Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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0600

Accredited to ISO/IEC 17025:2017

CCPI Europe Ltd

Issue No: 036 **Issue date**: 21 September 2020

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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 Temperature Technology Centre Vector 31 Business Park Waleswood Way Wales Bar Sheffield South Yorkshire S26 5NU	**Local contact** Mr Phil Williams Tel: +44 (0)1909 775 333 Fax: +44 (0)1909 772 225 Email: lab@ccpi-europe.com Website: www.ccpi-europe.com	Electrical Temperature	P

Site activities performed away from the locations listed above:

Location details		Activity	Location code
The customer's 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 as above	Electrical Temperature	S

DETAIL OF ACCREDITATION

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
ELECTRICAL			Electrical calibrations are performed by comparison with a reference instrument	
DC Voltage	0 mV to 200 mV 200 mV to 2 V 2 V to 20 V 20 V to 200 V	10 ppm + 0.50 μV 10 ppm + 1.0 μV 10 ppm 20 ppm	For the calibration of voltage measuring and generating equipment	P
	0 mV to 100 mV 100 mV to 1 V 1 V to 10 V	90 ppm + 5.0 μV 70 ppm + 10 μV 70 ppm		S
DC Current	0 μA to 200 μA 200 μA to 2 mA 2 mA to 20 mA 20 mA to 200 mA	40 ppm + 1.0 nA 20 ppm + 5.0 nA 20 ppm + 50 nA 200 ppm	For the calibration of current measuring and generating equipment	P
	0 mA to 10 mA 10 mA to 100 mA	750 ppm + 2.5 μA 800 ppm + 6.0 μA		S
DC Resistance	10 Ω to 200 Ω 200 Ω to 2 kΩ	15 ppm + 3.0 mΩ 20 ppm	For the calibration of resistance measuring and generating equipment	P
Electrical calibration of temperature indicators, calibrators, controllers and recorders for the following sensors:				
Noble metal thermocouples	-40 °C to +1800 °C	0.30 °C	with cold junction compensation	P
	-40 °C to +1800 °C	1.0 °C	with cold junction compensation	S
Base metal thermocouples	-250 °C to +1370 °C	0.25 °C	with cold junction compensation	P
	-250 °C to +1370 °C	0.80 °C	with cold junction compensation	S
Cold Junction Measurement	Normal Ambient 18 °C to 22 °C	0.5 °C		P
Pt100	-200 °C to +850 °C	0.025 °C		P

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
TEMPERATURE			Calibration by comparison with reference thermometers	
Resistance thermometers			2, 3 and 4 Wire	P
	-196 °C	0.010 °C	In Liquid Nitrogen	
	-100 °C to -80 °C	0.030 °C	In metal block bath	
	-80 °C to +525 °C	0.010 °C	In fluid bath	
	Triple Point of Water (0.01 °C)	0.0030 °C		
	-30 °C to 0 °C	0.40 °C	In metal block bath	S
	Ice Point 0 °C	0.15 °C		
	20 °C to 200 °C	0.20 °C	In metal block bath	
Platinum thermocouples			Type B only above 400 °C	P
	200 °C to 525 °C	0.20 °C	In fluid bath	
	0 °C to 1000 °C	0.41 °C	In a furnace	
	1000 °C to 1350 ºC	0.75 ºC		
	1350 ºC to 1500 °C	1.1 °C		
	1500 ºC to 1600 °C	1.7 °C		
	Fixed point calibrations			P
	Triple Point of Water (0.01 °C)	0.15 °C	FP = Freezing Point	
	FP Tin (231.928 °C	0.38 °C	MP = Melting Point	
	FP Zinc (419.527 °C)	0.35 °C		
	FP Aluminium (660.323 °C)	0.36 °C		
	FP Silver (961.78 °C)	0.36 ºC		
	MP Gold (1064.18 °C)	0.65 ºC		
	MP Co-C eutectic (1324.02 °C)	0.65 ºC		
	MP Pd-C eutectic (1491.16 °C)	0.90 ºC		
	MP Palladium (1553.5 °C)	1.4 ºC		
	0 °C to 1100°C	1.5 °C	In a furnace	S
	1100 °C to 1350 ºC	2.5 °C		
	1350 ºC to 1600°C	3.0 ºC		
Other thermocouples	-196 °C	0.20 °C	In Liquid Nitrogen	P
	-100 °C to +525 °C	0.20 °C	In metal block bath	
	525 °C to 1000 ºC	0.80 °C	In a furnace	
	1000 °C to 1350 °C	1.1 °C		
	0 °C to 200 °C	0.50 °C	In metal block bath	S
	200 °C to 600 °C	1.5 °C	In a furnace	
	600 °C to 1000 °C	2.0 °C		
	1000 °C to 1350 °C	2.7 °C		

Measured Quantity Instrument or Gauge	Range	Calibration and Measurement Capability (CMC) Expressed as an Expanded Uncertainty (k = 2)	Remarks	Location Code
TEMPERATURE (continued)				
Compensating and extension cables	-20 °C to +200 °C 0 °C to 200 °C	0.20 °C 0.50 °C	In fluid bath In metal block bath	P S
Electronic thermometers with sensors, analogue and digital	Range as per sensors	As for sensors		P and S
Metal block calibrators	-100 °C to +100 °C 100 °C to 450 °C 450 °C to 700 °C 700 °C to 1000 °C 1000 °C to 1350 °C	0.10 °C 0.15 °C 1.0 °C 1.1 °C 1.5 °C		P
Temperature surveys Temperature controlled, incubators, ovens, environmental chambers, fridges/refrigerators, and freezers	 -30 °C to 200 °C 200 °C to 600 °C 600 °C to 1000 °C 1000 °C to 1300 °C	 1.0 °C 3.0 °C 4.0 °C 5.0 °C	Single and multipoint time dependent temperature profiling, also referred to as spatial temperature surveying or mapping	S
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 uncertainty of measurement 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 CIPM-ILAC definition of the CMC is as follows:

A CMC is a calibration and measurement capability available to customers under normal conditions:
(a) as published in the BIPM key comparison database (KCDB) of the CIPM MRA; or
(b) as described in the laboratory's scope of accreditation granted by a signatory to the ILAC Arrangement.

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 CMC is calculated according to the procedures given in M3003 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 CMC in certificates issued under its accreditation.

The CMC may be described using various methods in the Schedule of Accreditation:

As a single value that is valid throughout the range.
As an explicit function of the measurand or of a parameter (see below).
As a range of values. The range is stated such that the customer can make a reasonable estimate of the likely uncertainty at any point within the range.
As a matrix or table where the CMCs depend on the values of the measurand and a further quantity.
In graphical form, providing there is sufficient resolution on each axis to obtain at least two significant figures for the CMC.

Expression of CMCs - symbols and units

In general, only units of the SI and those units recognised for use with the SI are used to express the values of quantities and of the associated CMCs. Nevertheless, other commonly used units may be used where considered appropriate for the intended audience. For example, the term "ppm" (part per million) is frequently used by manufacturers of test and measurement equipment to specify the performance of their products. Terms like this may be used in Schedules of Accreditation where they are in common use and understood by the users of such equipment, providing their use does not introduce any ambiguity in the capability that is being described.

When the CMC is expressed as an explicit function of the measurand or of a parameter, this often comprises a relative term (e.g., percentage) and an absolute term, i.e. one expressed in the same units as those of the measurand. This form of expression is used to describe the capability that can be achieved over a range of values. Some examples, and an indication of how they are to be interpreted, are shown below.

DC voltage, 100 mV to 1 V: 0.0025 % + 5.0 µV:

Over the range 100 mV to 1 V, the CMC is 0.0025 %·V + 5.0 µV, where V is the measured voltage.

Hydraulic pressure, 0.5 MPa to 140 MPa: 0.0036 % + 0.12 ppm/MPa + 4.0 Pa

Over the range 0.5 MPa to 140 MPa, the CMC is 0.0036 %·p + ($0.12 \cdot 10^{-6} \cdot p \cdot 10^{-6}$) + 4.0 Pa, where p is the measured pressure in Pa.

It should be noted that the percentage symbol (%) simply represents the number 0.01. In cases where the CMC is stated only as a percentage, this is to be interpreted as meaning percentage of the measured value or indication.

Thus, for example, a CMC of 1.5 % means $1.5 \cdot 0.01 \cdot i$, where i is the instrument indication.