Electron
Microscopy
Sciences

INSTRUCTIONAL MANUAL
CAT. 7610-A
TEMPERATURE CONTROLLED
STANDARD TISSUE BATH

Electron Microscopy Sciences
P.O. Box 550
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INTRODUCTION

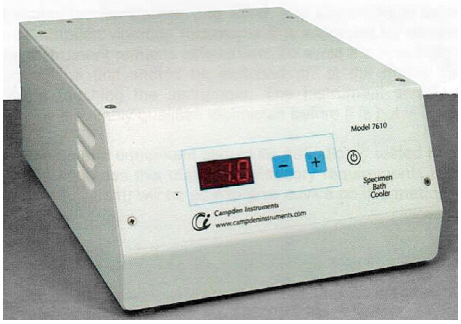
The 7610A Tissue Bath Cooler Unit is intended for use with our 7000 and 5100 range of vibrating microtomes. Unfixed brain slices sectioned at 4°C give better tissue preservation and are viable for longer in-vitro recordings. Additionally, some enzyme histochemical techniques give better staining results when sectioned at low temperatures.

The 7610A uses Peltier thermoelectric elements. The stainless steel tissue bath and mount are detachable to allow sterilization by autoclave if required.

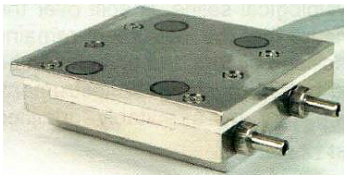
EQUIPMENT

The equipment comprises of a mains operated control unit, cooling element, tissue bath and specimen holder. The control unit houses a power supply and temperature control circuitry. The cooling element assembly consists of thermoelectric Peltier elements, temperature feedback sensors and a cold water fed heat exchanger. It is recommended that a thermal transfer pad (two are provided) be placed between the tissue bath and cooling unit .These pads are reusable but will need replacing, depending on degree of wear.

Current from the power supply flows through 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 a proportional temperature control algorithm to maintain bath temperature stability to within 0.5°C of the temperature set point. 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.



Control Unit



Cooling Head

Cooling Head fitted with Tissue Bath

SAFETY

- This instrument needs to be properly earthed/grounded before using.
- All electrical instruments and equipment should be tested periodically to ensure they remain safe to use. Consult the proper authorities for applicable laws/regulations in your area.
- In the event that the cutting lubricant/preserving liquid spills out, the unit should be switched off at the mains electrical outlet and disconnected before touching the instrument itself. The instrument should then be tested and inspected by a qualified service person before using.

PRODUCT SPECIFICATIONS

Display Resolution:	0.1°C
Temperature Accuracy:	+/- .5°C
*Temperature Range:	+8°C to 0°C
Voltage Requirements:	115V 60Hz or 230V 50Hz
Power Rating:	60W
Inlet Fuse Rating:	2A

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

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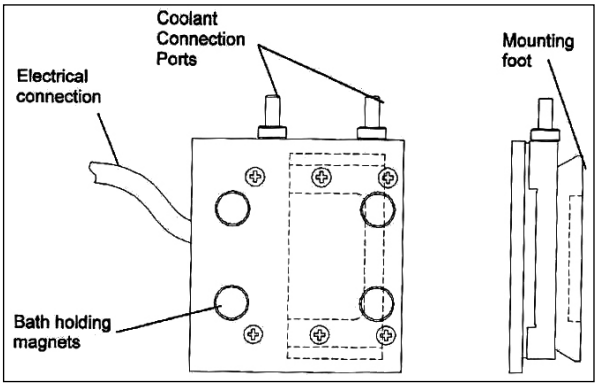
BATH ASSEMBLY SETUP

Cooling head assembly



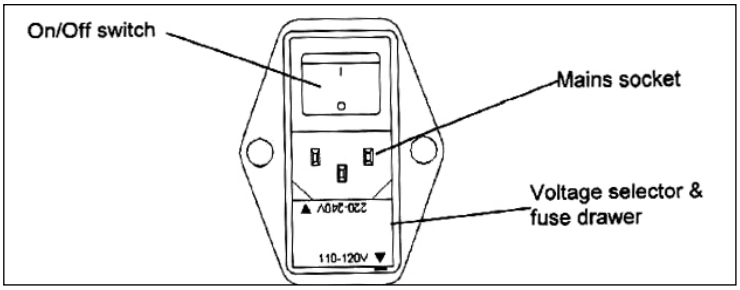
In order to operate correctly, the cooling unit must be connected to a cold water supply and fed to waste. Usually, a standard, cold-water tap is sufficient. Another option is to have water pumped through the unit from a suitable reservoir. Water flow needs to be at least 400 ml/minute. A temperature feedback sensor is built into the assembly and monitors the heat exchanger temperature. Unit will “beep” and display an “Err” message if water supply is not present or inadequate. This, in turn, will shut off the power to the thermoelectric elements. To reset, just turn the unit off and on again.

The tissue bath should be filled with the physiological buffer solution pre-cooled to the desired slicing temperature.

TEMPERATURE CONTROLLER SETUP

Set the temperature controller for your particular voltage supply before connecting to the mains supply. This is done by moving out the fuse holder drawer and re-inserting it so the voltage legend for your supply is aligned with the mark on the inlet molding.

Mains inlet/voltage selector. Example shown is set to 110-120V.



The instrument must not be used unless it is connected to an appropriately earthed/grounded mains supply. The inlet molding accepts a standard IEC socket. Where possible, the unit comes with a standard mains lead-IEC socket/mains plug that should be suitable to your local mains outlet. Always check with proper authorities to ensure plug is compliant with local regulations.

At the rear of the control unit, connect the cooling unit to the electrical socket and switch the controller on.

OPERATION

1. Remove protective coating from one side of a heat transfer pad and place pad on the top plate with exposed side towards the cooling unit.
2. Gently press pad into place, smoothing out any air bubbles.
3. Remove protective coating from other side of pad.
4. Fit tissue bath over cooling unit top plate/heat transfer pad. *(The bath is magnetic and will stay on the plate.)*

NOTE: Tissue bath has 3 flanges on its underside designed to situate the bath correctly on the cooling plate. *Make sure the flange running across the bath is fitted furthest from the electrical connection cable on the cooling unit.*

NOTE: To remove bath, just pull it up and away from the cooling unit.

5. To fit cooling unit and bath to microtome, move the microtome’s locking lever to the LEFT and slide the cooling unit’s dovetail mounting foot into the corresponding shoe on microtome.
6. Slide foot into shoe as far as it will go and release locking lever.
7. Connect cooling unit to water supply and make sure the cooling water is flowing through the cooling unit before pressing the standby button (⏻) to switch on the control unit.
8. Press standby button to illuminate LED display. The temperature of the upper surface of cooling element is displayed. *Unit is now operational and power is being supplied to cooling element.*
9. Press either the “-” or the “+” buttons once to display the set temperature.
10. To change the set temperature, keep pressing the “-” or the “+” buttons.

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NOTE:

- The actual temperature will be displayed, a few seconds after the last press of the button.
- If an “Err” message appears, it may mean that the cooling element is not connected or the equipment has a fault. In either situation, no power will be applied to the cooling element.
- The temperature feedback sensor is mounted in the upper surface of the cooling unit. The temperature at the point will be different from the temperature at the specimen holder. The temperature offset between specimen holder and cooling unit will vary depending upon conditions, however, once this offset has been found, then cooling unit temperature can be set accordingly to obtain and retain the desired temperature at the specimen holder.

CLEANING AND MAINTENANCE

CONTROL UNIT:

- Requires no maintenance!
- Has no user-serviceable parts

COOLING UNIT ASSEMBLY:

- Clean after every use
- DO NOT sterilize by autoclaving methods
- DO NOT immerse in water

TISSUE BATH & TISSUE HOLDERS:

- These are a magnetic stainless steel that will corrode if left immersed in physiological saline, buffer solutions, etc., and therefore need to be washed with clean water after every use to avoid the build-up of the corroding chloride concentrates.

NOTE:

- The tissue bath and the tissue holders do not have the higher corrosion-resistance properties of some non-magnetic stainless steels and need to be washed with clean water frequently to avoid the build-up of the corroding chloride concentrates.*
- The magnet that holds the tissue holder is ceramic, therefore non-corrosive, and can be autoclaved using normal procedures.
- Heat transfer mat should not be autoclaved.

**All steels, including the so-called 'stainless' steels, will corrode if left immersed in physiological saline/a.c.s.f./buffer solutions, the rate of corrosion will increase as the water in 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 metal. This concentration will increase during evaporation and the passive oxide layer of the steel will break down. For this reason it is essential that the bath is regularly and thoroughly cleaned with clean water after use to remove chloride concentrates.*

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