


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 <p>UKAS CALIBRATION 0175</p> <p>Accredited to ISO/IEC 17025:2005</p>	Isothermal Technology Ltd	
	Issue No: 052 Issue date: 05 September 2018	
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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
TEMPERATURE			
Platinum thermocouples			
Calibration by comparisons	- 50 °C to 0 °C 0 °C to 50 °C 50 °C to 660 °C 660 °C to 1100 °C 1100 °C to 1300 °C	0.50 °C 0.45 °C 0.40 °C 0.70 °C 1.7 °C	Thermocouples without a cold junction will have increased uncertainty
Other thermocouples	- 196 °C - 80 °C to 0 °C 0 °C to 50 °C 50 °C to 300 °C 300 °C to 420 °C 420 °C to 660 °C 660 °C to 1100 °C 1100 °C to 1300 °C	0.30 °C 0.25 °C 0.10 °C 0.25 °C 0.30 °C 0.40 °C 0.80 °C 2.2 °C	
Compensating and extension cables	- 25 °C to + 200 °C	1.0 °C	



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TEMPERATURE (cont'd)			
Platinum resistance thermometers			
Calibration by comparisons	- 80 °C to - 40 °C - 40 °C to + 50 °C 50 °C to 156 °C 156 °C to 300 °C 300 °C to 420 °C 420 °C to 660 °C	7.0 mK 4.0 mK 5.0 mK 6.5 mK 20 mK 35 mK	
Calibration at fixed points			Uncertainty in the determination of $W_{(t_{90})}$ used to calculate ITS-90 coefficients
See Note 1			
BP Nitrogen	- 195.798 °C	5.0 mK	
TP Argon	- 189.3442 °C	0.50 mK	
TP Mercury	- 38.8344 °C	0.24 mK	
TP Water (See Note 3)	0.01 °C	0.070 mK	Note: TP = Triple Point FP = Freezing Point MP = Melting Point BP = Boiling Point
MP Gallium	29.7646 °C	0.15 mK	
FP Indium	156.5985 °C	1.0 mK	
FP Tin	231.928 °C	1.0 mK	
FP Zinc	419.527 °C	1.2 mK	
FP Aluminium	660.323 °C	2.0 mK	Note 1: Suitable only for HT/SPRTs with high stability. Includes extrapolation to zero power and immersion checks.
FP Silver	961.78 °C	7.0 mK	
See Note 2			Note 2: Suitable for most SPRTs using nominal current.
BP Nitrogen	- 195.798 °C	10 mK	
TP Argon	- 189.3442 °C	2.0 mK	
TP Mercury	- 38.8344 °C	2.0 mK	
TP Water (See Note 3)	0.01 °C	1.0 mK	Note 3: Determination of R(0.01°C)
MP Gallium	29.7646 °C	1.0 mK	
FP Indium	156.5985 °C	2.0 mK	
FP Tin	231.928 °C	3.0 mK	
FP Zinc	419.527 °C	3.5 mK	
FP Aluminium	660.323 °C	6.0 mK	
FP Silver	961.78 °C	40 mK	



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TEMPERATURE (cont'd)			
Fixed point cells			
See Note 4			
TP Argon	- 189.3442 °C	2.0 mK	Note: TP = Triple Point FP = Freezing Point MP = Melting Point BP = Boiling Point Note 4: Suitable for optimal realisations. Includes 3 melts, 3 freezes, 2 intercomparisons. Note 5: Also appropriate for slim cells. Includes 1 melt, 1 freeze, 1 intercomparison sequence using a monitor SPRT.
TP Mercury	- 38.8344 °C	0.22 mK	
TP Water	0.01 °C	0.070 mK	
MP Gallium	29.7646 °C	0.070 mK	
FP Indium	156.5985 °C	0.65 mK	
FP Tin	231.928 °C	0.60 mK	
FP Zinc	419.527 °C	0.90 mK	
FP Aluminium	660.323 °C	1.1 mK	
FP Silver	961.78 °C	2.0 mK	
See Note 5			
TP Mercury	- 38.8344 °C	1.0 mK	
TP Water	0.01 °C	0.50 mK	
MP Gallium	29.7646 °C	1.0 mK	
FP Indium	156.5985 °C	2.0 mK	
FP Tin	231.928 °C	2.0 mK	
FP Zinc	419.527 °C	2.0 mK	
FP Aluminium	660.323 °C	6.0 mK	
FP Silver	961.78 °C	15 mK	
Metal block calibrators and portable liquid baths	0 °C - 80 °C to 0 °C 0 °C to 156 °C 156 °C to 300 °C 300 °C to 420 °C 420 °C to 660 °C 660 °C to 1100 °C 1100 °C to 1300 °C	10 mK 25 mK 20 mK 35 mK 50 mK 65 mK 1.0 °C 3.0 °C	Suitable for zero reference baths
ELECTRICAL			
DC VOLTAGE			
Specific Values	± 10 mV ± 20 mV ± 50 mV ± 100 mV ± 250 mV ± 500 mV ± 1 V ± 2 V	0.22 µV 0.25 µV 0.35 µV 0.50 µV 1.0 µV 1.4 µV 4.0 µV 5.5 µV	
Other values	0 mV to 140 mV 140 mV to 1.4 V 1.4 V to 14 V	12 ppm + 0.60 µV 12 ppm + 1.3 µV 12 ppm + 12 µV	



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ELECTRICAL (cont'd)			
DC RESISTANCE Measurement	0.1 Ω to 1 k Ω 1 k Ω to 100 k Ω	0.30 ppm 12 ppm	Resistors suitable for oil immersion can be measured over the range 20 °C to 23 °C
Specific Values			
	1 Ω	0.080 ppm	
	5 Ω	0.080 ppm	
	10 Ω	0.075 ppm	
	25 Ω	0.072 ppm	
	100 Ω	0.072 ppm	
	400 Ω	0.10 ppm	
AC RESISTANCE			The uncertainties can only be realised for resistors with suitable AC characteristics
	<i>At 75 Hz:</i> 0.1 Ω to 400 Ω 400 Ω to 1 k Ω	2.0 ppm 2.2 ppm	
DC RESISTANCE RATIO			
Resistance ratio	0.16 to 6.27	30 ppb	DC ratio bridge calibration using RBC 100A
TEMPERATURE SIMULATION			
Temperature indicators and simulators, calibration by electrical simulation, for the following sensor types:			
Base metal thermocouple	- 200 °C to + 1600 °C	0.31 °C	including cold junction compensation
Noble metal thermocouple	- 200 °C to + 1760 °C	0.40 °C	including cold junction compensation
Resistance sensors (Pt100)	- 200 °C to + 800 °C	0.020 °C	
END			