# Schedule of Accreditation

**issued by**

# United Kingdom Accreditation Service

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

**0625**

**Accredited to ISO/IEC 17025:2017**

## Labcal Limited

**Issue No:** 046 **Issue date:** 12 October 2021


**Unit 265**
**Ampress Park**
**Lymington**
**Hampshire**
**SO41 8JU**

**Contact: Mr C Clifford-Smith**
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**Calibration performed by the Organisation at the locations specified**

**Locations covered by the organisation and their relevant activities**

**Laboratory locations:**

| Location details | | Activity | Location code |
|---|---|---|---|
| **Address**<br>Labcal Limited<br>Unit 265<br>Ricardo Way<br>Ampress Park<br>Lymington<br>Hampshire<br>SO41 8JU | **Local contact**<br><br>Mr C Clifford-Smith | Air velocity calibration<br>Electrical calibration<br>Flow calibration<br>Humidity calibration<br>Pressure calibration<br>Temperature calibration | A |
| **Address**<br>Saltmarsh Park<br>67 Gosport Street<br>Lymington<br>SO41 9EG | **Local contact**<br><br>Mr C Clifford-Smith | Air velocity calibration | B |

Calibration and Measurement Capability (CMC)

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty (k = 2) | Remarks | Location Code |
|---|---|---|---|---|
| **FLOW** | | | Prover and reference meter methods: | |
| Gas - | | | | A |
| Flow-rate and Quantity passed | 0.024 ml/min to 0.5 ml/min<br>0.5 ml /min to 8 l/min<br>8 l/min to 1200 l/min<br>1200 l/min to 12983 l/min | 1.14 % + 0.0016 ml/min<br>0.15 %<br>0.18 %<br>0.30 % | Calibrations of pressure and flow devices with an electrical output may be undertaken.<br>Calibration medium Air<br>Other gases may be used up to 300 l/min | |
| Water | | | | |
| Mass, Volume,<br>Flow rate and Quantity passed | 0.5 ml/min to 500 ml/min<br>500 ml/min to 2 l/min<br>2 l/min to 500 l/min | 0.20 %<br>0.32 %<br>0.12 % | Gravimetric method: | |
| **AIR VELOCITY** | | | Laser doppler and reference meter methods: | |
| Calibration of Anemometers: | | | | A |
| Pitot Tubes | 2 m/s to 5 m/s<br>5 m/s to 27 m/s | 0.18% + 0.030 m/s<br>0.18% + 0.10 m/s | Anemometer up to 125 mm diameter can be calibrated. | |
| Thermal anemometers | 0.1 m/s to 5 m/s<br>5 m/s to 27 m/s | 0.18 % + 0.030 m/s<br>0.18 % + 0.10 m/s | Uncertainty is dependent on instrument under test | |
| Vane anemometers | 0.3 m/s to 5 m/s<br>5 m/s to 27 m/s | 0.23 % + 0.030 m/s<br>0.23 % + 0.10 m/s | Calibration using laser Doppler anemometer or by comparison | |
| Calibration of anemometers and Pitot tubes (including ultrasonic anemometers) | 5 m/s to 32 m/s<br>32 m/s to 50 m/s<br>50 m/s to 80 m/s | 1.2 % + 0.20 m/s<br>1.2 % + 0.40 m/s<br>1.3 % + 0.40 m/s | Large anemometers can be calibrated | B |
| **PRESSURE** | | | Methods consistent with EURAMET CG17: | |
| <u>Hydraulic pressure (gauge)</u> | | | | A |
| Calibration of pressure indicating instruments and gauges | 500 kPa to 55 MPa<br>55 MPa to 140 MPa | 0.010 %<br>0.014 % | | |
| <u>Hydraulic pressure (absolute)</u> | | | | A |
| Calibration of pressure indicating instruments and gauges | 600 kPa to 7 MPa<br>7 MPa to 140 MPa | 0.010 % + 10 Pa<br>0.012 % | | |

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty (k = 2) | Remarks | Location Code |
|---|---|---|---|---|
| Gas pressure (gauge) | | | | |
| Calibration of pressure indicating instruments and gauges | - 100 kPa to 0 Pa<br>0 Pa to 3 kPa<br>3 kPa to 9 kPa<br>9 kPa to 40 kPa<br>40 kPa to 500 kPa<br>500 kPa to 8.2 MPa | 0.010 % + 43 Pa<br>0.016% + 0.070 Pa<br>0.016 % + 0.31 Pa<br>0.010 % + 2.9 Pa<br>0.010 % + 43 Pa<br>0.010 % + 390 Pa | | A |
| "Pressure equivalent" Calibration of dead weight testers (Pressure balance supplied with associated mass set) | 0 kPa to 500 kPa<br>500 kPa to 8.2 MPa | 0.015 % + 43 Pa<br>0.015 % + 390 Pa | | A |
| Gas pressure (absolute) | | | | |
| Calibration of pressure indicating instruments and gauges | 80 kPa to 115 kPa | 0.010 % | Absolute pressure calibrations can be undertaken using associated barometric pressure measurement correction. The uncertainties quoted will be increased by 10 Pa | A |
| **ELECTRICAL** | | | Reference meter methods: | |
| DC Voltage | 0 V to 120 mV<br>120 mV to 1.2 V<br>1.2 V to 12 V<br>12. V to 120 V | 21 μV/V + 5.0 μV<br>21 μV/V + 31 μV<br>21 μV/V + 65 μV<br>21 μV/V + 300 μV | | A |
| DC Current | 0 A to 12 mA<br>12 mA to 120 mA | 110 μA/A + 3.0 μA<br>110 μA/A + 6.0 μA | | |
| DC Resistance | 10 Ω to 1.2 kΩ<br>1.2 kΩ to 12 kΩ | 12 μΩ/Ω + 13 mΩ<br>13 μΩ/Ω + 130 mΩ | | |
| FREQUENCY | 1 Hz to 50 kHz | 0.0020 % + 10 μHz | | |
| TIME INTERVAL | | | | |
| Elapsed time, single event Stop watches and timers | 5 s to 24 Hours | 20 ms | | |

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty (k = 2) | Remarks | Location Code |
|---|---|---|---|---|
| ELECTRICAL CALIBRATION OF TEMPERATURE INDICATORS AND SIMULATORS | | | Reference meter methods: | |
| <u>Base Metal thermocouples</u> | | | Including reference junction compensation | A |
| Type T | - 200 °C to +400 °C | 0.50 °C | | |
| Type N | - 200 °C to +1300 °C | 0.50 °C | | |
| Type K | - 200 °C to +1372 °C | 0.50 °C | | |
| Type J | - 200 °C to +1200 °C | 0.50 °C | | |
| Type E | - 200 °C to +1000 °C | 0.50 °C | | |
| <u>Noble Metal thermocouples</u> | | | Including reference junction compensation | |
| Type S | 0 °C to 1760 °C | 0.90 °C | | |
| Type R | 0 °C to 1760 °C | 0.90 °C | | |
| Reference Junction Temperature | Nominal Zero | 0.10 °C | | |
| | Ambient 16 °C to 25 °C | 0.30 °C | | |
| PRT simulation (Pt 50 to 1000) | - 200 °C to 200 °C | 0.16 °C | | |
| | 200 °C to 600 °C | 0.26 °C | | |
| | 600 °C to 850 °C | 0.36 °C | | |
| **TEMPERATURE** | | | Reference meter methods in block or fluid baths: | |
| Resistance thermometers | -30 °C to +140 °C | 0.10 °C | | A |
| Base Metal Thermocouples | -30 °C to +140 °C | 0.25 °C | | |
| Temperature indicators with probes | | | | |
| Resistance thermometers | - 30 °C to + 70 °C | 0.10 °C | | |
| | 70 °C to +140 °C | 0.15 °C | | |
| Base Metal Thermocouples | -30 °C to +140 °C | 0.25 °C | | |
| Temperature probes in air | 10 °C to 50 °C | 0.15 °C | Reference meter method in environmental chamber: | |

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| **HUMIDITY** | | | Reference meter methods: in environmental chamber | |
| Relative humidity measuring instruments | 15 %rh to 90 %rh<br>*10 °C to 15 °C*<br>10 %rh to 90 %rh<br>*15 °C to 40 °C* | 1.5 %rh | Dependant on probe length | A |
| Temperature probes built into humidity meters | 10 °C to 40 °C | 0.15 °C | Dependant on probe length | |
| Dew Point | - 15 °C to 0 °C<br>0 °C to 20 °C<br>20 °C to 40 °C | 0.35 °C<br>0.18 °C<br>0.21 °C | | |
| 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: $Q[a, b] = [a^2 + b^2]^{1/2}$