


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

| | | |
|--|--|--|
|  0316 Accredited to ISO/IEC 17025:2005 | Cuthbertson & Laird Instruments Ltd, Trading as Cuthbertson Laird Group | |
| | Issue No: 037 Issue date: 30 September 2015 | |
| | Parkburn Court Burnbank Hamilton Scotland ML3 0QQ | Contact: Mr P Greenshields 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 P Greenshields | Dimensional and 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 | 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 | | | | |
| LENGTH | | | NOTES | |
| Plain Plug Gauges (Parallel) | 1 to 50 diameter 50 to 100 100 to 200 200 to 300 | 0.80 1.5 2.0 3.0] on diameter | 1 All linear calibrations may be given in inch units. 2 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. | A |
| Length Gauges, Flat and Spherical Ended (excluding Length Bars) | 25 to 1000 | 1.0 + (8.0 x length in m) | | A |
| ANGLE | | | | |
| Squares Blade Type | BS 939:2007 50 to 300 300 to 450 | 3.0 on squareness 5.0 See Note 2 | | A |
| MEASURING INSTRUMENTS AND MACHINES | | | | |
| Micrometers External | BS 870:2008 0 to 1000 |] Heads: 2.0 between any two points Setting and extension rods: 1.0 + (8.0 x length in m) | | A |
| Internal | BS 959:2008 0 to 900 | | | |
| Depth | BS 6468:2008 0 to 300 | | | |
| Vernier gauges Caliper | BS 887:2008 0 to 1000 | Overall performance 10 + (30 x length in m) | | A |
| Height | ISO13225:2012 and BS 1643:2008 (withdrawn) 0 to 1000 | Overall performance 10 + (10 x length in m) | | |
| Depth | BS 6365:2008 0 to 600 | Overall performance 10 + (30 x length in m) | | |



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| MEASURING INSTRUMENTS AND MACHINES (cont'd) | | | | |
| Dial Gauges and Dial Test Indicators | BS 907:2008 and BS 2795:1981 0 to 50 | 1.0 | | A |
| Surface Plates Granite Cast Iron | BS 817:2008 and above 160 x 100 to 4000 x 4000 | 1.5 + (0.80 x diagonal in m) See Note 2 | | A & B |
| Feeler Gauges | BS 957:2008 0.025 to 1.00 | 2.0 | | A |
| Spirit Levels | 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 |



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| ELECTRICAL | | | | |
| RESISTANCE (Spot Values) | 10 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω 10 M Ω 100 M Ω 1 G Ω 10 G Ω 100 G Ω 1 T Ω | 14 ppm 7.0 ppm 4.0 ppm 5.0 ppm 6.0 ppm 21 ppm 100 ppm 220 ppm 0.13 % 1.0 % 2.0 % 2.0 % | | A |
| | 0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 100 k Ω to 1 M Ω 1 M Ω to 10 M Ω 10 M Ω to 100 M Ω 100 M Ω to 1 G Ω | 160 $\mu\Omega$ 58 ppm 8.0 ppm 8.0 ppm 8.0 ppm 34 ppm 160 ppm 240 ppm 0.13 % | | |
| DC VOLTAGE Spot values | 100 mV 1 V 10 V 100 V 1000 V | 0.50 μV 2.0 ppm 1.5 ppm 2.0 ppm 18 ppm | | A |
| | 0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V | 0.54 μV 4.0 ppm 2.0 ppm 4.0 ppm 18 ppm | | |
| DC CURRENT Spot Values | 1 μA 10 μA 100 μA 1 mA 10 mA 100 mA 1 A | 56 pA 14 ppm 10 ppm 11 ppm 7.4 ppm 12 ppm 27 ppm | | A |



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| DC CURRENT (cont'd) Ranges | 0 μ A to 1 μ A 1 μ A to 10 μ A 10 μ A to 100 μ A 100 μ A 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 200 A 200 to 550 A 550 to 1000 A | 56 pA 120 ppm 93 ppm 59 ppm 58 ppm 59 ppm 120 ppm 200 ppm) Generate 760 ppm) only | Simulated current using a multi turn coil | A |
| AC RESISTANCE Generation only All at a nominal 50 Hz Spot values | 20 m Ω 50 m Ω 100 m Ω 200 m Ω 500 m Ω 1 Ω 2 Ω 4 Ω 9 Ω | 0.35 % 0.20 % 0.15 % 0.11 % 0.10 % 0.10 % 0.10 % 0.10 % 0.10 % | | A |
| Earth Loop | 0.05 Ω 0.1 Ω 0.22 Ω 0.33 Ω 0.5 Ω 1 Ω 5 Ω 10 Ω 100 Ω 1 k Ω | 5.0 m Ω 5.0 m Ω 5.0 m Ω 5.0 m Ω 5.0 m Ω 5.0 m Ω 5.0 m Ω 7.5 m Ω 19 m Ω 36 m Ω | | A |
| AC VOLTAGE Spot Values 40 Hz to 1 kHz | 10 mV 100 mV 1 V 10 V 100 V 700 V 1 V 10 V 100 V | 150 ppm 53 ppm 40 ppm 46 ppm 49 ppm 56 ppm 42 ppm 48 ppm 79 ppm | The product of I*V may be reported as VA, the uncertainty will be the sum of the 2 associated uncertainties. | A |



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| AC VOLTAGE Range Values | 10 mV to 100 mV 40 Hz to 1 kHz | 0.23 % | | A |
| | 100 mV to 1 V 40 Hz to 1 kHz 1 kHz to 100 kHz | 0.23 % 0.23 % | | |
| | 1 V to 10 V 40 Hz to 1 kHz 1 kHz to 100 kHz | 0.23% 0.23 % | | |
| | 10 V to 100 V 40 Hz to 1 kHz 1 kHz to 100 kHz | 0.23 % 0.23 % | | |
| | 100 V to 700 V 40 Hz to 1 kHz | 0.23 % | | |
| | 700 V to 1 kV 40 Hz to 1 kHz | 0.25 % | Generate only | |
| AC CURRENT Spot Values | 45 Hz to 1 kHz 100 µA 1 mA 10 mA 100 mA 1 A | 0.050 % 330 ppm 260 ppm 260 ppm 280 ppm | | |
| AC CURRENT Range Values | 45 Hz to 1 kHz 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 | 230 nA 0.24 % 0.23 % 0.23 % 0.24 % | | |
| | 45 Hz to 1 kHz 1 A to 2.2 A 2.2 A to 11 A | 200 ppm 330 ppm |) Generate) only | |
| | 45 Hz to 1 kHz 11 A to 200 A 200 A to 550 A | 0.60 A 1.7 A | Simulated current using a multi turn coil | |
| 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 $10^8 + 3.0 \mu\text{Hz}$ 30 in 10^8 | May be reported as events per unit time, such as RPM | A |
| Elapsed time | 0 ms to 390 ms 391 ms to 100 s | 1.0 ms 8.0 ms | Suitable for RCD trip times | A |
| RCD testers | | | | A |



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| FREQUENCY (cont'd) Trip current (all at 50 Hz) | 10 mA 30 mA 100 mA 300 mA 1 A 2 A | 2.0 % 2.0 % 2.0 % 2.0 % 2.0 % 2.0 % | | |
| PAT Testers Earth bond current 50Hz Load Tests Flash tests High Voltage | 1 A to 50 A 3 kVA 700 V to 1.9 kV @ 50 Hz 1 KV to 30 kV DC 1 kV to 28 kV 50 Hz | 1.0 % + 450 mA 2.5 % 1.5 % + 5.0 V 0.90 % 1.7 % | Note, this sum of Current and Voltage uncertainties for volt-amperes. | A A A |
| ELECTRICAL SIMULATION Temperature simulators and indicators, calibration by electrical simulation Resistance thermometer (Pt 100) Base metal thermocouples Noble metal thermocouples | - 200 °C to + 800 °C - 200 °C to 0 °C 0 °C to + 1370 °C - 200 °C to 0 °C 0 °C to + 1370 °C - 200 °C to 0 °C 0 °C to + 1370 °C - 200 °C to 0 °C 0 °C to + 1370 °C | 0.050 °C 0.070 °C 0.020 °C 0.19 °C 0.17 °C 0.080 °C 0.020 °C 0.22 °C 0.20 °C | Excluding cold junction compensation Excluding cold junction compensation Including cold junction compensation Including cold junction compensation Excluding cold junction compensation Excluding cold junction compensation Including cold junction compensation Including cold junction compensation | A A A A |



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| ELECTRICAL SIMULATION (cont'd) Temperature of reference junction/Cold junction compensation | At ambient temperature of 20 $^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Or Nominal 0 $^{\circ}\text{C}$ | 0.10 $^{\circ}\text{C}$ | | A |
| END | | | | |