Recommendations for the Use and Care and Maximum Confidence in Measurement of ETI Ltd's Instruments.

ETI Thermometers and Probes.

Whilst designed for robustness and long-life as well as ease of use, it must be appreciated that a thermometer it is an instrument with sensitive components that can be damaged by misuse. Cases should not be dropped or placed on hot surfaces. Probes should be used with respect – not used for opening cans nor drum-sticks; and if designed as "hand-held" the handles should not be subjected to high temperatures. Regular servicing and calibration will provide confidence that your instrument is functioning correctly.

ETI Ltd's recommendations for proper care depend on; the number of units held by an organisation; the time available to check on instruments and monitor performance; the importance that accurate measurement plays in the performance of the business; and all of this combined with the manner in which measurement is monitored.

For a small business, perhaps small bakery or delicatessen, it is recommended that two thermometers be held. To comply with the requirements of BS EN 13486:2002 – Temperature recorders and thermometers for the transport, storage and distribution of chilled, frozen, deep-frozen/quick-frozen food and ice cream – Periodic Verification, at least one instrument should be checked and certified by a UKAS accredited laboratory once a year. (When returned from certification other instruments should be compared with the certified one as soon as possible)

Comparison can be undertaken by placing the two (or more) probes close together in different temperatures. A glass with a mixture of crushed ice and a little water will provide a temperature of near to 0°C to within ±0.5°C. This therefore enables comparison against a known temperature, and is a good indication of a thermometer's performance.

Boiling water can provide a temperature of approximately 100°C but great care must be taken to avoid scolding and it must be realised that the temperature will drop very quickly when taken from the heat source. A container of warm/hot water can provide a comparison of instruments at a temperature between zero and 100°C but the actual temperature cannot be specifically proved.

The two or more probes should be placed together (an elastic band can hold the probes together securely) and they should then be placed in the water, allowed to stand for at least 30 seconds, and then steadily stirred in the water for at least another 30 seconds. The stirring should ensure that the water is the same, uniform temperature throughout, and will improve the speed of response of the readings.

The two instruments should read the same ±1.5°C (or whatever tolerance difference your Quality System or process may determine). This tolerance allows for the fact that both instruments may be slightly out of adjustment and if one instrument is reading 0.7°C high, and the other 0.7°C low, there will be an apparent difference of 1.4°C.

There are various alternative methods of checking a thermometer, and one of the easiest is to use an ETI Comparator (814-132) combined with a certified reference thermometer.

Systems can be checked by immersion in a stirred water bath (822-900) or even a mini calibration bath (822-950) and comparing the temperature against another thermometer that you know is accurate i.e. has a current UKAS certificate. An ETI reference thermometer (222-005) is ideal.

Where an instrument has a socket for a probe, Calibrated Test Caps are available. These may be used on a regular basis to monitor the performance of the instrument. Test caps are available for Thermocouple, Thermistor and PT100 instruments.

ETI also manufacture thermometer Checkers, which act as probes at three different temperatures, and are used in the same way as test caps. However, a checker will only check the accuracy of the instrument and very often it is the probe that is faulty. To ensure confidence in a measurement, the combined system of instrument and probe should be calibrated.

Because of the frequency of damage inflicted on the probe, ETI recommend that a spare probe for each type of instrument be kept, to cover for instances of malfunction.

Whichever method is used, confidence that a reference thermometer is reading correctly and is traceable to National Standards requires a UKAS certificate, and whilst an individual's organisation will determine how often calibration is made, the manufacturer will recommend that an annual UKAS certificate is obtained.

All ETI Ltd Instrumentation

The above principles of Risk Assessment, Regular Calibration & Comparison, Traceability to National Standards and common-sense, apply to all instrumentation supplied by ETI Ltd.

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