

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

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



0811

Accredited to
ISO/IEC 17025:2017

UK Test Instruments Limited trading as Acutest, Test4Less and Socket and See.

Issue No: 023 Issue date: 23 August 2021

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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 |
|--|---|--|---|
| ELECTRICAL | | | Unless stated calibrations are performed as a direct comparison against a reference standard |
| DC Resistance | | | |
| Generation | 0 Ω to 33 Ω 33 Ω to 330 Ω 330 Ω to 3.3 k Ω 3.3 k Ω to 33 k Ω 33 k Ω to 330 k Ω 330 k Ω to 3.3 M Ω 3.3 M Ω to 33 M Ω | 7.2 m Ω 11 m Ω 90 m Ω 0.96 Ω 7.0 Ω 0.19 k Ω 9.4 k Ω | Source values for the calibration of ohmmeters |
| Measurement | 0 Ω to 10 Ω 10 Ω to 100 Ω 0.1 k Ω to 1 k Ω 1 k Ω to 10 k Ω 10 k Ω to 100 k Ω 0.1 M Ω to 1 M Ω 1 M Ω to 10 M Ω | 1.6 m Ω 5.3 m Ω 21 m Ω 0.20 Ω 1.9 Ω 30 Ω 0.70 k Ω | For the calibration of resistance sources Four wire connections used up to 10 k Ω , 2 wire above. |
| DC Voltage | | | |
| Generation | 0 mV to 330 mV 330 mV to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1020 V | 7.1 μ V 23 μ V 0.31 mV 3.3 mV 18mV | Source values for the calibration of voltmeters |
| Measurement | 0 mV to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V | 3.9 μ V 11 μ V 0.20 mV 2.1 mV 16 mV | For the calibration of voltage sources |



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Issue No: 022 **Issue date:** 15 March 2021

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| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty ($k = 2$) | Remarks |
|--|---|---|---|
| DC Current | | | |
| Generation | 0 μ A to 3.3 mA 3.3 mA to 33 mA 33 mA to 330 mA 330 mA to 2.2 A 2.2 A to 11 A | 0.089 μ A 0.86 μ A 11 μ A 0.21 mA 2.1 mA | Source values for the calibration of ammeters |
| Measurement | 0 μ A to 100 μ A 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 10 A | 31 nA 100 nA 3.1 μ A 16 μ A 0.21 mA 3.3 mA | For the calibration of current sources |
| AC Voltage | | | |
| Generation | 45 Hz to 1 kHz: 1.0 mV to 33 mV 33 mV to 330 mV 0.33 V to 3.3 V 3.3 V to 33 V 33 V to 330 V 330 V to 1020 V | 3.2 μ V 24 μ V 0.15 mV 2.2 mV 25 mV 74 mV | Source values for the calibration of voltmeters |
| Measurement | 60 Hz: 10 mV to 100 mV 0.1 V to 1 V 1 V to 10 V 10 V to 100 V 100 V to 1000 V | 37 μ V 0.29 mV 5.3 mV 48 mV 0.53 V | For the calibration of voltage sources |
| AC Current | | | |
| Generation | 45 Hz to 1 kHz: 29 μ A to 330 μ A 0.33 mA to 3.3 mA 3.3 mA to 33 mA 33 mA to 330 mA 0.33 A to 2.2 A 2.2 to 11 A | 54 nA 0.78 μ A 2.7 μ A 30 μ A 1.1 mA 6.5 mA | Source values for the calibration of ammeters |
| Measurement | 60 Hz: 10 μ A to 100 μ A 0.1 mA to 1 mA 1 mA to 10 mA 10 mA to 100 mA 0.1 A to 1 A 1 A to 10 A | 32 nA 0.22 μ A 2.3 μ A 24 μ A 0.63 mA 4.5 mA | For the calibration of current sources |



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| Measured Quantity Instrument or Gauge | Range | Expanded Measurement Uncertainty ($k = 2$) | Remarks |
|--|--|---|---|
| Frequency Generation | 100 Hz to 1.0 kHz 100 kHz | 58 mHz 5.8 Hz | For the calibration of timers & counters At 3.0 V |
| Electrical simulation and Measurement of thermocouples | | | With or without automatic cold junction correction |
| E | -250 °C to +1000 °C | 0.18 °C | |
| J | -210 °C to +1200 °C | 0.20 °C | |
| K | -200 °C to +1372 °C | 0.31 °C | |
| N | -200 °C to +1300 °C | 0.34 °C | |
| T | -250 °C to +400 °C | 0.24 °C | |
| PRESSURE | | | Methods consistent with EURAMET CG17. |
| <u>Gas pressure</u> <u>Barometric (Absolute)</u> | | | |
| Calibration of pressure indicating instruments and gauges | 80 kPa to 115 kPa | 21 Pa | Calibration of pressure devices with an electrical output can be undertaken |
| <u>Pneumatic (gauge)</u> | | | |
| Calibration of pressure indicating instruments and gauges | 0 Pa to 20 kPa 20 kPa to 100 kPa 100 kPa to 3.5 MPa 3.5 MPa to 7 MPa 7 MPa to 70 MPa | 9.2 Pa 19 Pa 0.018 % + 26 Pa 6.3 kPa 83 kPa | Absolute pressure calibrations can be undertaken using associated barometric pressure measurement correction. The uncertainties quoted will be increased by 26 Pa. Pressures can only be measured, not generated, above 3.5 MPa g on gas. |
| <u>Hydraulic pressure (gauge)</u> | | | |
| Calibration of pressure indicating instruments and gauges | 0 Pa to 7 MPa 7 MPa to 70 MPa | 6.4 kPa 83 kPa | |
| 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: $Q[a, b] = [a^2 + b^2]^{1/2}$