HistoPro® 650 H
Tissue Embedding Center Hot Unit

Operator's Manual

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1 Important Information

1.1 Intended Use:

The HistoPro 650 Tissue Embedding Center (The Embedding Center) is a modular system to be used for embedding processed tissue in paraffin to prepare the tissue blocks for sectioning.

There are two modules in HistoPro® 650 Embedding System.

1. HistoPro 650 H (The Hot Module) is the Hot Module of the system that contains the paraffin tank, two warming trays that can be used either as a mold oven or a cassette bath, two forceps holders, heated work surface and a peltier cooled cold spot. The tissue embedding is performed on this module.
2. HistoPro 650 CS (the Cold Module) is the Cold Module of the system that contains the cold plate.

Each unit is a standalone unit with its own display and rotary switch knob for programming and set up. Each unit can be operated independent of the other.

This manual covers the operation of the HistoPro 650 H only.

The Hot Unit may be operated only according to the instructions contained in this manual. Any other use of the Hot Unit is considered improper!

1.2 Qualification of Personnel

- • HistoPro® 650 H may be operated by trained laboratory personnel only.
- • All laboratory personnel designated to operate HistoPro® 650 H must read this Operating Manual carefully and must be familiar with all technical features of the Embedding Process and this Hot Module before attempting to operate it.

1.3 Warranty Information

RUSHABH Instruments' (RI) HistoPro® 650 H is warranted against defects in materials and workmanship, under its prescribed use and operating conditions, for a period of twelve months from the date of shipment. RI will repair or replace products that prove to be defective within the warranty period without charge **when shipped prepaid** to the RI office.

If the product is not registered by filling out and sending the warranty card to RUSHABH Instruments, it will be warranted for a period of twelve months from its manufacturing date.

<u>Warranty Exceptions</u>

- Consumables – bulbs, fuses, tubing, reagent containers, slide carriers, and other items of an expendable nature are not covered under this agreement.
- Failure or the damage caused by User's failure to provide ample electrical power at constant voltage, consistent with the specifications of the product is not covered under this agreement.
- Scratches, dents, and similar surface finish damage during normal use of the system are not covered under this agreement.

- Failure or the damage caused by any use other than the intended use specified in this Manual, Misuse and unauthorized repairs or alterations are not covered under this agreement.
- Acts of nature such as lightning strikes and floods are not covered under this agreement and should be covered under owner's separate insurance policy.

All RI products are sold on the condition that they be used and disposed of only within the scope of currently recognized, critical standards related to human health, local regulations and the physical environment.

EXCEPT FOR THE WARRANTY ABOVE, RI MAKES NO OTHER WARRANTY OF ANY KIND WITH REGARD TO ITS PRODUCTS WHETHER EXPRESS, ARISING BY OPERATION OF LAW, OR IMPLIED BY COURSE OF DEALING, USAGE OF TRADE, OR OTHERWISE, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.
RI SHALL NOT IN ANY CIRCUMSTANCE BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES.
RI's LIMITS ITS LIABILITY UNDER THIS WARRANTY TO THE PURCHASE PRICE PAID BY ITS CUSTOMER.

Contact our Technical Service Department for more information regarding your warranty.

Technical Service Department
RUSHABH Instruments, LLC.
25 Richard Road
Ivyland PA 18974
Phone: (215) 491-0081

1.4 Definition of Various Symbols

	Attention: This Symbol on the system and in the manual showing the warning triangle indicate that the correct operating instructions (as defined in this manual) must be followed when operating or replacing the item marked. Failure to adhere to these instructions may result in an accident, personal injury, damage to the system or accessory equipment.
	Caution: Electric Shock Hazard. Disconnect Line Cord before Servicing. Refer Servicing to Qualified Service Personnel. To avoid the risk of injury from electric shock, do not open this enclosure.
	Hot Surface: Surfaces may be very hot to touch.
	Alternating current symbol.
	Protective Conductor Terminal Symbol. For the safety of the operator, ensure that the earth ground is always connected at this terminal.
	Power Supply ON indication. Push the Power ON/OFF switch in the direction marked with this symbol to turn the unit power on.
	Power Supply OFF indication. Push the Power ON/OFF switch in the direction marked with this symbol to turn the unit power off.

1.5 Other Notes:

- **WARNING: Please read this manual carefully before using the HistoPro® 650 H.**
- **The manufacturer reserves the right to alter the HistoPro® 650 H specifications without notice.**
- **In order to improve the product performance and to increase the ease of use, several software and hardware functions may have been enhanced after this manual was printed. If you find any discrepancy with actual operation of the system and the description given in the manual, please contact our Technical Service Department.**

Cleaning: Apply aqueous solutions to a clean cloth for cleaning of all working and non-working surfaces. DO NOT SPRAY OR POUR ANY LIQUIDS INCLUDING ANY CLEANING AGENT ON ANY PART OF THE UNIT. Sterilization of HistoPro® 650 H or its individual components is not required.

Spillage: In the event of spillage of any fluid or paraffin, the system must be disconnected from the mains supply immediately and not reconnected or used until examined and tested by an Authorized Service Engineer. Failure to do this may result in a fire hazard.

Servicing: HistoPro® 650 H contains no user serviceable components. Contact our Technical Service Department or an Authorized Service Engineer for all service requirements.

2 Hot Module Components and Specifications

The HistoPro® 650 H Hot Module is designed for stand-alone use for paraffin embedding processed tissues.

2.1 Overview of Functional Areas of the Hot Module

(Refer to Figure 1 on page 7 and Figure 2 on page 7)
The HistoPro® 650 H Hot Module has the following functional areas.

1. **Paraffin Tank:** This tank holds 6 liters of melted paraffin. The temperature of the Paraffin Tank can be set independently of any other areas of the system. A filtering screen is included in the system to minimize the risk of getting debris in the system. Melted paraffin is gravity fed from the tank.

2. **Left Bath:** The large Left Bath of the Hot Module can hold a basket from virtually any Tissue Processor. A two-section lid of the bath is designed to provide a comfortable opening while keeping most of the tissues under the larger section of lid. The lid fully opens for loading the basket and for cleaning the bath and can be easily removed from the system also. The temperature of the Left Bath can be set independent of any other areas of the system.

3. **Right Bath:** The large Right Bath of the Hot Module can hold a basket from virtually any Tissue Processor. A two-section lid of the bath is designed to provide a comfortable opening while keeping most of the tissues under the larger section of lid. The lid fully opens for loading the basket and for cleaning the bath and can be easily removed from the system also. The temperature of the Right Bath can be set independent of any other areas of the system.

4. **Carry Tray:** The carry tray can be used to transport cassettes from the Tissue Processor and may be placed in the left bath or the right bath.

5. **Work Surface:** The heated Work Surface allows for a large open space to embed the tissue. The temperature of the Work Surface can be set independent of any other areas of the system.

6. **Left and Right Waste Trays:** Excess paraffin will accumulate in the channels of the Work Surface and drain through the Work Surface Drain Tubes into either the Left or Right Waste Tray.

7. **Paraffin Dispense Head, Dispense Activator, and Flow Rate Adjustment Knob**: The Paraffin Dispenser is placed behind the center of the Work Surface, and the Paraffin Dispense Head is located overtop the center of the work surface. The Paraffin Dispenser can be activated by pushing the Paraffin Dispense Activator plate, or can be activated by pressing the optional foot switch. Paraffin dispense rate can be adjusted by rotating the Flow Rate Adjustment Knob.

8. **Forceps Holders:** There are two self-draining, heated forceps holders for keeping the forceps paraffin free. The Forceps Holders are ergonomically placed, one on each side of

the Paraffin Dispense station to allow for easy access and to minimize the wrist movement for either left or right handed operation. Excess paraffin from the forceps holders drain on the work surface. The temperature of the Forceps Holders can be set independent of any other areas of the system.

9. **Cold Spot:** A Cold Spot, cooled by a Peltier device, is situated directly in front of the center of the work surface towards the operator. The area is thermally insulated from the rest of the work surface and cools down to $5^{\circ}C \pm 5^{\circ}C$. The operator cannot change the setpoint of this area.

10. **Insulated Wrist Support:** A thermally insulated wrist support minimizes the risk of burns and provides comfort during the Embedding Process.

11. **LCD Display, Control Knob:** A blue and white LCD and a Rotating Knob are used to set up the system parameters and to display the system status using proprietary Turn And Push (TAP) operator interface. The details of the system set up using TAP are provided in other sections of this manual.

12. **Front Power Switch:** A front power switch is in the front of the unit to conveniently turn the unit on and off.

13. **Rear Panel:** The following connectors are located on the rear panel of the Hot Module as shown Figure 3 on Page 8.
    a. Power Entry Module consisting of power cord inlet, rear power switch and fuse holder.
    b. Connector to Plug-in foot switch

Front of Unit

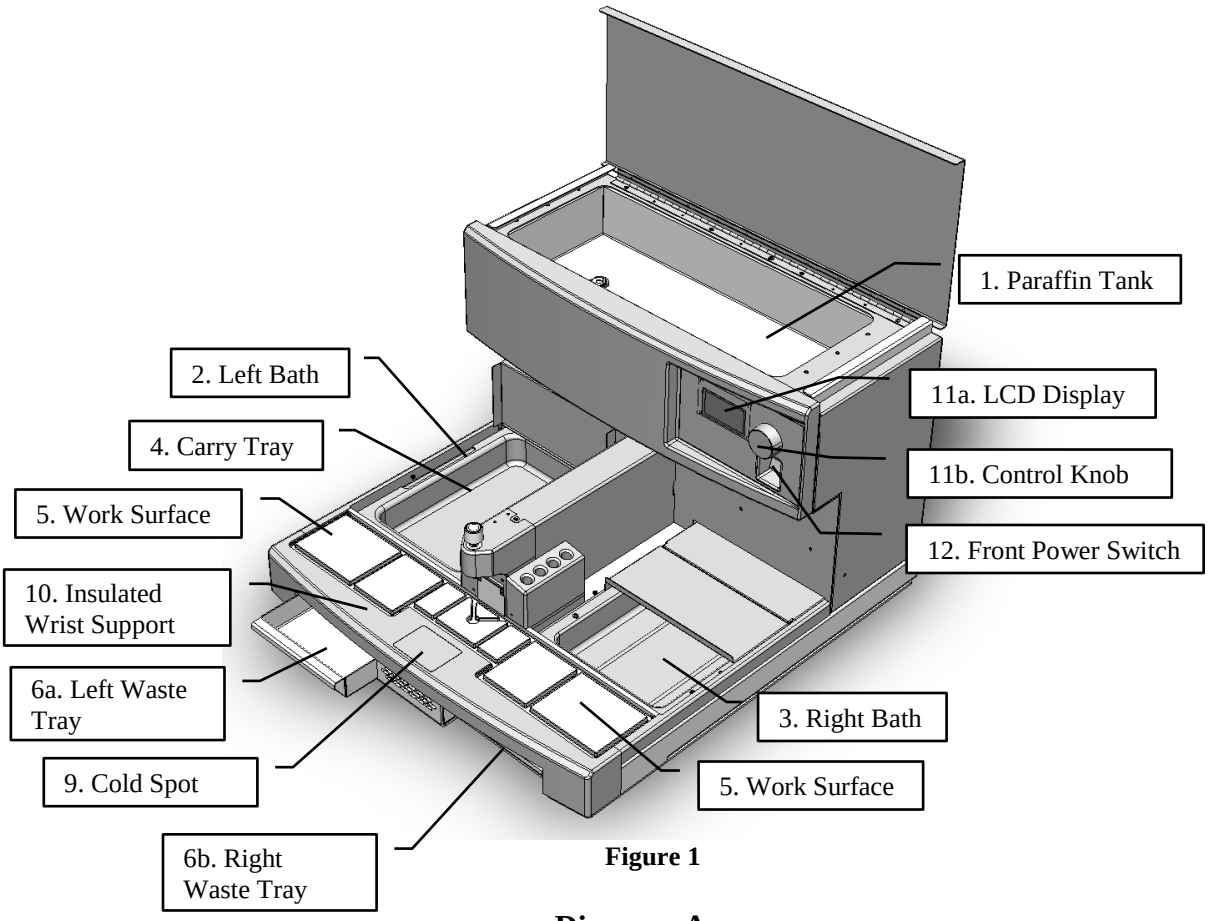

Figure 1

Dispense Area

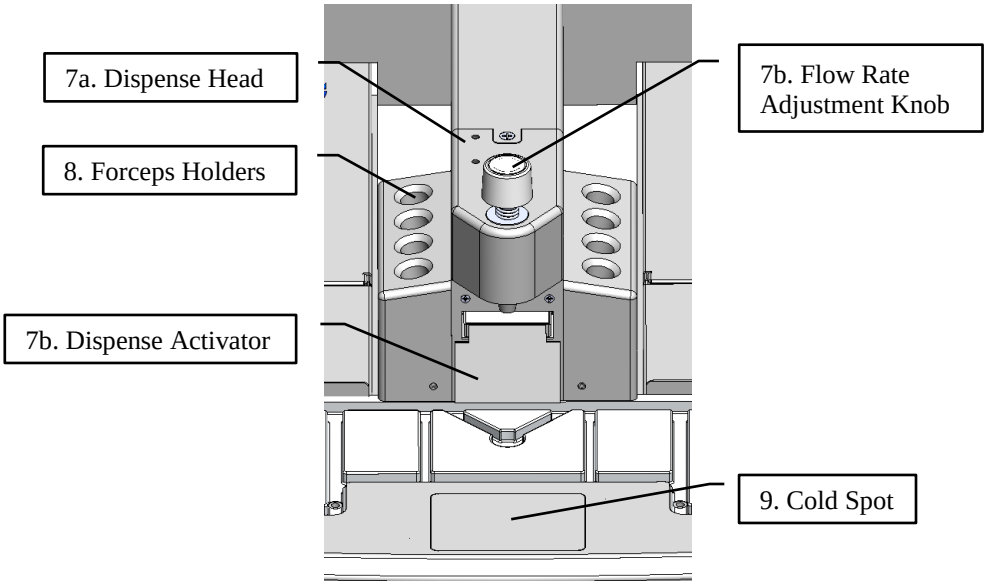

Figure 2

Back of Unit

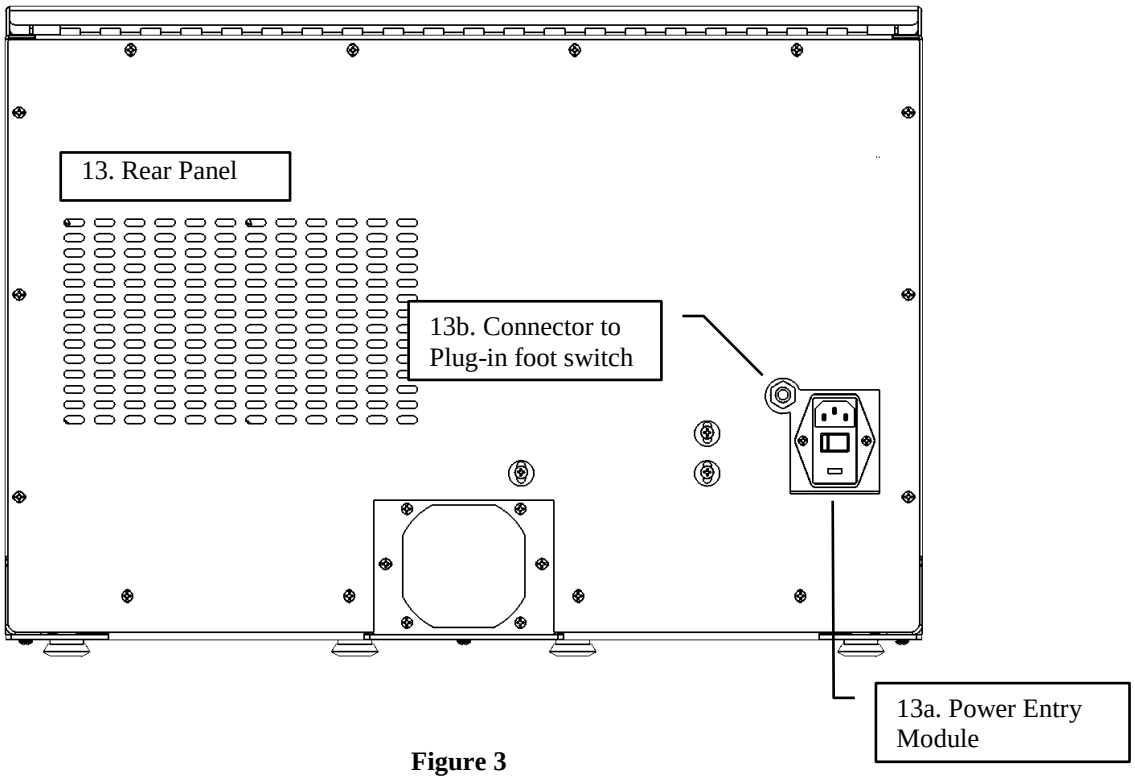

Figure 3

2.2 Technical Specifications

2.2.1 Electrical Characteristics

Power Input:

Voltage	AC, 115 volts or 230 volts (Factory set for either 115 volt or 230 volts operation, not user changeable), 60 or 50 Hz respectively
Current	8 Amps max for 120 volts input, 5 Amps max (RMS) for 230 volts input
Power	800 watts max

Fuse Rating:

110 Volt Unit	8 Amp x 250 volts Slo-Blo
220 Volt Unit	5 Amp x 250 volts Slo-Blo

Display:

Power	5 volts DC
Current	0.5 amp
Resolution	8 lines x 20 characters per line
Type	LCD with LED back light

Navigation:

Rotary encoder with a shaft mounted push switch

2.2.2 Physical Characteristics

Dimensions

Width	23" (58 cm)
Depth	25" (64 cm)
Height	16" (41 cm) lid closed, up to 24” (61 cm), lid open

Weight:

Actual Weight	45 lbs (21 kg)
Shipping Weight	50 lbs (23 kg)

Capacity

Paraffin Tank	6 Liters
Left Bath	7” (17.7 cm) wide x 10” (25.4 cm) long x 2” (5.1 cm) tall (from base of bath to Left Bath Cover
Right Bath	7” (17.7 cm) wide x 10” (25.4 cm) long x 2” (5.1 cm) tall (from base of bath to Right Bath Cover
Cold Spot	2.75” x 2”

User Selected Temperature Ranges in Degrees Celsius:

Area	Temperature Range
Paraffin Tank	40° C – 70° C
Left Bath	40° C – 70° C
Right Bath	40° C – 70° C
Forceps Holders	40° C – 70° C
Work Surface	40° C – 70° C

2.2.3 Environmental Conditions:

All HistoPro 650 H products are laboratory instruments and should be used in Medical / Histo-Pathology laboratory with the following conditions.

Ambient Temperature	15 to 40° C.
Relative Humidity	20-85% non-condensing.
Ambient Pressure	28”-32” (70-80 mm) of Hg

2.2.4 Storage/Transportation Conditions:

Temperature	10° to 40° C
Humidity	15% to 80% non-condensing
Pressure	28” to 32” (70 to 80 mm) of Hg

2.2.5 Installation Category:

In reference to Installation category as defined in UL 61010-1 standard, HistoPro 650 H products are categorized as Category II systems.

2.2.6 Pollution Degree:

In reference to Pollution Degree as defined in UL 61010-1 standard, HistoPro 650 H products are categorized as Pollution Degree 2 systems.

3 Safeguards and Inspection

(Before doing anything, read this)

3.1 Safeguards

Please read all the instructions 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. Read Warnings
   All warnings on the instrument and in the operating manual should be followed.
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. Power Sources
   This product should be operated from the type of power source indicated on the marking label and the instructions.
8. Grounding
   This product is equipped with a grounded three-wire plug.
9. 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.
10. Overloading
    Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
11. 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.
12. 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.

3.2 Safety Instructions

Make sure to comply with safety instructions and warnings in this chapter. Make sure to read these instructions, even if you are already familiar with the operation and use of other HistoPro® products.

- This instruction manual includes important information related to the operating safety and maintenance of the system and it is an important part of the product.
- This system has been built in accordance with the following safety regulations on electrical measuring, control, regulating and laboratory devices.
    - IEC 61010 – 1, 2nd Edition
- In order to ensure safe operation, the operator MUST observe the instructions and warnings contained in this Operator Manual.
- If additional instructions are required for accident prevention and environmental protection based on the location of the system operation (e.g. local regulations, laws and lab procedures and practices) this manual must be supplemented by appropriate instructions to ensure the compliance with these additional requirements.
- Obtain, review and retain the MSDS for the reagents used from the manufacturers of the reagents. They are also available on the Internet: http://www.msdsonline.com. Follow the safety precautions and disposal recommendations provided in MSDS.

Attention! The protective devices on both system and accessories may neither be removed nor modified. Only authorized and qualified service personnel may repair the system and access the system's internal components.

- All the safety and operating instructions must be read before the system is operated.
- The safety and operating instructions must be retained for future reference.
- All warnings on the system and in the operating manual must be followed.
- All operating and use instructions must be followed.
- Do not use any attachments not recommended by the product manufacturer as they may cause hazards, damage the system and void the warranty.
- Do not use any accessories not recommended by the product manufacturer as they may damage the system and void the warranty.
- This system must be operated from the type of power source indicated on the marking label and the instructions.
- This system is equipped with a grounded three-wire plug. The system must be connected to a grounded outlet for the safety of the operator.
- 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 system.
- Locate the Hot Module in well-ventilated area and away from the wall.
- Ensure that the Power Inlet and the Power Off Switch are easily accessible at all times while the Hot Module power is turned on.
- Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock.
- Do not attempt to service this system yourself as opening or removing covers may expose

you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

- 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 and void any existing warranty.

3.3 Additional Safety Instructions to Handle the Specimens and Chemicals

For safe operation of the system, for the safety of the operator and other personnel in the vicinity of the system and for the laboratory safety the following safety measures must be implemented.

- Keep the Hot Module away from the open flames.
- Do not smoke near the Hot Module.
- Do not eat, drink or smoke near the Hot Module.
-  Follow general laboratory safety procedures and practices for handling samples to process from Biohazard handling perspective.
-  Before shipping the Hot Module for any purpose, always decontaminate following general laboratory safety procedures and practices for handling samples to process from Biohazard handling perspective.
-  Follow general laboratory safety procedures and practices for handling and disposal of the flammable reagents used in used for cleaning the system.
- For safe operation, for the safety of the operator and other personnel in the vicinity of the unit and for the laboratory safety, protective gloves should be worn by the operator since the operator could come in contact with potentially infectious substances.
- Comply with your local and national regulations for the disposal of waste.

3.4 Warnings

The safety devices installed in this system by the manufacturer only constitute the basis for accident prevention. Primarily responsible for accident-free operation is above all the institution which owns the system and, in addition, the designated personnel who operates, services or repairs the system.

To ensure trouble-free operation of the system, make sure to comply with the following instructions and warnings.

Warning – Transport and Installation

	• Attention! The system may only be transported in an upright position. • Two people are needed to lift/carry the system. • Install the system on an even laboratory bench which must be absolutely level and can support 90 lbs (42 Kg) weight. • Do not expose the system to direct sunlight (windows).

	• The system MUST be connected to an earthed mains power outlet socket. The system must not be connected to an extension cord without protective earth conductor. • The system must be set up in a well-ventilated area, free from any ignition sources. • Do not operate the system in rooms with explosion hazard. • If there is a significant difference in temperature between the warehousing and the installation site of the system and if at the same time there is a high air humidity level, condensation water may form. In this case, a waiting period of at least four hours must be observed before the system is switched on. Failure to adhere to this waiting period may result in damage to the system. • Ensure that the system is installed on a vibration-free bench top. • Ensure that there are no significant variations in the room temperature. •

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Warnings – Operating the system

	• Attention! The HistoPro® 650 H may only be operated by trained laboratory personnel, according to its designated use and as per the present instruction manual. • In case of emergency, switch off mains and unplug the power cord. • While working with specimens, appropriate protective gear (lab coat, gloves, safety goggles) must be worn. When handling specimens, safety gloves are to be worn at all times to avoid injury. • Risk of fire, when working with an open flame (Bunsen burner) immediately next to the system (solvent fumes)! Therefore, keep a safety distance of 6 feet (2 meters)!

Warnings – Cleaning and maintenance

	• Attention! Prior to each maintenance and/or cleaning, switch the system off and disconnect mains power. Do not clean the system with solvents containing acetone or xylene. No liquid may be spilled into the internal components of the system – neither during operation nor during cleaning. • When working with cleaning detergents, comply with all safety instruction by the manufacturer of the product and the laboratory management policy. • Spilled solvents have to be wiped away immediately! In case of long-term exposure, the enclosure surfaces are only conditionally resistant to solvents! • To clean the enclosure use mild household detergents; -see safety instruction above for non-appropriate ingredients!

3.5 Inspection

- The HistoPro® 650 H is carefully quality controlled prior to shipping. The highest quality packaging materials have been used to ensure that the equipment is well protected during shipping. Please follow these inspection instructions carefully.
- 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 Hot Module. *Failure to report visible damage may forfeit any claims for internal damages.*
- Inspect the system for any visible damage. If any shipping damage is visible, retain all packing material intact with the Hot Module and file a claim with the final carrier. *Discarding any packaging materials prior to the carrier's inspection may void any shipper liability.*
- Retain all the packaging material for the duration of the warranty period.

3.6 Components Checklist

Each HistoPro 650 H comes with the following components. If an item is missing, please contact RUSHABH Instruments Customer Service immediately at (215) 491-0081.

Item	Quantity
HistoPro 650 H Unit	1
Carry Tray	1
Bath Covers	2
Waste Trays	2
Power cord	1
Operator's Manual with Warranty Registration Card	1
Paraffin Debris Filter for Paraffin Tank	1

4 Installation Procedures

Follow the instructions provided as "SAFEGUARDS" and "INSPECTION" procedures.

1. Follow the instructions provided as "SAFEGUARDS" and "INSPECTION" procedures.
2. Cut through the packing tape to open the box
3. Remove the Accessories, packaging material and operating manual.
4. Remove the instrument from the carton and place on a firm laboratory bench. *When lifting unit, do not put hand under front bezel. Instead, keep both hands behind the front bezel of the unit.*
5. Connect the power cord to the instrument and plug the power cord into the electrical outlet.
6. The system already has the appropriate software necessary to run it installed. It can be turned on by flipping the switch located on the rear panel on the right hand side of the system.
7. The Hot Module is now set up for correct use in accordance with the instructions specified in this Operating Manual.

4.1 Setup

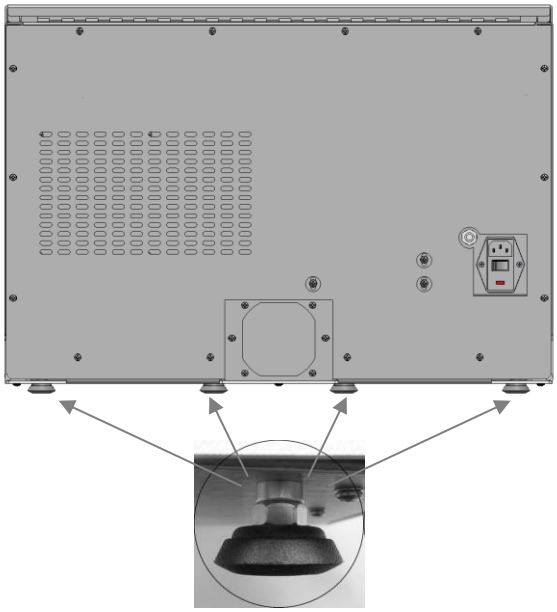
4.1.1 Horizontal Alignment

For safe and accurate work, it is important that all Hot Module feet are in uniform contact with the installation surface.

The Hot Module is horizontally aligned at the factory. If a completely level or horizontal surface is not available at the installation site, the Embedding Center Hot Module must be realigned.

For this purpose, the Hot Module feet are height adjustable.

- For alignment, loosen the locknuts using a size 7/16” open-end wrench
- Adjust the Hot Module feet until the Hot Module is in a stable position at the installation location according to requirement.
- Retighten the locknuts.



4.1.2 Switching on the Hot Module

The Hot Module MUST be connected to a grounded power socket.

Only the power cord provided may be used, which is intended for the local power supply (socket). The protective effect must not be eliminated by an extension cable without a protective grounding conductor.

The AC socket used for power supply must be close to the Hot Module and easily accessible.

- Before plugging the Hot Module into the A/C mains, make sure that the main switch on the rear of the Hot Module is in the OFF (“O”) position.
- Plug the power cable into the A/C mains power supply socket and connect it to the power socket on the wall. If applicable, switch on the switch for the power socket.
- Then switch on the main switch on the Hot Module

- Before plugging the Hot Module into the mains, make sure that the main switch on the rear of the Hot Module is in the OFF (“O”) position.
- Plug the power cable into mains power supply socket and connect it to the power socket on the wall. If applicable, switch on the switch for the power socket.
- Then, switch the main switch on the Hot Module, (ON = “I”).

4.1.3 Control Panel Functions

The control panel consists of a membrane keypad with six keys, and a screen consisting of a two-line display, each line being 16 characters long.

5 Operating the Histopro 650 H

5.1 General Usage

5.1.1 Set-Up Procedure

1. Partially fill the paraffin tank molten or palletized paraffin.
2. Press the power switch at rear of the instrument to the "on" position.
3. Adjust the brightness of the display by using Contrast Adjust Menu in Stand By mode.
4. Set the system in Active mode using TAP interface. (Refer to page 16 for instructions on using TAP interface.)
5. Place metal base molds in the mold warming oven.
6. Allow all components to reach set temperatures before continuing to operate the system.

5.1.2 Operating Procedure

1. Transfer the tissue cassettes from the tissue processor to the left or right bath.
2. Remove one or more cassettes and place them on the work surface at comfortable location.
3. Place a pre-warmed base mold on the work surface and, if applicable, remove the lid from the cassette.
4. Transfer the specimen to the base mold and partially fill with paraffin using paraffin dispense activator near the dispense head or the foot switch.
5. The flow rate of the paraffin may be adjusted by turning the flow rate adjustment knob on the dispense head.

6. Turn it clockwise (to the right) to reduce the flow and counterclockwise (to the left) to increase the flow.
7. Orient the specimen as required, using the cold spot (as necessary) to partially set the paraffin.
8. Place the cassette on the base mold and fill with paraffin.
9. Slide the base molds and cassette onto the cold plate and leave until the paraffin is solidified.
10. Repeat the Operating Procedure until all tissues are embedded.

5.1.3 Shutdown Procedure

1. If the system is to automatically turn on in the morning, set the system in the Standby mode by using TAP. (Refer to page 16 for instructions on using TAP interface.) In the event the system will not be in use for an extended period of time, push the power switch at the rear of the instrument to the "off' position.
2. Follow the daily maintenance procedures outlined in Section 4.

5.2 Changing Default Settings

The HistoPro 650 H Hot Module provides a very User-Friendly Turn And Push (TAP) Operator Interface to set-up and run the system. To select different functions, first turn the Rotary Control Knob (the Knob) to move the cursor (*) to the desired selection. Then push the Knob to make the selection. The display prompts the user about what options are available and how to select one of those options at all times. Several examples at the end of this section will clarify these concepts.

5.3 Operating modes

The system provides 3 operating modes: standby mode, active mode, and waiting mode.

Standby Mode: In the "Standby" mode, the system is ready to be turned ON. All devices (heaters, coolers, and paraffin dispense functions) are turned OFF. Various set-up functions may be performed from Standby Mode. The following options are available in the Standby Mode.

- Adjust the Display Contrast.
- Turn the System ON (enter Active Mode)
- View Temperatures
- Change the Setpoints for Various Areas
- View and Change the System Configuration

(If the system was set up to turn on automatically the next day, the system will automatically enter "Waiting" mode at midnight.)

Waiting Mode: In the "Waiting" mode, the system waits for the appropriate time to turn ON various functions based on the desired Start Time. The Start Time is the time when the system is ready for use. It takes about 2 hours and 30 minutes to melt the paraffin in the Paraffin Tank. Based on this performance data, the system will turn ON the heaters 3 hours prior to the programmed Start Time. Once the heaters are turned ON in the Waiting Mode, a message is displayed to indicate that all paraffin may not be melted until a certain time. In the event of a power interruption during this mode, a similar message is displayed to alert the operator.

Active Mode: In the "Active" mode, the system controls the temperatures of various zones at their respective set points. Dispense the paraffin by pushing the Paraffin Dispense Activator near the dispense nozzle or by pressing the foot switch. The dispense area light is also turned ON in this mode. The following options are available in Active Mode.

- Turn the System OFF (enter Standby Mode)
- View Temperatures
- Change the Setpoints for Various Areas
- Set the Time of Day and the Automatic Start Time
- View and Change the System Configuration

When the system enters the Active Mode (from Stand By, from power up, or from power interruption) the following message is displayed to alert the user that paraffin may not be fully melted in the Paraffin Tank.

```
ACTIVE          06:25

WARNING:

WAX MAY NOT
BE READY UNTIL 07:00

PUSH KNOB TO PROCEED
```

5.4 Display Examples

In the following paragraphs, several examples of displayed information in various modes as well as examples of some set-ups will be displayed. The actual display on the system may vary, reflecting the actual information at the time of set-ups, as well as the software version of the system.

Standby Mode Display:

```
STANDBY:        17:05

  DISPLAY CONTRAST
* TURN SYSTEM ON
  TIMES
  TEMPERATURES
  CONFIGURATION
PUSH OR ROTATE KNOB
```

When the Knob is turned clockwise (or to the right), with every click, the cursor ("*") moves down to the next selection; if the Knob is turned counter clockwise (or to the left), the cursor will move up to the next selection. In either case, the cursor wraps around.

Once the cursor is next to the desired selection, just push the Knob to select the options. For example, the Knob is pushed when the cursor is next to "TURN SYSTEM ON" selection, the system will go into Active Mode.

Active Mode Display:

```
ACTIVE:        17:05

  LED DIMMER
* TURN SYSTEM OFF
  TIMES
  TEMPERATURES
  CONFIGURATION
PUSH OR ROTATE KNOB
```

5.4.1 Display Contrast Adjust

To adjust the contrast of the display, while the system is in the Standby mode, select, "DISPLAY CONTRAST" using the TAP method. Rotate the knob to adjust the contrast. This selection is available in the Standby Mode only.

```
CONTRAST ADJUST:


   ROTATE TO ADJUST.
   PUSH TO ACCEPT.
```

5.4.2 LED Brightness Adjust

To adjust the brightness of the LED light in the dispense head, while the system is in the Active mode, select "LED DIMMER" using the TAP method. Rotate the knob to adjust the brightness. This selection is available in Active Mode only.

```
LED BRIGHTNESS
10 BRIGHTNESS LEVEL

   ROTATE TO ADJUST.
   PUSH TO ACCEPT.
```

5.4.3 Time Menus

To set the time of day or the automatic start time, select "TIMES" from either the Active or the Standby mode display using the TAP method. After selecting the "TIMES" selection using the TAP method, the following TIME menu will be displayed.

```
TIME:          17:05

OPTIONS:
* SET CLOCK
  SET START TIME
  EXIT

PUSH OR ROTATE KNOB
```

5.4.4 Setting Time of Day and day of week

The "SET CLOCK" menu is used to set the current time of day and day of the week. When this option is selected using the TAP method, the following display is presented.

```
SET CLOCK      17:05

* ADJUST HOURS
  ADJUST MINUTES
  ADJUST DAY
  EXIT

PUSH OR ROTATE KNOB
```

To change the hours of the time, select "ADJUST HOURS" from the menu using the TAP method. The following SET CLOCK menu is displayed.

Rotate the Knob to the right (or clock wise) to increase the time in one-hour increments, or to the left (or counter clockwise) to decrease the time in one-hour increments. When the desired hours are displayed, push the Knob to accept this as the hours for the time. *Note that this system runs on a twenty four hour clock when setting the hours of the time of day.* After setting the hours, the following information will be displayed. Note that the cursor is displayed next to the next logical choice, "ADJUST MINUTES".

```
SET CLOCK:     17:05

  ADJUST HOURS
* ADJUST MINUTES
  ADJUST DAY
  EXIT

PUSH OR ROTATE KNOB
```

Set the minutes of the time following the same procedure as used to adjust hours. To set the current day of the week, select the "ADJUST DAY" option using the TAP method from the SET CLOCK menu**. In order to turn the system ON automatically at preset "Start Time" on selected days of the week, it is necessary that the day of the week be set properly.** The following information is displayed when the "ADJUST DAY: option is selected.

```
SET CLOCK:      17:05

ADJUST DAY:  MONDAY

  ROTATE TO ADJUST.
  PUSH TO ACCEPT.

PUSH OR ROTATE KNOB
```

Set the day of the week using the TAP method. After pushing the Knob, the SET CLOCK menu will be displayed. Select "EXIT" to exit the SET CLOCK menu and return to the main menu in Standby or Active mode, that is, the Standby mode display or the Active mode display.

5.5 Temperature Menus

The next several paragraphs show various selections of Temperature Menus. Using Temperature Menus, the temperatures of various areas may be viewed, and the set points of these zones may be adjusted. To do any of these tasks, select "TEMPERATURES" from the Standby mode display or the Active mode display. After choosing the "TEMPERATURES" selection using the TAP method, the following TEMPERATURE menu will be displayed

```
TEMPERATURES:

OPTIONS
* VIEW TEMPERATURES
  ADJUST SETPOINTS
  EXIT

PUSH OR ROTATE KNOB
```

The default settings and allowable ranges for different variables are listed in the following table.

Zone	Default Temperature	Adjustment Range
Paraffin Tank	65° C	40° C – 70° C
Left Bath	65° C	40° C – 70° C
Right Bath	65° C	40° C – 70° C
Forceps Warmer	65° C	40° C – 70° C
Work Surface	65° C	40° C – 70° C
Dispense Valve and Paraffin Feed tube	3° C above Paraffin Tank setpoint	+/- 5° C above Paraffin tank temperature set by user in Configuration

		menu in Valve Offset sub-menu
Dispense Nozzle	Same as Paraffin Tank temperature setpoint	not user adjustable
Cold Spot	5° C	not user adjustable

5.5.1 Viewing Temperatures

To view the current temperatures of the system, select "VIEW TEMPERATURES" using the TAP method from the TEMPERATURE menu. The following menu will be presented.

```
VIEW TEMPS
          TANK    58
          L BATH  50
          R BATH  60
          FORCEPS 65
          SURFACE 62

PUSH TO EXIT
```

5.5.2 Setting Temperatures

To adjust the set temperatures, select "ADJUST SETPOINTS" form the TEMPERATURES menu using the TAP method. The following SETPOINTS menu will be presented after doing this.

```
SETPOINTS:
        * TANK    58
          L BATH  50
          R BATH  60
          FORCEPS 65
          SURFACE 62

          EXIT
```

Select the zone for which a different set point is desired by turning the Knob; when the cursor is next to the desired zone, push the Knob to select it. The following information will be displayed.

```
ADJUST SETPOINTS:


        WAX TANK: 62

TURN KNOB TO ADJUST
PUSH TO SET AND EXIT
```

Rotate the Knob to increase or decrease the temperature set point. Rotate it to the right to

increase the temperature in 1° C increments and to the left to decrease the temperature set point in 1° C increments. When the desired set temperature is displayed, push the Knob to set this value as the new temperature setpoint for this zone. The new temperature setpoint will be displayed on the screen. The setpoints of the other zones in a similar manner may be adjusted using the TAP method. Once the desired setpoints have been set, exit the SETPOINTS menu by selecting EXIT from this menu using the TAP method. Then exit to the Standby mode display or the Active mode display by selecting "EXIT" from the TEMPERATURES menu using the TAP method.

5.6 Configuration Menu

The Configuration Menu is used to set the days of the week on which the system should automatically turn on. Information necessary for the calibration of temperature sensors and helpful information for troubleshooting the system is accessible from this menu also. To perform any of these procedures, select CONFIGURATION from the Standby mode display or the Active mode display using the TAP method. The following CONFIGURATION menu will be displayed.

```
CONFIG:
      * AUTOSTART
        STATUS
        VALVE OFFSET
        CAL SENSORS
        EXIT

PUSH OR ROTATE KNOB
```

5.6.1 Setting automatic start

To change the configuration of the system regarding its autostart times, select "AUTOSTART" from the CONFIGURATION menu using the TAP method. The following menu will then be presented.

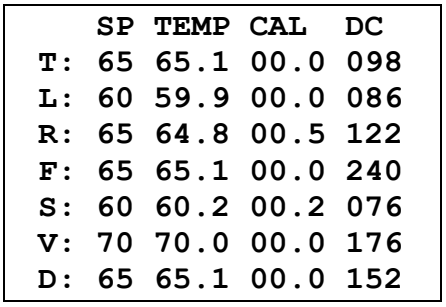
```
AUTOSTART:

* N SUN       Y THU
  Y MON       Y FRI
  Y TUE       N SAT
  Y WED         EXIT

PUSH OR ROTATE KNOB
```

If the system is scheduled to automatically turn on, a "Y" will be displayed to the left of the day of the week. An "N" will be displayed to the left of the day of the week it is not scheduled to automatically turn on. To change any of the settings regarding autostart, rotate the Knob to move the asterisk up and down. When the asterisk is beside the day of the week that needs to change, push the Knob to change the settings from "Y" to "N" or from "N" to "Y." When all necessary adjustments are made, exit this menu and return to the CONFIGURATION menu by

selecting EXIT using the TAP method. To return to the Standby mode menu or the Active mode menu, select "EXIT" again from the CONFIGUATION menu using the TAP method.

5.6.2 Viewing System Status

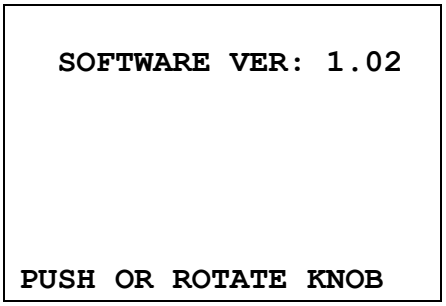
WARNING: The settings under this CONFIGURATION menu should not be altered by anyone other than personnel of the RUSHABH Instruments Technical Service Department.
The status screen shows what happens in the system. This information is useful to troubleshoot possible problems in the system. To access this screen, select "STATUS" from the CONFIGURATION menu using the TAP method. The following screen will be displayed.



The following table displays the abbreviations showed on this screen and what they stand for.

Term	**Abbreviation**
T	Paraffin **T**ank
L	**L**eft Bath
R	**R**ight Bath
F	**F**orceps Holders
S	Work **S**urface
V	Paraffin Dispense **V**alve
D	**D**rain Block
SP	**S**et **P**oint
TEMP	Current **Temp**eratures
CAL	**Cal**ibration Offset Valve
DC	Heater **D**uty **C**ycle

Push the Knob to exit the screen and return to the CONFIGURATION menu. Rotate the Knob to view information on the software version of the system as in the following display.



If the Knob was rotated to the above screen, push the Knob to exit and return to the CONFIGURATION menu. To return to the Standby mode menu or the Active mode menu, select "EXIT" again from the CONFIGUATION menu using the TAP method.

5.6.3 Setting Valve Offsets

To set how hot the dispense valve gets above paraffin tank set points, select "VALVE OFFSET" from the CONFIGURATION menu using the TAP method. The following menu will be presented.

```
VALVE OFFSET:

05 DEG ABOVE TANK SP

* MODIFY OFFSET
  EXIT

PUSH OR ROTATE KNOB
```

The current offset temperature is displayed on this screen. In this example screen, the offset is "05 DEG ABOVE TANK SP" meaning that it is five degrees above the setpoint of the tank. To change the valve offset set as displayed in the system, select "MODIFY OFFSET" using the TAP method. The following menu will be presented.

```
VALVE OFFSET:


05 DEG ABOVE TANK SP


TURN KNOW TO ADJUST
PUSH TO SET AND EXIT
```

Rotate the Knob to the right to increase the offset in 1^{o} C increments, or to the left to decrease the offset in 1^{o} C increments. When the desired offset is displayed, push the Knob to accept. Pushing the Knob will also exit this screen and display the CONFIGURATION menu. Select "EXIT" using the TAP method from the CONFIGURATION menu to return to the Standby mode display or the Active mode display.

5.6.4 Calibrating Sensors

This selection allows the manufacturing technician to set calibration off set for calibration sensors at the time of manufacturing. To access this, select "CAL SENSORS" from the CONFIGURATION menu. The calibration values for the proper operation of the system should not be changed. Please contact our Technical Service Department for assistance for this selection.

6 Maintenance Instructions

6.1 General Information

DO practice good housekeeping and maintain the instrument in a clean condition

DO wipe off spilled solvents immediately

DO switch off the power supply and unplug the power cord when the instrument is not in use

DO dispose of spent reagents in accordance with the laboratory guidelines in force in your country!

DO ensure that replacement fuses are of the correct specification

DO NOT use excessive amounts of solvent for cleaning

DO NOT use metal scraper to scrape off any residue on different surfaces

DO NOT use the instrument for purposes other than its designed function

DO NOT allow liquid to come into contact with the electrical connections or get inside the instrument

6.2 Cleaning Procedures

HistoPro 650 H is designed to minimize paraffin accumulation. However, paraffin will inevitably accumulate on various surfaces of the system. Please use the following instructions and cleaning procedures carefully.

- Disconnect line cord from instrument when cleaning. The instrument should always be disconnected from the main power supply when cleaning, particularly if flammable solvents are used.

- Use only minimal quantities of solvent on an absorbent cloth. Most paraffin solvents will attack paint, plastic and other insulating materials. While the instrument is sealed against egression of paraffin during normal working conditions, protection against excessive amounts of solvents cannot be guaranteed. We recommend using a xylene substitute for cleaning the instrument.

- Use only plastic or wooden scrapper to scrape off paraffin. DO NOT use sharp metal edges that can scratch the surfaces, paint and plastic parts.

- First scrape off excess paraffin build up from all surfaces. Wipe off the remaining paraffin using an absorbent cloth. Wipe the surfaces clean with a cloth moistened with a xylene substitute.

6.2.1 Additional Cleaning Procedures

Perform the following procedure to clean the cassette bath as required.

To remove the paraffin from the left or right bath turn the system off and let the paraffin solidify in the cassette bath. Once the paraffin has solidified and below 40 deg. C temperature, turn the system ON again. When the cassette bath reaches about 50 deg. C temperature, peel off the paraffin from the cassette bath. Depending on the type of paraffin, the paraffin will come out as one block very easily with very little residue left behind. Left over paraffin can be wiped off with a paper towel.

Occasionally 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.

6.3 Routine Maintenance

- No routine maintenance is necessary for the Hot Module.
- Keep the unit clean of any liquids in the path of the moving parts.
- In the event of a spillage of the liquids inside the unit, allow the qualified service technician to inspect and clean the Hot Module to ensure safe operation and long operational life of the Hot Module.

Troubleshooting GuideThe HistoPro® 650 H is equipped with a simple fault detection system, and can identify certain movement errors automatically.

- If an operation error is detected, the transfer mechanism will first stop moving.
- It will then back up a short distance, stop again, and then move forward in a second attempt to reach the desired position.
- If this error recovery attempt is successful, processing continues normally.

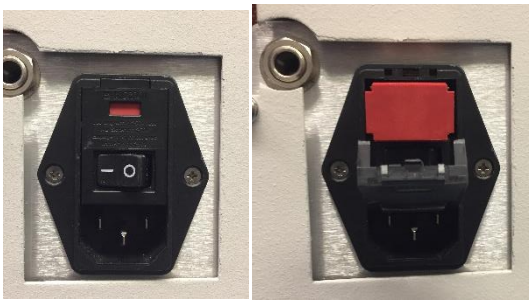
6.4 Fault Detection and Correction List

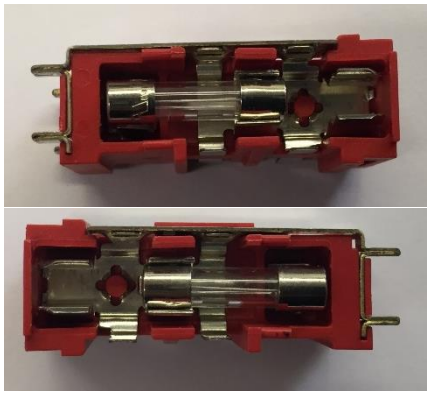
No	Symptom:	Probable Causes:	Suggested Actions:
1	• Unit does not power up	• The Power cord is not plugged into wall outlet properly. • Power cord is not plugged into the Hot Module properly. • Fuse is blown. • The power supply in the Hot Module is defective.	• Check the power cord connections at both ends. Replace the power cord if necessary. • Replace the fuse with the fuse of the same rating. Investigate why the fuse blown in the first place and remedy the situation before powering the unit again. • Contact authorized service personnel for repairs.
2	• Display appears to be blue, however, cannot see any text on the display.	• Contrast adjustment may be necessary • Defective Control PCB.	• Adjust the contrast using procedure described in paragraph 5.4.1. • Contact authorized service personnel for repairs.
3	• Keypad does not respond to rotary knob	• Defective rotary knob or a defective Control PCB.	• Contact authorized service personnel for repairs.

6.5 Power Failure

- Check whether there is a general power failure (no power)
- Check whether the power cord is inserted correctly into the power socket and whether the power socket is switched on, if applicable.
- Check whether the power cable is plugged into the socket on the Hot Module properly.
- Check whether the power switch is switched on correctly.
- Some Hot Module malfunctions/failures are caused by defective fuses. Check whether one or both secondary fuse(s) is/are defective.

Before replacing a fuse, always switch the Hot Module off and unplug from power supply. Defective fuses may be replaced only with the replacement fuses supplied together with the Hot Module.





To replace a fuse, proceed as follows:

- With a screwdriver, carefully push out the Hood of the fuse cover at rear of Hot Module and open it downwards.
- With the screwdriver, pop out the red fuse holder assembly – it contains two fuses on the left and right side.
- Check that the thin wire in the glass capillary of a fuse is intact. If not the fuse must be replaced. Replace any fuses that are not intact

Before plugging the power cable back in and switching on the Hot Module, you must have identified and corrected the cause of the defective fuse.

- Insert the red fuse holder assembly with the two fuses into the power entry module, close the fuse cover securely, and start up the Hot Module again.

7 Ordering Supplies, Optional Accessories and Parts

Item Description	Part No.
Magnifier Assembly for HistoPro® 650 H	15229
Cassette Carrying Tray	14650
Foot Switch	A12105
Operator's Manual	15227
Service Manual	15228

8 Service Information:

If you are in need of technical customer service or spare parts, please contact our Technical Service Department at 215-491-0081 or the dealer where you purchased the unit.

Please provide the following information:

- Model name and serial number of the Hot Module.
- Location of the Hot Module and name of the person to contact.
- Reason for the service call.
- Delivery date.

9 Decommissioning and Disposal:

The unit or parts of the unit must be disposed of according to existing local applicable regulations.