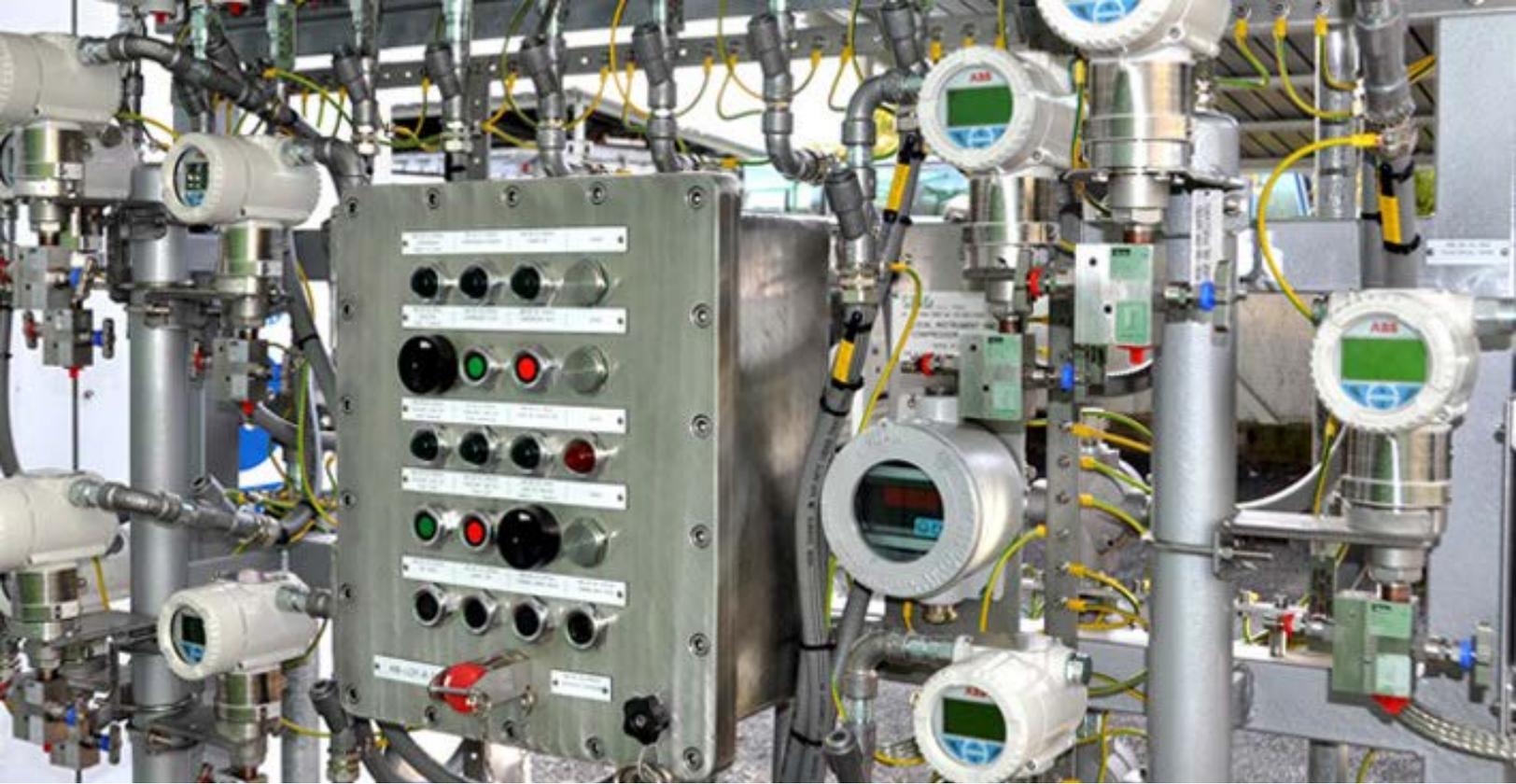


# Instrument Calibration and Why It's Important For Your Business

# Table of Contents

1. What is Instrument Calibration?
2. Types of Calibration Instruments
3. Why is instrument calibration important?
4. Instrument Calibration in Various industries
5. How often should you calibrate your measurement instruments?
6. ABM Calibration Certificates
7. Calibration Certificates FAQ
8. Why Choose ABM For Your Calibration Service
9. Contact Us



## What is Instrument Calibration?

---

Two of the most common questions we get asked are "**what is instrument calibration?**" and "**why is instrument calibration important?**". The answers are relatively simple, so we thought we'd explain in this short article.

Instrument calibration is the process of comparing a scientific measurement instrument to a standard of known accuracy, to determine the reliability of the data the device is capturing. There are two common types of calibration, field calibration and laboratory calibration.

Field calibration is the process of using a calibration source to verify an instrument's accuracy before and after a series of measurements are taken. Laboratory calibration is often mandated by regulations and requires an instrument to be sent to a dedicated calibration centre for more in-depth and accurate verification.

A calibration certificate is made available once a device has been laboratory calibrated to show the measured results for the instrument versus the measured results from the standard of known accuracy.

# Types of Calibration Instruments

---

Now, let's take a look at some of the most common types of calibration instruments you might have to use.

## Humidity and Temperature

If you work with thermal cameras, thermometers, humidity generators, weather stations, and other devices that work with temperature and humidity, you'll need to get them calibrated.

This type of calibration needs to happen in a controlled environment, so outside changes can't affect the results.

## Pressure

Transmitters, test gauges, and barometers may all need pressure calibration. In this process, the spectrum of hydraulic and gas pressure gets measured. The equipment usually needs to get calibrated to a national or international standard.

## Mechanical

Mechanical calibration calibrates for factors like force, mass, vibration, or torque. For example, you might need to get a scale calibrated to measure weight accurately. Torque wrenches, micrometers, and balances can also need this kind of calibration.

## Electrical

Devices that measure frequency, voltage, or resistance will need electrical calibration. The equipment that might need electrical calibration can include clamp meters, data loggers, and insulation testers.

In addition to these common calibration types, you might need to get many different implements calibrated in different ways. Each calibration type involves using different methods to get results.



## Why is instrument calibration important?

---

Instrument calibration, as described above, compares the accuracy of an instrument against a known standard and so reflects the accuracy and quality of measurements that that instrument takes. An instrument's accuracy tends to 'drift' over time, especially when measuring particular parameters such as temperature and humidity.

In order to be confident in the accuracy of your results and the data your instruments produce, it's incredibly important to have the accuracy of your instruments checked at regular intervals throughout its lifetime.

This will help guarantee reliable, accurate and repeatable measurements. Instrument calibration aims to minimise any uncertainty within your measurement dataset by ensuring the accuracy of measurement equipment. It's particularly important in industries where strict standards and regulations are in place, such as food/catering and manufacturing.

# Instrument calibration in the food and catering industry

---

Within the food and catering industry, especially in commercial kitchens for hotels, restaurants, bars and food manufacturing/processing facilities, the implications of using a piece of equipment that is recording inaccurate data due to improper calibration could be that critical food temperature is incorrectly measured; which could lead to:

- A food safety issue
- Breach of HACCP and consumer illness
- Environmental Health Officer notices of closure
- Litigation

These things could damage your reputation, and when you consider the possible implications of not calibrating, it's often not worth the risk of ignoring it.

# Instrument calibration in the manufacturing industry

---

In the manufacturing industry, any equipment that is used should be calibrated at multiple points across its operating range to ensure that reliable and accurate information is fed to system-critical critical alarms, warning systems and fail-safes.

Failing to calibrate or inaccurate calibration has been known to cause injury, death and even major environmental disasters.

# How often should you calibrate your measurement instruments?

The frequency of instrument calibration often depends on the industry and type of instrument. However, the majority of sectors and industry-specific standards and regulations suggest annual calibration as the norm.

It's essential to think of the cost of calibrating your instruments in terms of investing money to avoid potential errors or mistakes caused by not calibrating.

Most calibration laboratories, including ABM's, supply an official calibration certificate for you to retain as proof of that your instruments meet the required standards.





## ABM Calibration Certificates

---

The calibration certificate is the official document of record for instrument calibration and provides traceability to the **National Institute of Standards and Technology**. The accuracy and completeness of the calibration certificate itself is reflective of the validity and credibility of the calibrating organization.

Both **Accredited Calibrations** and **Traceable Calibrations** include a Calibration Certificate that accompanies the instrument when it is returned to its owner.

The calibration certificate documents essential information about the instrument's condition, and also provides details about out-of-tolerance conditions, special measurement conditions, and more.

Each certificate includes a serial number that associates one calibration with one instrument.

This document may be required by the end-users of products tested with the instrument, especially in the case of government contracts.

Calibration certificate formats will vary by geographical location and local government regulations.

Most **ABM certificates** will include the following information:

- **Dates and environmental conditions** at the time of calibration
- **Received Condition**
  - In tolerance/meets all specifications
  - Operational failure, includes a description of the failure
  - Out of tolerance, includes a description of the out of tolerance condition
- **Returned Condition**
  - In tolerance/meets all specifications
  - Meets limited or special specifications (customer request only)
- **Traceability Statement**
- **Identification of the standards** used during calibration. Associates specific traceable instruments with this certificate.
- **Calibration procedure** used, including revision level if applicable.
- **Calibration interval and source of recommendation:** ABM or customer. Accredited calibration certificates do not identify a calibration due date.
- **Contact information** for inquiries about this Certificate





## Calibration Certificates FAQ

---

ISO/IEC 17025 accreditation is the most important standard used by for calibration and testing laboratories, because it emphasizes the laboratory's competence and quality assurance. To achieve ISO 17025 accreditation, laboratories must demonstrate that they are technically proficient and able to produce precise and accurate test and calibration data. Continued ISO 17025 accreditation requires demonstrating all of these competencies through regular reassessments of;

- Traceability of measurements and calibrations to national standards.
- Technical competence of staff
- Maintenance of test equipment.
- Quality assurance of test and calibration data.
- Validity and appropriateness of test methods.
- Appropriate handling and transportation of test items.
- Quality of testing environment and sampling.

## What is the difference between a Standard (Traceable) Calibration Certificate and Accredited Calibration Certificate?

**Standard (Traceable) Calibration Certificate:** Instrumentation is calibrated to specifications with traceable standards. A full data report is optional with the calibration certificate.

**Accredited Calibration Certificate:** meets the requirements of ISO/IEC 17025 and the lab's accrediting body.

The unit under test is calibrated in accordance with ISO/IEC 17025 within the supplier's approved scope of accreditation. Accredited calibrations provide a certificate of calibration with the accrediting body's logo on the document.

The calibration date is on the certificate; the calibration due date is only placed on the document when specified by the customer or contractually agreed. A traceability statement is provided as well as measurement data and uncertainty data for each parameter tested during the calibration.

## Why is uncertainty in measurement important?

It's about risk. All measurements (ruler, electrometer, thermometer, etc.) have some degree of uncertainty in the measurement. What variability in measurement is acceptable? If a measurement tolerance is .01 and the level of uncertainty in measurement is .001, the risk is relatively low.

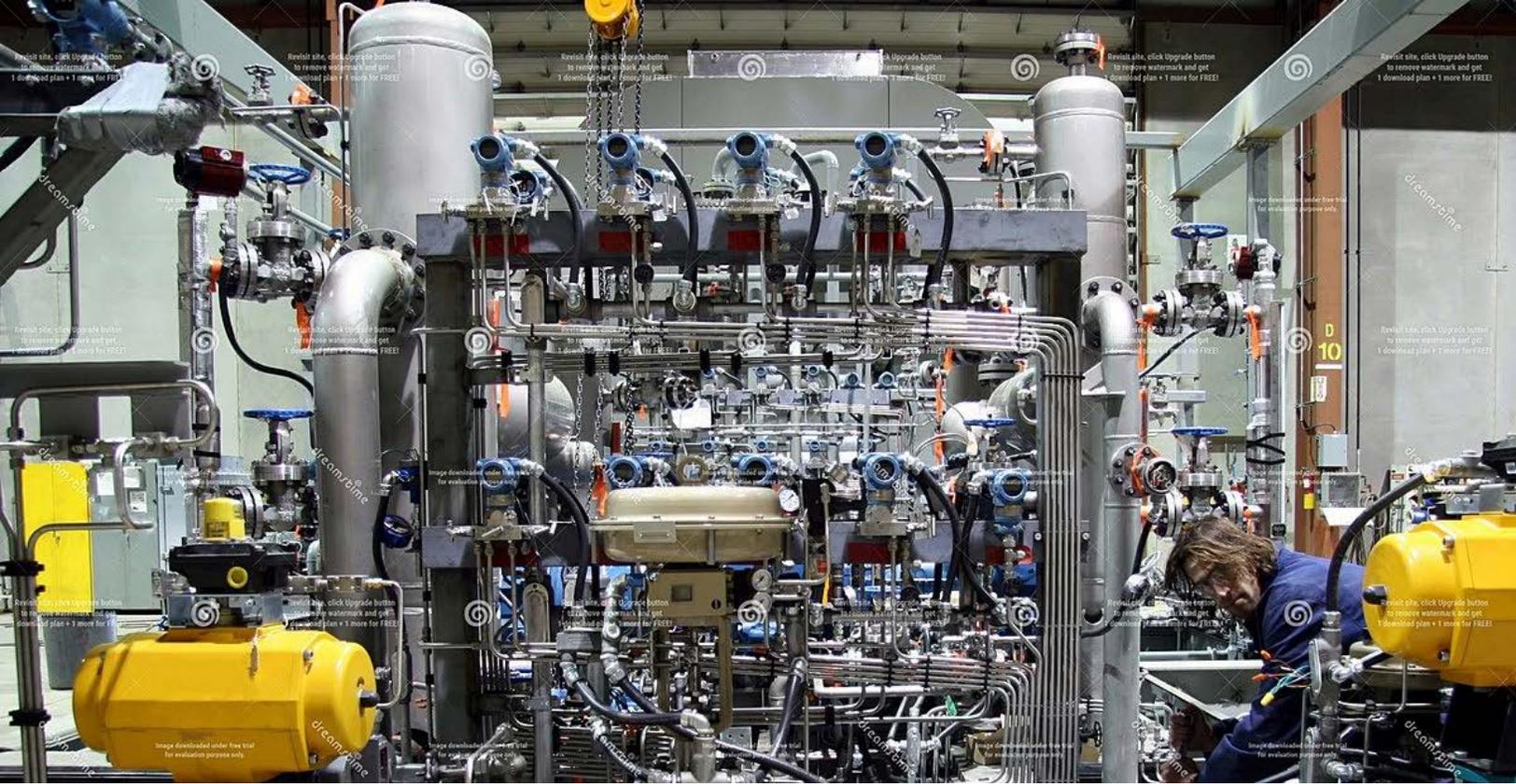
If the tolerance and uncertainty were reversed, the calibration would be inadequate and would provide a high level of risk to the user.

The level of uncertainty allows an informed decision to be made about the acceptability of measurements.

## What do different measurement test data types mean (ie: "as found", "before" data, "as left" and "after" data)?

There are several different measurement test data types that can be included on a calibration certificate, the primary ones being: "As Found" or "Before" Data: Calibration data that is documented during the calibration and before the unit is adjusted and/or repaired.

This data is critical to support any necessary customer investigation in the event that Out of Tolerance conditions are detected during the calibration. "As Left" or "After" Data: Calibration data that is documented during the calibration performed after the unit is adjusted and/or repaired.



# Why Choose ABM For Your Calibration Services

---

To sum up, instrument calibration is incredibly important wherever measurements are incredibly important. Instrument calibration enables users and businesses to have confidence in the data that your instruments capture, and subsequently control.

ABM Instruments offer a comprehensive instrument calibration service that covers a range of measurement instruments, including thermometer calibration, manometer calibration, hygrometer calibration and digital gauge calibration.

All our calibration work is traceable to NATA and with more than 5 years' experience in the business; we're incredibly well-placed to provide your business with the confidence and peace-of-mind you need to carry out your operations safely, effectively and reliably. In addition, we provide the following;

- Calibration services for equipment from 1,000-plus manufacturers—far more than just ABM!
- Extensive global service network—more than 5 points of service.
- Superior quality—ISO 9001:2015 & ISO/IEC 17025:2017 accreditation parameters.
- 20-plus associates—highly skilled technicians and sales representatives.



## Get In Touch

---

Call us today for pricing and availability, and learn how our newly certified laboratory can streamline your calibration and testing processes.

To find out more about our instrument calibration service, please get in touch with a member of our team today.

Contact