


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p style="text-align: center;">0331</p> <p style="text-align: center;">Accredited to ISO/IEC 17025:2005</p>	EMICS Ltd	
	Issue No: 025	Issue date: 03 December 2010
248 Radford Blvd Radford Nottingham NG7 5QG	Contact: Mr S Tingey Tel: +44 (0)115-9424748 Fax: +44 (0)115-9424746 E-Mail: stevetingey@emics.co.uk Website: www.emics.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		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Address 248 Radford Blvd Radford Nottingham NG7 5QG</td> <td style="width: 50%;">Local contact Mr S Tingey</td> </tr> </table>	Address 248 Radford Blvd Radford Nottingham NG7 5QG	Local contact Mr S Tingey	Dimensional Electrical Pressure Torque	A
Address 248 Radford Blvd Radford Nottingham NG7 5QG	Local contact Mr S Tingey			
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Address Gauge Room Rolls-Royce Naval Marine PO Box 21 Derby DE21 7XX</td> <td style="width: 50%;">Local contact Mr S Tingey</td> </tr> </table>	Address Gauge Room Rolls-Royce Naval Marine PO Box 21 Derby DE21 7XX	Local contact Mr S Tingey	Dimensional	B
Address Gauge Room Rolls-Royce Naval Marine PO Box 21 Derby DE21 7XX	Local contact Mr S Tingey			

Site activities performed away from the locations listed above:

Location details	Activity	Location code		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">At customers premises</td> <td style="width: 50%;">Mr S Tingey</td> </tr> </table>	At customers premises	Mr S Tingey	Dimensional Electrical Pressure	C
At customers premises	Mr S Tingey			



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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), cylindrical setting standards and rollers	1 to 50	0.50	1 The uncertainty quoted is for the departure from flatness, straightness, parallelism, or squareness, i.e. the distance separating the two parallel planes which just enclose the surface under consideration.	A, B			
	50 to 100	0.80					
	100 to 150	1.0					
	150 to 200	1.2					
	200 to 300	1.6					
Thread measuring cylinders	BS 5590 0.1 to 5	0.50		A			
Plain ring gauges (parallel) and setting standards	2 to 10 diameter	1.0	2. Single start, symmetrical thread forms only.	A			
	10 to 25	0.80					
	25 to 50	1.0					
	50 to 100	1.5					
	100 to 150	2.0					
Length gauges, flat and spherical ended	150 to 250	3.0	3. Single and multi- start symmetrical and asymmetrical thread forms.	A, B			
	0 to 600	1.0 + (8.0 x length in m)					
	Plain gap gauges (parallel)	0.5 to 100			3.0	4. Includes use of check plugs for screw rings from 1 mm to 14 mm diameter	A, B
		100 to 200			5.0		
		200 to 300			8.0		
Screw plug gauges (parallel) including check and setting plugs See Note 3	1 to 100 diameter	2.5	5. The uncertainty quoted is for the application of the calibration torque and does not take into account the characteristics of the device being calibrated.	A			
	100 to 150	5.0 on pitch diameter					
	150 to 200	8.0					
Screw plug gauges (taper) including check plugs See Note 2	5 to 100 diameter	5.0 on pitch diameter		A			
Screw ring gauges (parallel) See Notes 3 and 4	3 to 75 diameter	5.0 on pitch diameter	6. Calibrations may also be given in lbf.in and lbf.ft	A			
	75 to 150	7.0					
	150 to 250	10					
Screw ring gauges (taper) See Note 2	6 up to 150 diameter	7.0 on pitch diameter		A			
Screw pitch Screw flank angle	0.2 to 8	1.5	7. Features and associated parts of these gauges can be measured to the uncertainties given for equivalent items listed in this schedule.	A, B			
	0° to 52°	5.0 minutes of arc					
Parallels	BS906:1972 5 to 50 x 100 x 400	1.5 up to 5.0		A, B			



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
LENGTH (Cont'd)				
Vee blocks	BS 3731:1987 20 to 150	2.5 to 5.0		A, B
Receiver, position and profile gauges, jigs, fixtures See note 7	Maximum dimensions 0 to 1000 x 750 x 500 (Limited to gauges where a specific procedure and uncertainty budget are available).	Minimum per co-ordinate: 3.0 + (10 x length in m)		A
ANGLE				
Squares Blade type	BS 939:2007 50 to 300 300 to 600	3.0 On squareness 5.0 See Note 1		A, B
Angle plates and box angle plates	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	BS 3064:1978 0 to 500 length	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 3.0 seconds of arc		A, B
Sine centres	0 to 500 length or between centres	Linear dimensions: 1.0 + (10 x length in m) Overall performance: 5.0 seconds of arc		A, B
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 0.50 seconds or arc		A
FORM				
Surface plates Granite and Cast iron	BS 817:2008 and above 160 x 100 to 1600 x 1000	1.5 + (0.80 diagonal in m) See Note 1		A, C
Steel balls	1 to 25 diameter	0.50 on diameter		A



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED				
MEASURING INSTRUMENTS AND MACHINES				
Micrometers				
Micrometers External	BS 870:2008 0 to 600	Heads: 2.0		A, B
Internal	BS 959:2008 0 to 900	Setting and extension rods 1.0 + (8.0 x length in m)		
Depth	BS 6468:2008 0 to 300			
Micrometer heads	BS 1734:1951 0 to 50	1.0		A
Bench micrometer	NPL MOY/SCMI 22 0 to 100	Overall performance 1.0		A
Vernier caliper, height and depth gauges	BS 887:2008 0 to 1000 BS 1643:2008 0 to 1000 BS 6365:2008 0 to 600	Overall performance 10 + (30 x length in m)		A, B
Dial gauges and dial test indicators	BS 907:2008 and BS 2795:1981 0 to 50	1.0		A
Height setting micrometer	0 to 300	Heads 1.0 Stepped column 1.6 Overall performance 2.0		A
Riser blocks for above	150 300	1.0 2.0		A
Comparators (external)	BS 1054:1975 250 to 10 000 magnifications	1.0 % of range Minimum 0.20		A
Graduated rules	BS 4372:1968 0 to 1000	5.0 + (10 x length in m)		A
Bevel protractors	BS 1685:2008 0° to 360°	6.0 minutes of arc		A, B
Bench centres	0 to 1000 between centres	Linear dimensions 1.0 + (10 x length in m)		A
Electronic height gauges with microprocessor control	0 to 1000	2.0 + (5.0 x length in m)		A, C



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Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k=2$)	Remarks	Location Code
ELECTRICAL				
DC Voltage				
Generation	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V 1 kV to 30 kV 30 kV to 50 kV	11 ppm + 3.0 μ V 9.0 ppm + 6.0 μ V 7.0 ppm + 47 μ V 8.0 ppm + 0.50 mV 10 ppm + 5.0 mV 0.40 % + 7.0 V 0.40 % + 65 V		A
Measurement	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V 1kV to 30 kV 30 kV to 50 kV	10 ppm + 2.0 μ V 9.0 ppm + 4.0 μ V 9.0 ppm + 26 μ V 14 ppm + 0.40 mV 14 ppm + 4.0 mV 0.40 % + 7.0 V 0.40 % + 65 V		A
DC Resistance				
Sourcing	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	52 ppm 23 ppm 15 ppm 14 ppm 18 ppm 35 ppm 115 ppm 0.10 % 1.5 %		A
Measurement	0 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	18 ppm + 150 $\mu\Omega$ 13 ppm + 0.75 m Ω 11 ppm + 6.0 m Ω 11 ppm + 60 m Ω 11 ppm + 1.0 Ω 17 ppm + 20 Ω 60 ppm + 320 Ω 350 ppm + 18 k Ω 0.35 % + 1.1 M Ω		A
DC Current				
Generation	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 A to 10 A	60 ppm + 12 nA 45 ppm + 16 nA 60 ppm + 100 nA 45 ppm + 2.0 μ A 150 ppm + 28 μ A 0.030 % + 0.50 mA		A



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DC Current Measurement	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 A to 10 A	120 ppm + 4.0 nA 120 ppm + 21 nA 120 ppm + 210 nA 120 ppm + 3.0 μ A 230 ppm + 40 μ A 860 ppm + 5.0 mA		A
AC Voltage Generation	<i>50 Hz to 1 kHz</i> 0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V <i>1 kHz to 20 kHz</i> 0 V to 2 V 2 V to 20 V <i>50 Hz</i> 1 kV to 30 kV 30 kV to 50 kV	0.030 % + 36 μ V 0.020 % + 120 μ V 0.020 % + 1.2 mV 0.020 % + 14 mV 0.020 % + 120 mV 0.035 % + 0.20 mV 0.035 % + 2.0 mV 0.75 % + 75 V 0.75 % + 290 V		A
Measurement	<i>50 Hz to 10 kHz</i> 0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1000 V <i>10 kHz to 30 kHz</i> 0 V to 2 V 2 V to 20 V <i>50 Hz</i> 1 kV to 30 kV 30 kV to 50 kV	150 ppm + 20 μ V 150 ppm + 80 μ V 150 ppm + 0.70 mV 150 ppm + 8.0 mV 160 ppm + 80 mV 0.030 % + 80 μ V 0.030% + 0.80 mV 0.75 % + 75 V 0.75 % + 290 V		A
AC Current Generation	<i>50 Hz to 1 kHz</i> 0 V to 200 μ A 200 μ A to 2mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A	0.060% + 520 nA 0.060 % + 0.60 μ A 0.060 % + 1.7 μ A 0.060% + 17 μ A 0.070 % + 0.60 mA 0.080 % + 5.0 mA		A



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AC Current Measurement	50 Hz to 1 kHz 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	0.040 % + 0.030 μ A 0.040 % + 0.25 μ A 0.040 % + 2.5 μ A 0.040 % + 25 μ A 0.070 % + 0.50 mA		A
	50 Hz to 60 Hz 2 A to 30 A	0.77 % + 16 mA		A
Electrical calibration of temperature indicators for the following sensors:				A
Noble metal thermocouples	0 $^{\circ}$ C to + 1600 $^{\circ}$ C	0.50 $^{\circ}$ C	Including cold junction compensation	
Base metal thermocouples	-200 $^{\circ}$ C to + 1300 $^{\circ}$ C	0.35 $^{\circ}$ C	Including cold junction compensation	
Resistance sensors	-200 $^{\circ}$ C to + 850 $^{\circ}$ C	0.20 $^{\circ}$ C		
Electrical calibration of temperature indicators for the following sensors:				B
Noble metal thermocouples	0 $^{\circ}$ C to + 1600 $^{\circ}$ C	0.90 $^{\circ}$ C	Including cold junction compensation	
Base metal thermocouples	-200 $^{\circ}$ C to + 1300 $^{\circ}$ C	0.70 $^{\circ}$ C	Including cold junction compensation	
Resistance sensors	-200 $^{\circ}$ C to + 850 $^{\circ}$ C	0.30 $^{\circ}$ C		
Frequency	0 MHz to 160 MHz	1.2 in 10^9 + 0.30 MHz		A
Period	10 ns to 17000 s	1.5 in 10^9		A
Rise time	2 ns to 20 ns	3.0 %		A
Time interval	1 s to 8×10^5 s	8.0 in 10^9		A
Electrical verification of ultrasonic flaw detection equipment	BS EN 12668-1:2000	3.0 %		A
PRESSURE				
<u>Gas Pressure Gauge</u>				A & B
Calibration of pressure indicating instruments and gauges	-90 kPa to 0 kPa 0 kPa to 20 kPa 20 kPa to 2 MPa	0.060 % + 20 Pa 0.020 % + 20 Pa 0.060 % + 20 Pa		



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PRESSURE <u>Gas Pressure Absolute</u> Calibration of pressure indicating instruments and gauges <u>Hydraulic Pressure Gauge</u> Calibration of pressure indicating instruments and gauges	10 kPa to 80 kPa 80 kPa to 115 kPa 115 kPa to 2.1 MPa 0 to 14 MPa 14 MPa to 70 MPa	0.060 % + 32 Pa 25 Pa 0.060 % + 32 Pa 0.010 % + 17 kPa 0.10 % + 10 kPa		A & B A & B
TORQUE Hand torque tools	To BS EN ISO 6789:2003 1 N.m to 1000 N.m	1.5 % See Notes 5 and 6		A
END				