CMC of 3.0 µm

5. Includes use of check plugs for screw rings from 1 mm to 2.5 mm diameter.

6. The stated uncertainty has been calculated in accordance with ISO 14253-5 and relates to the test value uncertainty. The uncertainty quoted excludes contributions relating to the instrument under test

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (cont.)				
Thread measuring cylinders	BS 5590 and specials 0.1 to 5	0.50	By comparison with reference standards	BHM
Plain plug gauges (parallel) cylindrical setting standards and rollers	1 to 25 diameter 25 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 300 diameter 300 to 600 diameter	0.80 1.0 1.3 1.6 2.2 4.0	on diameter	By comparison with reference standards	BHM
	Concentricity TIR	1.4		
Plain plug gauges (taper)				BHM
Parallel to 1 in 8 on diameter	3 to 50 diameter 50 to 100 diameter 100 to 200 diameter 200 to 300 diameter	3.0 4.0 5.0 6.0	on diameter	By comparison with reference standards	
1 in 8 to 1 in 3 on diameter	3 to 50 diameter 50 to 100 diameter 100 to 200 diameter 200 to 300 diameter	5.0 6.0 7.0 8.0			
Plain ring gauges (parallel) and setting standards	2 to 25 diameter 25 to 100 diameter 100 to 150 diameter 150 to 200 diameter 200 to 400 diameter 400 to 600 diameter	0.8 1.0 2.0 3.0 4.0 6.0	on diameter	By comparison with reference standards	BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (cont'd) Plain ring gauges (taper)				BHM
Parallel to 1 in 8 on diameter	2 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter	4.0 5.0 6.0 7.0	.	
1 in 8 to 1 in 3 on diameter	2 to 50 diameter 50 to 100 diameter 100 to 150 diameter 150 to 200 diameter	6.0 7.0 8.0 9.0 on diameter	By comparison with reference standards	
Length gauges, flat and spherical ended	0 to 600	1.0 + (5.0 x length in m)	By comparison with reference standards	BHM
Plain gap gauges (parallel)	0.5 to 100 100 to 200 200 to 300	3.0 5.0 8.0	By comparison with reference standards	BHM
Receiver, position and profile gauges, jigs, fixtures (see note 1)	0 to 200 x 200 x 200	Minimum per coordinate: 3.0 + (10 x length in m)	Using documented in-house methods	BHM
Parallels	As BS 906:1972 5 to 50 x 100 x 400	0.5 to 5.0		BHM
Vee blocks	As BS 3731:1987 20 to 150	2.5 to 5.0		BHM
Screw plug gauges (parallel) including check and setting plugs See Note 3	1 to 100 diameter 100 to 300 300 to 600	3.0 5.0 8.0 on pitch diameter		BHM
Screw plug gauges (taper) including check plugs See Note 2	2 to 100 100 to 300 300 to 500	5.0 8.0 10		
Screw ring gauges (parallel) See Note 3 and 5	1 to 100 diameter 100 to 150 150 to 200 200 to 300 300 to 600	5.0 6.0 7.0 8.0 12 on pitch diameter	Methods consistent with NPL Notes on Applied Science No. 1.	
Screw ring gauges (tapered) See Note 2	6 to 100 diameter 100 to 200 200 to 400 400 to 600	7.0 10 13 16		
Screw pitch Screw flank angle	0.2 to 8 0° to 52°	1.5 5.0 minutes of arc	Mechanical and optical comparison	
Screw thread adjustable caliper gauges (parallel) See Note 3	1 to 200 diameter	See note 5	By use of setting plugs	BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (cont'd)				
Vee grooved jaw blades	0.6 (40 tpi) to 6.0 (4.5 T.P.I)	3.0	Documented in-house methods.	BHM
Vee grooved end pieces	0.6 (40 T.P.I) to 6.0 (4.5 T.P.I)	3.0	Documented in-house methods.	BHM
Plain end pieces	0 to 0.001	0.50 on flatness	Documented in-house methods.	BHM
Thread Stylii	0.6 (40 T.P.I) to 6.0 (4.5 T.P.I)	0.10 on form	Documented in-house methods.	BHM
Thread measuring vee pieces (prisms)	NPL Schedule MOY/SCM1/60 0 to 4.5	0.50		BHM
Penetration needles and cones	Needles to BS 2000-49:2007 0 to 2 diameter Cones to BS 2000:Part 50:1993 0 to 10 diameter	3.0 on diameter Mass 5.0 mg		BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
ANGLE				
Squares				BHM
Blade type	BS 939:2007 50 to 300 300 to 600 600 to 1000	 4.0 5.0 8.0		
Cylindrical	BS 939:2007 75 to 450 450 to 600 600 to 1000	 2.5 On squareness 3.5 See Note 1 7.0		
Block	BS 939:2007 50 to 300 300 to 600 600 to 1000	 3.0 5.0 8.0		
Angle plates and box angle plates	BS 5535:1978 50 to 450	Squareness: 3.0 + (1.0 per 100 mm) Flatness and Parallelism: 1.2 + (1.0 per 100 mm) See Note 1		BHM
Sine bars and tables	BS 3064:1978 0 up to 500	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 3.0 seconds of arc		BHM
Compound sine tables	0 to 500 length	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 3.0 seconds or arc	In house methods based on BS 3064:1978	BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
FORM				
Roundness External Internal	 0 to 350 diameter 5 to 350 diameter	 0.050 on radius	Mechanical styus form measurement	BHM
Straightedges Cast iron, Steel and Granite	 BS 5204:Part 1:1975 BS 5204:Part 2:1977 0 to 2000	 1.0 + (2.0 x length in m) See Note 1		BHM
Precision balls: Steel and Tungsten Carbide	 1 to 30	 0.80 on diameter	By comparison with reference standards	BHM
Surface plates Granite & cast iron	BS 817:2008 160 x 100 to 10m x 6m Flatness of working surface (Note1): Local variation of working surface:	 1.50 + (0.80 x diagonal in m) 3.0		BHM, Site
Surface texture (excluding measurement standards and roughness comparison specimens)	BS 1134:Part 1:1988 Ra 0.02 µm to 80 µm	7.0 % of measured Ra, minimum 0.10		BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
External micrometer	BS 870:2008 0 to 600 Heads: (Zero) Setting, 0 to 25: (Zero) Setting, 25 to 600: Flatness of anvils: Parallelism of anvils:	 2.0 between any two points 1.0 1.0 + (5.0 x length in m) 1.0 2.0		BHM
Internal micrometer	BS 959:2008 0 to 900	Heads: 2.0 between any two points Setting and extension rods: 1.0 + (5.0 x length in m)		BHM
Depth micrometer	BS 6468:2008 0 to 300	Heads: 2.0 between any two points Setting and extension rods: 1.0 + (5.0 x length in m)		BHM
3 point bore	0 to 150 150 to 250	5.0 8.0		BHM
Micrometer heads	BS 1734:1951 0 to 100	1.0		BHM
Bench micrometer	NPL MOY/SCMI 22 0 to 100	Overall performance 2.0		BHM
Height gauges - (Simple) including vernier, dial and digital types	BS EN ISO 13225:2012 0 to1000	Overall performance: 2.0 + (5.0 x length in m)		
Vernier, digital electronic, dial caliper, height and depth gauges	BS 887:2008 0 to 1000 BS 1643:2008 0 to 1000 BS 6365:2008 0 to 600	Overall performance 10 + (30 x length in m)		BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Calipers (see note 6)	ISO 13385-1 2019 Partial surface contact error (E) 0 to 1000 mm	4.0		BHM
	Shift error (S) internal jaws 3 to 50 mm	4.0		
	Shift error (S) depth and step 3 to 50 mm	4.0		
Dial gauges and dial test indicators	BS 907:2008 and BS 2795:1981 0 to 50	1.0		BHM
Displacement transducers	0 to 200	1.0	Documented in-house methods.	BHM
Height setting micrometer	0 to 300	Heads 1.0 Overall performance 3.0	Documented in-house methods.	BHM
Riser blocks for above	150 300	2.5 5.0	By comparison with reference standards	BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
MEASURING INSTRUMENTS AND MACHINES (cont'd)				
Height gauges, electronic	0 to 1000	1.0 + (5.0 x length in m)	Documented in-house methods.	BHM
Profile projectors	10 to 100 magnifications Linear 0 to 600 Angular 0° to 360°	Magnification 125 at screen Linear 5.0 Angular 2.0 mins of arc	Mechanical and optical comparison	BHM, Site
Bevel protractors	As BS 1685:2008 0° to 360°	6 0 minutes of arc		BHM
Comparators (external), including electronic	Based on BS 1054 250 to 10 000 magnifications and / or 0 to 0.5	1.0 % or range Minimum 0.25		BHM
Co-ordinate tables	0 to 500 square with 150 movement	Overall performance 3.0	Documented in-house methods.	BHM
Spirit levels	As BS 3509:1962 and BS 958:1968 5 seconds of arc to 60 minutes of arc nominal sensitivity	Mean sensitivity 10 % of nominal Minimum 0.50 seconds of arc		BHM
Electronic indicating levels	0 to 20 minutes of arc	1.0 % or range Minimum 0.50 seconds of arc	Documented in-house methods based on BS 3509:1962	BHM
Luer (taper) gauges	BS 3930:Part 1:1987 and BS 3930:Part 2:1991 0.3 to 8	As per plain taper and screw taper gauges above		BHM
Steel Rules	BS 4372:1968 0 to 1000	15 + (20 x L in m)		BHM
Feeler gauges	BS 957:2008 0.025 to 1	3.0		BHM
Paint thickness setting foils / shims	0 to 2	3.0	Calibration by comparison to length standards using a length measuring instrument	BHM
Thread diameter measuring	MOY/SCM1/9 and MOY/SCM1/12 0 to 300	Overall performance 1.5		BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
PRESSURE			Methods consistent with EURAMET CG3 and CG17	
<u>Hydraulic pressure (gauge)</u>				
Calibration of pressure indicating instruments and gauges, Pressure equivalent calibration of deadweight testers.	550 kPa to 110 MPa	0.017 %	Calibration of devices with an electrical output may be undertaken.	BHM
				Site
Calibration of pressure indicating instruments and gauges,	0 MPa to 7 MPa 7 MPa to 70 MPa	Q[0.023%, 2.3 kPa] Q[0.022%, 14 kPa]		
<u>Gas pressure (gauge)</u>				
Calibration of pressure indicating instruments and gauges, Pressure equivalent calibration of deadweight testers.	-97 kPa to -3.5 kPa 3.5 kPa to 100 kPa 100 kPa to 700 kPa 700 kPa to 12 MPa	Q[0.014 %, 1.5 Pa] Q[0.010 %, 1.5 Pa] 0.012 % 0.012 %		BHM
	-90 kPa to -3.5 kPa 3.5 kPa to 100 kPa 600 kPa to 2 MPa 2 MPa to 10 MPa	Q[0.030 %, 61 Pa] Q[0.030%, 0.16 kPa] Q[0.023%, 2.3 kPa] Q[0.022%, 14 kPa]		Site
<u>Gas pressure (absolute)</u>				
Calibration of pressure indicating instruments and gauges	3.5 kPa to 130 kPa 103.5 kPa to 200 kPa 200 kPa to 800 kPa 800 kPa to 12 MPa	Q[0.014 %, 9.0 Pa] Q[0.010 %, 25 Pa] Q[0.011 %, 25 Pa] Q[0.009 %, 25 Pa]		BHM

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL				
The method for all electrical measurement and generation capabilities listed below is by direct comparison against laboratory reference standards unless otherwise described in the remarks column.				
DC Voltage				
	0 mV to 200 mV	0.00080 % + 1.2 µV		BRM, BRS, Site
	200 mV to 2 V	0.00050 % + 1.3 µV		
	2 V to 20 V	0.00050 % + 4.8 µV		
	20 V to 200 V	0.00070 % + 47 µV		
	200 V to 1020 V	0.00070 % + 600 µV		
DC Current	0 µA to 200 µA	0.0038 % + 0.5 nA		BRM, BRS, Site
	200 µA to 2 mA	0.0016 % + 5.0 nA		
	2 mA to 20 mA	0.0018 % + 100 nA		
	20 mA to 200 mA	0.0057 % + 1.0 µA		
	200 mA to 2 A	0.022 % + 19 µA		
	2 A to 20 A	0.047 % + 500 µA	Limited to 11 A at BHM	
	10 A to 100 A	0.27 % + 0.1 A	Using a multi-turn coil for the calibration of clamp meters only.	BHM, BRS
	100 A to 550 A	0.27 % + 0.24 A		
	550 A to 1000 A	0.29 % + 0.24 A		BRS only
DC Resistance	0 Ω to 1 Ω	6.0 mΩ	Source values for the calibration of measuring instruments	BHM
	1 Ω to 10 Ω	130 µΩ/µ + 6.0 mΩ		
	10 Ω to 32 Ω	120 µΩ/µ + 10 mΩ		
	32 Ω to 100 Ω	91 µΩ/µ + 10 mΩ		
	100 Ω to 320 Ω	91 µΩ/µ + 10 mΩ		
	320 Ω to 1 kΩ	90 µΩ/µ + 60 mΩ		
	1 kΩ to 3.2 kΩ	90 µΩ/µ + 60 mΩ		
	3.2 kΩ to 10 kΩ	90 µΩ/µ + 600 mΩ		
	10 kΩ to 32 kΩ	90 µΩ/µ + 600 mΩ		
	32 kΩ to 100 kΩ	110 µΩ/µ + 6.0 Ω		
	100 kΩ to 320 kΩ	120 µΩ/µ + 6.0 Ω		
	320 kΩ to 1 MΩ	150 µΩ/µ + 55 Ω		
	1 MΩ to 3.2 MΩ	150 µΩ/µ + 55 Ω		
	3.2 MΩ to 10 MΩ	600 µΩ/µ + 550 Ω		
	10 MΩ to 32 MΩ	0.10 % + 800 kΩ		
	32 MΩ to 100 MΩ	0.50 % + 8.0 kΩ		
	100 MΩ to 320 MΩ	0.58 % + 61 kΩ		
	0 Ω to 1 Ω	1.2 mΩ		BRS
	1 Ω to 10 Ω	0.0077 % + 1.2 mΩ		
	10 Ω to 32 Ω	0.0047 % + 1.8 mΩ		
	32 Ω to 100 Ω	0.0036 % + 1.7 mΩ		
	100 Ω to 320 Ω	0.0035 % + 2.4 mΩ		
	320 Ω to 1 kΩ	0.0034 % + 3.3 mΩ		
	1 kΩ to 3.2 kΩ	0.0034 % + 24 mΩ		
	3.2 kΩ to 10 kΩ	0.0034 % + 33 mΩ		
	10 kΩ to 32 kΩ	0.0034 % + 230 mΩ		
	32 kΩ to 100 kΩ	0.0034 % + 330 mΩ		
	100 kΩ to 320 kΩ	0.0040 % + 2.3 Ω		
	320 kΩ to 1 MΩ	0.0041 % + 3.3 Ω		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
DC Resistance continued				BRS
	1 MΩ to 3.2 MΩ	0.0075 % + 35 Ω		
	3.2 MΩ to 10 MΩ	0.0153 % + 74 Ω		
	10 MΩ to 32 MΩ	0.0293 % + 2.9 kΩ		
	32 MΩ to 100 MΩ	0.060 % + 6.8 kΩ		
	100 MΩ to 320 MΩ	0.35 % + 130 kΩ		
	320 MΩ to 1000 MΩ	1.74 % + 581 kΩ		
	0 Ω to 2 Ω	0.0020 % + 32 µΩ	Measurement suitable for the calibration of sources	BHM, BRS, Site
	2 Ω to 20 Ω	0.0012 % + 29 µΩ		
	20 Ω to 200 Ω	0.0010 % + 63 µΩ		
	200 Ω to 2 kΩ	0.0010 % + 578 µΩ		
	2 kΩ to 20 kΩ	0.0010 % + 6.0 mΩ		
	20 kΩ to 200 kΩ	0.0010 % + 58 mΩ		
	200 kΩ to 2 MΩ	0.0012 % + 2.0 Ω		
	2 MΩ to 20 MΩ	0.0027 % + 120 Ω		
	20 MΩ to 200 MΩ	0.015 % +12 kΩ		
	200 MΩ to 2 GΩ	0.18 % + 1.2 MΩ		
AC Voltage	10 mV to 200 mV			BHM, BRS, Site
	10 Hz to 1 kHz	0.018 % + 4.7 µV		
	1 kHz to 10 kHz	0.019 % + 4.7 µV		
	200 mV to 2 V			
	10 Hz to 1 kHz	0.015 % + 24 µV		
	1 kHz to 10 kHz	0.015 % + 24 µV		
	2 V to 20 V			
	10 Hz to 1 kHz	0.015 % + 240 µV		
	1 kHz to 10 kHz	0.015 % + 240 µV		
	20 V to 200 V			
	10 Hz to 1 kHz	0.015 % + 2.3 mV		
	1 kHz to 10 kHz	0.015 % + 2.3 mV		
	200 V to 1 kV			
	55 Hz to 1 kHz	0.016 % + 23 mV		
	1 kHz to 10 kHz	0.018 % + 23 mV		
AC current	up to 200 µA			BHM, BRS, Site
	10 Hz to 1 kHz	0.059 % + 0.024 µA		
	1 kHz to 10 kHz	0.061 % + 0.024 µA		
	200 µA to 2 mA			
	10 Hz to 1 kHz	0.036 % + 0.24 µA		
	1 kHz to 10 kHz	0.036 % + 0.24 µA		
	2 mA to 20 mA			
	10 Hz to 1 kHz	0.036 % + 2.4 µA		
	1 kHz to 5 kHz	0.036 % + 2.4 µA		
	20 mA to 200 mA			
	10 Hz to 1 kHz	0.035 % + 24 µA		
	1 kHz to 5 kHz	0.035 % + 24 µA		
	200 mA to 2 A			
	10 Hz to 1 kHz	0.073 % + 240 µA		
	1 kHz to 5 kHz	0.086 % + 240 µA		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
AC Current continued	2 A to 20 A *10 Hz to 1 kHz* *1 kHz to 5 kHz* *45 Hz to 1 kHz* 10 A to 100 A 100 A to 550 A 100 A to 1000 A	 0.10 % + 2.4 mA 0.29 % + 2.4 mA 0.36 % + 0.01 A 0.39 % + 0.01 A 0.40 % + 0.01 A	Limited to 11 A at BHM Using a multi-turn coil for the calibration of clamp meters only.	 BHM, BRS BRS only
AC Resistance	*40 Hz to 400 Hz* 1 mΩ to 20 mΩ 20 mΩ to 200 mΩ 200 mΩ to 2 Ω 2 Ω to 20 Ω 20 Ω to 200 Ω 200 Ω to 2000 Ω	 0.160 % 0.100 % 0.090 % 0.090 % 0.090 % 0.150 %	 Excitation current 10 A: 1 mΩ to 20 mΩ 1 A: 20 mΩ to 2 Ω 100 mA: 2 Ω to 20 Ω 10 mA: 20 Ω to 200 Ω 1 mA: 200 Ω to 2000 Ω	 BRS
Oscilloscopes Vertical deflection coefficients: Horizontal deflection coefficients: Vertical deflection coefficients: Horizontal deflection coefficients:	 *1 kHz* 5 mV to 100 mV 100 mV to 100 V 2 ns to 20 ms 20 ms to 5 s *1 kHz* 5 mV to 100 mV 100 mV to 100 V 2 ns to 50 µs 50 µs to 5 s	 0.17 % + 47 µV 0.12 % + 47 µV 3.1 µs/s 0.59 % 0.32 % +120 µV 0.30 % + 120 µV 30 µs/s 0.59 %		BRS Site
Power Meters DC Power AC Power 45Hz to 1 kHz DC Power With Clamp AC Power With Clamp (45Hz to 1 kHz)	 1 W to 20 kW 1 W to 20 kW 20 kW to 100 kW 20 kW to 100 kW	 0.16 % 0.28 % 0.31 % 0.46 %	At unity power factor only. Voltages will be in th range 10 V to 1000 V and currents will be in the range 100 mA to 20 A For use with Power meters with clamp head	BRS BRS
HIPOT / HV Testers HVDC Voltage HVAC Voltage	 1 kV to 10 kV 50 Hz to 60 Hz 1 kV to 6 kV	 0.51 % 1.10 %		BHM, BRS

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature indicators and calibrators, calibration by electrical simulation				BHM
Thermocouple type:			Including reference junction compensation.	
K	- 200 °C to 0 °C 0 °C to 1350 °C	0.80 °C 0.40 °C		
J	- 200 °C to 0 °C 0 °C to 1200 °C	0.90 °C 0.40 °C		
E	- 200 °C to 0 °C 0 °C to 1000 °C	0.50 °C 0.40 °C		
N	- 200 °C to 0 °C 0 °C to 1300 °C	1.0 °C 0.50 °C		
T	- 200 °C to 0 °C 0 °C to 400 °C	0.70 °C 0.40 °C		
R	0 °C to 1000 °C 1000 °C to 1760 °C	2.0 °C 0.80 °C		
S	0 °C to 1000 °C 1000 °C to 1760 °C	2.0 °C 1.0 °C		
B	600 °C to 1000 °C 1000 °C to 1760 °C	1.6 °C 0.90 °C		
			Excluding reference junction compensation.	BHM
K	- 200 °C to 0 °C 0 °C to 1350 °C	0.70 °C 0.30 °C		
J	- 200 °C to 0 °C 0 °C to 1200 °C	0.90 °C 0.30 °C		
E	- 200 °C to 0 °C 0 °C to 1000 °C	0.50 °C 0.20 °C		
N	- 200 °C to 0 °C 0 °C to 1300 °C	1.0 °C 0.50 °C		
T	- 200 °C to 0 °C 0 °C to 400 °C	0.70 °C 0.30 °C		
R	0 °C to 1000 °C 1000 °C to 1760 °C	1.9 °C 0.80 °C		
S	0 °C to 1000 °C 1000 °C to 1760 °C	1.9 °C 0.90 °C		
B	600 °C to 1000 °C 1000 °C to 1760 °C	1.6 °C 0.90 °C		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature simulation continued, indicators and calibrators.				
Thermocouple type:			Including reference junction compensation.	BRS
K	- 200 °C to 0 °C 0 °C to 1350 °C	0.40 °C 0.30 °C		
J	- 200 °C to 0 °C 0 °C to 1200 °C	0.40 °C 0.30 °C		
E	- 200 °C to 0 °C 0 °C to 1000 °C	0.30 °C 0.30 °C		
N	- 200 °C to 0 °C 0 °C to 1300 °C	0.50 °C 0.30 °C		
T	- 200 °C to 0 °C 0 °C to 400 °C	0.40 °C 0.30 °C		
R	0 °C to 1000 °C 1000 °C to 1760 °C	0.90 °C 0.40 °C		
S	0 °C to 1000 °C 1000 °C to 1760 °C	0.90 °C 0.50 °C		
B	600 °C to 1000 °C 1000 °C to 1760 °C	0.70 °C 0.40 °C		
			Excluding reference junction compensation.	BRS
K	- 200 °C to 0 °C 0 °C to 1350 °C	0.40 °C 0.20 °C		
J	- 200 °C to 0 °C 0 °C to 1200 °C	0.40 °C 0.20 °C		
E	- 200 °C to 0 °C 0 °C to 1000 °C	0.30 °C 0.20 °C		
N	- 200 °C to 0 °C 0 °C to 1300 °C	0.50 °C 0.30 °C		
T	- 200 °C to 0 °C 0 °C to 400 °C	0.30 °C 0.20 °C		
R	0 °C to 1000 °C 1000 °C to 1760 °C	0.80 °C 0.40 °C		
S	0 °C to 1000 °C 1000 °C to 1760 °C	0.80 °C 0.40 °C		
B	600 °C to 1000 °C 1000 °C to 1760 °C	0.70 °C 0.40 °C		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature simulation continued, indicators and calibrators.				Site
Thermocouple type:			Including reference junction compensation.	
K	-200 °C to 0 °C 0 °C to 1350 °C	1.2 °C 0.7 °C		
J	-200 °C to 0 °C 0 °C to 1200 °C	1.4 °C 0.7 °C		
T	-200 °C to 0 °C 0 °C to 400 °C	1.1 °C 0.70 °C		
Cold junction compensation	0 ºC to 50 ºC	0.10 ºC	This is a supplementary measurement for monitoring temperature in air.	BHM, BRS
	0 ºC to 50 ºC	0.20 ºC		Site
PT 100	- 200 °C to 0 °C 0 ° to 850 °C	0.060 °C 0.38 °C		BHM,
	- 200 °C to 0 °C 0 ° to 850 °C	0.020 °C 0.060 °C		BRS
	- 200 °C to 0 °C 0 ° to 830 °C	0.19 °C 0.26 °C		Site
PT 1000	- 70 to 0 °C 0 to 500 °C	0.020 °C 0.040 °C		BRS
Calibration of thermocouple extension leads.	Nominal ambient 20 ºC	0.12 °C		BHM, BRS
Frequency	10 MHz 1 Hz to 1.35 GHz 1 Hz to 3.0 GHz	1.2 in 10^{11} 0.21 µHz/Hz 0.02 µHz/Hz		BRS, Site BHM, Site
Time Interval	0 s to 60 min	0.080 s		BHM, BRS, Site
Tachometers (Optical)	60 rpm to 90000 rpm	0.020 rpm	This is for devices with a resolution of 0.01 RPM	BHM, BRS, Site

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ADDITIONAL MEASUREMENTS SPECIFIC TO 17TH EDITION EQUIPMENT				
Continuity	0 Ω to 20 Ω 100 Ω 1 kΩ	1.1 % + 25 mΩ 342 mΩ 3.2 Ω		BHM, BRS, Site
Continuity Current	0 mA to 320 mA	1.3 % + 1.5 mA		
Insulation	1 MΩ 2 MΩ 3 MΩ 4 MΩ 5 MΩ 6 MΩ 7 MΩ 8 MΩ 9 MΩ 10 MΩ 20 MΩ 30 MΩ 40 MΩ 50 MΩ 60 MΩ 70 MΩ 80 MΩ 90 MΩ 100 MΩ 200 MΩ 400 MΩ 600 MΩ 800 MΩ 1 GΩ 2 GΩ 4 GΩ 6 GΩ 8 GΩ 10 GΩ	2.4 kΩ 2.9 kΩ 3.5 kΩ 4.4 kΩ 5.4 kΩ 63 kΩ 72 kΩ 82 kΩ 92 kΩ 103 kΩ 202 kΩ 307 kΩ 405 kΩ 504 kΩ 612 kΩ 711 kΩ 810 kΩ 910 kΩ 1.2 MΩ 2.7 MΩ 5.2 MΩ 7.8 MΩ 10 MΩ 13 MΩ 22 MΩ 210 MΩ 310 MΩ 410 MΩ 510 MΩ		BHM, BRS, Site
Insulation Test Voltage	50 VDC 100 VDC 250 VDC 500 VDC 1000 VDC	1.3 V 1.6 V 2.8 V 5.2 V 10.2 V		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ADDITIONAL MEASUREMENTS SPECIFIC TO 17TH EDITION EQUIPMENT continued				
Loop Impedance (50 Hz)	50 mΩ 100 mΩ 220 mΩ 330 mΩ 500 mΩ 1.0 Ω 5.0 Ω 10 Ω 100 Ω 1 kΩ	5.0 mΩ 5.1 mΩ 5.2 mΩ 5.4 mΩ 5.9 mΩ 7.9 mΩ 30 mΩ 60 mΩ 612 mΩ 6.0 Ω		BHM, BRS, Site
PAT Load Test	0.13 kVA (nom 440 Ω)	28 Ω		BHM, BRS, Site
PAT Leakage Current	2 mA 4.7 mA 7.7 mA	42 µA 85 µA 140 µA		
PAT Earth Bond Current	100 mA 10 A 25 A	8.4 mA 192 mA 441 mA		
PAT Earth Bond Resistance	0.05 Ω 0.1 Ω 0.22 Ω 0.33 Ω 0.5 Ω 1 Ω 5 Ω 10 Ω 100 Ω 1 kΩ	5.0 mΩ 5.0 mΩ 5.1 mΩ 5.4 mΩ 5.8 mΩ 7.9 mΩ 30 mΩ 60 mΩ 611 mΩ 6.3 Ω		
PAT Flash Voltage Class 1 Class 2	 1.5 kV 3.0 kV	 63 V 123 V		
PAT Flash Current	0 A to 1 mA 1 mA to 3 mA	56 µA 152 µA		
RCD Trip Current	3 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 2 A	542 µA 5.1 mA 5.7 mA 102 mA		
RCD Trip Time	20 m Sec 40 m Sec 100 m Sec 200 m Sec 390 m Sec 900 m Sec	0.70 m Sec 0.90 m Sec 1.5 m Sec 1.5 m Sec 1.5 m Sec 1.5 m Sec		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
TEMPERATURE			By comparison in a regulated heat source (block calibrator or Ice bath.)	
Resistance thermometers	-30 °C to 0 °C 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 300 °C 300 °C to 400 °C	0.31 °C 0.037 °C 0.25 °C 0.30 °C 0.35 °C 0.52 °C		BRS
Temperature indicators with PRT's	As per ranges above	As per CMC above	Uncertainties may Increase due to resolution	BRS
Thermocouples	-30 °C to 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 300 °C 300 °C to 400 °C	0.83 °C 0.85 °C 0.88 °C 0.95 °C 1.1 °C		BRS
Temperature indicators with Thermocouples	-30 °C to 0 °C 0 °C to 100 °C 100 °C to 200 °C 200 °C to 300 °C 300 °C to 400 °C	0.31 °C 0.35 °C 0.41 °C 0.55 °C 0.74 °C		BRS

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
MASS				
Weights and artefacts	25 000 g 20 000 g 10 000 g 5 000 g 2 000 g 1 000 g 500 g 200 g 100 g 50 g 20 g 10 g 5 g 2 g 1 g 0.5 g 0.2 g 0.1 g 0.05 g 0.02 g 0.01 g 0.005 g 0.002 g 0.001 g	250 mg 200 mg 100 mg 50 mg 20 mg 10 mg 5 mg 2 mg 1 mg 0.6 mg 0.5 mg 0.4 mg 0.3 mg 0.24 mg 0.20 mg 0.16 mg 0.12 mg 0.10 mg 0.08 mg 0.06 mg 0.05 mg 0.04 mg 0.04 mg 0.04 mg	Notes 1. Calibrated using Borda substitution method. 2. Calibrations can be given in other units as required. 3. Intermediate values can be calibrated to an uncertainty interpolated from the next higher and lower values in the table.	BHM
NON AUTOMATIC WEIGHING MACHINES Lab & Site Electronic, single pan	200 mg 500 mg 1 g 2 g 5 g 10 g 20 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg 50 kg 100 kg 107 kg	0.03 mg 0.03 mg 0.04 mg 0.05 mg 0.06 mg 0.07 mg 0.10 mg 0.12 mg 0.18 mg 0.36 mg 0.90 mg 1.8 mg 7.2 mg 18 mg 36.1 mg 72.4 mg 1.8 g 2.5 g 2.6 g	Notes 1. Calibrated by comparison with reference standards 2. Weights are available in OIML Class: E2 from 200 mg to 500 g, max. grouped load 1 kg F1 from 1 g to 20 kg, max. grouped load 55 kg. M1 from 5 kg to 20 kg, max. grouped load 107 kg 2. Other loads within the overall listed range may also be used	BHM, Site

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH				
Plain plug gauges (parallel)	1 to 25 diameter 25 to 100 diameter	0.80 1.0	By comparison with reference end standards	BRS
Plain ring gauges (parallel)	2 to 25 diameter 25 to 100 diameter	1.1 1.3		BRS
Length gauges, flat and spherical ended	0 to 300	1.5 + (5.0 x length in m)		BRS
MEASURING INSTRUMENTS AND MACHINES				
Micrometers External	BS 870:2008 0 to 300	Heads: 2.0 between any two points		BRS
Depth	BS6468:2008 0 to 150	Setting and extension rods 1.3 + (5.0 x length in m)		BRS
Vernier, digital electronic, dial caliper and height gauges	BS 887:2008 0 to 300	10 + (30 x length in m)		BRS
	BS 1643:2008 0 to 600	10 + (30 x length in m)		BRS
Calipers (see note 6)	ISO 13385-1 2019 Partial surface contact error (E) 0 to 600 mm	4.0		BRS
	Shift error (S) internal jaws 3 to 50 mm	4.0		
	Shift error (S) depth and step 3 to 50 mm	4.0		
Dial gauges and dial test indicators	BS 907:2008 and BS 2795:1981 0 to 25	1.5		BRS

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
GLOSS	Geometry 20°		By comparison with reference gloss standards	BHM
	0 to 10 GU	0.70 GU		
	10 to 70 GU	0.70 GU		
	70 to 125 GU	0.97 GU		
	1800 to 2000 GU	25.30 GU		
	Geometry 60°			
	0 to 10 GU	0.75 GU		BHM
	10 to 70 GU	1.05 GU		
	70 to 125 GU	0.85 GU		
	800 to 1000 GU	122.00 GU		
	Geometry 85°			
	10 to 70 GU	1.42 GU		BHM
	70 to 125 GU	0.88 GU		
	125 to 150 GU	3.50 GU		
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: $Q[a, b] = [a^2 + b^2]^{1/2}$