

TEC[™]
Tissue Embedding Center
Catalog # TEC-120, TEC-220
Operator's Manual
Version 1.5, September 2006

*Be certain to read this manual thoroughly
before proceeding with unpacking and installation.*

TABLE OF CONTENTS

Topic	Page
Warranty card	Insert A
1) Introduction	1
1.1) Product Description	1
1.2) Features and Benefits	1
1.3) Accessory Equipment	1
1.4) Safeguards	2
2) Unpacking	3
2.1) Inspection	3
2.1.1) Internal Packaging	3
2.1.2) TEC Equipment	3
2.2) Components Checklist	3
3) Specifications	4
3.1) Dimensions	4
3.2) Weight	4
3.3) Capacity	4
3.4) Temperature Ranges	4
3.5) Electrical Requirements	4
3.6) Fuse Rating	4
3.7) Refrigerant	4
4) Installation	5
5) Operating Instructions	6
5.1) Hardware	6
5.1.1) Setup Procedure	6
5.1.2) Operating Procedure	6
5.1.3) Shutdown Procedure	6
5.2) Software	7
5.2.1) Membrane Keypad Operation	7
5.2.1.1) Display	7
5.2.1.2) Up Arrow, Down Arrow	7
5.2.1.3) Automatic Timer	7
5.2.2) Power Control Switches	8
5.2.2.1) Cold Plate	8
5.2.2.2) Heating Elements	8
5.2.2.3) Light	9
5.2.3) System Configuration after Power Loss	9

Topic	Page
6) Routine Maintenance	10
6.1) General Information	10
6.1.1) Important Warning	10
6.2) Cleaning Procedures	10
6.2.1) Base Molds Warming Oven	10
6.2.2) Tissue Holding Tank	11
6.2.3) Work Stage	11
6.2.4) Paraffin Reservoir	11
6.2.5) Paraffin Dispenser Switch	11
6.2.6) Cold Plate	11
6.2.7) Housing	11
7) Troubleshooting	12
7.1) Error Codes	12
7.2) Problem / Solution	12
7.2.1) General	12
7.2.2) Wax Delivery Function	12, 13
7.2.3) Heating Elements	14
7.2.4) Cooling Functions	14
8) Contact Information	15

SECTION 1: INTRODUCTION

1.1) Product Description

The TBS[®] Tissue Embedding Center (TEC) is a single module unit for moderate to heavy workloads in the preparation of wax tissue blocks. Features include microprocessor control of the large 4-liter paraffin reservoir, base molds warming oven, tissue holding tank, work stage and cold plate, user-friendly touch membrane pad with LED displays, solid-state illuminated work stage, forceps warmer, built-in electronic dual forceps controller, foot switch and/or infrared (IR) activated paraffin dispenser, and programmable/automatic timer controls.

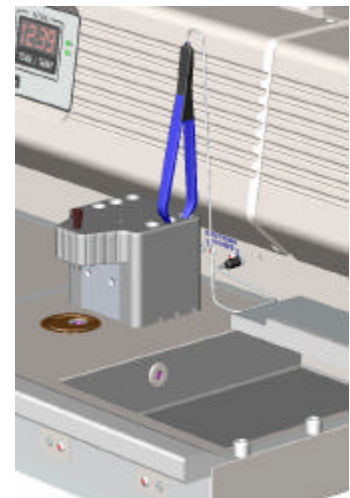
1.2) Features and Benefits

The TEC requires less counter space than most single-module and modular units on the market. Modern, microprocessor controls provide accurate temperature regulation and convenient monitoring of independently controlled heating and cooling elements. A user-programmable, automatic timer controls the heating and cooling components and automatically turns on and shuts off at the desired time. The 4-liter paraffin dispenser holds more paraffin than most competitive models.

1.3) Accessory Equipment

This system has built-in support for two accessories (sold separately): 1) an articulated dual power magnifying glass and electronic forceps (eForceps) available in three different sizes. For the user's convenience, the instrument has been equipped with two distinct locations (front edge and behind the dispensing stage) where to plug the eForceps. Other recommended TBS products include **PARA/Gard**[™] paraffin repellent and **POLY/Fin**[™] paraffin.

Catalog #	Description
PG	PARA/Gard [™] liquid paraffin repellent prevents wax from sticking to equipment and countertops, 4oz/ea, 6ea/cs.
PG-16	PARA/Gard [™] liquid paraffin repellent prevents wax from sticking to equipment and countertops, 16oz pump bottle/ea, 4ea/cs.
H-PF	POLY/Fin [™] paraffin for infiltrating and embedding tissue, Eight 1kg bags per case (17.6 lbs)
H-PF-15KG	POLY/Fin [™] paraffin in a 15kg drum (33 lbs)
TEC-HF1	Electronic Forceps – tip width 1 mm – length 16 cm
TEC-HF2	Electronic Forceps – tip width 2 mm – length 16 cm
TEC-HF3	Electronic Forceps – tip width 3 mm – length 16 cm
TEC-MG	Magnifying Glass for TEC-120 and TEC-220



1.4) Safeguards

Please read all the instructions regarding the TEC and retain for future reference. Follow all warnings and instructions marked on the instrument.

1. Read Instructions

All the safety and operating instructions should be read before the instrument is operated.

2. Retain Instructions

The safety and operating instructions should be retained for future reference.

3. Heed Warnings

All warnings on the instrument and in the operating manual should be followed.

Use of **Paraplast Plus** may damage the instrument and will void the warranty.

4. Follow Instructions

All operating and use instructions should be followed.

5. Attachments

Do not use any attachments not recommended by the product manufacturer as they may cause hazards, damage the instrument and void the warranty.

6. Accessories

Do not use any accessories not recommended by the product manufacturer as they may damage the instrument and void the warranty.

7. Ventilation

Slots and openings in the cabinet are provided to protect the instrument from overheating and to ensure reliable operation. These openings should never be blocked. This instrument should never be placed near or over a radiator or heat register.

8. Power Sources

This product should be operated from the type of power source indicated on the marking label and the instructions.

9. Grounding

This product is equipped with a hospital-grade, grounded three-wire plug.

10. Power-Cord Protection

Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords at plugs, receptacles, and the point where they exit the instrument.

11. Overloading

Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.

12. Servicing

Do not attempt to service this instrument yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

13. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer. Unauthorized substitutions may result in fire, electric shock or other hazards.

SECTION 2: UNPACKING

2.1) Inspection

2.1.1) External Packaging

Carefully inspect the outer carton for any visible damage. If any damage is noticed, contact the shipping carrier and file a damage report before unpacking the instrument. *Failure to report visible damage may forfeit any claims for internal damages.*

2.1.2) TEC Equipment

The TEC is carefully quality controlled prior to shipping. The highest quality packing materials have been used to ensure that the equipment is well protected during shipping. Please follow these inspection instructions carefully.

Inspect the unit for any visible damage. If any shipping damage is visible, retain all packing material intact with the instrument and file a claim with the final carrier. *Discarding any packaging material prior to the carrier's inspection may void any shipper liability.*

2.2) Components Checklist

Each TEC comes with the following components. If an item is missing, please contact TBS Customer Service immediately at (919) 384-9393.

Item	Quantity
Tissue Embedding Center: Serial # _____	1 ea
Foot Switch	1 ea
Power Cord	1 ea
Instruction Manual	1 ea
Paraffin Reservoir Filter	1 ea
Hot Spot Filter	1 ea

SECTION 3: SPECIFICATIONS

3.1) Dimensions

Overall	11.0" H x 32.0" W x 23.5" D
Height of Work Surface	2.8" H
Paraffin Reservoir	5.0" H x 6.0" W x 8.0" D
Base Molds Warming Oven	6.5" H x 7.5" W x 5" D (minimum) 6.5" H x 7.5" W x 6" D (maximum)
Cold Plate	14.8" W x 11.5" D
Tissue Holding Tank	8.0" W x 10.0"L x 1.7"D

3.2) Weight

Actual	100 lbs (45 kg)
Shipping	135 lbs (61 kg)

3.3) Capacity

Paraffin Reservoir	4 liters
--------------------	----------

3.4) Temperature Ranges

Paraffin Reservoir	50°C - 70°C (± 2°C)
Work Surface	50°C - 70°C (± 5°C)
Tissue Holding Tank	50°C - 70°C (± 2°C)
Cold Plate	- 8°C to ambient

3.5) Electrical Requirements

Power Supply for TEC-120	100-120VAC, 50/60 Hz Consumption 750 VA
Power Supply for TEC-220	220-240VAC, 50/60 Hz

3.6) Fuse Rating

Power Plug for TEC-120	10 amps
Power Plug for TEC-220	5 amps

3.7) Refrigerant

Cold Plate, Cold Spot	R406A
-----------------------	-------

SECTION 4: INSTALLATION

1. Follow the unpacking instructions provided in **Section 2.1 (Inspection)** and **Section 2.2 (Components Checklist)**.
2. Remove the instrument from the carton and place on the countertop.
3. Connect the power cord to the instrument and plug the power cord into the electrical outlet.
4. Plug the foot switch into the connector at the right rear of the instrument.
5. Place the debris screen filter in the paraffin tank and hot spot.

The installation is now complete. The arrangement should appear as shown (*Fig. 1*).

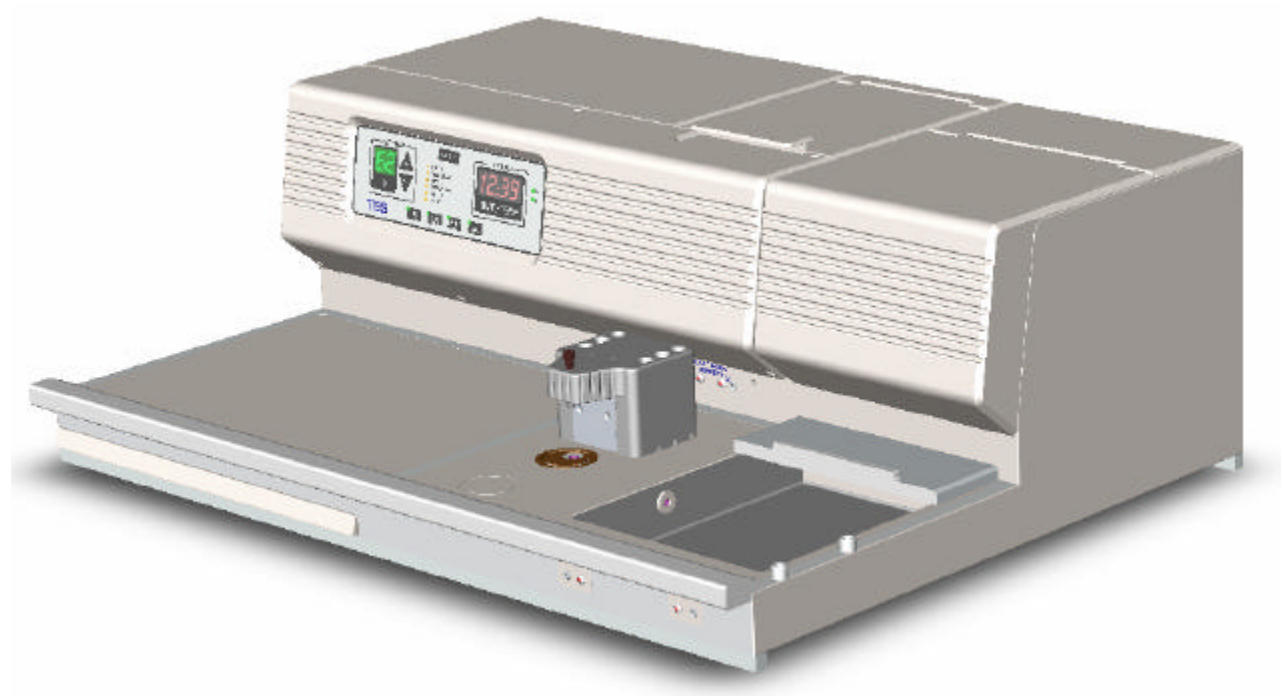


Fig. 1

SECTION 5: OPERATING INSTRUCTIONS

5.1) Hardware

After completing the Installation Procedure outlined in **Section 4 (Installation)**, the Tissue Embedding Center is ready for operation. The following procedures should be observed each time the TEC is used.

5.1.1) Setup Procedure

1. Partially fill the paraffin reservoir and tissue holding tank with molten or pelletized wax.
2. Press the power switch at rear of the instrument to the *ON* position. After the unit performs a self-diagnosis check, **PASS** should be displayed in the *ACTUAL TIME/TEMP* window. Depress the main power supply buttons on the front membrane panel for the *HEATING ELEMENTS* and *COLD PLATE* circuits. Once on, both buttons should be illuminated.
3. Set the desired temperature required for the paraffin reservoir, tissue holding tank and work stage. Refer to **Section 5.2.1 (Membrane Keypad Operation)** for specific instructions.
4. Set the cold plate temperature low enough to develop an even, thin frost. This setting will vary depending on the ambient room conditions and the setting of the hot work stage.
5. Place metal base molds in the base mold warming oven.
6. Allow all components to reach set temperatures before continuing to the Operating Procedure.

5.1.2) Operating Procedure

1. Transfer the tissue cassettes from the tissue processor to the tissue holding tank.
2. Place a pre-warmed base mold on the work stage and, if applicable, remove the lid from the cassette.
3. Transfer the specimen to the base mold and partially fill with wax using either the IR trigger or the foot switch. The flow rate of the wax may be adjusted by turning the thumb screw located at the back of the dispenser nozzle. Turn it clockwise to reduce the flow and counterclockwise to increase the flow.
4. Orient the specimen as required, using the cold spot (as necessary) to partially set the wax.
5. Place the cassette on the base mold and fill with wax.
6. Slide the base mold and cassette onto the cold plate and leave until the wax is solidified.
7. Repeat the Operating Procedure until all tissues are embedded.

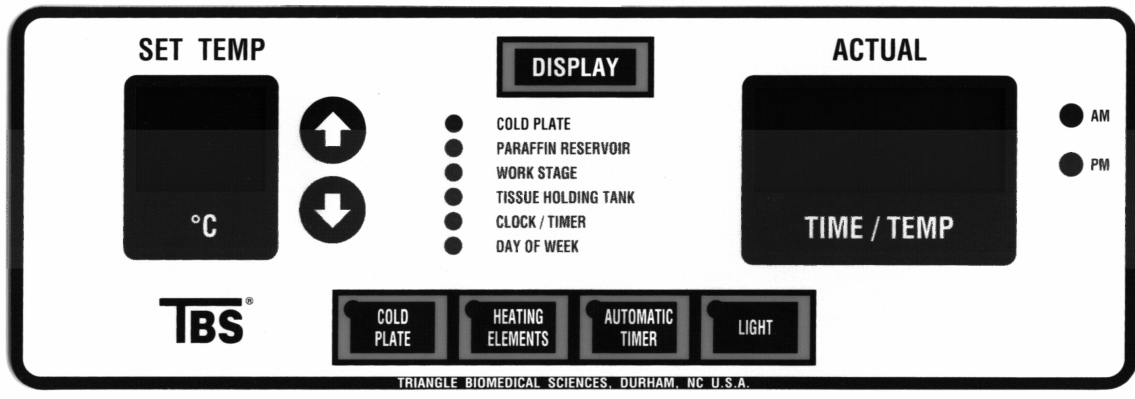
5.1.3) Shutdown Procedure

1. Push the power switch at the rear of the instrument to the *OFF* position.
2. Follow the daily maintenance procedures outlined in **Section 6.2 (Cleaning Procedures)**.

5.2) Software

The **TEC** is controlled by a microprocessor, which maintains continuous control of each of the heating and cooling elements. Each function, from temperature selection to automatic timing, is selected and modified by use of the membrane keypad, as shown below.

5.2.1) Membrane Keypad Operation



5.2.1.1) Display

Pressing the *DISPLAY* key will change the *SET TEMP* and *ACTUAL TIME/TEMP* windows to the next module in the sequence. The currently selected module will have the LED to the left of its name illuminated. Press this button and notice that the LED cycles from *COLD PLATE* to *PARAFFIN RESERVOIR*, *WORK STAGE*, *TISSUE HOLDING TANK*, *CLOCK/TIMER* and *DAY OF WEEK*. The corresponding data in the *SET TEMP* window changes as the current module selection is cycled. All set temperatures and actual temperatures are displayed using 1°C increments.

5.2.1.2) Up Arrow, Down Arrow

The *UP ARROW* and *DOWN ARROW* keys increment or decrement the *SET TEMP* for the module indicated in the display box. The key may be held down to continue changing the set temperature at a rate of 1°C per second. The *SET TEMP* for a module may be modified regardless of its corresponding *POWER LED* setting. If *CLOCK* or *DAY OF WEEK* is selected in the display box, the two arrow keys will modify the corresponding data.

5.2.1.3) Automatic Timer

The *AUTOMATIC TIMER* key will only function when the display mode is set to *CLOCK/TIMER* or *DAY OF WEEK*, while the LED will always indicate the enable/disable status of the automatic timer for the current day of week stored in the instrument (day shown when *DAY OF WEEK* display mode selected).

When the display is in the *DAY OF WEEK* mode, this key will enable or disable the automatic timer operation for the day shown in the display. The enable/disable status for other days of the week may be viewed (or changed) by selecting *DAY OF WEEK* in the display and pressing the up or down arrow keys to sequence through the days while watching (or pressing) the automatic timer switch LED. Be sure to return *DAY OF WEEK* to the correct setting when exiting the *DAY OF WEEK* module.

When the display mode is set to *CLOCK/TIMER*, pressing and holding the *AUTOMATIC TIMER* key will display the following data on alternating keypresses:

Left Display	Right Display
ON [READY TIME]	Time all modules will be ready for use. This occurs only on days which have the automatic timer enabled (as explained above).
OF [OFF TIME]	Time all modules will be automatically turned off. This occurs only on days which have the automatic timer enabled as explained above).

Pressing the *UP ARROW* and *DOWN ARROW* keys will modify the value currently displayed. Note that only one *READY TIME* and one *OFF TIME* may be set. Individual days of the week may be enabled/disabled to use these times.

Note that pressing the *AUTOMATIC TIMER* key with the display set to the *CLOCK/TIMER* mode does not modify the *AUTOMATIC TIMER LED* (enable/disable) setting, as it does in the *DAY OF WEEK* display mode.

Each module requires a different amount of time to reach its programmed operating temperature. The following table shows the time prior to the *READY TIME* each module will be turned on. The turn on time for each module is shown for an example ready time of 7:00 am. As the automatic timer turns on a module, the display mode will be set to the corresponding device.

EXAMPLE

Module	Warm-Up Time	Ready Time = 7:00 am
Paraffin Reservoir	3 hours 30 minutes	3:30 am
Tissue Holding Tank	1 hour 30 minutes	5:30 am
Mold Warming Oven	30 minutes	6:30 am
Forceps Warmer	30 minutes	6:30 am
Cold Plate	25 minutes	6:35 am
Work Stage	20 minutes	6:40 am
Light	0 minutes	7:00 am

5.2.2) Power Control Switches

The following switches contain an LED in the upper left hand corner. The corresponding module(s) will be turned on when the LED is illuminated and turned off when the LED is off. Pressing a power switch will toggle the adjacent LED status. These keys override any past actions of the automatic timer.

5.2.2.1) Cold Plate

The *COLD PLATE* switch enables cold plate module temperature control. Under certain conditions, the cold plate LED will blink, indicating the unit is waiting to turn the cold plate on. The delay will be no more than 90 seconds. This precaution prevents the compressor from overheating.

5.2.2.2) Heating Elements

The *HEATING ELEMENTS* switch controls power to the paraffin reservoir, work stage, spigot heater, tissue holding tank, mold warming oven, forceps warmer, and dispensing nozzle. The *HEATING ELEMENTS* LED will blink when in the warm-up mode for the automatic timer, meaning only some of the heating elements will be enabled based upon their warm-up time and the time remaining until the **TEC** is programmed to be ready. Pressing the *HEATING ELEMENTS* key while its LED is blinking will exit the warm-up mode and the *HEATING ELEMENTS* LED on continuously and enable control of all of the corresponding modules. Pressing the *HEATING ELEMENTS* key again will turn all heating elements off.

The paraffin reservoir operates in one of two modes and can be set to stay on continuously. The mode is changed by pressing and holding the *DISPLAY* button, then pressing the *HEATING ELEMENTS* button. While both keys are held down, the display will show the current paraffin reservoir mode:

PR HtrS

This setting is the default operating mode for the paraffin reservoir. The paraffin reservoir is turned on and off by the front panel switch or by the automatic timer with the rest of the heating elements.

PR Cont

This setting keeps the paraffin reservoir at the set temperature whenever the mains switch on the rear of the **TEC** is *ON*, unless the unit is in an error condition. The heating elements button LED will flash when turned off to indicate that the paraffin reservoir heater is still operating.

5.2.2.3) Light

The light button control turns the tap illumination on/off.

5.2.3) System Configuration after Power Loss

Each time power to the **TEC** is turned on, a self test is performed on the microprocessor memory. The following displays indicate a problem with the corresponding memory component:

PG FAIL = program memory failure

CD FAIL = configuration data memory failure

If one of these displays appear, turn the unit off for 1 minute and then turn the unit back on. If the problem persists, call TBS Customer Service at (919) 384-9393 for further instructions.

The **TEC** settings are stored in battery-backed memory, meaning all unit settings, such as the time, are preserved even during power loss. When the power switch on the rear of the unit is turned on (or after a power failure occurs) the **TEC** will continue to operate in the same mode prior to AC power interruption if the self test is successful. In the event the battery-backed configuration data is corrupted, the **TEC** will be configured as follows:

- The display will show the clock (flashing 6:00 am until it is set).
- Temperature control of the Paraffin Reservoir will be enabled, control of all other modules will be disabled. The *HEATING ELEMENTS LED* will blink to signify that not all heating elements are on.
- The *DAY OF WEEK* will be set to Sunday (flashing until it is set).
- The Automatic Timer will be disabled for all days of the week. The ready time will be set to 7:00 am. The off time will be set to 5:00pm. Both of these values will flash until set by the user.
- Set temperatures and adjustment ranges will be:

	Set Temp	Adjustment Range
Cold Plate	-5°C	-8°C to 0°C
Paraffin Reservoir	62°C	50°C to 70°C
Work Stage	62°C	50°C to 70°C
Tissue Holding Tank	62°C	50°C to 70°C
Mold Warming Oven	62°C	(not user adjustable)
Forceps Warmer	85°C	(not user adjustable)
Spigot Heater	62°C	(not user adjustable)

This "factory configuration" may be programmed from the keypad by pressing the following keys at the same time:

DISPLAY *UP ARROW* *DOWN ARROW*

SECTION 6: ROUTINE MAINTENANCE

6.1) General Information

<u>DOs</u>	<u>DON'Ts</u>
<ul style="list-style-type: none">• Practice good housekeeping and maintain the instrument in a clean condition.• Switch off the instrument before removing plug.• Ensure that replacement fuses are of the correct specification.	<ul style="list-style-type: none">• Cover air exchange grills at rear and side.• Use excessive amounts of solvent for cleaning.• Use metal implements to scrape off wax.• Use the instrument for purposes other than that for which it was designed.• Do not use Paraplast Plus as it may damage the instrument and will void the warranty.

6.1.1) Important Warning

Paraplast Plus contains DMSO, which is a penetrating agent for fixation. This chemical has been known to cause some accelerated oxidation in metal. Most lab instruments are made using stainless steel (SS). It is known, however, that oxidation may occur in SS if water is trapped for long periods of time. Paraplast Extra and Regular do not contain DMSO. Extra also has a lower molecular weight and is therefore a good penetrating wax that does not cause oxidation.

6.2) Cleaning Procedures

While the TEC is designed to minimize wax accumulation, wax will inevitably accumulate on the wax dispenser or embedding apparatus. Recommended cleaning procedures and specific instructions are provided below.

- **Use only plastic or wooden implements to scrape off wax.**
Metal implements will scratch surfaces, making subsequent cleaning more difficult and less effective.
- **Use only minimal quantities of solvent on an absorbent cloth.**
Most wax solvents will attack insulating materials. While the instrument is sealed against wax during normal working conditions, protection against excessive amounts of solvents cannot be guaranteed. TBS recommends using a xylene substitute for cleaning the instrument. Also, to facilitate cleanup, try TBS **PARA/Gard™** paraffin repellent on the work stage area and the front of the paraffin reservoir and base molds warming oven. A small amount of **PARA/Gard™** on a clean surface will establish a thin, protective film to prevent wax from sticking.
- **Disconnect instrument from mains power supply when cleaning.**
The instrument should always be disconnected from the mains power supply when cleaning, particularly if flammable solvents are used.

6.2.1) Base Molds Warming Oven

1. After use (oven will be warm), disconnect instrument from the mains power supply.
2. Wipe the inside of the oven with a tissue moistened with **PARA/Gard™**.

(Perform these steps once every two weeks.)

6.2.2) Tissue Holding Tank

1. Switch off the Heating Elements and allow the paraffin in the tank to solidify.
2. When the instrument is cool, press the Heating Elements button to turn the tissue holding tank on.
3. After about 15 minutes, the wax around the edges of the bath will melt and the remaining solidified wax can be removed as a block.
4. Switch the instrument off and disconnect from the mains. Residual wax in the tank may now be removed using an absorbent cloth.
5. Once cleaned, refill with molten or pelletized paraffin pellets, reconnect the mains and switch on.

(Perform these steps once or twice a week.)

6.2.3) Work Stage

1. The work stage has a slight gradient that directs excess molten wax towards the tissue holding tank. At the end of operation (or more often if needed) wipe down the surface of the work stage with an absorbent cloth.
2. Condensation that may form on the cold spot should not be allowed to enter the tissue holding tank. Frequently wipe the cold spot with a cloth to absorb any condensation.

(Perform these steps daily.)

6.2.4) Paraffin Reservoir

1. After use, and normally when the wax level is low, empty the reservoir by continuous operation of the paraffin dispenser IR trigger or foot switch. Collect molten wax in a suitable receptacle.
2. Depress the Heating Elements switch to *OFF* and remove residual wax with an absorbent cloth. (Another suggestion is to allow the excess wax to solidify and then scrap it out with a plastic or wooden implement, such as a spatula. **Do not** use metal implements.)
3. Remove the filter screen and clean the screen using a xylene substitute.
4. Replace the filter screen and refill the paraffin reservoir with molten or pelletized wax.

(Perform these steps every two to four weeks.)

6.2.5) Paraffin Dispenser Infra-red Switch

1. When the instrument is switched off, the dispenser nozzle casing may be wiped using a cloth moistened with a xylene substitute.
2. Inspect the infra-red detection area and remove any accumulated wax over the IR sensor orifices.

(Perform these steps as necessary.)

6.2.6) Cold Plate

1. Switch the instrument off and allow the cold plate to defrost.
2. Condensation that forms on the surface of the plate should drain through special channels on either side of the cold plate area into the drip tray below. Empty the drainage tray, dry and replace. Dry the cold plate surface with an absorbent cloth prior to refreezing.

(Perform these steps daily.)

6.2.7) Housing

1. Switch off the instrument. Using an absorbent cloth moistened with a xylene substitute, clean the surfaces of the casing. **Do not** use excessive amounts of solvent. The membrane touchpad should be cleaned with a cloth moistened with a standard glass cleaner – do not use any cleaner containing solvents!

(Perform these steps occasionally.)

SECTION 7: TROUBLESHOOTING

7.1) Error Codes

Upon detection of an error condition, the TBS PID controller will turn off all modules, sound an alarm, and display an error code in the left hand window. These error codes are defined as follows:

Error Code	Explanation
E0	General System Failure: An internal component failure has been detected.
E1	The Paraffin Reservoir sensor has reported a temperature that exceeds the safe operating range of this instrument (74°C). This may be due to a failed sensor.
E2	The Work Stage sensor has reported a temperature that exceeds the safe operating range of this instrument (74°C). This may be due to a failed sensor.
E3	The Tissue Holding Tank sensor has reported a temperature that exceeds the safe operating range of this instrument (74°C). This may be due to a failed sensor.

WARNING: *There are no user serviceable parts inside this instrument. If the instrument reports any of the above errors, turn off the instrument immediately and call Service.*

7.2) Problem / Solution

7.2.1) General

Symptom	Probable Cause	Solution
<ul style="list-style-type: none"> No heating or cooling, no indicator lights glowing, power switch in <i>ON</i> position, and mains supply connected 	<ul style="list-style-type: none"> Blown fuse in plug or power inlet socket 	<ul style="list-style-type: none"> Replace fuse or fuses (<i>NOTE:</i> correct any circuit fault before replacing any fuses)

7.2.2) Wax Delivery Function

Symptom	Probable Cause	Solution
<ul style="list-style-type: none"> No wax delivery from nozzle after 30-40 minutes and stage illumination is turned OFF 	<ul style="list-style-type: none"> Delivery switch in <i>OFF</i> position 	<ul style="list-style-type: none"> Activate switch to <i>ON</i> to activate wax delivery and stage illumination
<ul style="list-style-type: none"> Same as above but with no digital display showing on paraffin dispenser temp controller 	<ul style="list-style-type: none"> Blown fuse in circuit 	<ul style="list-style-type: none"> Replace fuse

7.2.2) Wax Delivery Function (*continuation*)

Symptom	Probable Cause	Solution
<ul style="list-style-type: none"> No wax from delivery after 30-40 minutes, and stage illumination is turned ON 	<ul style="list-style-type: none"> Closed wax flow regulator Tap heater inoperative Solenoid coil inoperative Blocked delivery nozzle 	<ul style="list-style-type: none"> Turn screw counterclockwise Call Service Call Service Attach short length of tubing to spout; with isolator switch <i>ON</i>, operate foot control and blow gently through tube (Note: cover paraffin reservoir)
<ul style="list-style-type: none"> No illumination on work stage after dispensing has been activated 	<ul style="list-style-type: none"> Blown fuse in transformer circuit 	<ul style="list-style-type: none"> Call Service
<ul style="list-style-type: none"> Foot control not operating IR trigger functioning normally (flow valve can be heard) but wax is still dripping from dispensing nozzle 	<ul style="list-style-type: none"> Pressure bulb leaking air Debris trapped inside valve 	<ul style="list-style-type: none"> Remove and refit foot control; replace if problem persists Dispense wax for 1-2 minutes to clear debris
<ul style="list-style-type: none"> No wax delivery from nozzle onto clear plastic base molds 	<ul style="list-style-type: none"> Base molds are being held up in the air gap; they cannot be detected, because they are transparent to the infra-red triggering sensor 	<ul style="list-style-type: none"> When using clear plastic base molds, place them on the work stage surface
<ul style="list-style-type: none"> No heating functions, and no heating functions indicated on digital display and Cold plate operating 	<ul style="list-style-type: none"> Main heater switch in <i>OFF</i> position 	<ul style="list-style-type: none"> Depress HEATING ELEMENTS switch to <i>ON</i> position
<ul style="list-style-type: none"> No digital display showing for a specific function and Mains heater switch is <i>ON</i> 	<ul style="list-style-type: none"> Blown fuse 	<ul style="list-style-type: none"> Replace fuse
<ul style="list-style-type: none"> Wax melting temperature is not achieved after 30-40 minutes 	<ul style="list-style-type: none"> Temperature set point too low for melting point of wax 	<ul style="list-style-type: none"> Increase temperature set point to a higher value

7.2.3) Heating Elements

(Wax bath, work stage, paraffin reservoir)

Symptom	Probable Cause	Solution
<ul style="list-style-type: none"> For a specific function no heating achieved and a fault error is displayed 	<ul style="list-style-type: none"> Failed heating element 	<ul style="list-style-type: none"> Call Service
<u>Warming Oven Only</u>		
<ul style="list-style-type: none"> Not heating (other functions operate normally) 	<ul style="list-style-type: none"> Failed heating element 	<ul style="list-style-type: none"> Call Service
<u>Forceps Warmer Only</u>		
<ul style="list-style-type: none"> Not heating (other functions operate normally) 	<ul style="list-style-type: none"> Failed heating element 	<ul style="list-style-type: none"> Call Service

7.2.4) Cooling Functions

Symptom	Probable Cause	Solution
<ul style="list-style-type: none"> No cooling function, heating functions operative and cold plate LED is off 	<ul style="list-style-type: none"> Cold plate switch in <i>OFF</i> position Blown fuse in cold plate circuit 	<ul style="list-style-type: none"> Depress switch to <i>ON</i> position Replace fuse
<ul style="list-style-type: none"> No cooling function, heating functions operative and cold plate LED is on 	<ul style="list-style-type: none"> Overload protection tripped on (cut-out) Blocked air grill or inlet grill near source of heat 	<ul style="list-style-type: none"> Ensure grills are free from obstruction Remove instrument from source of heat
<ul style="list-style-type: none"> Inadequate or not cooling function - control output indicator is intermittent 	<ul style="list-style-type: none"> Temperature control set point too high 	<ul style="list-style-type: none"> Adjust temperature control set point lower
<ul style="list-style-type: none"> Inadequate or no cooling function, while compressor operating LED indicator are continuously on 	<ul style="list-style-type: none"> Very high ambient temperature Blocked air grill or inlet grill near source of heat 	<ul style="list-style-type: none"> Relocate instrument to an area with lower ambient temperature Ensure grills are free and away from any heat source
<ul style="list-style-type: none"> Compressor not operating, fan audible, and control output indicator and LED indicator is continuously on 	<ul style="list-style-type: none"> Compressor overload protector faulty 	<ul style="list-style-type: none"> Call Service

SECTION 8: CONTACT INFORMATION

Customer service (919) 384-9393

Fax (919) 384-9595

Mailing address Triangle Biomedical Sciences, Inc.
3014 Croasdaile Drive
Durham, NC 27705 U.S.A.

Sales and product information sales@trianglebiomedical.com

Customer service questions service@trianglebiomedical.com

All other inquiries info@trianglebiomedical.com

Please visit us at

<http://www.trianglebiomedical.com>