Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



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	ВНМ

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

Location details		Activity	Location code
Address Rhopoint House Enviro 21 Business Park Queensway Avenue South St Leonards on Sea East Sussex TN38 9AG	Dean Hughes	Gloss	STL

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Site activities performed away from the locations listed above:

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

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location Code
	RANGE IN MILLIMETRES AND UNLESS OTH	JNCERTAINTY IN MICROME ⁻ ERWISE STATED	TRES	
LENGTH			NOTES	
Gauge blocks		Class (see footnote)		ВНМ
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 μ m				
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				

Calibration and Measurement Capability (CMC)

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location Code
		ND UNCERTAINTY IN MICRO OTHERWISE STATED	DMETRES	
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 Concentricity TIR	0.80 1.0 1.3 on diameter 1.6 2.2 4.0 1.4	By comparison with reference standards	ВНМ
Plain plug gauges (taper)				BHM
Parallel to 1 in 8 on diameter 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 3 to 50 diameter 50 to 100 diameter 100 to 200 diameter 200 to 300 diameter	3.0 4.0 5.0 6.0 0 on diameter 5.0 6.0 7.0 8.0	By comparison with reference standards	
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 on diameter 3.0 4.0 6.0	By comparison with reference standards	ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty $(k = 2)$	Remarks	Location Code
		AND UNCERTAINTY IN MICRO OTHERWISE STATED	DMETRES	
LENGTH (cont'd) Plain ring gauges (taper)				ВНМ
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 on diameter	By comparison with	
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	reference standards	
Length gauges, flat and spherical ended	0 to 600	1.0 + (5.0 x length in m)	By comparison with reference standards	ВНМ
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 400 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		ВНМ
Vee blocks	As BS 3731:1987 20 to 150	2.5 to 5.0		ВНМ
Screw plug gauges (parallel) including check and setting plugs See Note 3 Screw plug gauges (taper) including check plugs See Note 2	1 to 100 diameter 100 to 300 300 to 600 2 to 100 100 to 300 300 to 500	3.0 5.0 8.0 on pitch diameter 5.0 8.0 10		ВНМ
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	ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location Code
		ND UNCERTAINTY IN MICRON THERWISE STATED	METRES	
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.	ВНМ
Plain end pieces	0 to 0.001	0.50 on flatness	Documented in-house methods.	ВНМ
Thread Stylii	0.6 (40 T.P.I) to 6.0 (4.5 T.P.I)	0.10 on form	Documented in-house methods.	ВНМ
Thread measuring vee pieces (prisms)	NPL Schedule MOY/SCM1/60 0 to 4.5	0.50		ВНМ
Orifice plates	$\begin{array}{c} \text{BS EN ISO 5167-2:2003} \\ 12.5 \text{ to 200 bore (d) diameters} \\ 200 \text{ to 500 bore (d) diameters} \\ \text{Plate thickness (E)} \\ \text{Edge thickness (e)} \\ \text{Surface roughness - Ra} \\ \end{array}$	8.0 11 10 150 7.0 % of measured Ra, minimum 0.10 10 60 minutes of arc 12 minutes of arc 20 20		ВНМ
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		ВНМ

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		ND UNCERTAINTY IN MICRO	DMETRES	
ANGLE				
Squares				BHM
Blade type	BS 939:2007 50 to 300 300 to 600 600 to 1000	3.0 5.0 8.0		
Cylindrical	BS 939:2007 75 to 450 450 to 600 600 to 1000	2.5 On squareness3.5 See Note 17.0		
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		ВНМ
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		ВНМ
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	ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location Code
		ND UNCERTAINTY IN MICRON THERWISE STATED	METRES	
FORM				
Roundness External Internal	0 to 350 diameter 5 to 350 diameter	0.050 on radius	Mechanical styus form measurement	ВНМ
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		ВНМ
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			BHM, Site
	Flatness of working surface (Note1): Local variation of working surface:	1.50 + (0.80 x diagonal in m) 3.0		
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		ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
	RANGE IN MILLIMETRES AND UNLESS OTI	UNCERTAINTY IN MICROM HERWISE STATED	IETRES	
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
External micrometer	BS 870:2008 0 to 600 (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		ВНМ
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)		ВНМ
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)		ВНМ
3 point bore	0 to 150 150 to 250	5.0 8.0		ВНМ
Micrometer heads	BS 1734:1951 0 to 100	1.0		внм
Bench micrometer	NPL MOY/SCMI 22 0 to 100	Overall performance 2.0		внм
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)		ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (<i>k</i> = 2)	Remarks	Location Code
Calipers (see note 6)	ISO 13385-1 2019 Partial surface contact error (E) 0 to 1000 mm	4.0		ВНМ
	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	ВНМ

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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 300 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		ВНМ
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		ВНМ
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	ВНМ
Thread diameter measuring	MOY/SCM1/9 and MOY/SCM1/12 0 to 300	Overall performance 1.5		ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
PRESSURE			Methods consistent with EURAMET CG3 and CG17	
Hydraulic pressure (gauge)				
Calibration of pressure indicating instruments and gauges, Pressure equivalent calibration of deadweight	550 kPa to 110 MPa	0.017 %	Calibration of devices with an electrical output may be undertaken.	BHM
testers. Calibration of pressure indicating instruments and gauges,	0 MPa to 7 MPa 7 MPa to 70 MPa	0.023% + 2.3 kPa 0.022% + 14 kPa		Site
Gas pressure (gauge)				
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	0.017 % + 1.4 Pa 0.015 % + 1.4 Pa 0.012 % 0.012 %		ВНМ
	-90 kPa to -3.5 kPa 3.5 kPa to 100 kPa 600 kPa to 2 MPa 2 MPa to 10 MPa	0.030 % + 61 Pa 0.030% + 0.16 kPa 0.023% + 2.3 kPa 0.022% + 14 kPa		Site
Gas pressure (absolute)				
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	0.015 % + 9 Pa 0.014 % + 25 Pa 0.011 % + 25 Pa 0.009 % + 25 Pa		ВНМ

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code	
ELECTRICAL			l		
The method for all electrical mean standards unless otherwise descri		ies listed below is by direct con	nparison against laboratory r	eference	
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 1020 V	$\begin{array}{c} 0.00080 \ \% + 1.2 \ \mu V \\ 0.00050 \ \% + 1.3 \ \mu V \\ 0.00050 \ \% + 4.8 \ \mu V \\ 0.00070 \ \% + 47 \ \mu V \\ 0.00070 \ \% + 600 \ \mu V \end{array}$		BRM, BRS	
DC Current	0 μA to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A	0.0039 % + 1.4 nA 0.0017 % + 5.0 nA 0.0018 % + 100 nA 0.0057 % + 1.0 μA 0.022 % + 19 μA 0.047 % + 500 μA	Limited to 11 A at BHM	BRM, BRS	
	10 A to 100 A 100 A to 550 A 550 A to 1000 A	0.27 % + 0.1 A 0.27 % + 0.24 A 0.29 % + 0.24 A	Using a multi-turn coil for the calibration of clamp meters only.	BHM, BRS BRS only	
DC Resistance	0 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 32 Ω 32 Ω to 100 Ω 100 Ω to 320 Ω 320 Ω to 1 kΩ	6.0 mΩ 130 μΩ/μ + 6.0 mΩ 120 μΩ/μ + 10 mΩ 91 μΩ/μ + 10 mΩ 91 μΩ/μ + 10 mΩ 90 μΩ/μ + 60 mΩ	Source values for the calibration of measuring instruments	ВНМ	
	1 kΩ to 3.2 kΩ 3.2 kΩ to 10 kΩ 10 kΩ to 32 kΩ 32 kΩ to 100 kΩ 100 kΩ to 320 kΩ 320 kΩ to 1 MΩ	90 μΩ/μ + 60 mΩ 90 μΩ/μ + 600 mΩ 90 μΩ/μ + 600 mΩ 110 μΩ/μ + 6.0 Ω 120 μΩ/μ + 6.0 Ω 150 μΩ/μ + 55 Ω			
	1 MΩ to 3.2 MΩ 3.2 MΩ to 10 MΩ 10 MΩ to 32 MΩ 32 MΩ to 100 MΩ 100 MΩ to 320 MΩ	150 μΩ/μ + 55 Ω 600 μΩ/μ + 550 Ω 0.10 % + 800 kΩ 0.50 % + 8.0 kΩ 0.58 % + 61 kΩ			
	0 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 32 Ω 32 Ω to 100 Ω 100 Ω to 320 Ω 320 Ω to 1 kΩ	1.2 mΩ 0.0077 % + 1.2 mΩ 0.0047 % + 1.8 mΩ 0.0036 % + 1.7 mΩ 0.0035 % + 2.4 mΩ 0.0034 % + 3.3 mΩ		BRS	
	1 kΩ to 3.2 kΩ 3.2 kΩ to 10 kΩ 10 kΩ to 32 kΩ 32 kΩ to 100 kΩ 100 kΩ to 320 kΩ 320 kΩ to 1 MΩ	$\begin{array}{c} 0.0034 \ \% + 24 \ m\Omega \\ 0.0034 \ \% + 230 \ m\Omega \\ 0.0034 \ \% + 230 \ m\Omega \\ 0.0034 \ \% + 330 \ m\Omega \\ 0.0040 \ \% + 2.3 \ \Omega \\ 0.0041 \ \% + 3.3 \ \Omega \end{array}$			

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement	Remarks	Location Code		

Measured Quantity Instrument or Gauge	Range	Measurement Uncertainty (k = 2)	Remarks	Location Code
DC Resistance continued	1 MΩ to 3.2 MΩ 3.2 MΩ to 10 MΩ 10 MΩ to 32 MΩ 32 MΩ to 100 MΩ 100 MΩ to 320 MΩ 320 MΩ to 1000 MΩ	0.0075 % + 35 Ω 0.0154 % + 74 Ω 0.0294 % + 2.9 kΩ 0.060 % + 6.8 kΩ 0.35 % + 130 kΩ 1.74 % + 580 kΩ		BRS
	$\begin{array}{c} 0 \ \Omega \ \text{to} \ 1 \ \Omega \\ 1 \ \Omega \ \text{to} \ 20 \ \Omega \\ 20 \ \Omega \ \text{to} \ 200 \ \Omega \\ 200 \ \Omega \ \text{to} \ 200 \ \Omega \\ 2 \ \text{k} \Omega \ \text{to} \ 200 \ \text{k} \Omega \\ 2 \ \text{k} \Omega \ \text{to} \ 200 \ \text{k} \Omega \\ 200 \ \text{k} \Omega \ \text{to} \ 200 \ \text{k} \Omega \\ 200 \ \text{k} \Omega \ \text{to} \ 200 \ \text{k} \Omega \\ 200 \ \text{k} \Omega \ \text{to} \ 200 \ \text{k} \Omega \\ 200 \ \text{k} \Omega \ \text{to} \ 200 \ \text{M} \Omega \\ 200 \ \text{M} \Omega \ \text{to} \ 200 \ \text{M} \Omega \\ 200 \ \text{M} \Omega \ \text{to} \ 2 \ \text{G} \Omega \end{array}$	$\begin{array}{c} 32 \ \mu\Omega \\ 0.0012 \ \% + 29 \ \mu\Omega \\ 0.0010 \ \% + 63 \ \mu\Omega \\ 0.0010 \ \% + 580 \ \mu\Omega \\ 0.0010 \ \% + 580 \ \mu\Omega \\ 0.0010 \ \% + 58 \ m\Omega \\ 0.0012 \ \% + 2.0 \ \Omega \\ 0.0027 \ \% + 120 \ \Omega \\ 0.015 \ \% + 12 \ k\Omega \\ 0.18 \ \% + 1.2 \ M\Omega \end{array}$	Measurement suitable for the calibration of sources	BHM, BRS
AC Voltage	10 mV to 200 mV 20 Hz to 1 kHz 1 kHz to 10 kHz	0.018 % + 4.7 μV 0.019 % + 4.7 μV		BHM, BRS
	200 mV to 2 V 20 Hz to 1 kHz 1 kHz to 10 kHz	0.015 % + 24 μV 0.015 % + 24 μV		
	2 V to 20 V 20 Hz to 1 kHz 1 kHz to 10 kHz	0.015 % + 240 μV 0.015 % + 240 μV		
	20 V to 200 V 20 Hz to 1 kHz 1 kHz to 10 kHz	0.016 % + 2.3 mV 0.016 % + 2.3 mV		
	200 V to 1 kV 55 Hz to 1 kHz 1 kHz to 10 kHz	0.016 % + 23 mV 0.017 % + 23 mV		
AC current	20 mA to 200 mA 55 Hz to 1 kHz 1 kHz to 5 kHz	0.035 % + 24 μA 0.035 % + 24 μA		BHM, BRS
	200 mA to 2 A 55 Hz to 1 kHz 1 kHz to 5 kHz	0.073 % + 240 μA 0.087 % + 240 μA		
	2 A to 20 A 55 Hz to 1 kHz 1 kHz to 5 kHz	0.10 % + 2.4 mA 0.30 % + 2.4 mA	Limited to 11 A at BHM	
	<i>45 Hz to 1 kHz</i> 10 A to 100 A 100 A to 550 A 100 A to 1000 A	0.36 % 0.38 % 0.40 %	Using a multi-turn coil for the calibration of clamp meters only.	BHM, BRS BRS onlr

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code	

AC Resistance	40 Hz to 400 Hz 1 mΩ to 10 mΩ 10 mΩ to 100 mΩ 100 mΩ to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω	0.080 % 0.071 % 0.071 % 0.086 % 0.051 %	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	BRS
Oscilloscopes				BRS
Vertical deflection coefficients:	<i>1 kHz</i> 5 mV to 100 mV 100 mV to 100 V	0.17 % + 47 μV 0.12 % + 47 μV		
Horizontal deflection coefficients:	2 ns to 20 ms 20 ms to 5 s	3.9 μs/s 0.59 %		
Vertical deflection coefficients:	<i>1 kHz</i> 5 mV to 100 mV 100 mV to 100 V	0.32 % +120 μV 0.30 % + 120 μV		Site
Horizontal deflection coefficients:	2 ns to 50 μs 50 μs to 5 s	30 μs/s 0.59 %		
Power Meters			At unity power factor only. Voltages will be in	BRS
DC Power	1 W to 20 kW	0.16 %	th range 10 V to 1000 V	
AC Power 45Hz to 1 kHz	1 W to 20 kW	0.28 %	and currents will be in the range 100 mA to 20 A	
DC Power With Clamp	20 kW to 100 kW	0.31 %	For use with Power	BRS
AC Power With Clamp (45Hz to 1 kHz)	20 kW to 100 kW	0.46 %	meters with clamp head	
DC Voltage				
	0 mV to 320 mV 320 mV to 3.2 V 3.2 V to 32 V 32 V to 320 V 320 V to 1020 V	0.0071 % + 3.7 μV 0.0059 % + 5.9 μV 0.0059 % + 60 μV 0.0065 % + 600 μV 0.0065 % + 2.0 mV	Source values for the calibration of measuring instruments	Site
	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	$\begin{array}{c} 0.00080 \ \% + 1.2 \ \mu V \\ 0.00050 \ \% + 1.3 \ \mu V \\ 0.00050 \ \% + 4.8 \ \mu V \\ 0.00070 \ \% + 47 \ \mu V \\ 0.00070 \ \% + 0.60 \ m V \end{array}$	Measurement suitable for the calibration of sources	Site

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
DC Current				
	0 μA to 3.2 mA 3.2 mA to 32 mA 32 mA to 320 mA 320 mA to 1.1 A 1.1 A to 11 A	0.015 % + 60 nA 0.012 % + 300 nA 0.012 % + 4.0 μA 0.035 % + 44 μA 0.071 % + 400 μA	Source values for the calibration of measuring instruments	Site
	10 A to 100 A 100 A to 550 A	0.26 % + 0.24 A 0.28 % + 0.24 A	Using a multi-turn coil for the calibration of clamp meters only.	Site
	0 μA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 2 A 2 A to 20 A	0.0039 % + 0.5 nA 0.0017 % + 5.0 nA 0.0018 % + 50 nA 0.0057 % + 1.0 μA 0.022 % + 19 μA 0.047 % + 050 mA	Measurement suitable for the calibration of sources	Site
DC Resistance				
	0 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 32 Ω 32 Ω to 100 Ω 100 Ω to 320 Ω 320 Ω to 1 k Ω	7.0 mΩ 0.015 % + 7.0 mΩ 0.014 % + 11.6 mΩ 0.011 % + 11.6 mΩ 0.011 % + 11.6 mΩ 0.011 % + 70 mΩ	Source values for the calibration of measuring instruments	Site
	1 kΩ to 3.2 kΩ 3.2 kΩ to 10 kΩ 10 kΩ to 32 kΩ 32 kΩ to 100 kΩ 100 kΩ to 320 kΩ 320 kΩ to 1 MΩ	0.011 % + 70 mΩ 0.011 % + 700 mΩ 0.011 % + 700 mΩ 0.012 % + 7.0 Ω 0.014 % + 7.0 Ω 0.018 % + 64 Ω		
	1 MΩ to 3.2 MΩ 3.2 MΩ to 10 MΩ 10 MΩ to 32 MΩ 32 MΩ to 100 MΩ 100 MΩ to 320 MΩ	0.018 % + 64 Ω 0.069 % + 640 Ω 0.12 % + 0.86 kΩ 0.58 % + 8.6 kΩ 0.58 % + 61 kΩ		
	0 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ	32 μΩ 0.0012 % + 29 μΩ 0.0010 % + 63 μΩ 0.0010 % + 580 μΩ 0.0010 % + 6.0 mΩ	Measurement suitable for the calibration of sources	Site
	10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ	0.0010 % + 58 mΩ 0.0012 % + 2.0 Ω 0.0027 % + 120 Ω 0.015 % +12 kΩ 0.18 % + 1.2 MΩ		

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature indicators and calibrators, calibration by electrical simulation				ВНМ
Thermocouple type:			Including reference junction.	
к	- 200 °C to 0 °C 0 °C to 1350 °C	0.80 °C 0.40 °C	junction compensation.	
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	0.80 °C 0.40 °C		
Ν	- 200 °C to 0 °C 0 °C to 1300 °C	1.0 °C 0.50 °C		
т	- 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		
В	600 °C to 1000 °C 1000 °C to 1760 °C	1.6 °C 0.90 °C		
			Excluding reference junction.	BHM
К	- 200 °C to 0 °C 0 °C to 1350 °C	0.70 °C 0.30 °C	junction compensation.	
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		
Ν	- 200 °C to 0 °C 0 °C to 1300 °C	1.0 °C 0.50 °C		
т	- 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		
В	600 °C to 1000 °C 1000 °C to 1760 °C	1.6 °C 0.90 °C		

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Measured Quantity	Dence	Expanded	Demerica	Location

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.	BRS
к	- 200 °C to 0 °C 0 °C to 1350 °C	0.40 °C 0.30 °C	junction compensation.	
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		
т	- 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		
В	600 °C to 1000 °C 1000 °C to 1760 °C	0.70 °C 0.40 °C	Excluding reference	BRS
к	- 200 °C to 0 °C 0 °C to 1350 °C	0.40 °C 0.20 °C	junction compensation.	
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		
Ν	- 200 °C to 0 °C 0 °C to 1300 °C	0.50 °C 0.30 °C		
т	- 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		
В	600 °C to 1000 °C 1000 °C to 1760 °C	0.70 °C 0.40 °C		

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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.	
к	-200 °C to 0 °C 0 °C to 1350 °C	1.2 ℃ 0.7 ℃	junction compensation.	
J	-200 °C to 0 °C 0 °C to 1200 °C	1.4 °C 0.7 °C		
т	-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	BHM, BRS
	0 ºC to 50 ºC	0.20 ºC	monitoring temperature in air.	Site
PT 100	- 200 °C to 0 °C 0 ° to 850 °C	0.060 °C 0.37 °C		BHM,
	- 200 °C to 0 °C 0 ° to 850 °C	0.0140 °C 0.050 °C		BRS
	- 200 °C to 0 °C 0 ° to 830 °C	0.19 °C 0.26 °C		Site
Calibration of thermocouple extension leads.	Nominal ambient 20 °C	0.12 °C		BHM, BRS
Frequency	10 MHz 1 Hz to 1.35 GHz	1.2 in 10 ¹¹ 1.5 in 10 ¹¹ + 10 μHz		BHM, BRS,
Time Interval	0 s to 60 min	0.080 s		Site 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

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ADDITIONAL MEASUREMENTS	I SPECIFIC TO 17 [™] EDITION EC	I UIPMENT	l	
Continuity	0 Ω to 20 Ω 100 Ω 1 kΩ	1.1 % + 25 mΩ 400 mΩ 3.2 Ω		BHM, BRS, Site
Continuity Current	0 mA to 320 mA	1.3 % + 1.5 mA		
Insulation	$\begin{array}{c} 1 \ M\Omega \\ 2 \ M\Omega \\ 3 \ M\Omega \\ 4 \ M\Omega \\ 5 \ M\Omega \\ 5 \ M\Omega \\ 6 \ M\Omega \\ 7 \ M\Omega \\ 8 \ M\Omega \\ 9 \ M\Omega \\ 10 \ M\Omega \\ 20 \ M\Omega \\ 10 \ M\Omega \\ 20 \ M\Omega \\ 30 \ M\Omega \\ 40 \ M\Omega \\ 50 \ M\Omega \\ 50 \ M\Omega \\ 60 \ M\Omega \\ 70 \ M\Omega \\ 80 \ M\Omega \\ 90 \ M\Omega \\ 100 \ M\Omega \\ 200 \ M\Omega \\ 100 \ M\Omega \ M\Omega \\ 100 \ M\Omega \ M\Omega \\ 100 \ M\Omega \ M\Omega \ M\Omega \\ 100 \ M\Omega \ $	2.4 k Ω 2.9 k Ω 3.5 k Ω 4.4 k Ω 5.4 k Ω 63 k Ω 72 k Ω 82 k Ω 92 k Ω 103 k Ω 202 k Ω 310 k Ω 202 k Ω 310 k Ω 405 k Ω 504 k Ω 612 k Ω 711 k Ω 810 k Ω 910 k Ω 1.2 M Ω 2.7 M Ω 5.2 M Ω 7.8 M Ω 10 M Ω 13 M Ω 2210 M Ω 310 M Ω 410 M Ω 510 M Ω		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		

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ADDITIONAL MEASUBEMENTS	SPECIFIC TO 17 TH EDITION EQ	UIPMENT continued		
Loop Impedance (50 Hz)		5.1 m Ω 5.1 m Ω 5.2 m Ω 5.5 m Ω 5.9 m Ω 8.0 m Ω 60 m Ω 620 m Ω 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 μΑ 85 μΑ 140 μΑ		
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 5.3 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 μΑ 152 μΑ		
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 8.3 m Sec		

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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	0.22 °C 0.029 °C 0.15 °C 0.19 °C 0.28 °C 0.40 °C	Dam.	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	0.44 °C 0.45 °C 0.50 °C 0.70 °C 0.90 °C		BRS
Temperature indicators with the following probe types				BRS
Resistance (eg Pt100)	-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	0.20 °C 0.022 °C 0.10 °C 0.20 °C 0.40 °C 0.60 °C		BRS
Thermocouple	-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	0.44 °C 0.45 °C 0.50 °C 0.70 °C 0.90 °C		BRS

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
MASS				
Weights and artefacts	$\begin{array}{c} 25\ 000\ g\\ 20\ 000\ g\\ 10\ 000\ g\\ 5\ 000\ g\\ 2\ 000\ g\\ 2\ 000\ g\\ 1\ 000\ g\\ 500\ g\\ 200\ g\\ 1\ 000\ g\\ 50\ g\\ 200\ g\\ 100\ g\\ 50\ g\\ 20\ g\\ 10\ g\\ 50\ g\\ 20\ g\\ 10\ g\\ 0.5\ g\\ 0.2\ g\\ 0.1\ g\\ 0.05\ g\\ 0.02\ g\\ 0.005\ g\\ 0.005\ g\\ 0.002\ g\\ 0.001\ g\\ 0.001\ g\\ 0.001\ g\end{array}$	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 0.20 mg 0.24 mg 0.20 mg 0.16 mg 0.12 mg 0.10 mg 0.08 mg 0.05 mg 0.05 mg 0.05 mg 0.04 mg 0.04 mg 0.04 mg 0.04 mg	 Notes Calibrated using Borda substitution method. Calibrations can be given in other units as required. 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

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
		D UNCERTAINTY IN MICRON THERWISE STATED	IETRES	
LENGTH				
Plain plug gauges (parallel)	1 to 25 diameter 25 to 100 diameter	0.80 1.0	By comparison with	BRS
Plain ring gauges (parallel)	2 to 25 diameter 25 to 100 diameter	1.1 1.3	reference end standards	BRS
Length gauges, flat and spherical ended	0 to 175	1.5 + (5.0 x length in m)		BRS
MEASURING INSTRUMENTS AND MACHINES				
Micrometers External	BS 870:2008 0 to 200	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

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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
GLOSS	Geometry 20° 0 to 10 GU 10 to 70 GU 70 to 125 GU 1800 to 2000 GU Geometry 60°	0.62 GU 0.60 GU 0.98 GU 21.86 GU	By comparison with reference gloss standards	STL
	0 to 10 GU 10 to 70 GU 70 to 125 GU 800 to 1000 GU Geometry 85°	0.66 GU 1.05 GU 0.88 GU 11.23 GU		STL
	10 to 70 GU 70 to 125 GU 125 to 150 GU	1.02 GU 0.83 GU 3.76 GU		STL
		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: $Q[a, b] = [a^2 + b^2]^{1/2}$