Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

0816

Accredited to ISO/IEC 17025:2017

Caltech Service Co Ltd

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Unit 5, Poplar Drive **Poplar Industrial Estate** **Moor Lane** **Witton** **Birmingham** **B6 7AD**	**Contact: Mr P Westwood** **Tel: +44 (0)121 331 4445** **Fax: +44 (0)121 331 4447** **E-Mail: Paul@caltechservice.co.uk**

Calibration performed by the Organisation at the locations specified below

Locations covered by the organisation and their relevant activities

Laboratory locations:

Location details	Activity	Location code
Address Unit 5, Poplar Drive Poplar Industrial Estate Moor Lane Witton Birmingham B6 7AD **Local contact** Mr P Westwood Tel: +44 (0)121 331 4445 Fax: +44 (0)121 331 4447 Email: Paul@caltechservice.co.uk	Electrical Temperature Pressure	Calibrations performed at Permanent Laboratory are denoted: **P**

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. **Contact** Mr P Westwood Tel: +44 (0)121 331 4445 Fax: +44 (0)121 331 4447 Email: Paul@caltechservice.co.uk	Electrical Pressure	Calibrations performed away from the Permanent Laboratory, on site are denoted: **S**

Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL MEASUREMENT				
DC Voltage	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.031 mV 0.10 mV 0.60 V 6.0 mV 0.50 mV	Measurement with reference sources and meters.	P & S
AC Voltage	*10 Hz to 50 kHz* 10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000V	 0.050 mV 0.60 mV 6.2 mV 60 mV 1.0 V		
DC Current	0 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.12 mA 0.34 mA 3.0 mA		
AC Current	*1 kHz* 10 mA to 100 mA 100 mA to 1 A1 A to 10 A	 0.13 mA 0.30 mA 3.0 mA		
DC Resistance	0 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 100 MΩ	0.055 Ω 0.21 Ω 14 Ω 28 Ω 290 Ω		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL GENERATION				P & S
DC Voltage	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V	0.07 mV 0.11 mV 1.0 mV 6.0 mV 70 mV	These values can be generated for the calibration of measuring instruments.	
AC Voltage	*10 Hz to 60 kHz* 10 mV to 100 mV 100 mV to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000V	 0.070 mV 0.90 mV 7.0 mV 60 mV 1.0 V		
DC Current	0 mA to 100 mA 100 mA to 1 A 1 A to 10 A	0.12 mA 0.38 mA 3.10 mA		
AC Current	*1 kHz* 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A	 0.17 mA 0.32 mA 3.0 mA		
DC Resistance	0 Ω to 100 Ω 100 Ω to 1 kΩ 1 kΩ to 100 kΩ 100 kΩ to 1 MΩ 1 MΩ to 100 MΩ	0.12 Ω 0.27 Ω 1.2 Ω 5.4 Ω 7.0 Ω		

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty (k = 2)	Remarks	Location Code
Electrical calibration of temperature indicators, controllers and recorders for the following sensors:				
Noble metal thermocouples	-50 °C to 0 °C 0 °C to 1768 °C	1.3 °C (lab) 0.9 °C (lab) 1.2 °C (site)	with cold junction compensation	P & S
Base metal thermocouples	-200 °C to +1372 °C	0.5 °C (lab) 1.0 °C (site)	with cold junction compensation	P & S
Resistance thermometers (PT100)	-200 °C to +800 °C	0.3 °C		P & S
PRESSURE			Methods consistent with EURAMET CG3 and CG17.	
Hydraulic Pressure (Gauge) Calibration of pressure indicating instruments and gauges	0.55 to 5.5 MPa 5.5 to 55 MPa	0.023 % 0.023 %		P
	0 to 10 MPa 10 to 60 MPa	44 kPa 140 kPa	Including crack pressure calibration of pressure relief valves.	S
Gas Pressure (Gauge) Calibration of pressure indicating instruments and gauges	0 to 3.5 MPa	44 kPa	including crack pressure calibration of pressure relief valves.	S
TEMPERATURE				
Resistance thermometers and digital indicators with probes	0 °C to 100 °C 100 °C to 800 °C	0.32 °C 1.0 °C	With dry and liquid media dependent on range	P
Thermocouples, noble metal	100 °C to 500 °C 500 °C to 1000 °C 1000 °C to 1200 °C	1.2 °C 1.1 °C 1.6 °C	Calibration within horizontal furnace	P
Thermocouples, base metal	100 °C to 1000 °C 1000 °C to 1200 °C	1.0 °C 1.7 °C	Calibration within Horizontal furnace	P
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: $Q[a, b] = [a^2 + b^2]^{1/2}$