

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

 23653 Accredited to ISO/IEC 17025:2017	Thorcal Ltd	
	Issue No: 014 Issue date: 20 October 2026	
	B6 Citadel Trading Park Hull HU9 1TQ	Contact: Dublin Tindall Tel: +44 (0) 1482 242010 E-Mail: Info@thorcal.co.uk Website: www.thorcal.co.uk
Calibration performed by the Organisation at the locations specified		

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details		Activity	Location code
Address B6 Citadel Trading Park Hull HU9 1TQ	Local contact Dublin Tindall	Pressure Electrical Temperature Humidity	LAB

Site activities performed away from the locations listed above:

Location details	Activity	Location code
The customers' site or premises must be suitable for the nature of the particular calibrations undertaken and will be the subject of contract review arrangements between the laboratory and the customer.	Pressure	SITE



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Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
PRESSURE				
<u>Hydraulic pressure (gauge)</u> Calibration of pressure indicating instruments and gauges	275 kPa to 690 kPa 690 kPa to 5.5 MPa 5.5 MPa to 110 MPa	0.013 % 0.075 % 0.0080 %	Methods consistent with EURAMET CG17 Calibration of pressure measuring devices with an electrical output may be undertaken. Calibration on other fluids up to 70 MPa can be undertaken with an additional uncertainty of 1.4 kPa added in quadrature	LAB
<u>Gas pressure (gauge)</u> Calibration of pressure indicating instruments and gauges	0 kPa to 7 MPa 7 MPa to 35 MPa 35 MPa to 70 MPa	2.3 kPa 4.5 kPa 8.1 kPa		SITE
<u>Gas pressure (gauge)</u> Calibration of pressure indicating instruments and gauges	-100 kPa to -6.9 kPa -6.9 kPa to 1.5 kPa 1.5 kPa to 2.5 kPa 2.5 kPa to 10 kPa 10 kPa to 12.15 MPa	0.0080 % 10 Pa 0.011 % 0.0080 % 0.0075 %	Absolute pressure calibrations may be undertaken by associated barometric pressure measurement with an additional uncertainty of 13 Pa added in quadrature.	LAB
<u>Gas pressure (absolute)</u> Calibration of pressure indicating instruments and gauges	-90 kPa to 100 kPa 100 kPa to 7 MPa	130 Pa 1.7 kPa		SITE
<u>Gas pressure (absolute)</u> Calibration of pressure indicating instruments and gauges	75 kPa to 115 kPa	36 Pa		LAB



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
TEMPERATURE				
Temperature indicators and or recorders with temperature sensors	-45 °C to -20 °C -20 °C to 50 °C 50 °C to 75 °C 75 °C to 100 °C 100 °C to 150 °C 150 °C to 200 °C 200 °C to 300 °C 300 °C to 660 °C	0.034 °C 0.018 °C 0.024 °C 0.038 °C 0.047 °C 0.099 °C 0.059 °C 0.17 °C	By comparison in a range of metal and liquid media baths	LAB
Metal Block Calibrators	-90 °C to 0 °C 0 °C to 125 °C 125 °C to 660 °C	0.040 °C 0.030 °C 0.030 °C	Comparison to a reference PRT. Characterisation consistent with Euramet CG 13	LAB
Radiation pyrometers	-10 °C to 0 °C 0 °C to 20 °C 20 °C to 100 °C 100 °C to 120 °C	1.0 °C 0.85 °C 0.90 °C 0.80 °C	Using a calibrated blackbody source	LAB
Platinum Resistance Thermometers	-45 °C to -20 °C -20 °C to 50 °C 50 °C to 75 °C 75 °C to 100 °C 100 °C to 150 °C 150 °C to 200 °C 200 °C to 300 °C 300 °C to 660 °C	0.033 °C 0.017 °C 0.024 °C 0.038 °C 0.047 °C 0.10 °C 0.059 °C 0.17 °C	3 and 4 wire PRTs Output of the PRTs 4-20mA transmitters.	LAB
Thermocouple (Base metal)	-20 °C to 50 °C 50 °C to 100 °C 100 °C to 300 °C 300 °C to 660 °C	0.044 °C 0.051 °C 0.067 °C 0.17 °C		LAB
Temperature in air	-30 °C to 130 °C	0.72 °C to 1.6 °C	By comparison in a large volume air chamber	LAB
	5 °C to 10 °C 10 °C to 23 °C 23 °C to 30 °C 30 °C to 40 °C	0.77 °C 0.54 °C 0.15 °C 0.34 °C	By comparison in a small volume air chamber	



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HUMIDITY Relative Humidity	At 5 °C		Calibration by comparison with a reference hygrometer in an air chamber	LAB
	15 %rh	1.1 %rh		
	33 %rh	2.0 %rh		
	50 %rh	2.9 %rh		
	75 %rh	4.2 %rh		
	95 %rh	5.3 %rh		
	At 10 °C			
	15 %rh	0.95 %rh		
	33 %rh	0.83 %rh		
	50 %rh	2.0 %rh		
	75 %rh	3.0 %rh		
	95 %rh	3.7 %rh		
	At 23 °C			
	15 %rh	0.84 %rh		
	33 %rh	0.83 %rh		
	50 %rh	0.84 %rh		
	75 %rh	1.2 %rh		
	95 %rh	1.5 %rh		
	At 30 °C			
	15 %rh	0.81 %rh		
	33 %rh	0.85 %rh		
	50 %rh	0.89 %rh		
	75 %rh	1.2 %rh		
	95 %rh	1.4 %rh		
	At 40 °C			
	15 %rh	0.79 %rh		
	33 %rh	1.0 %rh		
	50 %rh	1.2 %rh		
	75 %rh	1.6 %rh		
	95 %rh	1.9 %rh		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
ELECTRICAL				
DC VOLTAGE				
Generation	0 V to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1050 V	46 $\mu\text{V/V} + 2.1 \mu\text{V}$ 46 $\mu\text{V/V} + 31 \mu\text{V}$ 46 $\mu\text{V/V} + 310 \mu\text{V}$ 47 $\mu\text{V/V} + 3.7 \text{ mV}$ 69 $\mu\text{V/V} + 35 \text{ mV}$	All electrical calibrations are performed as a comparison against a reference standard For the calibration of measuring instruments	LAB
Measurement	0 to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	9.2 $\mu\text{V/V} + 1.6 \mu\text{V}$ 1.7 $\mu\text{V/V} + 5.8 \mu\text{V}$ 1.5 $\mu\text{V/V} + 53 \mu\text{V}$ 4.9 $\mu\text{V/V} + 580 \mu\text{V}$ 47 $\mu\text{V/V} + 5.8 \text{ mV}$	Generation of these quantities with the same or similar CMCs may be undertaken over the same ranges by the use of a transfer method.	LAB
DC CURRENT				
Generation	0 A to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 20 A	0.018 % + 30 nA 0.014 % + 87 nA 0.014 % + 640 nA 0.014 % + 11 μA 0.046 % + 200 μA 0.070 % + 10 mA	For the calibration of measuring instruments	LAB
Simulated Current	10 A to 100 A 100 A to 1100 A	0.001 % + 1.9 A 0.0085 % + 1.9 A	For the calibration of clamp meters, using multi-turn coil technique.	
Measurement	0 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 3 A	28 $\mu\text{A/A} + 3.4 \text{ nA}$ 20 $\mu\text{A/A} + 21 \text{ nA}$ 140 $\mu\text{A/A} + 0.21 \mu\text{A}$ 63 $\mu\text{A/A} + 2.4 \mu\text{A}$ 10 $\mu\text{A/A} + 48 \mu\text{A}$ 0.15 % + 0.43 mA	Generation of these quantities with the same or similar CMCs may be undertaken over the same ranges by the use of a transfer method.	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
ELECTRICAL (continued)				
AC VOLTAGE				
Generation	<u>1 mV to 200 mV</u> 40 Hz to 1 kHz 1 kHz to 20 kHz <u>0.2 V to 2 V</u> 40 Hz to 1 kHz 1 kHz to 20 kHz <u>2 V to 20 V</u> 40 Hz to 1 kHz 1 kHz to 20 kHz <u>20 V to 200 V</u> 40 Hz to 1 kHz <u>200 V to 1000 V</u> 40 Hz to 1 kHz	0.058% + 0.12 mV 0.12 % + 0.18 mV 0.046 % + 0.33 mV 0.069 % + 0.60 mV 23 mV 21mV 0.077% + 42 mV 0.10 % + 14 mV	For the calibration of measuring instruments	LAB
Measurement	10 mV to 100 mV 10 Hz to 60 Hz 60 Hz to 1 kHz 1 kHz to 50 kHz 100 mV to 1 V 10 Hz to 60 Hz 60 Hz to 1 kHz 1 kHz to 50 kHz 1 V to 10 V 10 Hz to 60 Hz 60 Hz to 1 kHz 1 kHz to 100 kHz 100 kHz to 1 MHz 10 V to 100 V 40 Hz to 1 kHz 1 kHz to 10 kHz 10 kHz to 50 kHz 100 V to 700 V 40 Hz to 10 kHz	72 μ V/V + 39 μ V 84 μ V/V + 19 μ V 51 μ V/V + 50 μ V/V 81 μ V/V + 0.14 mV 67 μ V/V + 0.07 mV 97 μ V/V + 1.5 mV 70 μ V/V + 1.2 mV 68 μ V/V + 0.62 mV 82 μ V/V + 1.9 mV 0.17 % + 63 mV 25 μ V/V + 12 mV 27 μ V/V + 5.6 mV 170 μ V/V + 5.2 mV 0.02 % + 50 mV	Generation of these quantities with the same or similar CMCs may be undertaken over the same ranges by the use of a transfer method.	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
ELECTRICAL (continued)				
AC CURRENT				LAB
Generation	<u>0 A to 200 μA</u> 40 Hz to 1 kHz <u>200 μA to 2 mA</u> 40 Hz to 1 kHz <u>2 mA to 20 mA</u> 40 Hz to 1 kHz <u>20 mA to 200 mA</u> 40 Hz to 1 kHz <u>200 mA to 2 A</u> 40 Hz to 500 Hz <u>2 A to 20 A</u> 40 Hz to 500 Hz	0.081 % + 0.37 μ A 0.11 % + 0.88 μ A 0.081 % + 8.7 μ A 0.092 % + 87 μ A 0.12 % + 1.6 mA 0.23 % + 7.1 mA	For the calibration of measuring instruments	
Measurement	0 μ A to 100 μ A 10 Hz to 1 kHz 100 μ A to 1 mA 10 Hz to 1 kHz 1 mA to 10 mA 20 Hz to 1 kHz 1 kHz to 5 kHz 10 mA to 100 mA 10 Hz to 1 kHz 100 mA to 1 A 10 Hz to 1 kHz 1 A to 3 A	83 μ A/A + 0.12 μ A 19 μ A/A + 0.12 μ A 49 μ A/A + 2.8 μ A 75 μ A/A + 5.4 μ A 46 μ A + 28 μ A 49 μ A/A + 0.44 mA 13 mA	Generation of these quantities with the same or similar CMCs may be undertaken over the same ranges by the use of a transfer method.	
Simulated Current	10 A to 100 A 40 Hz to 1 kHz 100 A to 1100 A 40 Hz to 100 Hz	0.0014 % + 1.9 A 0.016 % + 1.9 A	For the calibration of clamp meters, using multi-turn coil technique.	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
ELECTRICAL (continued)				
DC RESISTANCE				
FIXED RESISTANCE 2 WIRE or 4 WIRE				
Generation	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	13 m Ω 17 m Ω 79 m Ω 0.79 Ω 7.9 Ω 0.18 k Ω 12 k Ω 1.2 M Ω 110 M Ω	For the calibration of measuring instruments	LAB
Measurement	0 Ω to 10 Ω 0 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	29 $\mu\Omega/\Omega + 3.5$ m Ω 8.6 $\mu\Omega/\Omega + 3.6$ m Ω 4.3 $\mu\Omega/\Omega + 8.9$ m Ω 1.9 $\mu\Omega/\Omega + 77$ m Ω 8.8 $\mu\Omega/\Omega + 1.2$ Ω 37 $\mu\Omega/\Omega + 24$ Ω 8.9 $\mu\Omega/\Omega + 0.45$ k Ω 0.02 % + 36 k Ω 0.35 % + 1.1 M Ω	Generation of these quantities with the same or similar CMCs may be undertaken over the same ranges by the use of a transfer method.	
SIMULATED RESISTANCE	0 Ω to 400 Ω 400 Ω to 4000 Ω 4000 Ω to 40 k Ω	0.058 % + 0.58 Ω 0.027 % + 1.2 Ω 0.023 % + 5.9 Ω	For the calibration of measuring instruments	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location
Temperature indicators, calibration by electrical simulation Thermocouple capabilities for measurement and generation are listed below and are given for type K Base and Type S Noble, using EMF sensitivity values as listed in BS EN 60584-1:2013. Other Thermocouple types can be calibrated; the uncertainties will correspond to the sensitivities listed in the standard. Calibrations which include and exclude the internal reference junction (CJC) are available for types: J, K, N, T, E, R, S, B & C, the claims listed are based around a 10 m°C resolution process calibrator.				LAB
Base Metal Thermocouples	-200 °C to -50 °C -50 °C to 0 °C 0 °C to 1372 °C	0.033 °C 0.049 °C 0.029 °C	Including automatic CJC	
Noble Metal Thermocouples	-50 °C to 0 °C 0 °C to 500 °C 500 °C to 1768 °C	0.21 °C 0.097 °C 0.021 °C		
Base Metal Thermocouples	-200 °C to -50 °C -50 °C to 0 °C 0 °C to 1372 °C	0.029 °C 0.028 °C 0.029 °C	Excluding automatic CJC	
Noble Metal Thermocouples	-50 °C to 0 °C 0 °C to 500 °C 500 °C to 1768 °C	0.21 °C 0.097 °C 0.021 °C		
Cold Junction Compensation	0 °C to 30 °C	0.025 °C		
PT100	-39 °C to 0 °C 0 °C to 420 °C 420 °C to 660 °C	0.15 °C 0.30 °C 0.50 °C	2 and 4 wire measurements.	
18th EDITION ELECTRICAL TEST EQUIPMENT CONTINUITY RESISTANCE CONTINUITY CURRENT INSULATION RESISTANCE				LAB
	0 Ω to 1 Ω 1 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 kΩ	0.29 % + 31 mΩ 0.29 % + 31 mΩ 0.29 % + 31 mΩ 0.29 % + 31 mΩ	For the calibration of Insulation Resistance Meters using a dedicated calibration system	
	10 mA to 320 mA	1.5 % + 0.7 mA		
	10 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 10 MΩ 10 MΩ to 100 MΩ 100 MΩ to 1 GΩ 1 GΩ to 10 GΩ	0.12 % + 0.20 Ω 0.12 % 1.2 % 1.2 % 1.4 % 6.5 %		



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18th EDITION ELECTRICAL TEST EQUIPMENT (continued)				LAB
INSULATION TEST VOLTAGE	50 V to 1000 V	1.2 % + 0.93 V		
AC VOLTAGE OUTPUT	100 V to 200 V 200 V to 400 V <i>At 50 Hz</i>	0.23 % + 0.16 V 0.23 % + 0.15 V		
RCD CURRENT	<i>At 50 Hz</i> <u>20 ms to 190 ms</u> 2 mA to 1 A 1 A to 3 A	5.8 % + 0.23 mA 5.8 % + 0.23 mA	For the calibration of RCD Testers using a dedicated calibration system	
	<u>190 ms to 5 s</u> 2 mA to 1 A 1 A to 3 A	1.4 % + 71 uA 1.4 % + 71 uA		
TRIP TIME	20 ms to 400 ms 400 ms to 5 s	0.95 ms 8.1 ms		
LOOP RESISTANCE	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1 k Ω <i>At 50 Hz</i>	0.58 % + 41 m Ω 0.58 % + 45 m Ω 0.58 % + 54 m Ω	For the calibration of Earth Loop Testers using a dedicated calibration system	
PAT TESTERS				LAB
PAT EARTH BOND RESISTANCE <i>at 50 Hz</i>	0 Ω to 10 Ω 10 Ω to 100 Ω 100 Ω to 1000 Ω	0.58 % + 4.7 m Ω 0.58 % + 19 m Ω 0.58 % + 35 m Ω	For the calibration of Portable Appliance Testers using a dedicated calibration system	
PAT EARTH BOND CURRENT <i>at 50 Hz</i>	0 mA to 500 mA 500 mA to 10 A 10 A to 30 A	1.7 % + 14 mA 1.7 % + 71 mA 1.7 % + 71 mA		
PAT INSULATION RESISTANCE	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 1 G Ω to 10 G Ω	0.12 % + 0.20 Ω 0.12 1.2 % 1.2 % 1.4 % 6.5 %		
PAT LEAKAGE CURRENT <i>at 50 Hz</i>	2.7 mA at 240 V 4.7 mA at 240 V 7.7 mA at 240 V	1.7 % + 9.6 μ A 1.7 % + 9.6 μ A 1.7 % + 9.6 μ A		
END				



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Appendix - Calibration and Measurement Capabilities

Introduction

The definitive statement of the accreditation status of a calibration laboratory is the Accreditation Certificate and the associated Schedule of Accreditation. This Schedule of Accreditation is a critical document, as it defines the measurement capabilities, ranges and boundaries of the calibration activities for which the organisation holds accreditation.

Calibration and Measurement Capabilities (CMCs)

The capabilities provided by accredited calibration laboratories are described by the Calibration and Measurement Capability (CMC), which expresses the lowest measurement uncertainty that can be achieved during a calibration. If a particular device under calibration itself contributes significantly to the uncertainty (for example, if it has limited resolution or exhibits significant non-repeatability) then the uncertainty quoted on a calibration certificate will be increased to account for such factors.

The CMC is normally used to describe the uncertainty that appears in an accredited calibration laboratory's schedule of accreditation and is the uncertainty for which the laboratory has been accredited using the procedure that was the subject of assessment. The measurement uncertainty is calculated according to the procedures given in the GUM and is normally stated as an expanded uncertainty at a coverage probability of 95 %, which usually requires the use of a coverage factor of $k = 2$. An accredited laboratory is not permitted to quote an uncertainty that is smaller than the published measurement uncertainty in certificates issued under its accreditation.

Expression of CMCs - symbols and units

It should be noted that the percentage symbol (%) represents the number 0.01. In cases where the measurement uncertainty is stated as a percentage, this is to be interpreted as meaning percentage of the measurand. Thus, for example, a measurement uncertainty of 1.5 % means $1.5 \times 0.01 \times q$, where q is the quantity value.

The notation $Q[a, b]$ stands for the root-sum-square of the terms between brackets: $Q[a, b] = [a^2 + b^2]^{1/2}$