


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>0199</p> <p>Accredited to ISO/IEC 17025:2005</p>	<h3>Avon-Dynamic Calibration</h3>	
	<p>Issue No: 029 Issue date: 01 February 2012</p>	
<p>Unit 2 The Old Mill Chapel lane Warmley Bristol BS15 4NQ</p>	<p>Contact: Mr R Stone Tel: +44 (0)117-9477846 Fax: +44 (0)117-9477831 E-Mail: info@avon-dynamic.co.uk Website: www.avon-dynamic.co.uk</p>	
<p>Calibration performed by the Organisations at the locations specified below</p>		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
<p>Address</p> <p>Unit 2 The Old Mill Chapel lane Warmley Bristol BS15 4 NQ</p>	<p>Local contact Mr R Stone</p>	Dimensional
	Mr P W Beamson	Electrical
		A
		A

Site activities performed away from the locations listed above:

Location details	Activity	Location code
At customers premises	Mr R Stone	Dimensional
	Mr P W Beamson	Electrical
		B
		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				
Gauge blocks		Class (see Notes)	NOTES	
Inch (steel)	As BS 4311:Part 1:2007 0.010 in to 0.4 in 0.4 in to 1 in Size 2 in Size 3 in Size 4 in	C 3.0 4.0 5.0 6.0 7.0	<p>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 grade 0, 1 and 2 gauges to BS 4311:Part 1:2007 and BS EN ISO 3650:1999.</p> <p>1 The uncertainty quoted is for the departure from either flatness, straightness, parallelism planes, which just enclose the surface under consideration.</p> <p>2. Single start, symmetrical thread forms only.</p> <p>3. Single start symmetrical and asymmetrical thread forms only.</p> <p>4. Includes use of check plugs for screw rings from 1 mm to 6mm diameter</p> <p>5. Includes use of check plugs for screw rings (taper) from 5 mm to 50 mm diameter</p> <p>6. Functional test of size using setting plugs calibrated</p> <p>7. Features and associated parts of these gauges can be measured to the uncertainties given for equivalent items listed in this schedule.</p>	A
Millimetre (steel)	As BS EN ISO 3650:1999 0.5 to 10 10 to 25 Sizes 30, 40, 50, 60, 70, 75 80, 90, 100	0.080 0.10 0.12 0.15 0.18		A
Gauge blocks accessories	As BS 4311:Part 2: 2009 0.1 to 12.5	0.30		A
Length bar accessories	As BS 1790:1961 and BS 5317:1976 10 to 25	0.30		A
Thread measuring cylinders	As BS 5590:1978 and specials 0.1 to 5	0.50		A
Plain plug gauges (parallel), cylindrical standards and rollers	1 to 50 diameter 50 to 150 diameter	0.80 1.0	on diameter	
Plain ring gauges (parallel) and setting standards	1 to 50 50 to 100	1.5 2.0		
Steel balls - steel	1 to 50	1.0		
Plain gap gauges (parallel)	0.5 to 100 100 to 200 200 to 300	3.0 5.0 8.0		A



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (Cont'd)				
Screw plug gauges (parallel) including check and setting plugs See Note 3	1 to 100 diameter	3.0 on pitch diameter		A
Screw plug gauges (taper) including check plugs See Note 2	1 to 100 diameter	4.0		
Screw ring gauges (parallel) See Notes 3 and 4	1 to 100 diameter	5.0 on pitch diameter		
Screw ring gauges (taper) See Notes 2 and 5	5 to 150 diameter	7.0 on pitch diameter		
Screw pitch Screw flank angle	0.2 to 8 0° to 52°	1.5 5.0 minutes of arc		
Screw thread adjustable calliper gauges (parallel) See Note 3	3 to 50 diameter	See Note 6		A
Length gauges, flat and spherical ended	1 to 1000	1.0 + (8.0 x length in m)		A
Engineers parallels	As BS 906:1972 5 to 50 x 100 x 400	1.5 to 5.0		A
Vee blocks	As BS 3731:1987 20 to 150	2.5 to 5.0		A
Receiver, position and profile gauges, jigs and fixtures	0 to 1000 x 600 x 600	See Note 7		A
ANGLE				
Squares				
Blade type	As BS 939:2007 50 to 300 300 to 600	3.0 5.0		A
Cylindrical	As BS 939:2007 75 to 300 300 to 600	2.0 5.0		
Block	As BS 939:2007 50 to 300 300 to 600	3.0 5.0 All on squareness See note 1		



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
ANGLE (Cont'd)				
Right angle 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 1		A
Sine bars and tables	As BS 3064:1978 0 to 250 length	Linear dimensions 1.0 + (10 x length in m) Overall performance 3.0 seconds of arc		A
Electronic indicating levels	0 minutes of arc to 20 minutes of arc	1.0 % of range Minimum 0.50 seconds of arc		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 0.50 seconds of arc		A
Clinometers	0° to 360°	10 seconds of arc		A
Thread measuring vee pieces (prisms)	As NPL Schedule MOY/SCMI/60 0 to 4.5	0.50		A
FORM				
Surface plates Granite Cast iron	As BS 817:1988 160 x 100 to 1600 x 1000	1.5 + (0.80 x diagonal in m) See Note 1		A
Straightedges Cast iron Steel Granite	As BS 5204:Part 1:1975 As BS 5204:Part 2:1977 Up to 1800	1.0 + (2.0 x length in m) See Note 1		A
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
External	As BS 870:2008 0 to 600	Heads: 2.0		A
Internal	As BS 959:2008 0 to 900	Setting and extension rods		
Depth	As BS 6468:2008 0 to 300	1.0 + (8.0 x length in m)		



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
MEASURING INSTRUMENTS AND MACHINES (Cont'd)				
Micrometer heads	As BS 1734:1951 0 to 100	1.0		A
Bore micrometers (three point)	0 to 150 diameter	5.0		A
Bench micrometers	As NPL MOY/SCMI 22 0 to 100	Overall performance 2.0		A
Height setting micrometer	0 to 300	Heads:1.2 Stepped column 2.0 Overall performance 2.5		A
Riser blocks for above	150 300	1.0 2.0		A
Vernier caliper, height and depth gauges	As BS 887:2008 0 to 1000 As BS 1643:2008 0 to 1000 As BS 6365:2008 0 to 600	Overall performance 10 + (30 x length in m)		A
Comparators (external)	As BS 1054:1975 250 to 10 000 magnifications	1.0 % of range Minimum 0.20		A
Dial gauges and dial test indicators	As BS 907:2008 and BS 2795:1981 0 to 50	1.0		A
Bevel protractors	As BS 1685:2008 0° to 360°	6 0 minutes of arc		A
Thread diameter measuring	As NPL Schedules MOY/SCMI/1/ 9 and MOY/SCMI1 //12 0 to 200 capacity	Overall performance 1.5		A
Steel Rules	As BS 4372:1968 0 to 1000	15 + (20 X length in m)		A
Feeler Gauges	As BS 975:Part 1:1941 BS 957:Part 2:1969 0.025 to 1	3.0		A
Electronic Height Gauges with microprocessor control	0 to 1000	1.0 + (8.0 x length in m)		A, B



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MEASURING INSTRUMENTS AND MACHINES (Cont'd)				
Surface plates Granite Cast iron	As BS 817:2008 160 x 100 Up to 2500 x 160	1.5 + (0.80 x length in m) See Note 1		A, B
Coordinate measuring machines	As ISO 10360-2:2001 0 to 1400 (longest diagonal using end standards)	1.0 + (3.0 x length in m)		B
Profile projectors	10 to 100 magnification Linear 0 to 300 Angular 0° to 360°	125 at the screen 5.0 3.0 minutes of arc		B
ELECTRICAL				
DC VOLTAGE Generation Specific Values	100 mV 1 V 10 V 100 V 1000 V	8.0 ppm 4.0 ppm 3.0 ppm 4.0 ppm 6.0 ppm		A, B
Generation and Measurement	0 μ V to 10 mV 10 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV	100 ppm + 1.0 μ V 10 ppm + 0.50 μ V 5.0 ppm + 2.0 μ V 5.0 ppm 8.0 ppm 15 ppm		
AC VOLTAGE Generation and Measurement	1 kHz 100 μ V to 1 mV 1 mV to 100 mV 100 kHz 100 μ V to 1 mV 1 mV to 10 mV 10 mV to 100 mV 100 V 30 kHz 1000 V 30 Hz to 10 kHz 100 μ V to 2 mV 2 mV to 20 mV 20 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V	0.50 % 0.05 % 1.0 % 0.50 % 0.10 % 0.030 % 0.050 % 0.50 % 0.10 % 0.10 % 0.030 % 0.030 % 0.030 %		A, B



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AC VOLTAGE (cont'd)				A, B
Generation and Measurement (cont'd)	50 Hz to 10 kHz 200 V to 1000 V 10 kHz to 100 kHz 100 μ V to 2 mV 2 mV to 20 mV 20 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V	0.040 % 1.0 % 0.15 % 0.10 % 0.050 % 0.050 % 0.050 %		
	100 kHz to 330 kHz 2 V to 20 V	0.15 %		
	30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz 100 mV to 1 V 1 V to 10 V 10 V to 100 V	0.050 % 0.020 % 0.020 %		
	45 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz 100 V to 1000 V	0.020 %		
	100 kHz, 300 kHz, 1 MHz 1 V 10 V	0.50 % 0.50 %		
DC RESISTANCE				A, B
Specific 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	15 ppm 10 ppm 12 ppm 6.0 ppm 10 ppm 20 ppm 30 ppm 0.030 % 0.30 %		
Other Values	0 Ω to 10 Ω 10 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 1 G Ω	60 ppm + 7.0 $\mu\Omega$ 60 ppm 20 ppm 16 ppm 10 ppm 15 ppm 30 ppm 40 ppm 600 ppm 0.60 %		



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DC RESISTANCE (cont'd)				A, B
Current Carrying Resistors	250 $\mu\Omega$ at 10 A 1 m Ω at 10 A 3 m Ω at 10 A 5 m Ω at 10 A 10 m Ω at 1 A 100 m Ω at 1 A	600 ppm 250 ppm 250 ppm 250 ppm 150 ppm 50 ppm		
DC CURRENT	10 μ A to 100 μ A 100 μ A to 100 mA 100 mA to 1 A 1 A to 10 A	80 ppm 50 ppm 90 ppm 0.020 %		A, B
AC CURRENT	10 A to 100 A 100 A to 1000 A	0.10 % 0.20 %	For the calibration of clamp meters only	
	100 μ A to 1 mA 10 Hz to 5 kHz	0.030 %		A, B
	1 mA to 10 mA 10 Hz to 5 kHz	0.030 %		
	10 mA to 100 mA 10 Hz to 5 kHz	0.030 %		
	100 mA to 1 A 10 Hz to 5 kHz	0.035 %		
	1 A to 10 A 50 Hz to 400 Hz	0.050 %		
Generation Only	10 A to 100 A 40 Hz to 100 Hz 100 Hz to 440 Hz	0.10 % 0.50 %	For the calibration of clamp meters only	
	100 A to 1000 A 40 Hz to 100 Hz	0.20 %		
Oscilloscope Bandwidth	40 Hz to 600 MHz 100 mV to 2.5 V peak to peak	2.0 %	Into 50 Ω	
Rise time	Nominal 1 ns	150 ps		
CAPACITANCE	1 pF to 1 μ F 1 kHz	50 ppm		A, B



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FREQUENCY				A, B
Specific Values	1 MHz, 5 MHz and 10 MHz	3.0 in 10^9		
Other Values	1 Hz to 10 Hz 10 Hz to 100 Hz 100 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 100 kHz 100 kHz to 1 MHz	3.0 in 10^5 3.0 in 10^6 3.0 in 10^7 3.0 in 10^8 4.0 in 10^9 2.0 in 10^9	Period Mode	
	1 MHz to 10 MHz 10 MHz to 1 GHz	3.0 in 10^9 5.0 in 10^9	Frequency Mode	
TIME INTERVAL	1 s to 1000 s	2.0 ms		A, B
ELECTRICAL SIMULATION OF TEMPERATURE READING INSTRUMENTS	Nominal 0 °C	0.060 °C	Support measurement suitable for measurement of reference junction compensation devices	A, B
Reference junction	18 °C to 25 °C	0.50 °C	Supporting temperature measurement only	
Electrical calibration of temperature simulators for the following sensors:				
Noble metal thermocouples	- 200 °C to 1800 °C	0.20 °C	Excluding cold junction compensation	
Base metal thermocouples	- 200 °C to 1380 °C	0.10 °C	Excluding cold junction compensation	
Resistance sensors	- 200 °C to 800 °C	0.050 °C	(PT 100)	
Electrical calibration of temperature indicators, controllers and recorders for the following sensors:				
Noble metal thermocouples	- 200 °C to 1800 °C	0.25 °C	Excluding cold junction compensation	
Base metal thermocouples	- 200 °C to 1380 °C	0.15 °C	Excluding cold junction compensation	
Resistance sensors	- 200 °C to 800 °C	0.080 °C		
Additional measurements in support of IEE 17 th edition test equipment				



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RCD				
Trip current	3 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 3 A	7.0 % + 20 μ A 7.0 % + 160 μ A 7.0 % + 840 μ A 7.0 % + 5.3 mA		
Trip time	20 ms to 390 ms 390 ms to 5 s	1.0 ms 8.9 ms		
AC resistance for Loop 50 Hz			Laboratory loop 0.47 Ω	
Nominal Ranges	0.05 Ω to 0.1 Ω 0.1 Ω to 0.22 Ω 0.22 Ω to 0.33 Ω	0.80 % + 1.7 m Ω 0.80 % + 3.0 m Ω 0.80 % + 1.7 m Ω		
	0.33 Ω to 0.5 Ω 0.5 Ω to 1 Ω 1 Ω to 5 Ω	0.80 % + 2.0 m Ω 0.80 % + 2.0 m Ω 0.80 % + 5.0 m Ω		
	5 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω	0.80 % + 6.2 m Ω 0.80 % + 26 m Ω 0.80 % + 1.1 Ω		
Earth Bond Resistance	25 m Ω to 1 k Ω	0.10 % + 1 m Ω		
Earth bond current 50 Hz	1 A to 10 A 10 A to 30 A	2.0 % + 26 mA 2.0 % + 30 mA		
END				