

What is calibration?

The recording and documentation of the deviation of a measuring instrument from another instrument under prescribed conditions. This instrument is described as the standard.

Calibration covers:

- Documentation of the deviation
- Calculation of the measurement uncertainty
- Issuing the certificate

Calibration and adjustment – what are the differences?

Calibration: Comparison of measurement values, traceable to a (national) standard

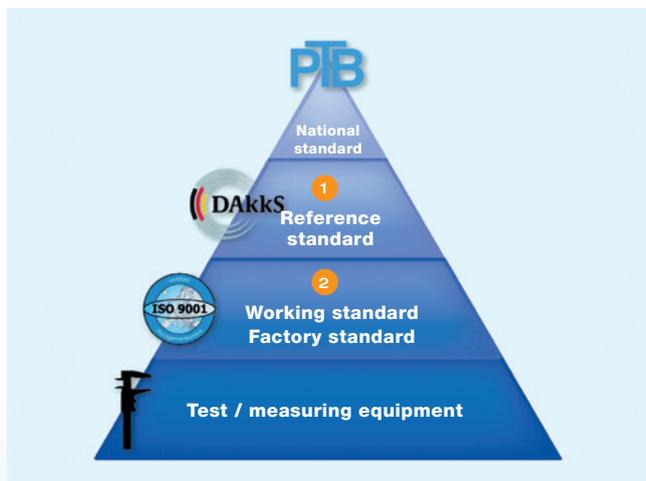
Adjustment: Setting a measuring instrument to the smallest possible deviation from the correct value. In adjustment, an interference with the instrument is necessary.

Adjustment: Interference with measuring instrument

Standards and traceability

Standard: Metrological comparison object for the calibration of other measuring instruments.

Traceability: Relating measurement results to national or international standards through an unbroken chain of calibrations.



1 Reference standard:

- The standard with the highest available accuracy from which measurements are derived.

2 Working/factory standard:

- Routinely used standard for the calibration/testing of material measures, measuring instruments or reference materials. A working standard is usually calibrated with the aid of a reference standard.



Types of calibration

ISO calibration

ISO calibrations are used in all areas in which test device monitoring and calibration are required but DAkkS calibrations are not. In principle, ISO calibrations can be independently conducted by all companies. As the level of detail and the procedures are not specified, a grey area arises.

Contents of an ISO calibration certificate

- Measuring equipment description and identification
- Calibration date
- Calibration results achieved following an adjustment or repair
- Identification of the calibration procedure
- Standard used to ensure traceability
- Ambient conditions
- Specification of the uncertainties when calibrating the measuring equipment
- Identification of the person(s) conducting the confirmation
- Identification of the person(s) responsible for ensuring the information is correctly recorded
- Unambiguous identification of the measuring equipment

Accredited calibration

E.g.: DAkkS (D), Accreditation Austria (ÖKD, A), SCS (CH), UKAS (GB), NVLAP (US)

Companies that choose an accredited calibration receive a service of the highest metrological level. The accredited calibration procedure and documents are benchmarks for all industrial calibration tasks. The appearance and contents of the certificates are specified by the national accreditation body and stored in the laboratory's quality assurance manual. In Germany, for example, DAkkS certificates are authorised for use before a court of law as binding evidence.

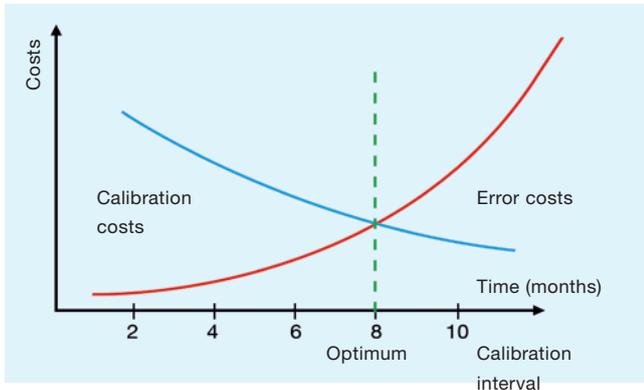
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The Testo team looks forward to your questions, and is happy to provide individual support.

Calibration interval

A calibration interval is the regular time period between calibrations. Those in charge of test equipment must here weigh up the risks against the costs to achieve an optimum balance between security and costs. Although longer calibration intervals mean lower costs, they also involve a huge risk of non-conformity of the measuring instrument.



Contents of a calibration certificate

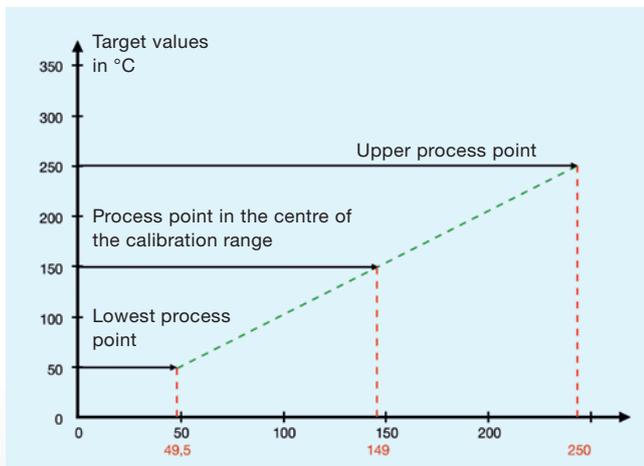
ISO and DAkkS certificates have largely the same contents. The DAkkS certificate contents are mandatory; the ISO certificate contents can be freely selected. This mandatory information must be contained in every DAkkS calibration certificate, and should also be included in every ISO certificate:

- Measuring equipment description and identification
- Calibration date
- Calibration results achieved following an adjustment or repair
- Identification of the calibration procedure
- Standard used to ensure traceability
- Ambient conditions
- Specification of the uncertainties when calibrating the measuring equipment
- Identification of the person(s) conducting the confirmation
- Identification of the person(s) responsible for ensuring the information is correctly recorded
- Unique ID (e.g. serial number) of the measuring equipment

Calibration points

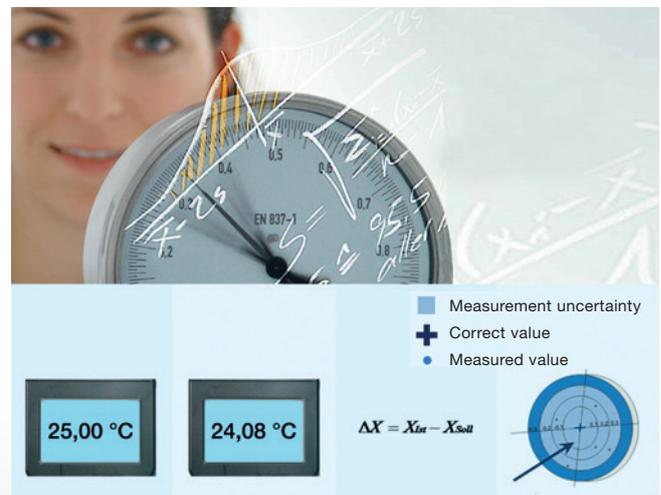
Recommendation:

Three calibration points distributed across the entire area of use. If a temperature probe monitors a temperature-control process in the range of 50 – 250 °C, the following three calibration points can be selected.



Measurement uncertainty

A complete calibration or measured value comprises several components: the reference value, the display value, the deviation and the tolerance or measurement uncertainty:



Calibration with Testo – all the advantages at a glance:

- Improvement of manufacturer's quality
- Avoidance of rejects and rectification work
- Fulfilment of norms, guidelines and standards
- Protection from potential compensation claims
- Audit security



Testo – your partner for calibration

Calibration of your measuring instruments in accredited laboratories

- Secure measurement results thanks to highly precise calibration – traceable to national or international standards
- Depending on your requirements, you receive accredited or ISO calibrations
- Benefit from 60 years of experience in measurement technology and calibration

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