Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

UKAS CALIBRATION **0143** **Accredited to ISO/IEC 17025:2017**	**Calmet Laboratory Services, a division of Lazgill Ltd** **Issue No:** 040 **Issue date:** 19 May 2021	
	11b Upper Teddington Road **Kingston-upon-Thames** **Surrey** **KT1 4DL**	**Contact: M Devanaboyina** **Tel: +44 (0)20 8977 8455** **Fax: +44 (0)20 8614 8048** **email: sales@calmet.co.uk** **Website: www.calmet.co.uk**
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 11b Upper Teddington Road Kingston-upon-Thames Surrey KT1 4DL	**Contact:** M Devanaboyina Tel: +44 (0)20 8977 8455 Fax: +44 (0)20 8614 8048 email: sales@calmet.co.uk	Dimensional, Electrical, Pressure and Torque.	A

Site activities performed away from the locations listed above:

Location details		Activity	Location code
At customers premises. The customers' site or premises 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.	**Contact:** M Devanaboyina Tel: +44 (0)20 8977 8455 Fax: +44 (0)20 8614 8048 email: sales@calmet.co.uk	Dimensional and Electrical.	B

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	
DIMENSIONAL CALIBRATION LENGTH			For dimensional calibrations, ranges are stated in millimetres and uncertainty in micrometres, unless otherwise stated. All linear calibration results may also be stated in inch units.	
Plain plug gauges (parallel) cylindrical setting standards and rollers	1 to 50 diameter 50 to 100 100 to 200 200 to 300	1.0 2.0 3.0 4.0	Using length measuring machine and end standards.	A
Plain and setting ring gauges (parallel)	1 to 10 diameter 10 to 50 50 to 100 100 to 200 200 to 300	2.0 1.5 2.0 3.5 5.0	Using length measuring machine and end standards.	A
Screw plug gauges (parallel) including check and setting plugs	1 to 100 diameter 100 to 200 200 to 300	4.0 5.0 6.0	Single and multi-start, symmetrical thread forms only, using length measuring machine.	A
Screw ring gauges (parallel)	1 to 50 50 to 150 150 to 300	5.0 6.0 8.0	Single and multi-start, symmetrical thread forms only, using length measuring machine. The 1 mm to 12 mm diameter range relates to functional test of size using check plugs.	A
Screw thread pitch	0.2 to 8	1.5	Using length measuring machine	A
Screw thread flank angles	0° to 52°	5.0 minutes of arc	Using a projector	A
Length gauges, flat and spherical ended	25 to 600	1.0 + (8.0 x length in m)	Using end standards	A
Plain gap gauges (parallel)	0.5 to 100 100 to 200	3.0 5.0	Using gauge blocks	A
Parallels	5 to 50 x 100 x 400	From 1.5 up to 5.0	As BS 906:1972 by comparison to datum surfaces and length standards	A
Vee blocks	20 to 150 diameter, vee capacity	From 2.5 up to 7.0	As BS 3731:1987 comparison to datum surfaces	A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
ANGLE				
Squares	50 to 300		As BS 939:2007	A
Blade type	300 to 600	3.0 on squareness 5.0		
Angle plates and box angle plates	50 to 600	Squareness: 3.0 + (1.0 per 100 mm) Parallelism: 1.0 + (1.0 per 100 mm)	As BS 5535:1978	A
FORM				
Straight edges				
Cast iron	300 to 8000	1.0 + (2.0 x length in m)	As BS 5204:Part 1:1975	A
Steel, Granite	300 to 2000	1.0 + (2.0 x length in m)	As BS 5204:Part 2:1977	A
Surface plates				
Granite and Cast iron	160 x 100 to 4000 x 6000	1.5 + (0.80 x diagonal in m)	As BS 817:2008	A & B
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
External	0 to 900	Heads 2.0 between any two points.	As BS 870:2008	A
Internal	0 to 900	Setting and extension rods 1.0 +	As BS 959:2008	A
Depth	0 to 300	(8.0 x length in m)	As BS 6468:2008	A
Three point bore micrometers	3 to 100 100 to 150	Overall performance 5.0 Overall performance 8.0	Using setting rings	A
Bore indicators	2 to 100 100 to 150	Overall performance 5.0 Overall performance 8.0	Using setting rings or length measuring machine	A
Micrometer heads	0 to 100	1.0	As BS 1734:1951	A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
MEASURING INSTRUMENTS AND MACHINES (continued)				
Vernier / Digital / Dial gauges Calliper	0 to 1000	Overall performance 10 + (30 x length in m)	BS 887:2008	A
Height	0 to 1000	Overall performance 10 + (30 x length in m)	BS 1643:2008 and ISO13225:2012	A
Depth	0 to 600	Overall performance 10 + (30 x length in m)	BS 6365:2008	A
Dial gauges and dial test indicators	0 to 50	1.0	As BS 907:2008 and BS 2795:1981	A
Electronic height gauges (including setting masters)	0 to 1000	1.0 + (5.0 x length in m)	Using end standards.	A
Profile projectors	10 to 100 magnifications	125 at the screen 5.0 linear 3.0 minutes of arc	Using glass scales .	A & B
Feeler gauges	0.02 to 1	3.0	As BS 957:2008	A
Spirit levels	5 seconds of arc to 60 minutes of arc nominal sensitivity	Mean sensitivity 10 % of nominal Minimum of 0.50 seconds of arc	As BS 3509:1962 and BS 958:1968	A
Electronic indicating levels	0 to 10 minutes of arc	1.0 % of range Minimum 0.50 seconds of arc	Using small angle generator.	A
TORQUE CALIBRATION			Calibration results may also be given in units of lbf·in and lbf·ft. The uncertainties quoted are for both the application of the calibration torque and the characteristics of the device being calibrated.	
Torque Wrenches and Torque Drivers	0.1 N·m to 3000 N·m	1.0 %	As BS EN ISO 6789-2:2017	A
Torque Wrenches and Torque Drivers	0.1 N·m to 3000 N·m	1.0 %	As BS EN ISO 6789:2003 (Withdrawn & superseded)	A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
ELECTRICAL CALIBRATION				
DC RESISTANCE				
Specific values	100 μΩ	60 ppm	Known values of resistance for the calibration of measuring instruments.	A
	1 mΩ	35 ppm		
	10 mΩ	15 ppm		
	100 mΩ	12 ppm		
	1 Ω	6.0 ppm		
	10 Ω	5.0 ppm		
	100 Ω	4.0 ppm		
	1 kΩ	4.0 ppm		
	10 kΩ	3.0 ppm		
	100 kΩ	3.0 ppm		
	1 MΩ	6.0 ppm		
	10 MΩ	10 ppm		
	100 MΩ	0.60 %		
	1 GΩ	0.65 %		
Other values	0 Ω to 1 Ω	20 ppm + 60 μΩ	Using digital multimeter; for the calibration of resistance sources.	A
	1 Ω to 12 Ω	6.7 ppm + 35 μΩ		
	12 Ω to 120 Ω	4.4 ppm + 350 μΩ		
	120 Ω to 1.2 kΩ	3.6 ppm + 230 μΩ		
	1.2 kΩ to 12 kΩ	4.4 ppm + 2.3 mΩ		
	12 kΩ to 120 kΩ	3.6 ppm + 23 mΩ		
	120 kΩ to 1.2 MΩ	14 ppm + 1.2 Ω		
	1.2 MΩ to 12 MΩ	64 ppm + 120 Ω		
	12 MΩ to 120 MΩ	650 ppm + 1.2 kΩ		
	0 Ω to 12 Ω	130 ppm + 3.5 mΩ	Using digital multimeter; for the calibration of resistance sources.	B
	12 Ω to 120 Ω	120 ppm + 4.6 mΩ		
	120 Ω to 1.2 kΩ	120 ppm + 12 mΩ		
	1.2 kΩ to 12 kΩ	120 ppm + 120 mΩ		
	12 kΩ to 120 kΩ	120 ppm + 1.2 Ω		
	120 kΩ to 1.2 MΩ	120 ppm + 12 Ω		
	1.2 MΩ to 12 MΩ	480 ppm + 120 Ω		
	12 MΩ to 120 MΩ	1.1 % + 12 kΩ		
Specific values	1 Ω	95 ppm	Known values of resistance for the calibration of measuring instruments.	B
	10 Ω	23 ppm		
	100 Ω	10 ppm		
	1 kΩ	6.5 ppm		
	10 kΩ	6.5 ppm		
	100 kΩ	8.5 ppm		
	1 MΩ	13 ppm		
	10 MΩ	40 ppm		
	100 MΩ	100 ppm		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
DC VOLTAGE				
Reference standard values	10 V	0.40 ppm	Using digital multimeter.	A
Other Values	0 V to 120 mV	8.3 ppm + 0.42 μV	Using digital multimeter; for the calibration of voltage sources.	A
	120 mV to 1.2 V	1.6 ppm + 0.20 μV		
	1.2 V to 12 V	0.80 ppm		
	12 V to 120 V	2.0 ppm		
	120 V to 1 kV	7.1 ppm + 0.41 mV	Using high voltage source and divider.	
	1 kV to 12 kV	0.50 %		
	0 mV to 120 mV	45 ppm + 4.5 μV	Using digital multimeter; for the calibration of voltage sources.	B
	120 mV to 1.2 V	32 ppm		
	1.2 V to 12 V	30 ppm		
	12 V to 120 V	47 ppm	Using high voltage divider.	
	120 V to 1050 V	480 ppm		
	1 kV to 12 kV	0.50 %		
	0 V to 220 mV	9.0 ppm + 0.80 μV	Using multifunction calibrator; for the calibration of measuring instruments.	A & B
	220 mV to 2.2 V	5.5 ppm + 1.0 μV		
	2.2 V to 11 V	3.8 ppm + 2.6 μV		
	11 V to 22 V	3.8 ppm + 4.2 μV		
	22 V to 220 V	5.2 ppm + 40 μV		
	220 V to 1100 V	6.8 ppm + 400 μV		
DC CURRENT				
	1 μA to 10 mA	15 ppm	Known values of direct current, using voltage/resistance method.	A
	10 mA to 100 mA	20 ppm		
	100 mA to 1 A	25 ppm		
	1 A to 3 A	25 ppm		
	3 A to 10 A	45 ppm		
	10 A to 20 A	50 ppm		
	20 A t0 40 A	85 ppm		
	40 A to 100 A	380 ppm		
	10 A to 550 A	0.55 %	For the calibration of current clamps and similar devices, using multi-turn coil method.	A & B
	550 A to 1000 A	0.55 %		A
	0 A to 120 μA	600 ppm + 31 nA	Using digital multimeter; for the calibration of current sources.	B
	120 μA to 1.2 mA	600 ppm + 60 nA		
	1.2 mA to 12 mA	600 ppm + 2.4 μA		
	12 mA to 120 mA	600 ppm + 12 μA		
	120 mA to 400 mA	600 ppm + 26 μA		
	400 mA to 1.2 A	600 ppm + 240 μA		
	1.2 A to 3 A	0.12 % + 700 μA		
	3 A to 10 A	0.18 % + 930 μA		
	10 A to 20 A	75 ppm + 75 μA		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
DC CURRENT (continued)				
	0 A to 220 µA	41 ppm + 6.0 nA	Using multifunction calibrator; for the calibration of measuring instruments.	A & B
	220 µA to 2.2 mA	36 ppm + 7.0 nA		
	2.2 mA to 22 mA	36 ppm + 40 nA		
	22 mA to 220 mA	46 ppm + 700 nA		
	220 mA to 2.2 A	81 ppm + 12 µA		
	2.2 A to 10 A	480 ppm + 260 µA		
AC VOLTAGE				A
	1.2 mV to 12 mV			
	40 Hz to 1 kHz	470 ppm + 1.3 µV	Using digital multimeter; for the calibration of voltage sources.	
	1 kHz to 20 kHz	560 ppm + 1.3 µV		
	20 kHz to 50 kHz	0.16 % + 1.3 µV		
	50 kHz to 100 kHz	0.59 % + 1.3 µV		
	100 kHz to 500 kHz	4.7 % + 2.3 µV		
	12 mV to 120 mV			
	40 Hz to 1 kHz	100 ppm + 2.3 µV		
	1 kHz to 20 kHz	180 ppm + 2.3 µV		
	20 kHz to 50 kHz	510 ppm + 2.3 µV		
	50 kHz to 100 kHz	0.10 % + 2.3 µV		
	100 kHz to 500 kHz	0.35 % + 2.3 µV		
	0.12 V to 1.2 V			
	40 Hz to 1 kHz	94 ppm + 23 µV		
	1 kHz to 20 kHz	180 ppm + 23 µV		
	20 kHz to 50 kHz	410 ppm + 23 µV		
	50 kHz to 100 kHz	950 ppm + 23 µV		
	100 kHz to 500 kHz	0.35 % + 120 µV		
	500 kHz to 1 MHz	1.2 % + 120 µV		
	1.2 V to 12 V			
	1 Hz to 40 Hz	100 ppm + 0.46 mV		
	40 Hz to 1 kHz	95 ppm + 0.23 mV		
	1 kHz to 20 kHz	180 ppm + 0.23 mV		
	20 kHz to 50 kHz	370 ppm + 0.23 mV		
	50 kHz to 100 kHz	940 ppm + 0.23 mV		
	100 kHz to 500 kHz	0.35 % + 1.2 mV		
	500 kHz to 1 MHz	1.2 % + 1.2 mV		
	12 V to 120 V			
	40 Hz to 1 kHz	240 ppm + 2.3 mV		
	1 kHz to 20 kHz	250 ppm + 2.3 mV		
	20 kHz to 50 kHz	410 ppm + 2.3 mV		
	50 kHz to 100 kHz	0.14 % + 2.3 mV		
	120 V to 700 V			
	40 Hz to 1 kHz	470 ppm + 23 mV		
	1 kHz to 20 kHz	700 ppm + 23 mV		
	700 V to 1000 V			
	10 Hz to 20 kHz	0.80 % + 260 mV		
	20 kHz to 50 kHz	0.15 % + 440 mV		
	50 kHz to 100 kHz	0.70 % + 700 mV		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
AC VOLTAGE (continued)				
	5 mV to 120 mV		Using digital multimeter; for the calibration of voltage sources.	B
	10 Hz to 20 kHz	850 ppm + 47 µV		
	20 kHz to 50 kHz	0.15 % + 58 µV		
	50 kHz to 100 kHz	0.70 % + 95 µV		
	0.12 V to 1.2 V			
	10 Hz to 20 kHz	600 ppm + 350 µV		
	20 kHz to 50 kHz	0.15 % + 580 µV		
	50 kHz to 100 kHz	0.70 % + 950 µV		
	1.2 V to 12 V			
	10 Hz to 20 kHz	0.080 % + 3.5 mV		
	20 kHz to 50 kHz	0.15 % + 5.8 mV		
	50 kHz to 100 kHz	0.70 % + 9.5 mV		
	12 V to 120 V			
	10Hz to 20kHz	0.080 % + 35 mV		
	20kHz to 50kHz	0.15 % + 58 mV		
	50kHz to 100kHz	0.70 % + 95 mV		
	120 V to 1000 V			
	10 Hz to 20 kHz	0.080 % + 260 mV		
	20 kHz to 50 kHz	0.15 % + 440 mV		
	50 kHz to 100 kHz	0.70 % + 700 mV		
	1 kV to 12 kV			
	50 Hz to 60 Hz	1.0 %	Using digital multimeter and high voltage divider; for the calibration of voltage sources.	A & B
	200 µV to 2.2 mV		Using multifunction calibrator; for the calibration of measuring instruments.	A & B
	10 Hz to 2 0Hz	420 ppm + 4.0 µV		
	20 Hz to 40 Hz	350 ppm + 4.0 µV		
	40 Hz to 20 kHz	350 ppm + 4.0 µV		
	20 kHz to 50 kHz	470 ppm + 4.0 µV		
	50 kHz to 100 kHz	710 ppm + 5.0 µV		
	100 kHz to 300 kHz	0.13 % + 10 µV		
	300 kHz to 500 kHz	0.17 % + 20 µV		
	500 kHz to 1 MHz	0.40 % + 20 µV		
	2.2 mV to 22 mV			
	10 Hz to 20 Hz	270 ppm + 4.0 µV		
	20 Hz to 40 Hz	130 ppm + 4.0 µV		
	40 Hz to 20 kHz	120 ppm + 4.0 µV		
	20 kHz to 50 kHz	220 ppm + 4.0 µV		
	50 kHz to 100 kHz	530 ppm + 5.0 µV		
	100 kHz to 300 kHz	0.11 % + 10 µV		
	300 kHz to 500 kHz	0.15 % + 20 µV		
	500 kHz to 1 MHz	0.29 % + 45 µV		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
AC VOLTAGE (continued)				A & B
	22 mV to 220 mV			
	10 Hz to 20 Hz	250 ppm + 12 µV		
	20 Hz to 40 Hz	100 ppm + 7.0 µV		
	40 Hz to 20 kHz	62 ppm + 7.0 µV		
	20 kHz to 50 kHz	130 ppm + 7.0 µV		
	50 kHz to 100 kHz	320 ppm + 17 µV		
	100 kHz to 300 kHz	670 ppm + 20 µV		
	300 kHz to 500 kHz	0.15 % + 25 µV		
	500 kHz to 1 MHz	0.28 % + 45 µV		
	220 mV to 2.2 V			
	10 Hz to 20 Hz	250 ppm + 40 µV		
	20 Hz to 40 Hz	100 ppm + 15 µV		
	40 Hz to 20 kHz	46 ppm + 8.0 µV		
	20 kHz to 50 kHz	70 ppm + 10 µV		
	50 kHz to 100 kHz	88 ppm + 30 µV		
	100 kHz to 300 kHz	350 ppm + 80 µV		
	300 kHz to 500 kHz	0.11 % + 200 µV		
	500 kHz to 1 MHz	0.18 % + 300 µV		
	2.2 V to 22 V			
	10 Hz to 20 Hz	250 ppm + 400 µV		
	20 Hz to 40 Hz	92 ppm + 150 µV		
	40 Hz to 20 kHz	46 ppm + 50 µV		
	20 kHz to 50 kHz	70 ppm + 100 µV		
	50 kHz to 100 kHz	86 ppm + 200 µV		
	100 kHz to 300 kHz	260 ppm + 600 µV		
	300 kHz to 500 kHz	0.11 % + 2.0 mV		
	500 kHz to 1 MHz	0.16 % + 3.2 mV		
	22 V to 220 V			
	10 Hz to 20 Hz	250 ppm + 4.0 mV		
	20 Hz to 40 Hz	93 ppm + 1.5 mV		
	40 Hz to 20 kHz	56 ppm + 600 µV		
	20 kHz to 50 kHz	83 ppm + 1.0 mV		
	50 kHz to 100 kHz	160 ppm + 2.5 mV		
	100 kHz to 300 kHz	910 ppm + 16 mV		
	220 V to 1100 V			
	50 Hz to 1 kHz	74 ppm + 4.0 mV		
AC CURRENT				
	6 µA to 120 µA		Using digital multimeter; for the calibration of current sources.	A
	20 Hz to 45 Hz	0.17 % + 35 nA		
	45 Hz to 100 Hz	750 ppm + 35 nA		
	100 Hz to 5 kHz	750 ppm + 35 nA		
	120 µA to 1.2 mA			
	10 Hz to 20 Hz	0.50 % + 240 nA		
	20 Hz to 45 Hz	0.20 % + 240 nA		
	45 Hz to 100 Hz	730 ppm + 240 nA		
	100 Hz to 5 kHz	400 ppm + 240 nA		
	5 kHz to 20 kHz	730 ppm + 240 nA		
	20 kHz to 50 kHz	0.50 % + 470 nA		
	50 kHz to 100 kHz	0.66 % + 1.8 µA		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
AC CURRENT (continued)	1.2 mA to 12 mA			A
	10 Hz to 20 Hz	0.48 % + 2.5 µA		
	20 Hz to 45 Hz	0.20 % + 2.5 µA		
	45 Hz to 100 Hz	700 ppm + 2.5 µA		
	100 Hz to 5 kHz	380 ppm +2.5 µA		
	5 kHz to 20 kHz	730 ppm +2.5 µA		
	20 kHz to 50 kHz	0.50 % +4.8 µA		
	50 kHz to 100 kHz	0.65 % +24 µA		
	12 mA to 120 mA			
	10 Hz to 20 Hz	0.48 % + 24 µA		
	20 Hz to 45 Hz	0.18 % + 24 µA		
	45 Hz to 100 Hz	730 ppm + 24 µA		
	100 Hz to 5 kHz	380 ppm + 24 µA		
	5 kHz to 20 kHz	730 ppm + 2.5 µA		
	20 kHz to 50 kHz	0.50 % + 48 µA		
	50 kHz to 100 kHz	0.65 % + 180 µA		
	120 mA to 1 A			
	10 Hz to 20 Hz	0.48 % + 240 µA		
	20 Hz to 45 Hz	0.20 % + 240 µA		
	45 Hz to 100 Hz	0.10 % + 240 µA		
	100 Hz to 5 kHz	0.14 % + 240 µA		
	5 kHz to 20 kHz	0.38 % + 240 µA		
	20 kHz to 50 kHz	1.2 % + 470 µA		
	1 A to 20 A			
	40 Hz to 1 kHz	750 ppm		
	5 µA to 120 µA		Using digital multimeter; for the calibration of current sources.	B
	10 Hz to 5 kHz	0.18 % + 70 nA		
	5 kHz to 10 kHz	0.41 % + 810 nA		
	0.12 mA to 1.2 mA			
	10 Hz to 5 kHz	0.18 % + 480 nA		
	5 kHz to 10 kHz	0.24 % + 2.9 µA		
	1.2 mA to 1 2mA			
	10 Hz to 5 kHz	0.18 % + 7.0 µA		
	5 kHz to 10 kHz	0.41 % +81 µA		
	12 mA to 120 mA			
	10 Hz to 5 kHz	0.12 % + 46 µA		
	5 kHz to 10 kHz	0.23 % + 290 µA		
	120 mA to 400 mA			
	10Hz to 1kHz	0.12 % + 460 µA		
	1kHz to 10kHz	0.24 % + 3.3 mA		
	400 mA to 1.2 A			
	10 Hz to 5 kHz	0.12 % + 460 µA		
	5 kHz to 10 kHz	0.41 % + 8.1 mA		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
AC CURRENT (continued)	1.2 A to 3 A			A
	10 Hz to 5 kHz	0.19 % + 2.1 mA		
	5 kHz to 10 kHz	0.41 % + 25 mA		
	3 A to 10 A			
	10 Hz to 5 kHz	0.19 % + 7.0 mA		
	5 kHz to 10 kHz	0.42 % + 81 mA		
	9 µA to 220 µA		Using multifunction calibrator; for the calibration of measuring instruments.	A & B
	10 Hz to 20 Hz	260 ppm + 16 nA		
	20 Hz to 40 Hz	170 ppm + 10 nA		
	40 Hz to 1 kHz	120 ppm + 8.0 nA		
	1 kHz to 5 kHz	290 ppm + 12 nA		
	5 kHz to 10 kHz	0.11 % + 65 nA		
	220 µA to 2.2 mA			
	10 Hz to 20 Hz	250 ppm + 40 nA		
	20 Hz to 40 Hz	170 ppm + 35 nA		
	40 Hz to 1 kHz	110 ppm + 35 nA		
	1 kHz to 5 kHz	200 ppm + 110 nA		
	5 kHz to 10 kHz	0.11 % + 650 nA		
	2.2 mA to 22 mA			
	10 Hz to 20 Hz	250 ppm + 400 nA		
	20 Hz to 40 Hz	160 ppm + 350 nA		
	40 Hz to 1 kHz	110 ppm + 350 nA		
	1 kHz to 5 kHz	200 ppm + 550 nA		
	5 kHz to 10 kHz	0.11 % + 5.0 µA		
	22 mA to 220 mA			
	10 Hz to 20 Hz	250 ppm + 4.0 µA		
	20 Hz to 40 Hz	160 ppm + 3.5 µA		
	40 Hz to 1 kHz	110 ppm + 2.5 µA		
	1 kHz to 5 kHz	200 ppm + 3.5 µA		
	5 kHz to 10 kHz	0.11 % + 10 µA		
	220 mA to 2.2 A			
	20 Hz to 1 kHz	250 ppm 35 µA		
	1 kHz to 5 kHz	450 ppm + 80 µA		
	5 kHz to 10 kHz	0.70 % + 160 µA		
	2.2 A to 11 A			
	45 Hz to 65 Hz	550 ppm + 1.6 mA		
	65 Hz to 500 Hz	830 ppm + 1.6 mA		
	500 Hz to 1 kHz	0.26 % + 1.6 mA		
	45 Hz to 60 Hz		For the calibration of current clamps and similar devices, using multi-turn coil method.	
	10 A to 100 A	0.15 %		A & B
	100 A to 500 A	0.55 %		A & B
	500 A to 1000 A	0.60 %		A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
AC RESISTANCE	*40 Hz to 1 kHz*		Known values of resistance for the calibration of measuring instruments.	A
	0.05 Ω	120 ppm		
	0.1 Ω	90 ppm		
	0.2 Ω	80 ppm		
	0.5 Ω	75 ppm		
	1 Ω	70 ppm		
	2 Ω	70 ppm		
	5 Ω	70 ppm		
	10 Ω	45 ppm		
	100 Ω	45 ppm		
	1 kΩ	45 ppm		
	10 kΩ	50 ppm		
	100 kΩ	65 ppm		
AC POWER	*47 Hz to 63 Hz*			
	Voltages 60 V to 240 V Currents 0.5 A to 5 A 15 W to 1200 W	90 ppm	Using phantom load technique; unity to 0.5 power factor, capacitive or inductive.	A
	Voltages 60 V to 240 V Currents 5 A to 100 A 150 W to 24 kW	150 ppm		
	Combination of specific voltage and current values: V = 75 V, 100 V, 150 V, 300 V I = 0.5 A, 1 A, 2 A, 5 A, 10 A, 20 A	0.035 %	Using phantom load technique; unity to 0.5 power factor, capacitive or inductive. Calibrations at lower power factors can be carried out to however the assigned uncertainties may be increased.	
FREQUENCY	0.2 Hz to 1 kHz	2 in 10^8	Multi-period measurement.	A
	1 kHz to 1000 MHz	2 in 10^8	Frequency measurement.	
TIME INTERVAL	100 ms to 24 hours	200 ms	Stopwatch calibration.	
TRANSITION TIME	250 ps to 500 ns	5.0 % + 45 ps	For oscilloscope calibration using fast pulse generator.	A & B
BANDWIDTH	50 kHz to 1 GHz	5.0 %	For oscilloscope calibration using wide band oscillator.	A & B
CAPACITANCE	*At 1 kHz* 1 nF to 10 μF	770 ppm	Measurement of capacitance using LCR meter.	A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
TEMPERATURE SIMULATION Ambient in support of reference junction	17 ˚C to 23 ˚C	0.10 ˚C		
Temperature indicators, calibration by electrical simulation	Simulated temperature	Uncertainty of simulated temperature		
Type K	-200 °C to +1370 °C	0.20 °C	Including cold junction compensation.	A
Type J	-200 °C to +750 °C	0.20 °C		
Type N	-200 °C to +400 °C	0.20 °C		
Type T	-200 °C to +1300 °C	0.20 °C		
Type R	0 °C to 1700 °C	0.20 °C		
Type S	0 °C to 1700 °C	0.20 °C		
Resistance thermometer (Pt 100)	-200°C to +800°C	0.030 °C	Using equivalent DC resistance values.	A
Type K	-200 °C to +1370 °C	0.50 °C	Including cold junction compensation.	B
Type J	-200 °C to +750 °C	0.50 °C		
Type N	-200 °C to +400 °C	0.80 °C		
Type T	-200 °C to +1300 °C	0.50 °C		
Resistance thermometer (Pt 100)	-200°C to 800°C	0.10 °C	Using equivalent DC resistance values.	B
CALIBRATION OF 17TH / 18TH EDITION TEST EQUIPMENT			Using dedicated calibrator.	A & B
Insulation Resistance	100 kΩ	0.50 %		
	1 MΩ	8.0 %		
	5 MΩ	1.6 %		
	10 MΩ	5.0 %		
	100 MΩ	5.0 %		
	1 GΩ	5.0 %		
Insulation Voltage	50 V to 250 V	2.0 %		
	250 V to 500 V	2.0 %		
	500 V to 1 kV	1.5 %		
RCD Trip Current	10 mA to 15 mA	5.0 %		
	15 mA to 50 mA	2.0 %		
	100 mA to 100 mA	3.0 %		
	100 mA to 150 mA	3.0 %		
	150 mA to 500 mA	2.0 %		
	500 mA to 1 A	2.5 %		
RCD Trip Time	0 s to 100 ms	2.0 ms		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
CALIBRATION OF 17TH / 18TH EDITION TEST EQUIPMENT (continued)			Using dedicated calibrator.	A & B
Continuity Resistance	10 mΩ to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 10 kΩ	1.2 % 1.2 % 1.2 % 1.2 % 1.2 %		
Loop impedance	100 mΩ to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ	100 mΩ 1.0 Ω 15 Ω		
PAT test Voltage	50 V to 100 V nominal 50 Hz 100 V to 400 V nominal 50 Hz	1.0 V 1.5 V		
Earth Bond resistance	5 mΩ to 50 mΩ 50 mΩ to 5 Ω	5.0 mΩ 10 mΩ		
Earth bond current	10 mA to 500 mA 500 mA to 10 A 10 A to 25 A	10 mA 20 mA 65 mA		
PAT Leakage current	50 µA to 7.7 mA	50 µA		
Flash Test	1 kV to 3 kV 3 kV to 12 kV 1 kV to 3 kV nominal 50 Hz 3 kV to 12 kV nominal 50 Hz	100 V 200 V 100 V 200 V		
Flash Current	2 µA to 200 µA 200 µA to 2 mA 2 mA to 20 mA 2 µA to 200 µA nominal 50 Hz 200 µA to 2 mA nominal 50 Hz 2 mA to 20 mA nominal 50 Hz	2.0 µA 30 µA 200 µA 3.0 µA 30 µA 300 µA		
Load for PAT	0.13 kW	1.0 % + 1.5 Ω	At nominal UK mains supply voltage	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	
PRESSURE CALIBRATION			Calibration of devices with an electrical output may be undertaken.	
Gas pressure (gauge)				A
Calibration of pressure indicators and gauges	-95 kPa to +200 kPa 200 kPa to 2 MPa 2 MPa to 10 MPa	150 Pa 650 Pa 3.0 kPa	Calibration by comparison with digital pressure standards.	A
Gas pressure (absolute)				A
Calibration of pressure indicators and gauges	10 kPa to 300 kPa 300 kPa to 2.1 MPa 2.1 MPa to 10 MPa	350 Pa 850 Pa 3.2 kPa	Calibration by comparison with digital pressure standards.	A
Hydraulic pressure (gauge)				A
Calibration of pressure indicators and gauges	550 kPa to 69 MPa	0.037 %	Calibration by comparison with deadweight tester.	A
Calibrations using water	0 MPa to 100 MPa	30 kPa	Calibration by comparison with digital pressure standards.	A
END				

Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest uncertainty of measurement that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors. The CIPM-ILAC definition of the CMC is as follows:

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

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The CMC is calculated according to the procedures given in M3003 and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published CMC in certificates issued under its accreditation.

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

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

Expression of CMCs - symbols and units

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

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

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

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

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

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

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

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