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Thermometer Calibration FAQs Answered

What You Need to Know About
Temperature Instrument Calibration

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Who Are Eurolec Instrumentation?

With 40 years' experience in the design, manufacture and supply of quality portable temperature and pressure instrumentation, our range of precision thermometers, probes, infrared thermometers, manometers and temperature calibration sources are exported globally providing solutions for a wide range of markets and applications.

At Eurolec, we are dedicated to providing the highest levels of product quality and service and through our commitment to product development. We continuously strive to address all application challenges in a progressing and dynamic industry.

Whether you work within the food processing industry/HACCP, pharmachem, engineering, laboratory, maintenance, QA or environmental sectors, Eurolec can provide your measurement and calibration solutions.

If you have any questions about the calibration of thermometers or temperature measurement instruments, please call us and we will be pleased to help.

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FAQ 1:

Why Do You Calibrate a Thermometer?

Why Do You Calibrate a Thermometer?

Calibration of temperature measurement instruments, such as thermometers and temperature data loggers, is necessary to ensure that readings are consistent, accurate and reliable.

This is especially important where safety plays a role.

For example, in the food manufacturing and distribution industries, it's vital that temperature measurements are accurate. There may be a risk to public safety otherwise.

The more critical your instrument is to your business, the more important calibration of your equipment will be.



FAQ 2:

How Often Should You Calibrate a Thermometer?

How Often Should You Calibrate a Thermometer?

In the majority of cases, calibration is required at least annually to ensure the accuracy and reliability of measurements and to meet any standards, regulations or guidelines, such as HACCP.

Calibration may be required more often where accurate measurements are critical. In these cases, a higher accuracy reference thermometer can be used.

Even if you work within an industry where high accuracy is not essential, the only way that you can be sure your equipment is working and measuring correctly is to have it calibrated on a regular basis.



FAQ 2:

What is a Calibration Certificate?

What is a Calibration Certificate?

A calibration certificate, like a health check, provides a snapshot of the accuracy and performance of your instrument across a range of temperatures at a specific point in time. This is why it may be necessary to use a temperature calibration source between external calibrations where accuracy is a major consideration.

The readings that your instrument displays are compared with readings provided by a highly accurate and stable reference thermometer at the same temperatures.

This reference thermometer is itself calibrated by an accredited laboratory.

Any deviation or error found with your instrument can then be reflected on your certificate, so that you can be confident of carrying out accurate measurements.

Where the calibration certificate shows some deviation from the reference reading, you can take account of that in your measurements.

NOTE: Some level of “error” is always likely as no thermometer is perfectly accurate!

FAQ 3:

What Should the Error be on My Calibration Certificate?

What Should the Error be on My Calibration Certificate?



This will depend on the specification of the instrument itself.

Some thermometers will state an accuracy of, for example, $\pm 0.5^{\circ}\text{C}$ or maybe $\pm 0.2^{\circ}\text{C}$ over a specific temperature range.

Any error or deviation reported on your calibration certificate should not exceed these limits.

NOTE: The accuracy of some instruments will change depending on the temperature being measured and this should also be borne in mind when making measurements.

FAQ 4:

What is the “System Accuracy” of a Thermometer or Probe?

What is the “System Accuracy” of a Thermometer or Probe?

To be meaningful, a calibration certificate should reflect the “system accuracy” of your equipment.

The “system accuracy” is the overall accuracy of the measurement chain from the sensor (or probe) through to the readout or display.

This represents the total accuracy of the measurement chain and is particularly important where the measurement instrument has a detachable sensor or probe.

If this is the case, all parts of the system must be calibrated together otherwise you cannot be certain of the overall accuracy of your measurement system.

Where different sensors or probes can be used with one instrument, each combination should be calibrated together to ensure that all combinations are measuring accurately and as intended.

If an instrument has an internal sensor or a probe that is permanently attached, this should be regarded as the system in itself.



FAQ 6:

What is a Dry Block Calibrator and Why Are They Used?

What is a Dry Block Calibrator and Why Are They Used?

An alternative to part of the calibration process is to use a dry block calibrator, more commonly known as a temperature calibrator or calibration source.

The term “Dry” in this case refers to the fact that these dry block calibrators usually feature a metal “block” that can accommodate probe diameters of different sizes into which your probes are inserted (as opposed to a liquid heated/cooled bath).



The block is heated or cooled via an adjustable controller to give

an accurate temperature source that can be used to check the performance of thermometers over a range of temperatures.

Some dry block calibrators also feature a black body source that allows infra-red thermometers to be calibrated.

A high accuracy reference thermometer can also be used in conjunction with a dry block calibrator. This allows the temperature to be verified to a very high level of accuracy.

The reference thermometer itself will still need regular calibration. However, if you have a number of thermometers in use, this approach can soon become a more economical and time-saving solution to sending all your units off-site for calibration.

More questions about Thermometer Calibration?

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