# 765LP & 765HP

*Standard and High Performance Peltier Tissue Bath Temperature Controllers for use with WPI Vibroslice Models NVSL and NVSLM1*

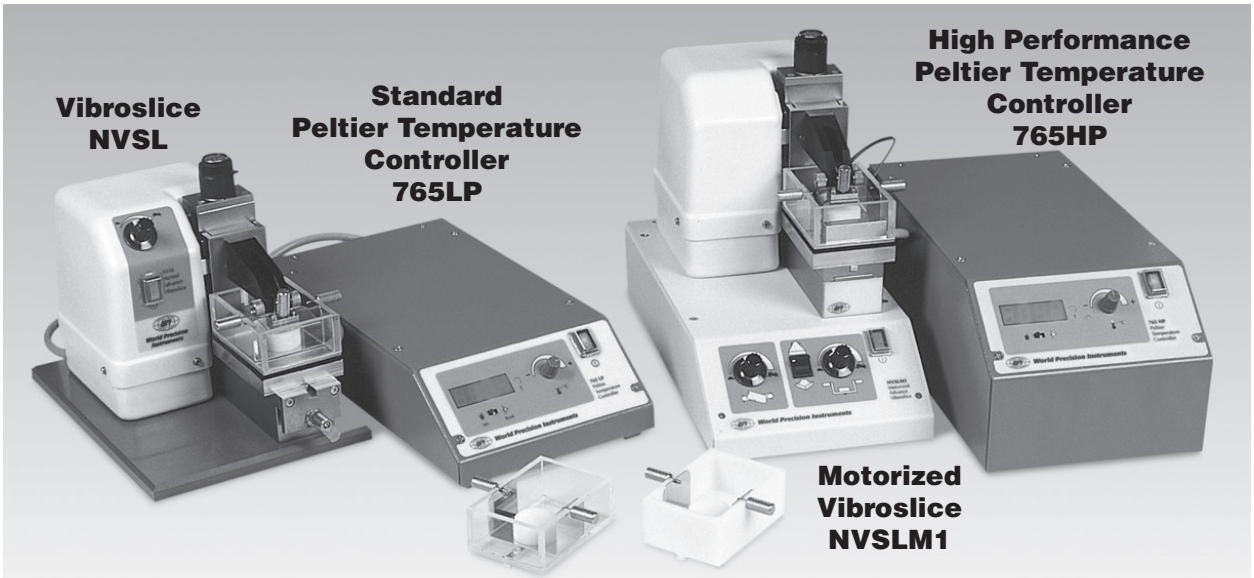


# INSTRUCTION MANUAL

Serial No._____

061801

***World Precision Instruments***




***Standard tissue baths, replaced by Peltier baths***

# Warnings and Cautions

**Spillage** — If the cutting lubricant/preserving liquid, *e.g.* physiological saline, is spilled 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 grounded.

**Cold Water Supply** — *It is essential that the Bath Assembly be connected to an adequate cold water supply before the unit is operated.* Failsafe devices ensure that the unit will be shut down, and therefore cannot be damaged, if either the cooling water flow is omitted by mistake or interrupted, or in the case of use as a heater, if the water freezes in the heat exchanger.

# Contents

# Introduction

The 765 Peltier Tissue Bath Temperature Controllers are intended for use with WPI Vibroslice models **NVSL** (manual) and **NVSLM1** (motorized) and allow heating or cooling of the solution contained in the bath assembly. The **765LP** and **765HP** Tissue Bath Assembly replace the standard Vibroslice bath; simply remove one bath assembly and replace it with the other. The tissue blocks of all three are identical. The 765LP enables the cooling of physiological fluid and tissue from normal room temperature to 0°C in approximately 5 to 6 minutes. The higher-powered 765HP will achieve 0°C in about 4 minutes and has the capacity to go as low as -10°C. Both units have the capability to heat fluid to +40°C. The advantages of being able to select the most appropriate temperature for tissue sectioning include improvement in the slice quality and, at lower temperatures, the ability to maintain viability of unfixed tissue for longer *in vitro* recordings. Additionally, some enzyme histochemical techniques give better staining results when sectioned at low temperatures.

***765LP and 765HP Control Units and Bath Assemblies.***

# Instrument Description

The 765 Peltier Tissue Bath Temperature Controller is comprised of a mains operated Control Unit, a Bath Assembly and Bath Heat Sink Modules. 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 a cold water fed heat exchanger.

**Note:** the 765LP and 765HP baths are NOT interchangeable.

Current from the power supply flows through one side of the thermoelectric elements that 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 cool water supply fed through the heat exchanger. The reverse of this process takes place if the unit is used to heat the solution in the tissue bath.

## Set-up Instructions

### Parts List

#### Standard Unit

Standard Power Supply and Control Unit (part number **765/2LP**)
Standard Bath Assembly (part number **765/1LP**)
Heat Sink Module (1) (part number **765/TFB**)

#### High Performance Unit

High Performance Supply and Control Unit (part number **765/2HP**)
High Performance Bath Assembly (part number **765/1HP**)
Heat Sink Modules (2) (part numbers **765/TFB** and **765/HS**)

### Unpacking

Upon receipt of this instrument, make a thorough inspection of the contents and check for possible damage. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. Please read the section entitled “Claims and Returns” on the Warranty page of this manual.

### Returns

Do not return any goods to WPI without obtaining prior approval and instructions

from our Service Department. Goods returned (unauthorized) by collect freight may be refused. If a return shipment is necessary, use the original container. If the original container is not available, use a suitable substitute that is rigid and of adequate size. Wrap the instrument in paper or plastic surrounded with at least 100 mm (four inches) of shock absorbing material. Please read the section entitled "Claims and Returns" on the Warranty page of this manual.

## Assembly

**Power Cable**—The power cable is permanently wired to the bath unit and is connected to the control unit by a plug. The user simply plugs the cable into the mating socket on the rear of the control unit. This allows for easy cleaning of the bath unit and for replacement/additional baths.

**Tissue Bath Assembly**—The Bath Assembly will fit directly onto the WPI Vibroslice without modification. It has the same volume as the standard WPI Bath Chamber (VSLM1C) and the tissue holder is identical to the standard WPI Specimen Holder (VSLM1H). See Fig. 1.

# Operating Instructions

## Sequence of Operations

The 765 Peltier Tissue Bath Temperature Controllers and Vibroslice are independent — it does not matter which is turned on first, although it is usual to stabilize the bath at the desired temperature before trying to cut slices.

## Tissue Bath Assembly

The Bath Assembly should be filled with physiological buffer solution at room temperature or less. The bath Heat Sink Module(s) must be present within the bath (see Heat Sink Section below). Care should be taken to ensure that the cooling water is circulating prior to initial start up and during operation, otherwise the unit will be automatically shut-off. See Cold Water Supply Section below.

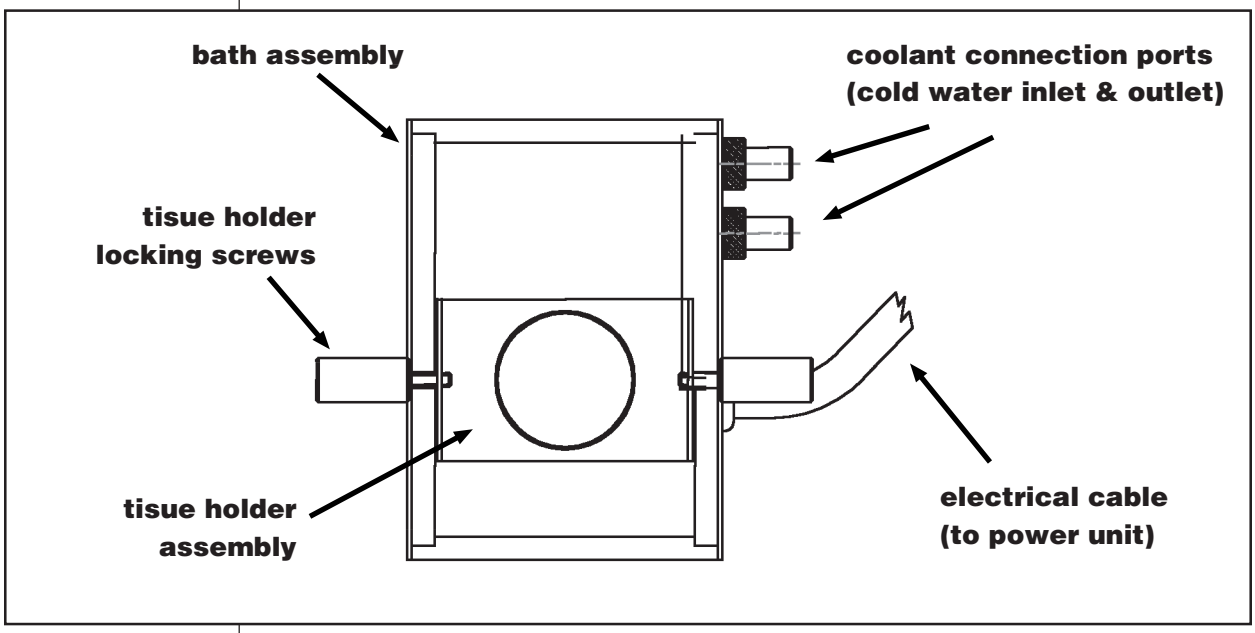



***Fig. 1—Tissue bath assembly***

**Note:** The power supply to the thermoelectric elements shuts down if the water supply is either inadequate or not present. When the supply is resumed, the power supply is automatically re-connected.

## Heat Sink Modules

These are two stainless steel blocks 48mm long x 8mm wide x 14mm tall. One is a plain block and the second has an embedded thermistor to provide temperature feedback. **Note that the 765LP unit is supplied with the temperature feedback block only.** The feedback block has a cable protruding from one end. The free end of the cable plugs into the back of the control unit. If this connection is not made the unit will not work. Place these blocks in the tissue bath — across the bath, one at the front and one at the rear. Ideally, the feedback block should be at the rear to remove the possibility of the cutting blade cutting into the feedback cable. The heat sink modules perform two functions: They both assist in temperature transfer through the liquid in the bath (thus speeding up the cooling rate and promoting a uniform temperature gradient through the liquid) and the block with the embedded thermistor provides a temperature feedback to the control unit.

There are two functions of the temperature feedback mechanism: it provides the user with the facility to request (via the control unit) a specific temperature, and it allows the control unit to detect the presence of liquid in the bath and shut the system down in the event of its absence.

## Cold Water Supply

***It is essential that the Bath Assembly be connected to an adequate cold water supply before the unit is operated.*** Typically, the unit may be connected to a cold water tap and fed to waste. Either port can be used for “inflow” or “outflow”. The flow of water through the heat exchanger should be greater than 400 mL/min. A temperature feedback sensor is built into the Bath Assembly and monitors the temperature of the heat exchanger.

**Caution:** In order to reach -10°C, the lowest temperature achievable by the 765HP, iced cooling waterflow is required.

## Temperature Control

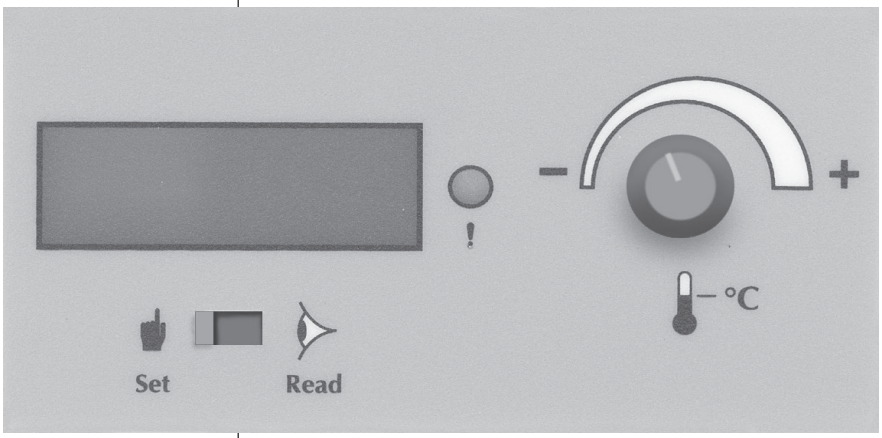
The unit uses proportional temperature control. This will take the bath temperature to within 0.5°C at the point of measurement. The temperature feedback sensor is located in one of the stainless steel heat sink blocks and will only indicate the

temperature at the point of measurement. There will, however, be a small variation in temperature vertically through the bath. Experience will dictate the best temperature for any given requirement and ambient temperature.

The underside of the bath base is also in contact with a temperature sensor; a second temperature sensor is mounted on the cooling chamber. The purpose of these two sensors is to monitor the presence of and the conditions of the buffer solution in the bath and the cooling water in the cooling chamber. If either of these detects any abnormality (*e.g.,* a lack of water flowing through the cooling chamber) they will cause the control unit to shut down the power until acceptable conditions are restored.

A third temperature sensor is placed in the bath and monitors the physiological buffer temperature providing feedback for true temperature display (degrees Celsius) on the control unit.

## Temperature Setting




Turning the display switch to set (hand symbol) and adjusting the temperature control knob to the required temperature sets the bath temperature. The actual bath temperature is displayed when the display switch is turned to read (eye symbol). The unit will heat or cool the solution in the bath (at the point of measurement) to within 0.5°C 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.

### Pre-cooling or heating

Pre-cooling or heating times will depend on many factors — ambient air temperature, bath fluid temperature, cooling water temperature, etc., and are therefore difficult to predict.

# Maintenance

## Power Supply

The 765/2 Power supply & control unit contains no user-serviceable parts and requires no maintenance.

## Bath Assembly

**Caution:** Do not autoclave.

**Caution:** Do not immerse unit in water.

The Bath Assembly requires cleaning with water after use. All steel, including stainless steel, will rust if left immersed in saline solution. The effect is more pronounced as the water bath solution evaporates and the salt concentration increases. The Bath Assembly and Heat Sink blocks should therefore be regularly cleaned with water to remove saline concentrates. However, do not immerse the Bath Assembly in water.

# Specifications

Display Resolution ..... 0.1°C

Temperature Accuracy ..... ± 1°C

Temperature Range

765LP ..... +40°C to -1°C
765HP ..... +40°C to -10°C

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

Deviation from Set Temperature ..... ±0.5°C

Voltage Requirements ..... 230 v 50 Hz Fused at 1A
110 v 60 Hz Fused at 2A
*(Set via switch on rear of unit.)*

Power Requirement ..... 250 W

# Replacement Parts

| Part # | Item |
|---|---|
| **765/1LP** | Standard Bath Assembly |
| **765/2LP** | Standard Power Supply & Control Unit |
| **765/1HP** | High Performance Bath Assembly |
| **765/2HP** | High Performance Power Supply & Control Unit |
| **765/HS** | Heat Sink Modules: Heat Sink Module |
| **765/TFB** | Temperature Feedback Block |

# Warranty

WPI (World Precision Instruments, Inc.) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of one year* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

## Claims and Returns

• Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within 10 days after receipt of shipment. Claims for lost shipments must be made within 30 days of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim settles. In some instances, photographic documentation may be required. Some items are time sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.

• WPI cannot be held responsible for items damaged in shipment en route to us. Please enclose merchandise in its original shipping container to avoid damage from handling. We recommend that you insure merchandise when shipping. The customer is responsible for paying shipping expenses including adequate insurance on all items returned.

• Do not return any goods to WPI without obtaining prior approval and instructions (RMA#) from our returns department. Goods returned unauthorized or by collect freight may be refused. The RMA# must be clearly displayed on the outside of the box, or the package will not be accepted. Please contact the RMA department for a request form.

• Goods returned for repair must be reasonably clean and free of hazardous materials.

• A handling fee is charged for goods returned for exchange or credit. This fee may add up to 25% of the sale price depending on the condition of the item. Goods ordered in error are also subject to the handling fee.

• Equipment which was built as a special order cannot be returned.

• Always refer to the RMA# when contacting WPI to obtain a status of your returned item.

• For any other issues regarding a claim or return, please contact the RMA department

***Warning: This equipment is not designed or intended for use on humans.***

** Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.*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# DECLARATION OF CONFORMITY

We: World Precision Instruments, Inc.
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USA

as the distributor of the apparatus listed, declare under sole responsibility that the product(s):

**Title: Model 765HP Peltier Cooling Unit**
**Model 765LP Peltier Cooling Unit**

to which this declaration relates is/are in conformity with the following standards or other normative documents:

EC Directives:

Electromagnetic Compatibility Directive 89/336/EEC.
The Low Voltage Directive 73/23/EEC.

European Standards:

EN 55081-1: 1992 Electromagnetic compatibility generic emissions standard part 1..
EN 55082-1: 1992 Electromagnetic compatibility generic emissions standard part 1.

UK Regulations:

Electricity at Work Regulations 1989.

Additionally, the health and safety requirements of the following British and harmonized European Standards have been incorporated in the design of the above machines:

BS 2771:part 1:1986 (EN 60 204:part 1:1985).
BS 5304:1988.

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