


# Schedule of Accreditation

issued by

## United Kingdom Accreditation Service

21 - 47 High Street, Feltham, Middlesex, TW13 4UN, UK

 <p><b>UKAS</b> CALIBRATION</p> <p>0666</p> <p>Accredited to ISO/IEC 17025:2005</p>	<h3>Allied Aerosystems Ltd</h3> <p>Issue No: 012    Issue date: 14 May 2012</p>	
	<p><b>Avionic and Metrology Centre</b> Unit G1/2 Treforest Industrial Estate Pontypridd CF37 5YL</p>	<p><b>Contact: Mr P Ashurst</b> Tel: +44 (0)1443 849970 Fax: +44 (0)1443 849988 E-Mail: <a href="mailto:phillip.ashurst@allied-aerosystems.com">phillip.ashurst@allied-aerosystems.com</a> Website: <a href="http://www.allied-aerosystems.co.uk">www.allied-aerosystems.co.uk</a></p>
<p><b>Calibration performed at the above address only</b></p>		

### DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks
<b>DC VOLTAGE</b>			
Generation	0 mV to 220 mV 220 mV to 2.2 V 2.2 V to 22 V 22 V to 220 V 220 V to 1100 V	13 ppm + 1.0 $\mu$ V 9.0 ppm + 2.0 $\mu$ V 9.0 ppm + 8.0 $\mu$ V 10 ppm + 120 $\mu$ V 12 ppm + 0.80 mV	
Measurement	0 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V 120 V to 1050 V	16 ppm + 2.0 $\mu$ V 11 ppm + 3.0 $\mu$ V 11 ppm + 9.0 $\mu$ V 16 ppm + 130 $\mu$ V 16 ppm + 1.0 mV	
<b>DC CURRENT</b>			
Generation	0 $\mu$ A to 220 $\mu$ A 220 $\mu$ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A	110 ppm + 12 nA 70 ppm + 12 nA 70 ppm + 120 nA 82 ppm + 1.2 $\mu$ A 120 ppm + 35 $\mu$ A	
Measurement	0 $\mu$ A to 120 $\mu$ A 120 $\mu$ A to 1.2 mA 1.2 mA to 12 mA 12 mA to 120 mA 120 mA to 1.05 A	120 ppm + 13 nA 73 ppm + 14 nA 74 ppm + 130 nA 100 ppm + 2.0 $\mu$ A 210 ppm + 37 $\mu$ A	



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks
DC RESISTANCE			
Generation	1.0 $\Omega$ 1.9 $\Omega$ 10 $\Omega$ 19 $\Omega$ 100 $\Omega$ 190 $\Omega$ 1.0 k $\Omega$ 1.9 k $\Omega$ 10 k $\Omega$ 19 k $\Omega$ 100 k $\Omega$ 190 k $\Omega$ 1.0 M $\Omega$ 1.9 M $\Omega$ 10 M $\Omega$ 19 M $\Omega$ 100 M $\Omega$	150 ppm 150 ppm 40 ppm 40 ppm 24 ppm 24 ppm 17 ppm 17 ppm 16 ppm 16 ppm 19 ppm 19 ppm 31 ppm 31 ppm 51 ppm 74 ppm 170 ppm	
Measurement	0 $\Omega$ to 12 $\Omega$ 12 $\Omega$ to 120 $\Omega$ 120 $\Omega$ to 1.2 k $\Omega$ 1.2 k $\Omega$ to 12 k $\Omega$ 12 k $\Omega$ to 120 k $\Omega$ 120 k $\Omega$ to 1.2 M $\Omega$ 1.2 M $\Omega$ to 12 M $\Omega$ 12 M $\Omega$ to 120 M $\Omega$	49 ppm + 64 $\mu\Omega$ 33 ppm + 0.70 m $\Omega$ 25 ppm + 0.70 m $\Omega$ 24 ppm + 7.0 m $\Omega$ 26 ppm + 79 m $\Omega$ 39 ppm + 4.0 $\Omega$ 97 ppm + 100 $\Omega$ 0.10 % + 1.4 k $\Omega$	
AC VOLTAGE			
Generation	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	0.50 % + 6.0 $\mu$ V 0.12 % + 7.0 $\mu$ V 0.090 % + 19 $\mu$ V 0.090 % + 120 $\mu$ V 0.090 % + 2.0 mV 0.090 % + 12 mV  0.50 % + 6.0 $\mu$ V 0.080 % + 7.0 $\mu$ V 0.070 % + 12 $\mu$ V 0.070 % + 35 $\mu$ V 0.070 % + 0.40 mV 0.070 % + 4.0 mV	



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks
AC VOLTAGE (cont'd) Generation (cont'd)	<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>0.50 % + 6.0 <math>\mu</math>V 0.070 % + 7.0 <math>\mu</math>V 0.030 % + 12 <math>\mu</math>V 0.020 % + 13 <math>\mu</math>V 0.020 % + 82 <math>\mu</math>V 0.020 % + 2.0 mV</p> <p>0.030 % + 7.0 mV</p> <p>0.50 % + 6.0 <math>\mu</math>V 0.11 % + 7.0 <math>\mu</math>V 0.060 % + 12 <math>\mu</math>V 0.030 % + 24 <math>\mu</math>V 0.030 % + 0.30 mV 0.040 % + 5.0 mV</p> <p>0.80 % + 10 <math>\mu</math>V 0.20 % + 10 <math>\mu</math>V 0.20 % + 35 <math>\mu</math>V 0.050 % + 93 <math>\mu</math>V 0.040 % + 0.50 mV 0.090 % + 12 mV</p> <p>1.3 % + 18 <math>\mu</math>V 0.30 % + 18 <math>\mu</math>V 0.17 % + 35 <math>\mu</math>V 0.080 % + 180 <math>\mu</math>V 0.090 % + 2.0 mV</p> <p>2.7 % + 35 <math>\mu</math>V 0.50 % + 35 <math>\mu</math>V 0.26 % + 47 <math>\mu</math>V 0.18 % + 500 <math>\mu</math>V 0.21 % + 6.0 mV</p> <p>2.8 % + 35 <math>\mu</math>V 0.70 % + 35 <math>\mu</math>V 0.52 % + 120 <math>\mu</math>V 0.40 % + 1.2 mV 0.45 % + 11 mV</p>	



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ( $k = 2$ )	Remarks
AC VOLTAGE (cont'd) Measurement	<p><i>20 Hz to 40 Hz</i> 1.2 mV to 12 mV 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V</p> <p><i>40 Hz to 1 kHz</i> 1.2 mV to 12 mV 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V</p> <p><i>50 Hz to 1 kHz</i> 120 V to 700 V</p> <p><i>1 kHz to 20 kHz</i> 1.2 mV to 12 mV 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V</p> <p><i>20 kHz to 50 kHz</i> 1.2 mV to 12 mV 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V</p> <p><i>50 kHz to 100 kHz</i> 1.2 mV to 12 mV 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V 12 V to 120 V</p> <p><i>100 kHz to 300 kHz</i> 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V</p> <p><i>300 kHz to 1 MHz</i> 12 mV to 120 mV 120 mV to 1.2 V 1.2 V to 12 V</p>	<p>0.12 % + 9.0 <math>\mu</math>V 0.080 % + 13 <math>\mu</math>V 0.080 % + 59 <math>\mu</math>V 0.080 % + 700 <math>\mu</math>V 0.090 % + 7.0 mV</p> <p>0.090 % + 8.0 <math>\mu</math>V 0.040 % + 13 <math>\mu</math>V 0.030 % + 27 <math>\mu</math>V 0.030 % + 250 <math>\mu</math>V 0.040 % + 3.1 mV</p> <p>0.090 % + 25 mV</p> <p>0.090 % + 8.0 <math>\mu</math>V 0.050 % + 27 <math>\mu</math>V 0.040 % + 28 <math>\mu</math>V 0.040 % + 250 <math>\mu</math>V 0.040 % + 3.1 mV</p> <p>0.23 % + 8.0 <math>\mu</math>V 0.11 % + 13 <math>\mu</math>V 0.070 % + 34 <math>\mu</math>V 0.070 % + 400 <math>\mu</math>V 0.080 % + 5.6 mV</p> <p>1.0 % + 11 <math>\mu</math>V 0.40 % + 36 <math>\mu</math>V 0.20 % + 96 <math>\mu</math>V 0.20 % + 600 <math>\mu</math>V 0.30 % + 13 mV</p> <p>1.1 % + 37 <math>\mu</math>V 0.60 % + 300 <math>\mu</math>V 0.60 % + 2.4 mV</p> <p>2.0 % + 120 <math>\mu</math>V 2.2 % + 1.3 mV 2.0 % + 12 mV</p>	



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AC CURRENT			
Generation	<i>50 Hz to 1 kHz</i> 22 $\mu$ A to 220 $\mu$ A 220 $\mu$ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A  <i>1 kHz to 5 kHz</i> 22 $\mu$ A to 220 $\mu$ A 220 $\mu$ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A  <i>5 kHz to 10 kHz</i> 22 $\mu$ A to 220 $\mu$ A 220 $\mu$ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A	0.040 % + 24 nA 0.030 % + 120 nA 0.030 % + 500 nA 0.030 % + 5 $\mu$ A 0.11 % + 53 $\mu$ A  0.12 % + 60 nA 0.12 % + 600 nA 0.12 % + 5.8 $\mu$ A 0.12 % + 58 $\mu$ A 0.12 % + 120 $\mu$ A  0.30 % + 120 nA 0.30 % + 1.2 $\mu$ A 0.30 % + 12 $\mu$ A 0.30 % + 120 $\mu$ A 1.4 % + 240 $\mu$ A	
Measurement	<i>50 Hz to 1 kHz</i> 12 $\mu$ A to 120 $\mu$ A 120 $\mu$ A to 1.2 mA 1.2 mA to 12 mA 12 mA to 120 mA 120 mA to 1.05 A  <i>1 kHz to 5 kHz</i> 120 $\mu$ A to 1.2 mA 1.2 mA to 12 mA 12 mA to 120 mA 120 mA to 1.05 A	0.16 % + 43 nA 0.15 % + 300 nA 0.15 % + 2.4 $\mu$ A 0.15 % + 24 $\mu$ A 0.25 % + 240 $\mu$ A  0.16 % + 700 nA 0.17 % + 7.0 $\mu$ A 0.17 % + 63 $\mu$ A 0.25 % + 260 $\mu$ A	
FREQUENCY	10 MHz	0.95 in $10^9$	For oscillator calibration over gate times of 100 s or greater  Can be quoted as time for repetitive events
	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 100 kHz 100 kHz to 3 GHz	1.0 in $10^5$ 1.0 in $10^6$ 2.0 in $10^7$ 2.0 in $10^9$ 1.0 in $10^9$	
RPM	0.5 RPM to 100 000 RPM	0.7 RPM	Optical or electrically triggered devices. Mechanical tachometers will attract a larger uncertainty due to resolution.



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Elapsed Time	1 s to 100 ks	0.20 s	Mechanically triggered events
<b>DIMENSIONAL MEASUREMENTS</b>			
Measuring Instruments and Machines			
Micrometers, external	As BS 870:2008 0 mm to 600 mm	Heads 2.0 $\mu\text{m}$ between any two points. Setting and extension rods 1.0 + (5.0 x length in m) $\mu\text{m}$	
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 mm to 25 mm	2.0 $\mu\text{m}$	Dial gauges and dial test indicators
<b>TORQUE</b>			
Torque Wrenches	1 N-m to 1500 N-m	1.6 % of reading	
Static Torque Transducers	1 N-m to 1500 N-m	0.040 % of reading	
Torque Wrench Measurement	1 to 2500 N-m See note 1	1.6 %	Note 1 Values may be given in other units i.e. lbf/ft, mV/V etc.
Torque Screwdriver Measurement	0.1 to 1.0 N-m See note 1	1.6 %	
Torque Transducers	0.005 to 1.0 N-m Classes 0.05 to 5.0	0.04 %	
Torque Transducers	1.0 to 1500 N-m Classes 0.05 to 5.0	0.04 %	



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MASS	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) 50 200 100 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	
TEMPERATURE  Temperature block calibrators	- 50 °C to + 100 °C 100 °C to 500 °C 250 °C to 650 °C	0.060 °C 0.060 °C to 0.13 °C 0.13 °C	
NON AUTOMATIC WEIGHING INSTRUMENTS  Digital Class II	Capacity x resolution  1 000 kg x 100 g  100 kg x 10 g  10 kg x 1 g  1 kg x 0.1 g	15 g  1.5 g  0.15 g  0.12 g	NOTE:  Weights are available in OIML Class:  F1 max grouped load 95 kg  M1 max. Grouped load 2,500 kg  Permanent laboratory only.
END			