


Schedule of Accreditation

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United Kingdom Accreditation Service

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

 UKAS CALIBRATION 0666 Accredited to ISO/IEC 17025:2017	Allied Aerosystems Ltd Issue No: 050 Issue date: 11 October 2021	
	Avionic and Metrology Centre Unit G1/2 Treforest Industrial Estate Pontypridd CF37 5YL	Contact: Mr P Ashurst Tel: +44 (0)1443 849970 Fax: +44 (0)1443 849988 E-Mail: phillip.ashurst@allied-aerosystems.com Website: www.allied-aerosystems.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 Avionic and Metrology Centre Unit G1/2 Treforest Industrial Estate Pontypridd CF37 5YL Local contact Mr P Ashurst Tel: +44 (0)1443 849970 Fax: +44 (0)1443 849988 E-Mail: phillip.ashurst@allied-aerosystems.com	Electrical, DC&LF Electrical, RF Rotational speed Time	Lab 1
Address Units 1-6, Moy Road Industrial Estate Taffs Well Cardiff CF15 7QR Local contact All correspondence and deliveries are to be made to the above address	Dimensional Torque Mass Temperature Pressure Surface plates and tables Accelerometry	Lab 2

Site activities performed away from the locations listed above:

Location details	Activity	Location code
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.	Non-automatic weighing instruments Surface plates and tables Temperature Pressure	Site



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CALIBRATION AND MEASUREMENT CAPABILITY (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
ELECTRICAL CALIBRATION				
DC VOLTAGE	0 mV to 220 mV 220 mV to 2.2 V 2.2 V to 11 V 11 V to 22 V 22 V to 220 V 220 V to 1100 V	8.4 μ V/V + 0.60 μ V 7.0 μ V/V + 1.0 μ V 7.0 μ V/V + 3.6 μ V 7.0 μ V/V + 6.6 μ V 8.0 μ V/V + 80 μ V 9.0 μ V/V + 560 μ V	Using multifunction calibrator.	Lab 1
	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV	5.2 μ V/V + 1.2 μ V 3.3 μ V/V + 0.59 μ V 3.2 μ V/V + 5.1 μ V 4.7 μ V/V + 51 μ V 15 μ V/V + 0.29 mV	Using digital multimeter	
DC CURRENT	0 μ A to 220 μ A 220 μ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A 2.2 A to 11 A 11 A to 20 A 20 A to 100 A	50 μ A/A + 8.0 nA 50 μ A/A + 8.0 nA 50 μ A/A + 100 nA 60 μ A/A + 800 nA 81 μ A/A + 25 μ A 0.080 % + 0.39 mA 0.10 % + 4.6 mA 0.10 % + 23 mA	Using multifunction calibrator.	Lab 1
	11 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A	0.30 % + 2.4 mA 0.30 % + 18 mA 0.30 % + 61 mA	Simulated current using a multi turn coil, for the calibration of clamp-on ammeters and similar devices.	
	0 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2.0 A to 20 A 20 A to 100 A	10 μ A/A + 0.48 nA 10 μ A/A + 4.7 nA 10 μ A/A + 47 nA 39 μ A/A + 0.93 μ A 200 μ A/A + 16 μ A 440 μ A/A + 51 μ A 0.11 %	Using digital multimeter.	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
DC RESISTANCE				Lab 1
Specific values	0 Ω 1 m Ω 10 m Ω 100 m Ω 1.0 Ω 1.9 Ω 10 Ω 19 Ω 100 Ω 190 Ω 1.0 k Ω 1.9 k Ω 10 k Ω 19 k Ω 100 k Ω 190 k Ω 1.0 M Ω 1.9 M Ω 10 M Ω 19 M Ω 100 M Ω	59 $\mu\Omega$ 100 $\mu\Omega/\Omega$ 100 $\mu\Omega/\Omega$ 100 $\mu\Omega/\Omega$ 110 $\mu\Omega/\Omega$ 98 $\mu\Omega/\Omega$ 31 $\mu\Omega/\Omega$ 37 $\mu\Omega/\Omega$ 18 $\mu\Omega/\Omega$ 18 $\mu\Omega/\Omega$ 14 $\mu\Omega/\Omega$ 14 $\mu\Omega/\Omega$ 12 $\mu\Omega/\Omega$ 13 $\mu\Omega/\Omega$ 15 $\mu\Omega/\Omega$ 16 $\mu\Omega/\Omega$ 25 $\mu\Omega/\Omega$ 30 $\mu\Omega/\Omega$ 54 $\mu\Omega/\Omega$ 68 $\mu\Omega/\Omega$ 110 $\mu\Omega/\Omega$	Known values of DC resistance for application to measuring instruments in a 2- wire or 4-wire configuration, as appropriate.	
	0 Ω to 2 Ω 2 Ω to 20 Ω 20 Ω to 200 Ω 200 Ω to 2 k Ω 2 k Ω to 20 k Ω 20 k Ω to 200 k Ω 200 k Ω to 2 M Ω 2 M Ω to 20 M Ω 20 M Ω to 200 M Ω 200 M Ω to 2 G Ω	12 $\mu\Omega/\Omega + 5.0 \mu\Omega$ 8.5 $\mu\Omega/\Omega + 21 \mu\Omega$ 8.5 $\mu\Omega/\Omega + 70 \mu\Omega$ 8.4 $\mu\Omega/\Omega + 0.62 \text{ m}\Omega$ 8.4 $\mu\Omega/\Omega + 6.2 \text{ m}\Omega$ 8.6 $\mu\Omega/\Omega + 62 \text{ m}\Omega$ 9.9 $\mu\Omega/\Omega + 1.4 \Omega$ 16 $\mu\Omega/\Omega + 120 \Omega$ 68 $\mu\Omega/\Omega + 670 \Omega$ 0.060 % + 1.2 M Ω	Using digital multimeter; for the calibration of resistors and resistance boxes.	
AC VOLTAGE	10 Hz to 20 Hz 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V 20 Hz to 40 Hz 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V	0.071 % + 4.6 μV 0.057 % + 5.0 μV 0.057 % + 13 μV 0.051 % + 80 μV 0.051 % + 810 μV 0.051 % + 8.1 mV 0.050 % + 4.5 μV 0.023 % + 5.0 μV 0.022 % + 8.0 μV 0.017 % + 25 μV 0.017 % + 250 μV 0.017 % + 2.6 mV	Using multifunction calibrator.	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
AC VOLTAGE (continued)	<p><i>40 Hz to 20 kHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V</p> <p><i>50 Hz to 1 kHz</i> 220 V to 1100 V</p> <p><i>20 kHz to 50 kHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V</p> <p><i>50 kHz to 100 kHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V</p> <p><i>100 kHz to 300 kHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V</p> <p><i>300 kHz to 500 kHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V</p> <p><i>500 kHz to 1 MHz</i> 1 mV to 2.2 mV 2.2 mV to 22 mV 22 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V</p>	<p>0.046 % + 4.5 μV 0.014 % + 5.0 μV 0.0090 % + 1.0 μV 0.0090 % + 7.0 μV 0.0090 % + 62 μV 0.0090 % + 1.0 mV</p> <p>0.010 % + 5.0 mV</p> <p>0.058 % + 6.0 μV 0.039 % + 7.0 μV 0.033 % + 8.0 μV 0.013 % + 17 μV 0.013 % + 170 μV 0.023 % + 3.5 mV</p> <p>0.10 % + 7.0 μV 0.090 % + 7.0 μV 0.090 % + 25 μV 0.025 % + 70 μV 0.025 % + 350 μV 0.050 % + 8.0 mV</p> <p>0.12 % + 13 μV 0.11 % + 12 μV 0.11 % + 25 μV 0.050 % + 140 μV 0.050 % + 1.5 mV</p> <p>0.18 % + 25 μV 0.17 % + 25 μV 0.17 % + 35 μV 0.11 % + 360 μV 0.13 % + 4.3 mV</p> <p>0.35 % + 25 μV 0.34 % + 25 μV 0.34 % + 80 μV 0.22 % + 850 μV 0.27 % + 8.5 mV</p>	Using multifunction calibrator.	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
AC VOLTAGE (continued)	<p><i>10 Hz to 20 Hz</i> 1.3 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V 70 V to 220 V</p> <p><i>20 Hz to 40 Hz</i> 2 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V 70 V to 220 V</p> <p><i>40 Hz to 20 kHz</i> 1.3 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V 70 V to 220 V</p> <p><i>100 Hz to 20 kHz</i> 220 V to 700 V 700 V to 1100</p> <p><i>20 kHz to 50 kHz</i> 1.8 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V 70 V to 220 V 220 V to 700 V</p>	<p>0.010 % 1.3 μV 70 μV/V + 1.8 μV 60 μV/V + 2.1 μV 50 μV/V + 1.5 μV 50 μV/V + 2.4 μV 50 μV/V + 11 μV 50 μV/V + 23 μV 50 μV/V + 0.11 mV 50 μV/V + 0.3 mV 50 μV/V + 1.7 mV 50 μV/V + 3.7 mV</p> <p>50 μV/V + 2.0 μV 50 μV/V + 2.2 μV 50 μV/V + 2.1 μV 30 μV/V + 2.2 μV 30 μV/V + 3 μV 30 μV/V + 10.5 μV 30 μV/V + 14.6 μV 30 μV/V + 30.3 μV 30 μV/V + 0.28 mV 30 μV/V + 0.55 mV 30 μV/V + 2.0 mV</p> <p>40 μV/V + 1.3 μV 30 μV/V + 1.5 μV 30 μV/V + 1.8 μV 20 μV/V + 1.7 μV 20 μV/V + 2.5 μV 20 μV/V + 13 μV 20 μV/V + 12 μV 20 μV/V + 44 μV 20 μV/V + 81 μV 20 μV/V + 0.13 mV 40 μV/V + 0.90 mV</p> <p>20 μV/V + 12 mV 20 μV/V + 20 mV</p> <p>50 μV/V + 1.8 μV 40 μV/V + 1.9 μV 40 μV/V + 2.1 μV 30 μV/V + 3.2 μV 20 μV/V + 4 μV 20 μV/V + 7 μV 20 μV/V + 15 μV 20 μV/V + 25 μV 20 μV/V + 41 μV 30 μV/V + 0.61 mV 30 μV/V + 1.9 mV 90 μV/V + 15 mV</p>	Using digital multimeter.	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
AC VOLTAGE (continued)	<p><i>50 kHz to 100 kHz</i> 2.2 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V 70 V to 220 V 220 V to 700 V</p> <p><i>100 kHz to 300 kHz</i> 5.7 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V 22 V to 70 V</p> <p><i>300 kHz to 500 kHz</i> 6 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V</p> <p><i>500 kHz to 1 MHz</i> 7 μV to 2.2 mV 2.2 mV to 7 mV 7 mV to 22 mV 22 mV to 70 mV 70 mV to 220 mV 220 mV to 700 mV 700 mV to 2.2 V 2.2 V to 7 V 7 V to 22 V</p>	<p>70 μV/V + 2.2 μV 50 μV/V + 2.2 μV 70 μV/V + 2.5 μV 70 μV/V + 4.4 μV 50 μV/V + 9.3 μV 50 μV/V + 3.7 μV 50 μV/V + 25 μV 60 μV/V + 31 μV 60 μV/V + 21 μV 60 μV/V + 4.0 mV 60 μV/V + 9.1 mV 0.040 % + 17 mV</p> <p>0.017 % + 5.7 μV 0.010 % + 5.8 μV 0.0090 % + 5.8 μV 0.010 % + 6.9 μV 0.0090 % + 11 μV 0.0090 % + 9 μV 0.0080 % + 24 μV 0.012 % + 67 μV 0.012 % + 21 μV 0.012 % + 7.0 mV</p> <p>0.051 % + 6.0 μV 0.032 % + 7.0 μV 0.027 % + 9.0 μV 0.023 % + 22 μV 0.022 % + 9.0 μV 0.022 % + 34 μV 0.019 % + 17 μV 0.030 % + 0.18 mV 0.030 % + 0.20 mV</p> <p>0.19 % + 7.0 μV 0.14 % + 7.0 μV 0.11 % + 9.0 μV 0.11 % + 21 μV 0.080 % + 7.0 μV 0.080 % + 33 μV 0.070 % + 21 μV 0.10 % + 0.34 mV 0.10 % + 0.26 mV</p>	<p>Using digital multimeter.</p> <p>Using digital multimeter.</p>	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
AC CURRENT	<p><i>45 Hz to 1 kHz</i> 22 μA to 220 μA 220 μA to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A</p> <p><i>45 Hz to 100 Hz</i> 2.2 A to 11 A 11 A to 20 A 20 A to 100 A</p> <p><i>100 Hz to 1 kHz</i> 2.2 A to 11 A 11 A to 20 A</p> <p><i>45 Hz to 65 Hz</i> 11 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A</p> <p><i>65 Hz to 440 Hz</i> 11 A to 16.5 A 16.5 A to 150 A 150 A to 1025 A</p> <p><i>1 kHz to 5 kHz</i> 22 μA to 220 μA 220 μA to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A</p> <p><i>5 kHz to 10 kHz</i> 22 μA to 220 μA 220 μA to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A</p> <p><i>50 Hz to 1 kHz</i> 1 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</p> <p><i>50 Hz to 60 Hz</i> 20 A to 100 A</p>	<p>0.021 % + 16 nA 0.018 % + 35 nA 0.014 % + 370 nA 0.014 % + 3.6 μA 0.065 % + 42 μA</p> <p>0.070 % + 2.4 mA 0.14 % + 5.8 mA 0.27 % + 120 mA</p> <p>0.070 % + 2.4 mA 0.17 % + 24 mA</p> <p>0.40 % + 3.5 mA 0.40 % + 29 mA 0.40 % + 110 mA</p> <p>1.0 % + 4.0 mA 1.0 % + 32 mA 1.0 % + 120 mA</p> <p>0.064 % + 40 nA 0.062 % + 400 nA 0.060 % + 4.0 μA 0.060 % + 40 μA 0.075 % + 80 μA</p> <p>0.17 % + 120 nA 0.17 % + 800 nA 0.16 % + 8.0 μA 0.16 % + 80 μA 0.85 % + 160 μA</p> <p>0.034 % + 26 nA 0.033 % + 0.26 μA 0.033 % + 2.6 μA 0.034 % + 26 μA 0.078 % + 0.26 mA 0.11 % + 2.6 mA</p> <p>0.17 %</p>	<p>Using multifunction calibrator.</p> <p>Simulated current using a multi turn coil, for the calibration of clamp-on ammeters and similar devices.</p> <p>Simulated current using a multi turn coil, for the calibration of clamp-on ammeters and similar devices.</p> <p>Using digital multimeter.</p>	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
AC CURRENT (continued)	<i>1 kHz to 5 kHz</i> 1 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A <i>5 kHz to 10 kHz</i> 1 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A	0.036 % + 26 nA 0.033 % + 0.26 μ A 0.033 % + 6.4 μ A 0.034 % + 26 μ A 0.090 % + 0.27 mA 0.33 % + 2.6 mA 0.052 % + 26 nA 0.034 % + 0.26 μ A 0.033 % + 6.4 μ A 0.034 % + 26 μ A 0.091 % + 0.27 mA 0.38 % + 2.0 mA	Using digital multimeter.	
DC POWER 0.1 mW to 100 kW	33 mV to 1020 V 3.3 mA to 9 mA 9 mA to 33 mA 33 mA to 90 mA 90 mA to 330 mA 330 mA to 900 mA 900 mA to 2.2 A 2.2 A to 4.5 A 4.5 A to 11 A 11 A to 20.5 A 20.5 A to 100 A	0.040 % 0.030 % 0.040 % 0.030 % 0.080 % 0.060 % 0.12 % 0.090 % 0.13 % 0.13 %	For voltages in the range 33 mV to 1020 V.	Lab 1
0.1 W to 1 MW	10 A to 16.5 A 16.5 A to 110 A 110 A to 150 A 150 A to 1000 A	0.25 % 0.27 % 0.28 % 0.31 %	For voltages in the range 33 mV to 1020 V; clamp meter calibrations.	Lab 1



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AC POWER			By phantom load technique at unity power factor.	Lab 1
0.1 mW to 100 kW 45 Hz to 65 Hz	33 mV to 330 mV 3.3 mA to 9 mA 9 mA to 33 mA 33 mA to 90 mA 90 mA to 330 mA	0.40 % 0.25 % 0.35 % 0.25 %		
	330 mA to 900 mA 900 mA to 2.2 A 2.2 A to 4.5 A 4.5 A to 11 A	0.35 % 0.25 % 0.35 % 0.30 %		
	11 A to 20.5 A 20.5 A to 100 A	0.22 % 0.90 %		
	330 mV to 1020 V 3.3 mA to 9 mA 9 mA to 33 mA 33 mA to 90 mA 90 mA to 330 mA	0.25 % 0.15 % 0.25 % 0.15 %		
	330 mA to 900 mA 900 mA to 2.2 A 2.2 A to 4.5 A 4.5 A to 11 A	0.25 % 0.15 % 0.30 % 0.30 %		
	11 A to 20.5 A 20.5 A to 100 A	0.22 % 0.90 %		
0.1 W to 1 MW	33 mV to 1020 V 10 A to 16.5 A 16.5 A to 110 A 110 A to 150 A 150 A to 1000 A	0.32 % 0.34 % 0.34 % 0.43 %	Clamp meter calibrations.	
PHASE ANGLE				Lab 1
Voltage:Current	0 ° to 360 ° 10 Hz to 65 Hz 65 Hz to 500 Hz 0.5 kHz to 1kHz 1 kHz to 5 kHz 5 kHz to 10 kHz	0.18° 1.0° 2.3° 7.0° 12°	For applied currents in the range 3.3 mA to 20.5 A and applied voltages in the range 33 mV to 1020 V	



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Calibration of 17th/18th Edition Test Equipment					
INSULATION TESTERS					
Continuity	0 Ω to 100 m Ω 100 m Ω to 500 m Ω 0.5 Ω to 1 Ω 1 Ω to 5 Ω 5 Ω to 200 Ω 200 Ω to 10 k Ω	5.0 m Ω 1.1 % + 12 m Ω 0.53 % + 12 m Ω 0.46 % + 12 m Ω 0.25 % + 12 m Ω 0.25 %	Applied resistances of known value.	Lab 1	
High Resistance	10 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 1 G Ω 1 G Ω to 10 G Ω	0.24 % 0.35 % 0.6 % 1.3 %	Applied resistances of known value. Uncertainty increases by 0.10 % per 200 V above 500 V.		
Test Voltage Measurement	0 V to 2 kV DC <i>10 kΩ to 1 MΩ load</i> <i>1 MΩ to 10 GΩ load</i>	1.0 % + 2.0 V 1.0 % + 5.0 V	By voltage measurement.		
LINE / LOOP IMPEDANCE TESTERS					
Resistance (nominal values)	25 m Ω 50 m Ω 100 m Ω 330 m Ω 500 m Ω 1 Ω 1.8 Ω 5 Ω 10 Ω 18 Ω 50 Ω 100 Ω 180 Ω 500 Ω 1 k Ω 1.8 k Ω	6.0 m Ω 6.0 m Ω 6.0 m Ω 9.0 m Ω 10 m Ω 12 m Ω 22 m Ω 36 m Ω 0.070 Ω 0.12 Ω 0.35 Ω 0.59 Ω 1.2 Ω 3.0 Ω 5.9 Ω 12 Ω	At 50 Hz nominal		
Current	0.05 A 0.1 A 0.25 A 0.5 A 0.8 A 1.5 A 2.0 A 3.2 A 6 A 8 A 10 A 14 A 25 A 28 A 30 A	1.5 % + 2.0 mA 1.5 % + 3.0 mA 1.5 % + 5.0 mA 1.5 % + 10 mA 1.5 % + 20 mA 1.5 % + 30 mA 1.5 % + 50 mA 1.5 % + 70 mA 1.5 % + 100 mA 1.5 % + 150 mA 1.5 % + 0.20 A 1.5 % + 0.30 A 1.5 % + 0.35 A 1.5 % + 0.50 A 1.5 % + 0.70 A	50 Hz nominal		



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RCD TESTERS				
Timing	10 ms to 5 s	0.024 % + 0.32 ms		
Current				
0.5 x I and 1 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 3000 mA	1.3 % + 1.3 μ A 1.3 % + 14 μ A 1.3 % + 0.13 mA		
1.4 x I and 2 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 1500 mA	2.6 % + 1.3 μ A 2.6 % + 14 μ A 2.6 % + 0.13 mA		
5 x I Mode	3 mA to 30 mA 30 mA to 300 mA 300 mA to 600 mA	6.4 % + 1.3 μ A 6.4 % + 14 μ A 6.4 % + 0.13 mA		
LEAKAGE TESTERS				
Current				
Passive/Differential/Substitute Modes	0.1 mA to 30 mA	0.30 % + 2 μ A (ac + dc) rms		
Active Mode	0.1 mA to 30 mA	0.30 % + 1 μ A (ac + dc) rms		
Touch Voltage	250 V Range	5.0 % + 3.0 V		
PORTABLE APPLIANCE TESTERS				
Earth Bond Resistance.	25 m Ω 50 m Ω 100 m Ω 330 m Ω 500 m Ω 1 Ω 1.8 Ω 5 Ω 10 Ω 18 Ω 50 Ω 100 Ω 180 Ω 500 Ω 1 k Ω 1.8 k Ω	6.0 m Ω 6.0 m Ω 6.0 m Ω 9.0 m Ω 10 m Ω 12 m Ω 22 m Ω 36 m Ω 70 m Ω 0.12 Ω 0.35 Ω 0.59 Ω 1.2 Ω 3.0 Ω 5.9 Ω 12 Ω	Nominal values at 50 Hz to 60 Hz	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
PORTABLE APPLIANCE TESTERS (continued)				Lab 1
Earth Bond Current At 50 Hz to 60 Hz	0.05 A 0.1 A 0.25 A 0.5 A 0.8 A 1.5 A 2.0 A 3.2 A 6 A 8 A 10 A 14 A 25 A 28 A 30 A	1.5 % + 2 mA 1.5 % + 3 mA 1.5 % + 5 mA 1.5 % + 10 mA 1.5 % + 20 mA 1.5 % + 30 mA 1.5 % + 50 mA 1.5 % + 70 mA 1.5 % + 100 mA 1.5 % + 150 mA 1.5 % + 0.2 A 1.5 % + 0.3 A 1.5 % + 0.35 A 1.5 % + 0.5 A 1.5 % + 0.7 A		
Insulation Resistance	10 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 1 G Ω 1 G Ω to 10 G Ω	0.24 % 0.35 % 0.60 % 1.3 %	Applied resistances of known value. Uncertainty increases by 0.10 % per 200 V above 500 V.	
Test Voltage	0 V to 2 kV DC <i>10 kΩ to 1 MΩ load</i> <i>1 MΩ to 10 GΩ load</i>	1.0 % + 2.0 V 1.0 % + 5.0 V	By voltage measurement.	
Continuity	100 m Ω to 500 m Ω 0.5 Ω to 1 Ω 1 Ω to 5 Ω 5 Ω to 200 Ω 200 Ω to 10 k Ω	1.1 % + 12 m Ω 0.53 % + 12 m Ω 0.46 % + 12 m Ω 0.25 % + 12 m Ω 0.25 %		
HIPOT/HV TESTERS				
HVDC Voltage	0.1 kV to 10 kV 10 kV to 20 kV 20 kV to 35 kV 35 kV to 40 kV	0.35 % + 7.0 V 2.4 % + 46 V 1.3 % + 78 V 2.4 % + 97 V		
HVAC Peak Voltage	<i>50Hz/60Hz</i> 100 V to 10 kV 10 kV to 40 kV	0.6 % + 19 V 5.8 % + 100 V		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
HIPOT/HV TESTERS (continued)				Lab 1
DC Leakage Current	0 A to 300 μ A 0.3 mA to 3 mA 3 mA to 30 mA 30 mA to 300 mA	0.37 % + 0.26 μ A 0.24 % + 1.9 μ A 0.24 % + 19 μ A 0.24 % + 0.19 mA		
AC Leakage Current	20 Hz to 400 Hz 0 A to 300 μ A 0.3 mA to 3 mA 3 mA to 30 mA 30 mA to 300 mA	0.37 % + 0.26 μ A 0.24 % + 1.9 μ A 0.24 % + 19 μ A 0.24 % + 0.19 mA		
FREQUENCY	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 1 kHz 1kHz to 10kHz 10 kHz to 100 kHz 100 kHz to 10 MHz 10 MHz to 100 MHz 100 MHz to 1 GHz 1 GHz to 10 GHz 10 GHz to 20 GHz	2.0 in 10^6 1.0 in 10^6 1.0 in 10^7 1.0 in 10^8 1.0 in 10^9 1.0 in 10^9 1.6 in 10^{10} 19 in 10^{12} 15 in 10^{12} 2.8 in 10^{12}	Results and uncertainties may be quoted as average periodic time for repetitive events.	Lab 1
TEMPERATURE SIMULATION				
Electrical calibration of temperature indicators and simulators				
Resistance thermometers (Pt 100)	-200 $^{\circ}$ C to +400 $^{\circ}$ C 400 $^{\circ}$ C to 800 $^{\circ}$ C	0.070 $^{\circ}$ C 0.070 $^{\circ}$ C	By resistance simulation. Other RTD types can be calibrated but may attract larger uncertainties	
Thermocouples				
Type J	-250 $^{\circ}$ C to -100 $^{\circ}$ C -100 $^{\circ}$ C to -30 $^{\circ}$ C -30 $^{\circ}$ C to +190 $^{\circ}$ C 190 $^{\circ}$ C to 1200 $^{\circ}$ C	0.14 $^{\circ}$ C 0.080 $^{\circ}$ C 0.074 $^{\circ}$ C 0.070 $^{\circ}$ C	By millivolt simulation, including cold junction compensation.	
Type K	-200 $^{\circ}$ C to -100 $^{\circ}$ C -100 $^{\circ}$ C to -25 $^{\circ}$ C -25 $^{\circ}$ C to +250 $^{\circ}$ C 250 $^{\circ}$ C to 1000 $^{\circ}$ C 1000 $^{\circ}$ C to 1372 $^{\circ}$ C	0.41 $^{\circ}$ C 0.37 $^{\circ}$ C 0.36 $^{\circ}$ C 0.36 $^{\circ}$ C 0.36 $^{\circ}$ C		
Type R	-50 $^{\circ}$ C to +50 $^{\circ}$ C 50 $^{\circ}$ C to 270 $^{\circ}$ C 270 $^{\circ}$ C to 1768 $^{\circ}$ C	0.50 $^{\circ}$ C 0.36 $^{\circ}$ C 0.25 $^{\circ}$ C		
Type T	-200 $^{\circ}$ C to -150 $^{\circ}$ C -150 $^{\circ}$ C to 0 $^{\circ}$ C 0 $^{\circ}$ C to 120 $^{\circ}$ C 120 $^{\circ}$ to 400 $^{\circ}$ C	0.16 $^{\circ}$ C 0.12 $^{\circ}$ C 0.082 $^{\circ}$ C 0.074 $^{\circ}$ C		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
TIME INTERVAL Elapsed Time	1 s to 24 hrs	0.22 s 0.0010 s	Mechanically triggered. The quoted uncertainty is particularly dependent on the resolution of the timer being calibrated. Electronically triggered	Lab 1
ROTATIONAL SPEED Tachometers	60 rpm to 999 rpm 1 000 rpm to 9 999 rpm 10 000 rpm to 120 000 rpm	$6.2 \times 10^{-6} + 0.0060$ rpm $6.2 \times 10^{-6} + 0.058$ rpm $6.0 \times 10^{-6} + 0.58$ rpm	Optical or electrically triggered devices. Mechanical tachometers will attract a larger uncertainty due to resolution.	Lab 1
VOLTAGE REFLECTION COEFFICIENT	0 to 1 10 MHz to 8 GHz 8 GHz to 18 GHz	0.030 0.070	Using R & S ZNB-20 The uncertainties are quoted for 50 Ω systems for devices fitted only with Type N Connectors. Results and uncertainties may also be quoted in units of Return Loss (dB) or VSWR .	Lab 1
RF ATTENUATION	<i>10 MHz to 4 GHz</i> 0 dB to 10 dB 10 dB to 40 dB 40 dB to 50 dB 50 dB to 70 dB 70 dB to 90 dB <i>4 GHz to 12 GHz</i> 0 dB to 10 dB 10 dB to 20 dB 20 dB to 30 dB 30 dB to 40 dB 40 dB to 50 dB 50 dB to 70 dB 70 dB to 80 dB 80 dB to 90 dB <i>12 GHz to 18 GHz</i> 0 dB to 10 dB 10 dB to 20 dB 20 dB to 30 dB 30 dB to 40 dB 40 dB to 50 dB 50 dB to 70 dB 70 dB to 90 dB	0.036 dB 0.040 dB 0.050 dB 0.080 dB 0.090 dB 0.043 dB 0.040 dB 0.050 dB 0.040 dB 0.060 dB 0.13 dB 0.12 dB 0.13 dB 0.16 dB 0.16 dB 0.15 dB 0.16 dB 0.24 dB 0.25 dB 0.26 dB	Using R & S ZNB-20 The uncertainties are quoted for 50 Ω systems for devices fitted only with Type N Connectors which present a near match to the 50 Ω measurement system. Measurement of devices presenting a significant mismatch will receive much larger uncertainties.	Lab 1



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
RF POWER Reference	1 mW Reference 50 MHz	0.0063 mW		Lab 1
RF POWER			Note: These uncertainties are for type N systems with a source VSWR of 1.20:1 or less. Measurement of devices with a higher mismatch will receive higher measurement uncertainties.	Lab 1
	100 kHz to 300 kHz +20 dBm to +10 dBm +10 dBm to -25 dBm	0.21 dB 0.16 dB	Using 438A Power Meter and 8482A Sensor.	
	300 kHz to 1 MHz +20 dBm to +10 dBm +10 dBm to -25 dBm	0.16 dB 0.10 dB		
	1 MHz to 100 MHz +20 dBm to +10 dBm +10 dBm to -25 dBm	0.15 dB 0.090 dB	Using 438A Power Meter and 8482A Sensor	
	100 MHz to 3 GHz +20 dBm to +10 dBm +10 dBm to -25 dB	0.16 dB 0.090 dB		
	3 GHz to 4.2 GHz +20 dBm to +10 dBm +10 dBm to -25 dBm	0.17 dB 0.11 dB		
	10 MHz to 30 MHz +20 dB to + 10 dB +10 dB to - 25 dB	0.16 dB 0.10 dB	Using 438A Power Meter and 8481A Sensor	
	30 MHz to 3.9 GHz +20 dBm to + 10 dBm +10 dBm to - 25 dBm	0.15 dB 0.080 dB		
	4 GHz to 12 GHz +20 dBm to + 10 dBm +10 dBm to - 25 dBm	0.16 dB 0.10 dB		
	4 GHz to 12 GHz +20 dBm to + 10 dBm +10 dBm to - 25 dBm	0.16 dB 0.10 dB		
	10 MHz to 30 MHz -20 dBm to -30 dBm -30 dBm to -60 dBm	0.14 dB 0.19 dB	Using 438A Power Meter & 8484A Sensor	
	30 MHz to 3.9 GHz -20 dBm to -30 dBm -30 dBm to -60 dBm	0.13 dB 0.12 dB		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code			
RF POWER (continued)	4 GHz to 12 GHz -20 dBm to -30 dBm -30 dBm to -60 dBm	0.14 dB 0.14 dB	Using ML2437A Power Meter and MA 2481B Sensor	Lab 1			
	12 GHz to 18 GHz -20 dBm to -30 dBm -30 dBm to -60 dBm	0.15 dB 0.15 dB					
	10 MHz to 50 MHz +20 dBm to -60 dBm	0.13 dB					
	50 MHz to 3 GHz +20 dBm to -60 dBm 3 GHz to 6 GHz +20 dBm to -60 dBm	0.10 dB 0.11 dB					
	RF PEAK POWER	10 MHz to 6.6 GHz 0 dBm to -50 dBm -50 dBm to -70 dBm -70 dBm to -100 dBm -100 dBm to -130 dBm	0.036 dB 0.042 dB 0.050 dB 0.059 dB	N5531S Measuring Receiver & Sensor Module	Lab 1		
		6.6 GHz to 13.2 GHz 0 dBm to -40 dBm -40 dBm to -60 dBm -60 dBm to -90 dBm -90 dBm to -120 dBm	0.031 dB 0.038 dB 0.046 dB 0.056 dB				
		13.2 GHz to 18 GHz 0 dBm to -30 dBm -30 dBm to -50 dBm -50 dBm to -90 dBm -90 dBm to -120 dBm	0.026 dB 0.034 dB 0.046 dB 0.056 dB				
		2.5 MHz to 1.3 GHz 0 dBm to -30 dBm -30 dBm to -80 dBm -80 dBm to -120 dBm -120 dBm to -130 dBm	0.10 dB 0.095 dB 0.12 dB 0.19 dB			Tuned RF Level using 8902A measuring receiver	
		+20 dBm to -40 dBm	0.10 dB			For the calibration of pulsed RF sources and generators using 4541 Peak Power Meter & 57006 Sensor	Lab 1
		500 MHz to 800 MHz	0.11 dB				
800 MHz to 1 GHz	0.12 dB						
1 GHz to 1.6 GHz	0.13 dB						
1.6 GHz to 2.5 GHz	0.12 dB						
2.5 GHz to 3.2 GHz	0.11 dB						
3.2 GHz to 3.6 GHz	0.10 dB						
3.6 GHz to 4.2 GHz	0.11 dB						
4.2 GHz to 4.4 GHz	0.14 dB						
4.4 GHz to 4.5 GHz	0.15 dB						
4.5 GHz to 4.6 GHz	0.14 dB						
4.6 GHz to 4.8 GHz	0.13 dB						
4.8 GHz to 5.2 GHz	0.14 dB						
5.2 GHz to 5.4 GHz	0.13 dB						
5.4 GHz to 5.5 GHz	0.12 dB						
5.5 GHz to 5.8 GHz	0.11 dB						



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Bandwidth at -3dB point	9 kHz to 18 GHz - 3 dB from set point	0.34 MHz	Filter shape using 438A Power Meter & 8481A Sensor	Lab 1
DIMENSIONAL MEASUREMENTS			All linear calibrations may be given in inch units.	Lab 2
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
External	BS 870:2008 0 mm to 600 mm	Heads 2.0 μ m between any two points. Zero set 1.0 + (8.0 x length in m) μ m		
Internal	BS 959:2008 and above 0 mm to 1000 mm	Heads 2.0 μ m between any two points. Extension rods 1.0 + (8.0 x length in m) μ m		
Depth	BS 6468:2008 0 mm to 300 mm	Heads 2.0 μ m between any two points. Extension rods 1.0 + (8.0 x length in m) μ m		
Micrometer heads	As BS 1734:1951 0 to 100	1.6 μ m		
Micrometer setting rods/ Length gauges, flat & spherical ended	BS 870:2008 25 mm to 600 mm	1.0 + (5.0 x length in m) μ m		
Three point bore	3 mm to 150 mm	Overall performance 5.0 μ m	Using ring gauges of a known size	
Vernier Gauges				
Caliper	BS 887:2008 and above 0 mm to 1500 mm	Overall performance 10 + (30 x length in m) μ m		
Depth	As BS 6365: 2008 0 to 600			
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 mm to 25 mm	2.0 μ m		
Simple height gauges	BS EN ISO 13225:2012 0 mm to 300mm 300 mm to 450mm 450 mm to 600mm 600 mm to 1000mm	25 μ m 26 μ m 27 μ m 28 μ m		
Spirit levels	As BS 958:1968 5 seconds to 60 minutes of arc nominal sensitivity	1.5 seconds of arc		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
ACCELEROMETRY Portable Accelerometer (brake meters)	Horizontal acceleration 16 % to 100 %	1.0 % of horizontal acceleration	Horizontal acceleration expressed as a percentage (%) of the local free fall acceleration due to gravity.	Lab 2
LENGTH Plain plug and pin gauges (parallel) Cylindrical setting standards Plain ring gauges (parallel) and setting standards Thread measuring cylinders Plain gap gauges (parallel) Gauge blocks Inch (Steel) Millimetre (Steel) Feeler Gauges Paint thickness setting foils Parallels	1 mm to 50 mm diameter 50 mm to 150 mm diameter 3 mm to 50 mm diameter 50 mm to 100 mm 100 mm to 150 mm diameter 150 mm to 200 mm diameter As BS3777:1964 and BS5590:1978 and specials 0.1 to 5.0 diameter 1 to 50mm As BS 4311-1:2007 0.01 inch to 0.4 inch 0.4 inch to 1 inch 2 inch 3 inch 4 inch As BS EN ISO 3650:1999 0.25 mm to 10 mm 10 mm to 25 mm 30 mm, 40 mm, 50 mm 60 mm, 70 mm, 75 mm 80 mm, 90 mm, 100 mm As BS 957:2008 0.02 mm to 1.00 mm 0.01 mm to 8 mm As BS 906:1972 5 to 50 x 100 x 400	1.0 μ m 1.5 μ m 1.7 μ m 1.8 μ m 2.2 μ m 2.3 μ m 0.80 μ m 3.0 μ m Class (see note) <u>C</u> 3.4 μ inches 4.1 μ inches 5.7 μ inches 7.6 μ inches 9.6 μ inches <u>C</u> 0.10 μ m 0.11 μ m 0.13 μ m 0.17 μ m 0.20 μ m 1.5 μ m 2.0 μ m 2.0 μ m to 5.0 μ m	All linear calibrations may be given in inch units. By comparison with reference standards By comparison with reference standards Using gauge blocks Note: Class C uncertainties apply to the measurement of length of steel gauges by comparison with grade K standards of length of a similar material. Class C uncertainties apply to new and used grade 0,1 & 2 gauges to BS 4311-1:2007 and BS EN ISO 3650:1999 By comparison with reference standards and a single axis measuring machine.	Lab 2



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Squares Blade type	50 mm to 450 mm	5.5 μ m	The uncertainty quoted is for the departure from flatness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration.	
Right angle and box angle plates	As BS 5535:1978 50 mm to 300 mm	Squareness: 3.0 +(1.0 per 100 mm) Parallelism: 0.0030 mm		
Vee blocks	As BS 3731:1987 20 mm to 100 mm	5 μ m		
FORM				Lab 2 and Site
Surface plates and tables Granite Cast iron	BS 817:2008 160 mm x 100 mm to 2500 mm x 1600 mm	1.5 μ m + (0.80 x diagonal in m) μ m See Note 1	The uncertainty quoted is for the departure from flatness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration.	
MASS See notes 1 and 2	Nominal Value (g) 50 000 20 000 10 000 5 000 2 000 1 000 500 200 100 50 20 10 5 2 1 0.5 0.2 0.1 0.05 0.02 0.01 0.005 to 0.001	(mg) 50 20 10 5.0 2.0 1.0 0.50 0.20 0.10 0.060 0.050 0.040 0.030 0.024 0.020 0.016 0.012 0.010 0.0080 0.0060 0.0050 0.0040	Note 1: Calibrations can be given in other units as required. Note 2: Intermediate values can be calibrated to an uncertainty interpolated from the next higher and lower values in the table. Note 3: The calibration is based on Borda's method of substitution	Lab 2



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
TORQUE			Note 1: Values may be given in other units, i.e. lbf/ft, mV/V etc.	Lab 2
Torque Wrenches and screwdrivers	BS EN 6789-2:2017 (See note 2) 0.1 to 1000 N-m	1.0 %	Note 2: Excluding setting screwdrivers.	
Static Torque Transducers	BS EN 6789:2003 (withdrawn) 1 to 2500 N-m 0.005 to 1500 N-m Classes 0.05 to 5.0 See Note 1	1.6 % 0.040 % of reading	Calibrated to BS 7882:2017	
TEMPERATURE				Lab 2
Temperature block calibrators	-50 °C to +100 °C 100 °C to 250 °C 250 °C to 650 °C	0.060 °C 0.060 °C to 0.13 °C 0.13 °C		
Resistance thermometers	-40 °C to 0 °C 0 °C Ambient temperature (20 °C) 0 °C to 250 °C 250 °C to 270 °C 270 °C to 650 °C	0.040 °C 0.025 °C 0.025 °C 0.040 °C 0.090 °C 0.35 °C	Comparison in liquid bath, ice bath or block calibrator	
Thermocouples	-40 °C to 50 °C 50 °C to 250 °C 250 °C to 650 °C 650 °C to 1000 °C 1000 °C to 1200 °C	0.10 °C 0.10 °C to 0.20 °C 0.35 °C to 0.60 °C 1.7 °C to 2.5 °C 2.5 °C to 3.5 °C	Comparison in block calibrator	
Thermocouples, batch calibration	-40 °C to +250 °C	0.080 °C	Comparison in liquid bath or ice bath	
Compensating and extension cables for Base metal thermocouples Noble metal thermocouples	0 °C and 20 °C to 40 °C 0 °C and 20 °C to 40 °C	0.055 °C 0.12 °C	Comparison in liquid bath or ice bath	
Digital thermometers with probes	-40 °C to 0 °C 0 °C Ambient temperature(20 °C) 0 °C to 250 °C 250 °C to 270 °C 270 °C to 650 °C 650 °C to 1000 °C 1000 °C to 1200 °C	0.040 °C 0.025 °C 0.025 °C 0.040 °C 0.065 °C 0.25 °C 1.7 °C to 2.5 °C 2.5 °C to 3.5 °C	Comparison in liquid bath, ice bath or block calibrator	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
TEMPERATURE (continued) Liquid in glass thermometers Liquid baths	 -40 °C to 70 °C 70 °C to 270 °C -50 °C to 300 °C	 0.050 °C 0.050 °C to 0.20 °C 0.040 °C	 Comparison in liquid bath, ice bath or block calibrator. Thermometers can be read with an uncertainty of 1/5 of the smallest marked division Using PRTs. Suitable for characterisation of temperature calibration baths	
ELECTRICAL SIMULATION Electrical calibration of temperature indicators and simulators Base metal thermocouples Noble metal thermocouples Cold junction compensation	 -200 °C to -100 °C -100 °C to -30 °C -30 °C to +1200 °C 1200 °C to 1370 °C -50 °C to +50 °C 50 °C to 270 °C 270 °C to 1820 °C Ambient temperature	 0.18 °C 0.090 °C 0.080 °C 0.11 °C 0.70 °C 0.50 °C 0.40 °C 0.08 °C	 Uncertainties based on Types J, K, R and B. Uncertainties may be higher for other thermocouple types Including cold junction compensation Including cold junction compensation	Lab 2
PRESSURE Gas pressure (absolute) Calibration of pressure measuring instruments and gauges Gas pressure (gauge) Calibration of pressure measuring instruments and gauges	 3.5 kPa to 175 kPa 175 kPa to 700 kPa 700 kPa to 7 MPa 7 MPa to 17 MPa - 100 kPa to 0 kPa 0 kPa to 3.5 kPa 3.5 kPa to 175 kPa 175 kPa to 700 kPa 700 kPa to 7 MPa 7 MPa to 17 MPa	 0.0088 % + 2.0 Pa 0.0095 % + 0.020 Pa 0.0099 % + 0.020 Pa 0.028 % + 73 Pa 97 Pa 2.0 Pa 0.0083 % + 0.020 Pa 0.0090 % + 0.020 Pa 0.0090 % + 0.020 Pa 0.028 %	 Methods consistent with EURAMET CG17	Lab 2



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
Hydraulic pressure (gauge) Calibration of pressure measuring instruments and gauges	350 kPa to 0.69 MPa 0.70 MPa to 7.1 MPa 7.1 MPa to 83.5 MPa 83.5 MPa to 140 MPa	0.0082 % + 0.13 kPa 0.0094 % + 0.11 kPa 0.0090 % + 0.11 kPa 0.080 % + 10 kPa		Lab 2
Hydraulic pressure (gauge) Calibration of pressure measuring instruments and gauges	0 MPa to 7 MPa 7 MPa to 35 MPa 35 MPa to 70 MPa 70 MPa to 140 MPa	0.080 % + 0.10 kPa 0.090 % + 1.0 kPa 0.20 % + 7.0 kPa 0.080 % + 10 kPa		Site
NON AUTOMATIC WEIGHING INSTRUMENTS (NAWI) Electronic, single pan weighing machines and weighing instruments See notes 1 and 2	Capacity 200 mg 500 mg 1 g 2 g 5 g 10 g 12 g 50 g 100 g 200 g 500 g 1 kg 2 kg 5 kg 10 kg 20 kg 50 kg 100 kg 200 kg 500 kg 1000 kg 2000 kg 3500 kg	0.012 mg 0.015 mg 0.018 mg 0.025 mg 0.037 mg 0.042 mg 0.058 mg 0.092 mg 0.16 mg 0.30 mg 0.78 mg 3.3 mg 6.5 mg 16 mg 33 mg 65 mg 160 mg 3.5 g 7.0 g 18 35 g 70 g 110 g	Note 1: Weights are available in OIML Class E2 Max grouped load 800 g OIML Class F1 Max grouped load 95 kg OIML Class M1 Max grouped load 3500 kg Note 2: Other loads within the overall listed range may also be used. Note 3: The calibration procedure PRO17 is based on EURAMET CG-18	Site



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
TEMPERATURE Temperature controlled environmental chambers, fridges/refrigerators, freezers, ovens, incubators and rooms Digital thermometers with probes	-40 °C to +250 °C -20 °C to +140 °C	1.0 °C 0.20°C	Single and multipoint time dependent temperature profiling, also referred to as spatial temperature surveying or mapping.	Site
FORCE Calibration of force measuring devices (e.g. strain gauged load cells and load measuring rings) but excluding proving devices, in tension and compression modes using masses and reference devices Calibration of push pull force measuring devices in tension and compression using masses and reference devices	From 0.1 N up to 2500 N From 0.6 kN up to 600 kN 0.001 N to 2 kN	0.10 % 0.23 % 0.10 %	Calibration performed to BS 8422:2003	Lab 2
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 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:

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 CMC is stated only as a percentage, this is to be interpreted as meaning percentage of the measurand.

Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \cdot 0.01 \cdot q$, where q is the quantity value.

The notation $Q[a, b]$ stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$