

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



0096

Accredited to
ISO/IEC 17025:2005

Trescal Limited

Issue No: 036 Issue date: 15 September 2011

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Calibration performed at the above address only

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty ($k = 2$)	Remarks
ELECTRICAL			
DC Resistance			
Specific Values - Measurement	1 m Ω 0.01 Ω 0.1 Ω 1 Ω 10 Ω 25 Ω 100 Ω 1 k Ω 10 k Ω 100 k Ω 1 M Ω	25 ppm 8.0 ppm 6.0 ppm 4.0 ppm 4.0 ppm 3.5 ppm 2.0 ppm 4.0 ppm 2.0 ppm 3.0 ppm 8.0 ppm	
Specific Values - Sourcing	100 $\mu\Omega$ 1 m Ω 0.01 Ω 0.1 Ω 1 Ω 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	0.14 % 300 ppm 150 ppm 120 ppm 6.0 ppm 2.0 ppm 2.0 ppm 6.0 ppm 5.0 ppm 6.0 ppm 100 ppm 120 ppm 0.10 % 0.65 % 0.75 % 1.3 %	Resistors are available for The calibration of instruments with higher test voltages at higher uncertainties



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DC Resistance (cont'd)			
Other Values	0 Ω to 10 Ω 10 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	50 ppm + 100 $\mu\Omega$ 40 ppm 20 ppm 30 ppm 40 ppm 120 ppm 0.090 % 0.15 %	
DC Voltage			
Other Values Generation	0 V to 219 mV 219 mV to 220 V 220 V to 1100 V	18 ppm + 1.0 μ V 4.0 ppm + 1.0 μ V 7.0 ppm	
Measurement	0 V to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	40 ppm + 2.0 μ V 11 ppm + 2.0 μ V 16 ppm + 2.0 μ V 9.0 ppm 27 ppm	
High Voltage	1.1 kV to 70 kV	0.20 %	Sourcing capability limited to 50 kV
DC Current			
Generation	0 A to 22 μ A 22 μ A to 220 μ A 220 μ A to 2.2 mA 2.2mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A 2.2 A to 10 A 10 A to 100 A	3.0 nA 120 ppm 30 ppm 35 ppm 55 ppm 55 ppm 40 ppm + 0.10 μ A 0.025 %	Current up to 2000 A can be simulated at increased uncertainties, using a multi turn coil. Suitable for clamp meters.
AC Voltage			
Generation	<i>At 1 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 220 V to 1100 V <i>10 Hz to 1 kHz</i> 2.2 V to 22 V <i>1 kHz to 50 kHz</i> 2.2 V to 22 V	0.58 % + 1.0 μ V 0.070 % + 5.0 μ V 0.020 % + 5.0 μ V 0.0020 % 0.0030 % 0.0050 % 0.070 % 0.020 % 0.0060 %	Load impedance not less than 100 k Ω



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AC Voltage (cont'd)			
Measurement	1 kHz 1 mV to 1000 V	0.045 % + 5.0 μ V	
	1 kV to 12 kV 50 Hz	0.70 %	
AC Current	40 Hz to 1 kHz 10 μ A to 220 μ A 220 μ A to 2.2 mA 2.2 mA to 22 mA 22 mA to 220 mA 220 mA to 2.2 A	0.031 % 0.014 % 0.018 % 0.014 % 0.019 %	
	30 Hz to 1 kHz 2.2 A to 10 A	0.05 %	
	50 Hz 10 A to 100 A	0.15 %	Current up to 2000 A can be simulated at increased uncertainties, using a multi turn coil. Suitable for clamp meters.
AC Resistance	50 Hz to 1 kHz 1 Ω 10 Ω 100 Ω 1 k Ω 10 k Ω	10 ppm	
LF Capacitance	1 kHz 100 pF 1 pF to 11.1 μ F 11.1 μ F to 100 μ F	20 ppm 90 ppm 250 ppm	The uncertainty quoted is for measurement of 3-terminal capacitance. 2-terminal capacitance measurements can also be undertaken but there will be an additional uncertainty of 0.5 pF.
Inductance	1 kHz 1 mH, 10 mH, 100 mH, 1 H	0.030 % 0.020 % 0.020 % 0.020 %	
RF Capacitance	1 MHz 1 pF, 10 pF, 100 pF, 300 pF, 1000 pF	0.25 %	
	1 MHz 3000 pF	0.45 %	
Frequency	1 MHz to 1.3 GHz	3.0 in 10^{10}	
Tachometers Optical	60 rpm to 18 000 rpm	0.013 %	



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AC Power	1 W to 10 kW 30 Hz to 1 kHz	0.40 %	Based on ac voltage and ac current measurements for unity power factor
RCD Testers nominal	1 mA to 1 A @ 50 Hz 10 ms, 35 ms, 100 ms, 300 ms 500 ms, 750 ms and 1 s	1.6 % 1.2 %	
Temperature indicators, calibration by electrical simulation			
Base metal thermocouple	- 200 °C to + 1600 °C	0.45 °C	including cold junction compensation
Noble metal thermocouple	- 200 °C to + 1760 °C	0.45 °C	including cold junction compensation
Resistance thermometer (Pt 100)	- 200 °C to + 800 °C	0.030 °C	
TORQUE			
Torque measuring devices	As BS EN 7882:2008 0.05 Nm to 1000 Nm	0.10 %	
Hand torque tools	As BS EN ISO 6789 :2003 0.2 Nm to 1500 Nm	0.84 % 0	
PRESSURE			
<u>Gas Pressure (Gauge)</u>			
Calibration of pressure indicating instruments and gauges.	- 95 kPa to 0 Pa 0 Pa to 200 Pa 200 Pa to 2 kPa 2 kPa to 3.5 kPa 3.5 kPa to 20.7 MPa	30 Pa 1.5 Pa 20 Pa 30 Pa 0.0075 %	Calibration of Devices with an electrical output may be undertaken
"Pressure equivalent" calibration of dead-weight testers	3.5 kPa to 20.7 MPa	0.0075 %	
<u>Gas Pressure (Absolute)</u>			
Calibration of pressure indicating instruments and gauges	1 Pa to 2 kPa 2 kPa to 75 kPa 75 kPa to 115 kPa 115 kPa to 20.8 MPa	27 % 30 Pa 15 Pa 0.0075 % + 20 Pa	



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<p>PRESSURE (cont'd)</p> <p><u>Hydraulic Pressure (Gauge)</u></p> <p>Calibration of pressure indicating instruments and gauges. "Pressure equivalent" calibration of dead-weight testers</p> <p>TEMPERATURE</p> <p>4-wire platinum resistance thermometers</p> <p>Base metal thermocouples</p> <p>Liquid in glass thermometers</p> <p>Dial type and electronic thermometers with sensors:</p> <p> Resistance sensors</p> <p> Thermocouple sensors</p> <p> Thermistors</p> <p>Metal block calibrators</p>	<p>550 kPa to 140 MPa</p> <p>0.01 °C (Triple point of water) - 80 °C to + 10 °C 10 °C to 260 °C 260 °C to 650 °C</p> <p>- 80 °C to 260 °C 260 °C to 650 °C</p> <p>- 80 °C to 0 °C 0 °C to 250 °C</p> <p>- 80 °C to + 260 °C 260 °C to 650 °C</p> <p>- 80 °C to 260 °C 260 °C to 650 °C</p> <p>- 80 °C to 260 °C 260 °C to 650 °C</p> <p>- 30 °C to 260 °C 260 °C to 650 °C</p>	<p>0.010 %</p> <p>0.0020 °C 0.020 °C 0.010 °C 0.45 °C</p> <p>0.25 °C 0.45 °C</p> <p>0.020 °C + ¼ of a scale division 0.010 °C + ¼ of a scale division</p> <p>0.040 °C 0.45 °C</p> <p>0.25 °C 0.45 °C</p> <p>0.050 °C 0.45 °C</p> <p>0.15 °C 0.25 °C</p>	
<p>RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED</p>			
<p>DIMENSIONAL</p> <p>MEASURING INSTRUMENTS AND MACHINES</p> <p>Micrometers External (including digital and electronic)</p>	<p>As BS 870:2008 0 to 1000)</p>	<p>Heads: 2.0 between any two points. Setting and extension rods: 1.0 + (8.0 x length in m)</p>	



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RANGE IN MILLIMETRES AND UNCERTAINTY IN MICROMETRES UNLESS OTHERWISE STATED			
DIMENSIONAL (cont'd) MEASURING INSTRUMENTS AND MACHINES (cont'd) Vernier gauges Caliper	As BS 887:2008 0 to 1000	Overall performance $10 + (30 \times \text{length in m})$	NOTES 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. All linear calibrations may be given in Inch units.
END			