Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0143

Accredited to ISO/IEC 17025:2005

Calmet Laboratory Services

Issue No: 033 **Issue date:** 17 March 2017

11b Upper Teddington Road
Kingston-upon-Thames
Surrey
KT1 4DL

Contact: Mr R Griffiths
Tel: +44 (0)20 8977 8455
Fax: +44 (0)20 8614 8048
E-Mail: 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:** Mr R Griffiths Tel: +44 (0)20 8977 8455 Fax: +44 (0)20 8614 8048 E-Mail: 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	Mr R Griffiths	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	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
DIMENSIONAL			NOTES	
LENGTH				
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	1. All linear calibrations may be given in inch units.	A
Plain 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	2 The uncertainty quoted is for the departure from flatness, straightness, parallelism or squareness, ie the distance separating the parallel planes which just enclose the surface under consideration.	
Screw plug gauges (parallel) including check and setting plugs See Note 4	1 to 100 diameter 100 to 200 200 to 300	4.0 5.0 6.0	3 Calibration results may also be given in units of lbf.in and lbf.ft.	A
Screw ring gauges (parallel) See Notes 4 and 5	1 to 50 50 to 150 150 to 300	5.0 6.0 8.0	4 Single and multi-start, symmetrical thread forms only.	A
Screw thread pitch	0.2 to 8	1.5	5. 1 mm to 12 mm diameter range relates to functional test of size using check plugs.	A
Screw thread flank angles	0° to 52°	5.0 minutes of arc		A
Length gauges, flat and spherical ended	25 to 600	1.0 + (8.0 x length in m)		A
Plain gap gauges (parallel)	0.5 to 100 100 to 200	3.0 5.0		A
Parallels	As BS 906:1972 5 to 50 x 100 x 400	From 1.5 up to 5.0		A
Vee blocks	As BS 3731:1987 20 to 150 diameter, vee capacity	From 2.5 up to 7.0		A

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

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	Location Code
MEASURING INSTRUMENTS AND MACHINES (cont'd)				
Vernier / Digital / Dial gauges Calliper	BS 887:2008 0 to 1000	Overall performance 10 + (30 x length in m)		A
Height	ISO13225:2012 and BS 1643:2008 0 to 1000	Overall performance 8.0 + (27 x length in m)		
Depth	BS 6365:2008 0 to 600	Overall performance 10 + (30 x length in m)		
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 to 50	1.0		A
Electronic height gauges (including setting masters)	0 to 1000	1.0 + (5.0 x length in m)		A
Profile projectors	10 to 100 magnifications	125 at the screen 5.0 linear 3.0 minutes of arc		A & B
Feeler gauges	As BS 957:2008 0.02 to 1.00	3.0		A
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 of 0.50 seconds of arc		A
Electronic indicating levels	0 to 10 minutes of arc	1.0 % of range Minimum 0.50 seconds of arc		A
TORQUE				
Hand torque tools	As BS EN ISO 6789:2003 0.1 N·m to 3000 N·m	1.0 % of applied torque See Note 3		A

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
ELECTRICAL				
DC Resistance				
Sourcing	100 μΩ 1 mΩ 10 mΩ 100 mΩ 1 Ω 10 Ω 100 Ω 1 kΩ 10 kΩ 100 kΩ 1 MΩ 10 MΩ 100 MΩ 1.0 GΩ	70 ppm 35 ppm 15 ppm 12 ppm 6.0 ppm 5.0 ppm 4.0 ppm 4.0 ppm 3.0 ppm 3.0 ppm 6.0 ppm 10 ppm 0.60 % 0.65 %		A
Measurement	0 Ω to 100 Ω 100 Ω to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ	10 ppm + 0.20 mΩ 10 ppm 15 ppm 20 ppm		A
	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ	25 ppm + 1.0 mΩ 15 ppm 10 ppm 45 ppm 60 ppm		B
Generation	0.001 Ω to 10 Ω 10 Ω to 10 kΩ 10 kΩ to 1 MΩ 1 MΩ to 10 MΩ	100 ppm + 1.0 mΩ 25 ppm 120 ppm 250 ppm		B
DC Voltage				
Standard Cell Values	10 V	0.80 ppm		A
Other Values	1 μV to 1.1 V 1.1 V to 11 V 11 V to 100 V 100 V to 1 kV 1 kV to 12 kV	0.80 ppm + 0.20 μV 2.4 ppm + 0.20 μV 2.5 ppm 2.5 ppm 0.50 %		A
Measurement	0 mV to 100 mV 100 mV to 100 V 100 V to 1000 V	25 ppm + 2.0 μV 20 ppm 20 ppm		B
	1 kV to 12 kV	0.50 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
DC Voltage Continued				
Generation	0 V to 1 V	25 ppm + 1.0 µV		B
	1 V to 1000 V	35 ppm		
DC Voltage Ratio	0 to unity	0.10 ppm of input + 0.40 µV	For input voltages in the range 1 to 100 V	A
DC Current				A
Measurement and sourcing	1 µA to 10 mA	15 ppm		
	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		
	20 A	80 ppm		
	50 A and 100 A	0.020 %		
	100 A to 1000 A	0.55 %	For the Calibration of Current Clamps	
Generation	1.0 µA to 100 mA	0.010 %		B
	100 mA to 10 A	0.035 %		
AC Voltage	*10 mV to 250 mV*			A
	40 Hz to 20 kHz	0.014 %		
	250 mV to 16 V			
	20 Hz to 50 kHz	40 ppm		
	50 kHz	30 ppm		
	100 kHz	35 ppm		
	16 V to 125 V			
	20 Hz to 20 kHz	30 ppm		
	20 kHz to 50 kHz	25 ppm		
	50 kHz	25 ppm		
	100 kHz	25 ppm		
	125 V to 1000 V			
	20 Hz to 10 kHz	60 ppm		
	50 kHz	50 ppm		
	250 V			
	50 kHz	40 ppm		
	1 kV to 10 kV			
	50 Hz to 60 Hz	1.0 %		
Generation	*40 Hz to 100 kHz*			B
	10 mV to 10 V	0.020 %		
	10 V to 1000 V	0.030 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
AC Current				A
Specific Values	*40 Hz to 1 kHz*			
	1 μA and 10 μA	40 ppm		
	100 μA	20 ppm		
	1 mA	10 ppm		
	10 mA	15 ppm		
	100 mA	10 ppm		
	200 mA, 500 mA and 1 A	55 ppm		
	2 A	60 ppm		
	5 A	65 ppm		
	10 A	75 ppm		
	20 A	100 ppm		
	1 kHz to 5 kHz			
	1 μA and 10 μA	130 ppm		
	100 μA	25 ppm		
	5 kHz to 10 kHz			
	100 μA	30 ppm		
	1 kHz to 10 kHz			
	1 mA	20 ppm		
	10 mA	15 ppm		
	100 mA	10 ppm		
	200 mA, 500 mA and 1 A	65 ppm		
	2 A	80 ppm		
	5 A	80 ppm		
	10 A	70 ppm		
	20 A	120 ppm		
Other Values	*40 Hz to 1 kHz*			
	1 μA to 10 μA	40 ppm		
	10 μA to 100 mA	20 ppm		
	100 mA to 10 A	75 ppm		
	10 A to 20 A	100 ppm		
	45 Hz to 60 Hz			
	50 A to 100 A	150 ppm		
	100 A to 500 A	0.55 %	For the Calibration of Current Clamps	
	500 A to 1000 A	0.60 %		
Generation	*40 Hz to 10 kHz*			B
	10 μA to 10 A	0.030 %		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	Location Code
AC Resistance	*40 Hz to 1 kHz*			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/DC Voltage Transfer	*250 mV to 16 V*			A
	20 Hz to 20 kHz	40 ppm		
	20 kHz to 50 kHz	40 ppm		
	50 kHz	30 ppm		
	100 kHz	35 ppm		
	16 V to 125 V			
	20 Hz to 20 kHz	35 ppm		
	20 kHz to 50 kHz	25 ppm		
	50 kHz	25 ppm		
	100 kHz	25 ppm		
	250 V			
	20 Hz to 10 kHz	60 ppm		
	20 kHz	35 ppm		
	50 kHz	40 ppm		
	500 V to 1 kV			
	20 Hz to 10 kHz	85 ppm		
	20 kHz	120 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	))) Unity to 0.5 power) factor lagging or	A
	Voltages 60 V to 240 V Currents 5 A to 100 A 150 W to 24 kW	150 ppm	) leading))	
	Combination of specific voltage and current values: V = 75, 100, 150, 300 V I = 0.5, 1, 2, 5, 10, 20 A	0.035 %	) Unity to 0.5 power) factor lagging or) leading. Calibrations at) lower power factors) can be carried out to) greater uncertainties.	

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	Location Code
Frequency	0.2 Hz to 1 kHz 1 kHz to 1000 MHz	2 in 10^8 2 in 10^8	Multi-period measurement Frequency measurement	A
Elapsed time	100 ms to 1 day	20 ms	Stop watches	
Rise/Fall Time	160 ps to 500 ns	5.0 % + 20 ps	For the calibration of	A
Bandwidth	50 kHz to 1.0 GHz	5.0 %	Oscilloscopes	A
Capacitance				
	At 1 kHz 1 nF to 10 µF	 0.077 %		
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	including cold junction compensation	A
Type K Type J Type N Type T	-200 °C to 1370 °C -200 °C to 750 °C -200 °C to 400 °C -200 °C to 1300 °C	0.20 °C 0.20 °C 0.20 °C 0.20 °C		
Type R Type S	0 °C to 1700 °C 0 °C to 1700 °C	0.20 °C 0.20 °C		
Resistance thermometer (Pt 100)	-200°C to 800°C	0.030 °C		
Type K Type J Type N Type T	-200 °C to 1370 °C -200 °C to 750 °C -200 °C to 400 °C -200 °C to 1300 °C	0.50 °C 0.50 °C 0.80 °C 0.50 °C		B
Resistance thermometer (Pt 100)	-200°C to 800°C	0.10 °C		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k=2)	Remarks	Location Code
Measurements to support 17th edition type test equipment				A & B
Insulation Resistance	100 kΩ 1 MΩ 5 MΩ 10 MΩ 100 MΩ 1 GΩ	500 Ω 80 kΩ 80 kΩ 500 kΩ 5.0 MΩ 50 MΩ		
Insulation Voltage	50 V to 250 V 250 V to 500 V 500 V to 1 kV	5.0 V 10 V 15 V		
RCD Trip Current	10 mA to 15 mA 15 mA to 50 mA 100 mA to 100 mA 100 mA to 150 mA 150 mA to 500 mA 500 mA to 1 A	500 µA 1.0 mA 3.0 mA 5.0 mA 10 mA 25 mA		
RCD Trip Time	0 s to 100 ms	2.0 ms		
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	100 mΩ 500 mΩ 3.0 Ω 50 Ω 300 Ω		
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 250 V		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (*k*=2)	Remarks	Location Code
Measurements to support 17th edition type test equipment continued				A & B
Flash Current	2 µA to 200 µA 200 µA to 2 mA 2 mA to 20 mA	2.0 µA 30 µA 200 µA		
	2 µA to 200 µA nominal 50 Hz 200 µA to 2 mA nominal 50 Hz 2 mA to 20 mA nominal 50 Hz	3.0 µA 30 µA 300 µA		
Load for PAT	0.13 kW	1.0 % + 1.5 Ω	At nominal UK mains supply voltage	
PRESSURE			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		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		A
Hydraulic pressure (gauge)				A
Calibration of pressure indicators and gauges	550 kPa to 69 MPa	0.043 %		A
Calibrations using water	0 MPa to 100 MPa	30 kPa		A
END				