# Schedule of Accreditation

**issued by**

# United Kingdom Accreditation Service

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**0138**

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

## DH Budenberg
## A division of WIKA Instruments Ltd

**Issue No:** 053 **Issue date:** 17 March 2025


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**Calibration performed at the above address only**

Calibration and Measurement Capability (CMC)

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty ($k$ = 2) | Remarks |
|---|---|---|---|
| PRESSURE | | | |
| Gas pressure (absolute) | | | |
| Calibration of pressure indicating instruments and gauges | 1 kPa to 10 kPa<br>10 kPa to 160 kPa<br>160 kPa to 400 kPa<br>400 kPa to 7 MPa<br>7 MPa to 40 MPa | Q [0.019 %, 2.1 Pa]<br>Q [0.0045 %, 2.9 Pa]<br>Q [0.0040 %, 15 Pa]<br>Q [0.0035 %, 15 Pa]<br>Q [0.0070 %, 15 Pa] | Methods consistent with EURAMET CG3 and CG17<br>Calibration of devices with an electrical output may be undertaken |
| Gas pressure (gauge) | | | |
| Determination of effective area of Dead Weight Testers and "Pressure equivalent" calibration of Dead Weight Testers (pressure balances supplied with an associated mass set) | 1.8 kPa to 10 kPa<br>10 kPa to 7 MPa<br>7 MPa to 40 MPa | Q [0.0040 %, 0.090 Pa]<br>0.0040 %<br>0.0070 % | |
| Calibration of pressure indicating instruments and gauges | - 90 kPa to - 10 kPa<br>- 10 kPa to - 1.8 kPa<br>1.8 kPa to 10 kPa<br>10 kPa to 4 MPa<br>4 MPa to 7 MPa<br>7 MPa to 40 MPa | 0.0070 %<br>0.0080 %<br>Q [0.0040 %, 0.090 Pa]<br>0.0040 %<br>0.0035 %<br>0.0070 % | |
| Hydraulic pressure (absolute) | | | |
| Calibration of pressure indicating instruments and gauges | 100 kPa to 600 kPa<br>600 kPa to 6 MPa<br>6 MPa to 250 MPa<br>250 MPa to 400 MPa<br>400 MPa to 500 MPa | Q [0.0040 %, 25 Pa]<br>Q [0.0045 %, 15 Pa]<br>0.0040 %<br>0.0045 %<br>0.0050 % | |
| Hydraulic pressure (gauge) | | | |
| Determination of effective area of Dead Weight Testers and "Pressure equivalent" calibration of Dead Weight Testers (pressure balances supplied with an associated mass set) | 600 kPa to 6 MPa<br>6 MPa to 50 MPa<br>50 MPa to 500 MPa | 0.0045 %<br>Q [0.0040 %, $0.11 \times 10^{-6}$/MPa]<br>Q [0.0040 %, $0.065 \times 10^{-6}$/MPa] | |

| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty ($k$ = 2) | Remarks |
|---|---|---|---|
| PRESSURE (cont'd) | | | |
| Calibration of pressure indicating instruments and gauges | 10 kPa to 600 kPa<br>600 kPa to 6 MPa<br>6 MPa to 250 MPa<br>250 MPa to 400 MPa<br>400 MPa to 500 MPa | Q [0.0040 %, 20 Pa]<br>0.0045 %<br>0.0040 %<br>0.0045 %<br>0.0050 % | |
| MASS | | | |
| Mass determination of dead weight tester weights | 0.1 g<br>0.2 g<br>0.5 g<br>1 g<br>2 g<br>5 g<br>10 g<br>20 g<br>50 g<br>50 g to 20 kg | 0.035 mg<br>0.040 mg<br>0.050 mg<br>0.060 mg<br>0.080 mg<br>0.10 mg<br>0.12 mg<br>0.16 mg<br>0.20 mg<br>3.0 µg/g | Comparison methods using ABABA or ABA<br>Intermediate values will be calibrated to an uncertainty interpolated from the next higher and lower values |
| TEMPERATURE | | | |
| Platinum resistance thermometers (4 wire) by Comparison | -35 °C to 165 °C<br>165 °C to 450 °C<br>450 °C to 650 °C | 0.092 °C<br>0.86 °C<br>0.86 °C | Calibration within dry and liquid media. |
| Calibration at Fixed points | 0.010 °C<br>29.7646 °C | 0.0060 °C<br>0.0030 °C | Triple Point of Water fixed point cell and Gallium fixed point cell |
| Electronic thermometers with sensors and Temperature Transmitters | As per Platinum resistance thermometer ranges | As per Platinum resistance thermometer uncertainties. | Calibration within dry and liquid media.<br>4 to 20mA transmitters can be calibrated with additional uncertainty dependent on the scale range. |
| Dry Block Calibrators | -50 °C to +165 °C<br>165 °C to 420 °C<br>420 °C to 650 °C | 0.17 °C<br>0.93 °C<br>1.2 °C | Calibration in removable or fixed metal inserts. Method consistant with Euramet CG 13. |
| 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: $Q[a, b] = [a^2 + b^2]^{1/2}$