Comparison Calibration

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A temperature probe is calibrated in a block by *comparison* with a known reference thermometer. For accurate calibration, the two thermometers must be in thermal equilibrium which requires that they are as close as possible over their full length and ideally of similar thermal mass, and response time.

In figure 1, the thermometers in the same insert, is a much better reference than the control probe, or other built-in probe, as it shares closely the same environment as the probe for calibration. Surprisingly, some block designs rely on a built-in probe as the reference and although a display offset is used, it can only be correct for one temperature. The separate reference thermometer, with no limitations of being built-in, can be designed for best stability and can be easily calibrated and re-calibrated to national standards. The control probe of the ASL B series, free of the restriction of being used as a reference, is designed and positioned for the best control stability.

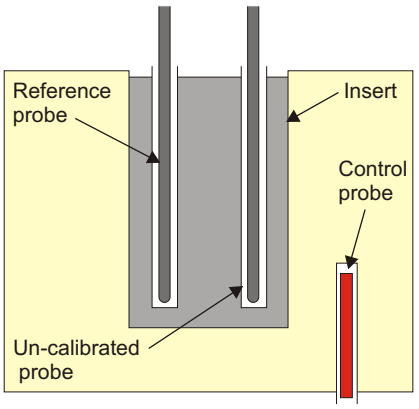


Figure 1. *(not to scale)*

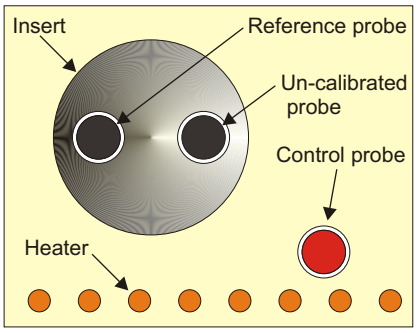


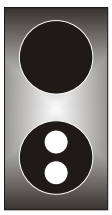
Figure 2. *(not to scale)*

CALIBRATION ACCURACY

The accuracy of your calibration will depend on the sum of the accuracy of the reference thermometer with its indicator and the uncertainties associated with stability and uniformity of the block. Be cautious of claims for accuracy with no explanation, as it may be just another way to specify uniformity. The independent indicator option has probe data correction to improve accuracy, and is supplied with, or without, probe and traceable calibration. For best results, use an external reference such as ASL's F250 precision thermometer, which offers a traceable system accuracy of up to ±0.025°C.

UNIFORMITY

Uniformity is defined for the B series as the temperature difference between two probes in a two-hole insert. For customised blocks, uniformity will depend on the design. "Gradient" or "homogeneity" are other terms used for describing uniformity.



B140

B700

Typical inserts.

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