Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0778

Accredited to ISO/IEC 17025:2017

Eurotherm Limited

Issue No: 020 **Issue date:** 13 September 2023

Faraday Close
Durrington
Worthing
West Sussex
BN13 3PL

Contact: Mr Warwick Vercoe
Tel: +44 (0)1903 268500
E-Mail: warwick.vercoe@watlow.com
Website: www.eurotherm.com

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
Address Faraday Close Durrington Worthing West Sussex BN13 3PL	**Local contact** Mr **Warwick Vercoe**	Electrical	Permanent Laboratory

Site activities performed away from the locations listed above:

Location details		Activity	Location code
Customers' sites or premises 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.	**Local contact** Mr **Warwick Vercoe**	Electrical Pressure Temperature Time	Site Calibration

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL				Site Calibration
All electrical measurements are carried out using the method of direct comparison or transfer to laboratory reference standards unless otherwise determined in the remarks column.				
Temperature indicators and simulators, calibration by electrical simulation				
Base metal thermocouples			including cold junction compensation	
Type T	-100 ºC to +400 ºC	0.40 ºC		
Type N	-100 ºC to +1300 ºC	0.50 ºC		
Type K	-100 ºC to +1300 ºC	0.40 ºC		
Type J	-100 ºC to +1200 ºC	0.40 ºC		
Type E	-200 ºC to +1000 ºC	0.50 ºC		
Noble metal thermocouples			including cold junction compensation	
Type S	400 ºC to 1760 ºC	0.95 ºC		
Type R	400 ºC to 1760 ºC	0.95 ºC		
Type B	500 ºC to 1820 ºC	1.5 ºC		
Pt 100 indicators	-100 °C to +400 °C	0.17 °C		
Pt100 simulators	-100 °C to +400 °C	0.17 °C		
DC VOLTAGE				
Generation	0 mV to 100 mV 100 mV to 10 V	12.5 µV 2.5 mV		
Measurement	0 mV to 100 mV 100 mV to 10 V	20 µV 2.5 mV		
DC CURRENT				
Generation	0 mA to 20 mA	10 µA		
Measurement	0 mA to 20 mA	10 µA		
DC RESISTANCE				
Generation	0 Ω to 1 kΩ	0.35 Ω		
TIME				
Timers	10 s to 200 hr	3.0 s	Including absolute time	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
PRESSURE			Methods consistent with EURAMET CG17	Site Calibration
<u>Gas Pressure (Gauge)</u>				
Calibration of pressure indicating instruments and gauges	-80 kPa to +2.07 MPa	2.5 kPa	Results may be expressed in other units of pressure as required Calibration of pressure measuring devices with an electrical output may be undertaken	
TEMPERATURE			Calibration by comparison with reference thermometers	
Electronic thermometers with sensors				
	-40 °C to -20 °C -20 °C to +100 °C 100 °C to 140 °C	0.40 °C 0.40 °C 0.40 °C	Calibration of temperature measuring devices with an electrical output may be undertaken	
Platinum resistance thermometers 3-wire and 4-wire	-40 °C to -20 °C -20 °C to +100 °C 100 °C to 140 °C	0.65 °C 0.45 °C 0.65 °C		
Type T Thermocouples	-40 °C to -20 °C -20 °C to +100 °C 100 °C to 140 °C	0.75 °C 0.60 °C 0.75 °C		
Temperature controlled ovens, furnaces and autoclaves	20 °C to 650 °C 650 °C to 1100 °C 1100 °C to 1200 °C	2.1 °C 2.7 °C 4.2 °C	Multiple point measurements Time dependent profiling spatial, survey(ing) or mapping	

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
DC VOLTAGE				Permanent Laboratory
Generate				
	0 V to 100 mV	4.0 µV		
	100 mV to 300 mV	7.0 µV		
	300 mV to 1 V	12.5 µV		
	1 V to 3 V	31 µV		
	3 V to 10 V	131 µV		
	10 V to 30 V	350 µV		
	30 V to 100 V	3.0 mV		
Measure				
	0 V to 100 mV	3.1 µV		
	100 mV to 1 V	29 µV		
	1 V to 10 V	288 µV		
	10 V to 100 V	3.1 mV		
DC CURRENT				
Generate				
	0 A to 100 µA	30 nA		
	100 µA to 300 µA	60 nA		
	300 µA to 1 mA	200 nA		
	1 mA to 3 mA	300 nA		
	3 mA to 10 mA	1.2 µA		
	10 mA to 30 mA	2.7 µA		
	30 mA to 100 mA	12 µA		
	100 mA to 300 mA	27 µA		
	300 mA to 1 A	195 µA		
DC CURRENT (cont'd)				
Measure				
	0 A to 100 µA	4.0 nA		
	100 µA to 1 mA	110 nA		
	1 mA to 10 mA	1.8 µA		
	10 mA to 100 mA	8.0 µA		
	100 mA to 1 A	219 µA		
Resistance				
Generate				
	0 Ω to 10 Ω	10 mΩ		
	10 Ω to 100 Ω	20 mΩ		
	100 Ω to 1 kΩ	40 mΩ		
Measure				
	0 Ω to 1 Ω	3.1 µΩ		
	1 Ω to 10 Ω	3.2 µΩ		
	10 Ω to 100 Ω	5.0 µΩ		
	100 Ω to 1 kΩ	35 µΩ		
	1 kΩ to 10 kΩ	340 µΩ		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Temperature simulation				Permanent Laboratory
Source and Measure				
Thermocouples				
Type T	-200 ºC to -150 ºC -150 ºC to 0 ºC 0 ºC to 120 ºC 120 ºC to 400 ºC	0.49 ºC 0.19 ºC 0.13 ºC 0.11 ºC		
Type S	0 ºC to 250 ºC 250 ºC to 1000 ºC 1000 ºC to 1400 ºC 1400 ºC to 1767 ºC	0.37 ºC 0.29 ºC 0.29 ºC 0.36 ºC		
Type R	0 ºC to 250 ºC 250 ºC to 1000 ºC 1000 ºC to 1400 ºC 1400 ºC to 1767 ºC	0.45 ºC 0.28 ºC 0.26 ºC 0.32 ºC		
Type N	-200 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 120 ºC 120 ºC to 410 ºC 410 ºC to 1300 ºC	0.32 ºC 0.18 ºC 0.15 ºC 0.14 ºC 0.21 ºC		
Thermocouples (cont'd)				
Type K	-200 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 120 ºC 120 ºC to 1000 ºC 1000 ºC to 1372 ºC	0.26 ºC 0.15 ºC 0.13 ºC 0.21 ºC 0.32 ºC		
Type J	-210 ºC to -100 ºC -100 ºC to -30 ºC -30 ºC to 150 ºC 150 ºC to 760 ºC 760 ºC to 1200 ºC	0.21 ºC 0.13 ºC 0.11 ºC 0.14 ºC 0.18 ºC		
Type E	-250 ºC to -100 ºC -100 ºC to -25 ºC -25 ºC to 350 ºC 350 ºC to 650 ºC 650 ºC to 1000 ºC	0.40 ºC 0.13 ºC 0.11 ºC 0.13 ºC 0.17 ºC		
Type B	600 ºC to 800 ºC 800 ºC to 1000 ºC 1000 ºC to 1550 ºC 1550 ºC to 1820 ºC	0.35 ºC 0.28 ºC 0.24 ºC 0.21 ºC		
Cold junction measurement in thermocouple generate mode		125 mºC		

0778
Accredited to
ISO/IEC 17025:2017

Eurotherm Limited

Issue No: 020 **Issue date:** 13 September 2023

Calibration performed by the Organisation at the locations specified

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	
PT 100 Source	-200 ºC to -80 ºC -80 ºC to 0 ºC 0 ºC to 100 ºC 100 ºC to 300 ºC 300 ºC to 400 ºC 400 ºC to 630 ºC 630 ºC to 800 ºC	40 mºC 40 mºC 55 mºC 70 mºC 80 mºC 95 mºC 0.18 ºC		
PT 100 Measure	-200 ºC to 0 ºC 0 ºC to 232 ºC 232 ºC to 660 ºC	5.0 mºC 7.0 mºC 14 mºC		
END				

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: $Q[a, b] = [a^2 + b^2]^{1/2}$