


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 0316 Accredited to ISO/IEC 17025:1999	Cuthbertson Laird Group	
	Issue No: 022 Issue date: 26 January 2006	
	Parkburn Court Burnbank Hamilton Scotland ML3 0QQ	Contact: Mr G A Vallance Tel: +44 (0)1698-829711 Fax: +44 (0)1698-828363 E-Mail: hamilton@cuthbertsonlaird.co.uk Website: www.cuthbertsonlaird.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 Parkburn Court Burnbank Hamilton Scotland ML3 0QQ	Local contact Mr G A Vallance	Dimensional & Electrical A

Site activities performed away from the locations listed above:

Location details	Activity	Location code
At customers premises	Dimensional	B



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DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Best Measurement Capability Expressed as an Expanded Uncertainty ($k=2$)	Remarks	Location Code																			
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED																							
LENGTH			NOTES																				
Gauge Blocks		Class (See Notes)	<p>Class C uncertainties apply to the measurement of length by comparison with grade K standards of length of a similar material. Class C uncertainties apply to new grade 0, 1 and 2 gauges to BS EN ISO 3650:1999 and represent the best capability for all Grades of used gauges to BS 4311:Part 3:1993.</p> <p>Class D and E uncertainties are the maximum applicable to the measurement of length of grade 3 and 4 gauges respectively to BS 4311:Part 3:1993, by comparison with grade K standards of length of a similar material.</p> <p>1 All calibrations must be carried out in Accordance with procedures agreed by UKAS.</p> <p>2 All calibrations may be given in Metric or Imperial units.</p> <p>3 The uncertainty quoted is for the departure from flatness, straightness, parallelism or squareness, ie the distance separating the two parallel planes which just enclose the surface under consideration.</p>	A																			
Inch (Steel)	As BS 4311:Parts 1&3:1993 Up to 0.4 in Above 0.4 in up to 1 in Size 2 in Size 3 in Size 4 in	<table border="0"> <tr> <td>C</td> <td>D</td> <td>E</td> <td rowspan="7">} μ inches</td> </tr> <tr> <td>3</td> <td>4</td> <td>6</td> </tr> <tr> <td>4</td> <td>5</td> <td>8</td> </tr> <tr> <td>5</td> <td>7</td> <td>10</td> </tr> <tr> <td>6</td> <td>8</td> <td>12</td> </tr> <tr> <td>7</td> <td>10</td> <td>14</td> </tr> </table>			C	D	E	} μ inches	3	4	6	4	5	8	5	7	10	6	8	12	7	10	14
C	D	E			} μ inches																		
3	4	6																					
4	5	8																					
5	7	10																					
6	8	12																					
7	10	14																					
Millimetre (Steel)	As BS EN ISO 3650:1999 & As BS 4311:Parts 1&3:1993 Up to 10 Above 10 up to 25 Sizes 30, 40, 50 60, 70, 75 80, 90, 100	<table border="0"> <tr> <td>C</td> <td>D</td> <td>E</td> </tr> <tr> <td>.08</td> <td>.10</td> <td>.15</td> </tr> <tr> <td>.10</td> <td>.13</td> <td>.20</td> </tr> <tr> <td>.12</td> <td>.17</td> <td>.25</td> </tr> <tr> <td>.15</td> <td>.21</td> <td>.30</td> </tr> <tr> <td>.18</td> <td>.25</td> <td>.35</td> </tr> </table>				C	D	E	.08	.10	.15	.10	.13	.20	.12	.17	.25	.15	.21	.30	.18	.25	.35
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.08	.10	.15																					
.10	.13	.20																					
.12	.17	.25																					
.15	.21	.30																					
.18	.25	.35																					
Plain Plug Gauges (Parallel)	From 1 up to 50 diameter Above 50 up to 150 From 150 up to 200 Above 200 up to 300	<table border="0"> <tr> <td>0.8</td> <td rowspan="4">} on diameter</td> </tr> <tr> <td>1.0</td> </tr> <tr> <td>3</td> </tr> <tr> <td>5</td> </tr> </table>	0.8	} on diameter	1.0	3	5																
0.8	} on diameter																						
1.0																							
3																							
5																							
Parallels	As BS 906 up to 50 x 100 x 400	Dependent on size and grade From 1.5 up to 5																					
Vee Blocks	As BS 3731 up to 150	Dependent on size and grade																					
Length Gauges, Flat and Spherical Ended (excluding Length Bars)	Up to 1 m	1 + (8 x length in m)																					
ANGLE																							
Squares Blade Type Block	As BS 939 up to 450 As BS 939 and specials	<table border="0"> <tr> <td>3</td> <td rowspan="2">} on squareness See Note 3</td> </tr> <tr> <td>2</td> </tr> </table>	3	} on squareness See Note 3	2	A																	
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Measured Quantity Instrument or Gauge	Range	Best Measurement Capability Expressed as an Expanded Uncertainty ($k=2$)	Remarks	Location Code
RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
MEASURING INSTRUMENTS				
Micrometers External Internal Depth	As BS 870 up to 1000 As BS 959 As BS 6468 and up to 300	Heads: 2.0 between any two points Setting and extension rods: $1 + (8 \times \text{length in m})$		A
Height Setting Micrometer	Up to 300		Heads: 1.2 Stepped Column: 2 Overall Performance: 2.5	A
Riser Blocks for above	150 300	1.0 2.0		A
Vernier Caliper, Height and Depth Gauges	As BS 887, BS 1643 and BS 6365 Up to 1000	Overall performance: $10 + (30 \times \text{length inm})$		A
Dial Gauges and Dial Test Indicators	As BS 907 and BS 2795		1.0	A
Sine Bars and Tables	As BS 3064 and up to 300 length	Linear Dimensions: $1 + (10 \times \text{length in m})$ Overall Performance: 3 seconds of arc		A
Surface Plates Granite Cast Iron	As BS 817	$1.5 + (0.8 \times \text{diagonalin m})$ See Note 3		A & B
Micrometer Heads	As BS 1734	1		A
Feeler Gauges	As BS 957	3		A
Spirit Levels	As BS 958 and BS 3509	Mean sensitivity: 10% of nominal Minimum 0.5 seconds of arc		A



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AC RESISTANCE Generation only All at a nominal 50 Hz Spot values	20 mΩ 50 mΩ 100 mΩ 200 mΩ 500 mΩ 1 Ω 2 Ω 4 Ω 9 Ω	5.4% 0.37% 0.42% 0.42% 0.75% 0.43% 0.35% 0.36% 0.45%		A
Ranges	0.38 Ω to 0.5 Ω 0.5 Ω to 1 Ω 1 Ω to 5 Ω 5 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ	6 mΩ 7 mΩ 12 mΩ 18 mΩ 140 mΩ 1.4 Ω	Earth Loop	
AC VOLTAGE				A
1 mV to 10 mV 10 mV to 100 mV 100 mV to 1 V 100 mV to 1 V 1 V to 10 V 1 V to 10 V 10 V to 100 V 10 V to 100 V 100 V to 700 V 700 V to 1 kV 700 V to 1.9 kV 10 kV to 28 kV	40 Hz to 1 kHz 40 Hz to 1 kHz 40 Hz to 1 kHz 1 kHz to 100 kHz 40 Hz to 1 kHz 1 kHz to 100 kHz 40 Hz to 1 kHz 1 kHz to 100 kHz 40 Hz to 1 kHz 1 kHz to 100 kHz 40 Hz to 1 kHz 40 Hz to 1 kHz 50 Hz 50 Hz	300 ppm 70 ppm 40 ppm 100 ppm 70 ppm 100 ppm 250 ppm 250 ppm 350 ppm 500 ppm 2.3% 1.5%	The product of 1*V may be reported as such in terms of VA. Generate only Measurement only Measurement only	
AC CURRENT				A
5 μA to 100 μA 100 μA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 2.2 A 2.2 A to 11 A 11 A to 50 A	45 Hz to 1 kHz 45 Hz to 1 kHz 45 Hz to 5 kHz 45 Hz to 5 kHz 45 Hz to 5 kHz 40 Hz to 1 kHz 40 Hz to 1 kHz 50 Hz	500 ppm 450 ppm 300 ppm 300 ppm 0.12% 0.27 %) Generate 330 ppm) only 2.3% + 300 mA	At increased uncertainty current up to 550 amps can be simulated using a multi turn coil. Suitable for the calibration of clamp meters.	



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FREQUENCY	0.1 Hz to 10 Hz 10 Hz to 1 kHz 1 kHz to 2.1 GHz	30 in $10^8 + 40 \mu\text{Hz}$ 30 in $10^8 + 3 \mu\text{Hz}$ 30 in 10^8	May be reported as events per unit time, such as RPM	A
Elapsed time	Up to 100 s	1.3 ms	Suitable for RCD trip times	
Temperature	18°C to 22°C	0.1°C	As a supporting measurement for electrical simulation of temperature measuring/generating devices only.	A
ELECTRICAL				
Resistance thermometer (Pt 100)	-200°C to 800°C	0.05°C		A
Temperature simulators, calibration by electrical simulation				A
Base metal thermocouples	-200°C to 0°C 0°C to 1370°C -200°C to 0°C 0°C to 1370°C	0.07°C 0.015°C 0.19°C 0.17°C	Excluding cold junction compensation Excluding cold junction compensation Including cold junction compensation Including cold junction compensation	A
Noble metal thermocouples	-200°C to 0°C 0°C to 1370°C -200°C to 0°C 0°C to 1370°C	0.08°C 0.02°C 0.22°C 0.20°C	Excluding cold junction compensation Excluding cold junction compensation Including cold junction compensation Including cold junction compensation	A
Cold junction compensation	At ambient temperature of 20°C	0.1°C	20°C \pm 3°C Specific thermocouple types may be calibrated, the degrees equivalent to μV will be calculated in accordance with the prevailing ITS 90 tables	A



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ELECTRICAL (Cont'd) Temperature indicators, calibration by electrical simulation			As per simulators plus resolution and stability of UUT.	A
END				