Calibration basics

Together with promesstec for the quality in your house...

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calibration basics

The reasons for a calibration of your measurement technology is very diverse. It ranges from the company's own quality assurance to ISO 9000 certification to further certificates (IFS in the food sector), approvals, etc. Accordingly, the requirements that you as a customer/client place on the performance of the calibration and, in particular, the documentation, are very different.
promesstec, as a manufacturer of measurement technology, has maintained its own calibration laboratory for over 10 years. With high quality and precise equipment and specially trained technicians, we are able to respond to your requirements. SOf course, calibration in your company is also possible. For this purpose, our service technicians are on the road with equipped vehicles
on the road all over Europe.

equipment and gear

our service technicians on their way to the customer...

equipment for temperature calibration...

terms in the calibration world

calibration
Calibration in the field of metrology is the determination of measurement deviations as well as measurement uncertainties of a measuring device or sensor (referred to as a test specimen). During calibration, there is no technical intervention in the test specimen.

adjust
During the adjustment of a measuring device or sensor, an intervention in the test specimen takes place. Here, the measurement deviations are reduced by adjusting and setting/parameterizing.

calibrate
Calibration of a measuring instrument or sensor involves the verification and documentation of a test item by a government agency, the Weights and Measures Office, or specially trained and licensed and sworn personnel. Calibration is usually necessary in the case of traffic subject to payment. A higher accuracy compared to calibration is not necessarily given.

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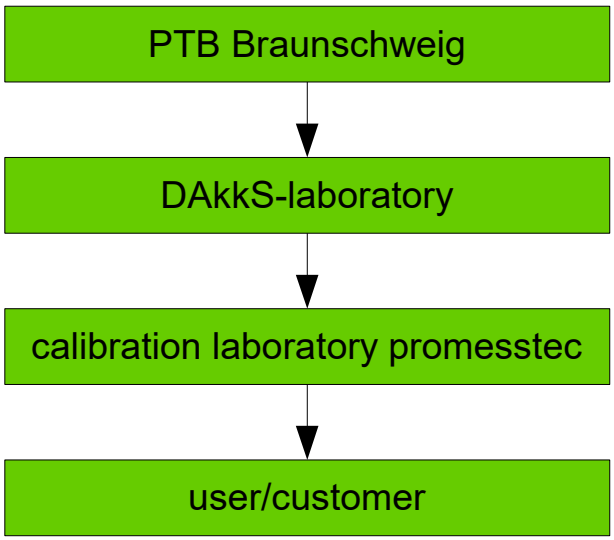
the calibration hierarchy

The term traceability describes a process by which the measured value represented by a measuring instrument can be compared, through one or more steps, with a national or international standard for the measurand in question. In each of these steps, the test specimen (measuring instrument, sensor, etc.) is compared with a calibration standard, which in turn was determined with a higher-rank ing standard. This creates a calibration hierarchy that ensures traceability.
The highest authority in Germany is the Physikalisch-Technische Bundesanstalt (PTB) in Braunschweig. The hierarchy is as follows:



the right partner for calibration

Due to the different requirements of the institutions and companies, there are a wide variety of performance options and of course pricing. Calibrating a measuring device or sensor at the PTB or in a DAKKs certified laboratory would not only be much too expensive, but primarily also much too time-consuming. Therefore, adherence to the calibration hierarchy makes sense here. The right partner should have the customer's trust, have the necessary technical equipment, offer the know-how and also be able to provide advice. In more than 10 years, promesstec has advised and accompanied many well-known companies in a wide variety of certifications and carried out the calibrations.

what to consider during calibration

accuracies
Each customer can define the accuracies to be maintained in the measurement and the test specimen itself or specify them in the quality assurance manual. Most of the time, you follow the manufacturer's instructions. Special attention should be paid to the definition of accuracies for measuring chains (sensor ... transmitter ... PLC...etc.).
Boundaries should be as precise as **necessary**, not as **possible**. If you are unsure in the decision-making process, consult with specialist companies such as promesstec GmbH beforehand. Too narrow limits or too high accuracies can quickly lead to failure to achieve approval and result in considerable costs.

test intervals
Like the accuracies, the test intervals are also determined by the user, ideally after consultation with the calibration laboratory. The test intervals depend on the use of the test specimen. A temperature sensor will not age under laboratory conditions, even after years. On the other hand, temperature sensors under intensive process conditions can show changes after only 1-2 years. In the case of pressure transmitters, this may already be the case earlier, depending on the process. A regular review of the results together with the calibration service makes sense here in order to change the test intervals if necessary.

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the documents of calibration

the test equipment card
Each test item (measuring device, sensor) receives a test equipment card. All basic data of the test specimen are recorded here. These are: Test equipment no., device, measuring range, accuracies, place of use, calibration intervals.In addition, all calibration certificates are entered in the test equipment card. Electronic management (e.g. with Excel) is permitted. The test equipment card is maintained by the user.

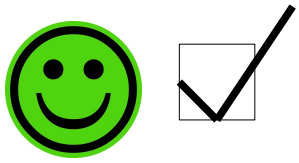
the calibration certificate
A calibration certificate is issued after each calibration. In addition to the key data of the test specimen, it contains brief calibration instructions, traceability to national/international standards, the required measuring points in graphical or tabular form, and an evaluation of each individual test point. Even if the test specimen is outside the tolerances, a calibration certificate is issued. The results are to be presented accordingly. The calibration certificate is issued in paper form with the stamp and signature of the tester. Together with the test card, it is part of the history and documentation of the test specimen.

the return documents
In a calibration certificate the traceability to national/international standards is mentioned. At the request of the customer, the calibration laboratory must in turn prove this traceability to its own calibration certificates of the traceable measuring instruments. This also includes the professional qualification of the tester. When selecting your calibration partner, pay attention to the training and qualification of the employees.

the process of a calibration

Here we differentiate between a calibration in our house (calibration laboratory) or a calibration by our service technicians at your company. In case of a calibration in our laboratory, we need the test specimen with the corresponding history as well as a completed return and decontamination document (you can find this as a download on our homepage under "Technical Information").
If it is a recalibration of test items from our company, we know the history. Then send the order to us and you will promptly receive your calibrated test specimen including all necessary documentation back.

In case of a calibration in your company, please arrange an on-site appointment with the responsible technician from our company. Here, too, we require the history of the test piece. Our service technicians will then perform the calibration on your company premises. The subsequent preparation of the calibration certificate takes place at our headquarters in Schüttorf. We will send you the necessary documentation promptly.



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