

Calibration Contract Requirements

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Note: Lennox Laboratory Supplies specifications Terms and Conditions of Calibrations and instrument Specifications

- 1 Standards used to calibrate the above equipment are traceable to national standards (where traceability is available).
- 2 Equipment must be accessible, in working order, safe to work on and free from any hazardous material. Balances must be switched on overnight and temperature enclosures must be set at the lowest temperature point.
- 3 Lennox Laboratory Supplies cannot guarantee that any unit will meet the customer's desired specifications. Technical manuals and accessories must be provided by the customer, if necessary.
- 4 Balances to be calibrated will be checked as found and adjusted, where this is possible, and re-calibrated after adjustment.
- 5 Unless specific balance ranges and settings are requested by the customer, (where this is possible) single range balances will be calibrated over the full range (1 calibration) and dual range balances will be calibrated over both ranges (2 calibrations). As "multi resolution" balances are calibrated either over each full range (2 or 3 calibrations) or with 5 readings over each range with an overall uncertainty of measurement, balance type must be clarified. Prices may vary to that quoted if balance is identified incorrectly (dual range/multi resolution).
- 6 Unless otherwise requested at contract stage, thermometers will be calibrated at the standard temperatures -20°C, 0°C, 37°C and 100°C. Other temperatures may and extra temperatures will incur extra charges. Standard uncertainty of measurement is calculated with probe immersion depths between 100mm to 380mm from -40°C to 180°C and between 110mm to 150mm from 180°C to 400°C. Actual depths outside these are defined, as uncertainty of measurement will be affected.
- 7 Temperature enclosures will be calibrated using the agreed number of probes over a 30 minute run time at 60 second intervals, after 30 minutes maximum stabilisation period. Extra probes, longer run times, shorter time intervals and, where adjustment is required, as found results may incur extra charges.
- 8 For all temperatures enclosures, the load capacity can affect the units ability to meet specifications.
- 9 For autoclaves, an extra charge will be incurred if adjustment is required, as this necessitates an initial run to be completed to establish possible adjustment. Unless specific sterile loads for autoclaves are agreed at contract stage and provided on the day by the customer, unit will be calibrated empty.
- 10 Where necessary, a decontamination certificate must be completed by you and given to the engineer before calibration can commence.
- 11 Acceptance criteria for procedures used:

Balances are calibrated by following CPM-001 (or CPM-004 for multi resolution balances) with units in grams (g) and an uncertainty of measurement reported.

Acceptance criteria are as follows:

For resolutions of	Linearity	Eccentricity	Repeatability (i.e. Standard Deviation)
≥ 0.0001g	±5 times resolution	±6 times resolution	3 times resolution
≤0.00001g	±5 times resolution ±UOM of the standard used	±10 times resolution	3 times resolution

Temperature Enclosures are calibrated by following CPM-002 with acceptance criteria of ±2°C (incubators), ±3°C (waterbaths, environmental chambers ≤100°C), ±6°C (environmental chambers ≥100°C, ovens, fridges, dry blocks), ±10°C (freezers) and -2°C/+5°C (autoclaves). Units are in °C and an overall uncertainty of measurement is reported.

Thermometers are calibrated by following CPM-003 with acceptance criteria of ±0.5°C + 0.2% reading at specified temperature (PRTs) and ±10 times the resolution + 0.5% of the reading at specified temperature (thermocouples, thermistors), or manufacturer's specifications (whichever is greater). Units are in °C and an overall uncertainty of measurement is reported.

For other items, procedure, acceptance criteria and units vary.