


Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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

 0683 Accredited to ISO/IEC 17025:2017	Pullman Instruments (UK) Ltd	
	Issue No: 028	Issue date: 17 August 2021
	Chatsworth House Chatsworth Terrace Harrogate HG1 5HT	Contact: Mr M Conboy Tel: +44 (0)1423 720360 Fax: +44 (0)1423 720361 E-Mail: info@pullman.co.uk Website: www.pullman.co.uk
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 Chatsworth House Chatsworth Terrace Harrogate HG1 5HT Local contact Mr M Conboy Tel: +44 (0)1423 720360 Fax: +44 (0)1423 720361 Email: info@pullman.co.uk Website: www.pullman.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.	Temperature	Calibrations performed on site are denoted: S



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Calibration and Measurement Capability (CMC)

Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
ELECTRICAL			Electrical calibrations are performed as a direct comparison against a reference standard	
DC Voltage Generation	20 mV to 200 mV	5.0 μ V	Values can be generated for the calibration of measuring instruments	P
Measurement	200 mV to 2 V 2 V to 20 V 20 V to 200 V 200 V to 1 kV	25 μ V 220 μ V 4.5 mV 16 mV	For measurement of instrument outputs	
DC Current Generation	0 μ A to 200 μ A	15 nA	Values can be generated for the calibration of measuring instruments	P
Measurement	200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 10 A 10 A to 30 A 30 A to 1500 A	120 nA 1.2 μ A 17 μ A 220 μ A 3.7 mA 16 mA 1.0 %	For the calibration of clamp meters only	
	0 μ A to 100 μ A	3.0 nA	For measurement of instrument outputs	
	100 μ A to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 30 A	33 nA 250 nA 5.6 μ A 220 μ A 6.1 mA 22 mA		



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
ELECTRICAL (cont'd)				
DC Resistance (cont'd)				P
Generation	1 Ω	7.0 m Ω	Values can be generated for the calibration of measuring instruments	
	10 Ω	6.0 m Ω		
	100 Ω	8.0 m Ω		
	1 k Ω	32 m Ω		
	10 k Ω	290 m Ω		
	100 k Ω	2.9 Ω		
	1 M Ω	80 Ω		
	10 M Ω	1.2 k Ω		
Measurement	0 Ω to 1 Ω	33 $\mu\Omega$	For measurement of instrument outputs	
	1 Ω to 10 Ω	200 $\mu\Omega$		
	10 Ω to 100 Ω	1.7 m Ω		
	100 Ω to 1 k Ω	15 m Ω		
	1 k Ω to 10 k Ω	600 m Ω		
	10 k Ω to 100 k Ω	1.8 Ω		
	100 k Ω to 1 M Ω	25 Ω		
	1 M Ω to 10 M Ω	470 Ω		
AC Voltage			Values can be generated for the calibration of measuring instruments	P
Generation	40 Hz to 1 kHz 10 mV to 200 mV	63 μ V		
	40 Hz to 50 kHz 200 mV to 2 V	800 μ V		
	40 Hz to 1 kHz 2 V to 20 V	5.0 mV		
	1 kHz to 20 kHz 2 V to 20 V	6.0 mV		
	40 Hz to 1 kHz 20 V to 200 V	48 mV		
	56 Hz to 1 kHz 200 V to 1000 V	240 mV		



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ELECTRICAL (cont'd)					
AC Voltage (cont'd)					
Measurement	40 Hz to 20 kHz		For measurement of instrument outputs	P	
	10 mV to 100 mV 10 V to 100 V	50 μ V 55 mV			
	10 Hz to 50 kHz 100 mV to 1 V	1.2 mV			
	40 Hz to 50 kHz 1 V to 10 V	17 mV			
	40 Hz to 1 kHz 100 V to 1 kV	650 mV			
AC Current					
Generation	40 Hz to 1 kHz				
	10 μ A to 200 μ A 200 μ A to 2 mA 2 mA to 20 mA 20 mA to 200 mA 200 mA to 2 A 2 A to 30 A	220 nA 1.2 μ A 12 μ A 110 μ A 1.2 mA 33 mA			
	45 Hz to 100 Hz 30 A to 1500 A	1.0 %	For the calibration of clamp meters only		
Measurement	40 Hz to 1 kHz		For measurement of instrument outputs		
	1 μ A to 100 μ A 100 μ A to 1 mA 1 mA to 10 mA 10 mA to 100 mA 100 mA to 1 A 1 A to 10 A 10 A to 30 A	50 nA 500 nA 5.0 μ A 60 μ A 630 μ A 14 mA 33 mA			



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
CAPACITANCE Generation fixed points	1 nF 10 nF 20 nF 50 nF 100 nF 1 μ F 10 μ F	25 pF 42 pF 76 pF 180 pF 360 pF 5.0 nF 84 nF	Values can be generated for the calibration of measuring instruments	
FREQUENCY Measurement	100 Hz to 10 kHz 10 kHz to 100 kHz 100 kHz to 1 MHz	350 mHz 450 mHz 5.2 Hz	Frequency may also be reported as 1/f for repetitive events.	
Generation	500 mHz to 1 kHz	240 mHz	Values can be generated for the calibration of measuring instruments	
	1 kHz to 10 kHz 10 kHz to 20 kHz 20 kHz to 50 kHz 50 kHz to 100 kHz 100 kHz to 1 MHz 1 MHz to 10 MHz	420 mHz 900 mHz 2.2 Hz 4.3 Hz 4.5 Hz 45 Hz		
RPM	600 RPM to 60000 RPM	0.50 RPM	Optical Tachometers	



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Measured Quantity Instrument or Gauge	Range	Expanded Measurement Uncertainty ($k = 2$)	Remarks	Location Code
TEMPERATURE			Calibration by comparison with reference thermometers	
Temperature indicators and recorders, with temperature sensor(s)	- 100 °C to 150 °C 150 °C to 660 °C 660 °C to 1100 °C	0.10 °C 0.20 °C 4.0 °C	Calibration performed within Metal Block Baths	P & S
Block calibrators	- 90 °C to - 30 °C - 30 °C to 450 °C	0.40 °C 0.65 °C		P & S
Temperature controlled fridges, freezers, autoclaves, ovens and environmental chambers	- 90 °C to - 30 °C - 30 °C to 450 °C	0.30 °C 0.70 °C	Single monitoring probe. Time dependent temperature profiling	P & S
	-50 °C to 150 °C	0.70 °C	Multipoint monitoring probes. Time dependent temperature profiling	
Data Loggers	- 30 °C to 120 °C	0.70 °C	Calibration performed within Air Chamber	P
PRESSURE			Methods consistent with EURAMET CG17.	P
Gas pressure (gauge)				
Calibration of pressure indicating instruments and gauges	-99.5 kPa to 700 kPa 700 kPa to 7 MPa	0.14 kPa 0.75 kPa		P
Gas pressure (absolute)				
Calibration of pressure indicating instruments and gauges	0 Pa to 800 kPa 800 kPa to 7.1 MPa	0.14 kPa 0.75 kPa		P
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: $Q[a, b] = [a^2 + b^2]^{1/2}$