CAMPDEN INSTRUMENTS LIMITED

INSTRUCTION MANUAL

FOR

765 PELTIER COOLING UNIT

For use with
7550 Integraslice, HA752 and MA752 Vibroslice Tissue Cutters

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Introduction

PACKAGING
Please retain original packaging for future.
Instruments will not be accepted for service or repair unless the unit is returned adequately and properly packaged as inadequate packing has resulted in transit damage in the past.

SAFETY
Spillage - If the cutting lubricant/preserving liquid, e.g. physiological saline, is spilt over the instrument it is important for electrical safety reasons to ensure that the instrument remains safe to use. To avoid the possibility of electrical shock if a spillage occurs, the unit should be switched off at the mains electrical outlet and disconnected before touching the instrument. The instrument should be inspected and tested if necessary by a suitably qualified technician before it is put into further use.

This instrument must not be operated unless it is adequately earthed (grounded).

765LP and 765HP Temperature Controllers for Tissue Bath.

All electrical instruments and equipment should be periodically tested to ensure they remain safe to use. In some countries this may be a statutory requirement. Your local Health and Safety Executive (or equivalent) will be able to advise on this matter.

The 765 Peltier Cooling Units are intended for use with the Campden Instruments tissue cutters models HA752 and MA752. Research has shown that unfixed brain slices sectioned at 4°C give better tissue preservation and are viable for longer in-vitro recordings. Additionally, some enzyme histochemical techniques give better staining results when sectioned at low temperatures.

The 765 Peltier Cooling Unit is available in two versions: 765LP (low power) and 765HP (high power). The equipment comprises a mains operated control unit (part number 765/2LP or 765/2HP), a tissue bath assembly (part number 765/1) and a bath temperature feedback block (part number 765/TFB). Additionally, the 765HP high power version is also supplied with a plain heat sink block (part number 765/HS) to aid efficient cooling.

The control unit houses a power supply and temperature control circuitry. The bath assembly has a tissue bath with a stainless steel bottom plate, thermoelectric elements and cold water fed heat exchanger.
The bath assembly will fit onto a Campden Instruments Vibroslice without modification and the bath chamber has the same volume as the standard Campden Instruments tissue bath (752/2B). The tissue holder is the standard Campden Instruments tissue holder (752/2A).

Current from the power supply flows through one side of the thermoelectric elements, which act as heat transfer units. Heat is drawn off, cooling the solution in the tissue bath. The heat generated by this process is removed by the water supply fed through the heat exchanger. The unit uses proportional temperature control. This will take the bath temperature to within 0.5 ºC at the point of measurement. A temperature feedback sensor is located in the stainless steel temperature feedback block and will only indicate the temperature at the point of measurement. There will, however, be a small variation in temperature vertically through the bath. Experience will show the best temperature to be set for any given requirement and ambient temperature.

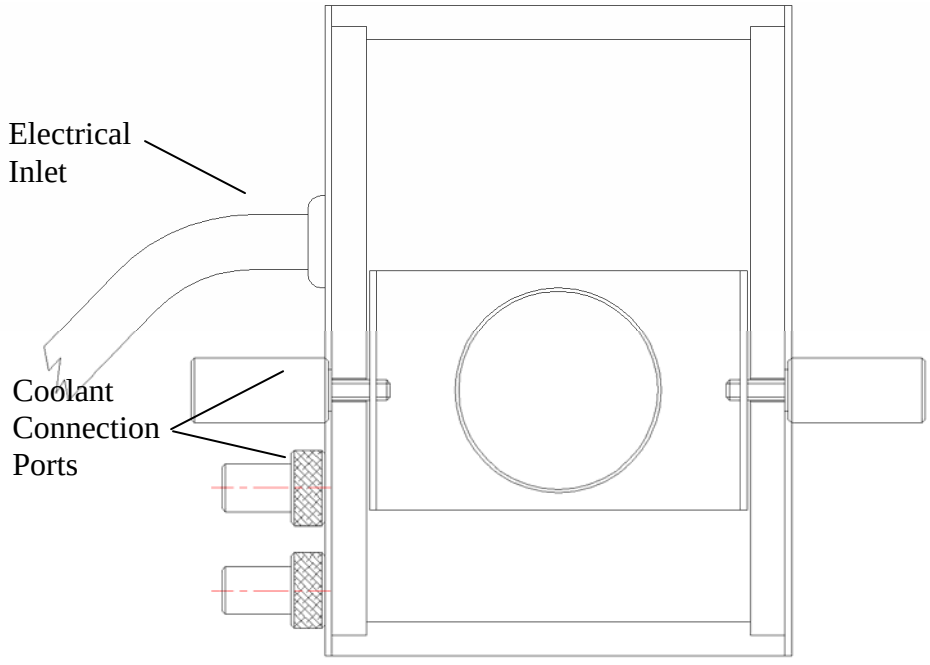

Fig. 1 Tissue bath assembly

It is essential that the bath assembly be connected to an adequate cold water supply whenever the unit is in operation. Typically the unit may be connected to a cold-water tap and fed to waste. The flow of water through the heat exchanger should not be less than 400ml/minute. On the 765HP an iced water flow is recommended to reach temperatures below 0ºC. A temperature feedback sensor is built into the bath assembly and monitors the temperature of the heat exchanger. The power supply to the thermoelectric elements will shut down if the water supply is either inadequate or not present; when the supply is resumed the power supply will be automatically re-connected.
If red warning light with the '!' symbol [at the side of the temperature display] illuminates this indicates that the thermoelectric elements have been shut down due to inadequate flow of cooling water.

Care should be taken to ensure that the cooling water is maintained prior to initial start up and during operation otherwise cooling of tissue bath solution will be inhibited. To eliminate air locks or bubbles within the unit that may impair efficient cooling we recommend that once the cooling water is flowing, the bath assembly should be tilted back and forth until clear water flows and any air bubbles have been expelled. The unit can then be fitted to the slicer. The tissue bath should be filled with physiological buffer solution at room temperature or less. The bath temperature feedback block must be present within the bath. It helps to distribute the thermal energy supplied by the Peltier coolers evenly throughout the bath and also provides the temperature feedback to the control unit via a socket on the rear of the control box. The additional heat sink block supplied with the 765HP should also be placed in the bath to aid faster, even cooling.

The bath temperature should be set by moving the display switch to 'set' (hand symbol) and adjusting to the required temperature with the temperature control knob. The actual bath temperature will be displayed when the display switch is moved to 'read' (eye symbol). The unit will heat or cool the solution in the bath (at the point of measurement) to within 0.5 degrees Celsius of the set temperature. It should be noted that once a solution starts to freeze it might begin to act as a thermal insulator and inhibit further cooling.

Cleaning & Maintenance

The 765/2 Power supply & control unit contains no user-serviceable parts and requires no maintenance.
The bath assembly requires only cleaning after use. **It must not be sterilised by autoclaving methods nor must it be immersed in water.**
All steels (including the so-called stainless steels) will corrode (rust) if left immersed in physiological saline/a.c.s.f/buffer solutions, the rate of corrosion will increase as the solution evaporates and the corroding concentrate increases. Stainless steels rely on a thin, protective oxide layer on their surface to give corrosion resistance. Corrosion occurs when this passive film breaks down. The main factor causing corrosion is the chloride content of the liquid in contact with the material; typically seawater, which is generally considered to be quite corrosive, has a chloride concentration of 19000ppm. A.c.s.f has a much higher concentration. This concentration will increase due to evaporation and the passive oxide layer will break down. For this reason it is essential that the bath and heat sink blocks be regularly and thoroughly cleaned with clean water after use to remove chloride concentrates.

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Order codes

Description	Order code
Standard Peltier cooling unit (complete)	765LP
High Performance Peltier cooling unit (complete)	765HP
Standard Tissue bath assembly	765/1LP
Standard Power Supply & Control Unit	765/2LP
High Performance Tissue bath assembly	765/1HP
High Performance Power Supply & Control Unit	765/2HP
Temperature Feedback Block	765/TFB
Heat Sink Block	765/HS

Specification

Display Resolution	0.1 ºC
Temperature Accuracy	+/- 1 ºC
Temperature Range 765LP	+40 ºC to -1 ºC
Temperature Range 765HP	+40 ºC to -10 ºC

(Note that the actual temperatures achievable will be dependent upon the solutions used and local temperature conditions)

Voltage requirements 765LP (765HP)	230v 50Hz Fused at 2A, (4A) 110v 60Hz Fused at 3.15A, (4A) Set via switch on rear of unit.
Power requirement 765LP (765HP)	250W (350W)

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