

# CytoTherm

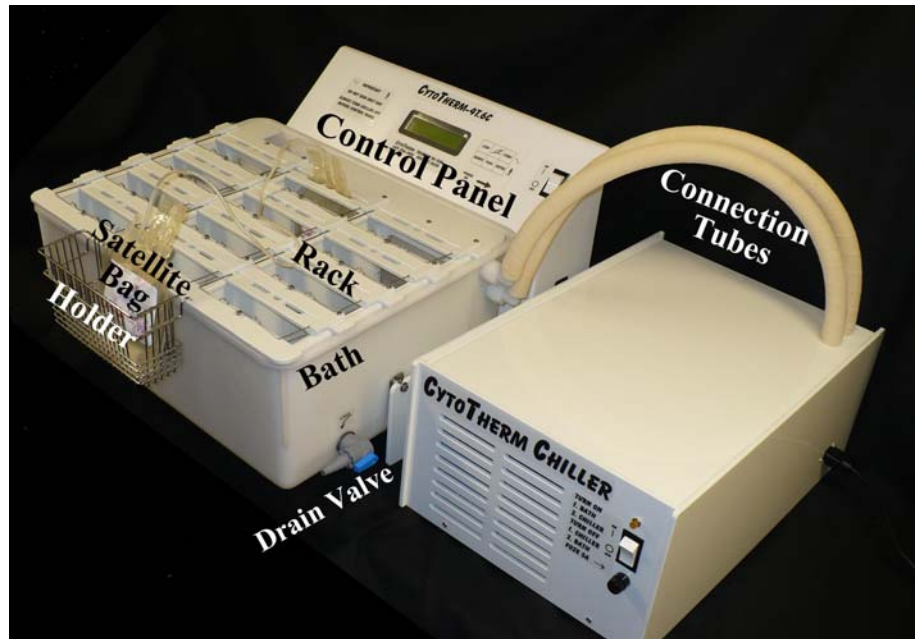
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## CytoTherm 4T.6C

**ROCKING WATER BATH  
with CHILLER to  
THAW PLASMA at 6°C to be  
used in the manufacture of  
Cryoprecipitated AHF.**

Model **CT-4T.6C**

Owners Manual  
Version 509 and higher



### WARRANTY

Each CytoTherm product is produced under rigid quality control standards. This unit is fully warranted for a period of one year from the date of purchase. Call 609 396-1456 or 800 747-9699 for help. If necessary send unit to:  
CytoTherm 110 Sewell Ave. Trenton, NJ USA Tel 609 396-1456 Fax 609 396-9395

Please mail in your warranty card. Please record the following:

Control Panel Ser.# \_\_\_\_\_ Bath Ser.# \_\_\_\_\_ Chiller Ser. # \_\_\_\_\_ Date of Purchase \_\_\_\_\_

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\\DrawRec\Drawings\Instruct\CT4T6CinsP.doc 6 Nov 08. New picts of Sat Holder

### SPECIFICATIONS

**BATH:** Thawing temperature is adjustable (4.0°C programmable or 5.0°C default) to 20.0° C. Preset thawing temperature is 6.0°C. Overtemp Alarm 1.0°C over thawing temperature. 45°C safety thermostat. Accuracy 0.1°C. Easy to do, digital temperature calibration. Power 770 Watt, Available in 120 or 230 Volts, 50 or 60 Hz. (must be grounded).  
**CHILLER:** Available in 120 or 230 Volts, 50 or 60 Hz. Current is 4 Amps at 120 Volts, 2 Amps at 240 Volts.

## **DESCRIPTION**

The CytoTherm-4T.6C (CT-4T.6C) is a laboratory instrument that consists of a recirculating water temperature bath that uses a rocking action to massage the plasma. This action speeds up the plasma thawing time. An external CHILLER lowers the temperature so that thawing can occur at low temperatures (6°C). The CT-4T.6C is used in the manufacture of Cryoprecipitated AHF. It is not used for thawing Cryoprecipitated AHF which requires thawing at 37°C.

The CT-4T.6C comes with a RACK that will thaw 1 to 12 plasma units at a time. The operator's hands stay dry when handling the plasma bags. The RACK keeps the entry ports of flat-frozen units out of the water.

A large digital display indicates the temperature and counts down the thawing time.

## **SETTING-UP**

The unit comes packed in 2 boxes. Make sure you have received the following:

..... Control Panel	..... Bath
..... Rack with 12 Bag Clamps	..... 2 Arms
..... Drain Tubing	..... Condensate Drip Tray
..... 2 x Power Cord	.....Instruction Book
..... Overwrap bags	.....2 x Connecting Tubes
..... Chiller	.....Video or DVD
..... Satellite Bag Holder	.....Algaecide. Part # ALG240 (contiguous USA only)

The CT-4T.6C consists of a modified standard plasma thawer Model CT-4T and an accessory CHILLER to lower the thawing temperature. The CHILLER is positioned to the right of the CT-4T.

Please watch the enclosed video or DVD on how to set up the standard CT-4T Plasma Thawer.

Screw the ARMS to the side of the CONTROL SECTION. The notched side of the ARMS faces up.

Place the BATH in front of the CONTROL SECTION so that the chassis on the BATH is next to the indented portion of the CONTROL SECTION.

Connect the umbilical cord of the CONTROL SECTION to the plug receptacle on the back of the BATH section. The label on the connector faces up. \* \* THE POWER SWITCH MUST BE OFF WHEN MAKING OR BREAKING THIS CONNECTION \* \*

Lift the BATH and position it so that the pivots on the side of the BATH slip into the notches on the ARMS.

Make sure the power switch is OFF. Plug the power cord into a properly grounded electrical outlet.

Fill the BATH with cold tap water to 2.5" (8 cm.) from the top of the bath. After the unit is loaded with plasma bags, add water to get more coverage of the bags, but not so high that it will spill as the unit rocks.

If your tap water contains a lot of lime, use distilled or de-ionized water, add a pinch of salt to make the water conductive so that the level sensors will work. Do NOT use saline solution. Add 8 ml. of Algaecide Part #ALG240 (1.0 ml. per 4 liters of water . Available USA only) to the water. Do not add bleach to the water.

Place the RACK inside the bath. The RACK holds up to 12 individual plasma bags. Mount the SATELLITE BAG HOLDER on the front of the BATH.

Slide the Condensate drip tray underneath the BATH.

Place the CHILLER to the right of the BATH and plug it into an outlet. Connect the 2 CONNECTION TUBES between the BATH and the CHILLER.

Turn the power switch of the Thawer ON. The display will say "Push Enter if Chiller connected". Make sure the TUBES are connected and push ENTER. The unit will turn on the pump and will display "Turn on cooler! Push PLUS". It is

important that water is recirculated through the CHILLER, before turning on the CHILLER. Turn ON the CHILLER and then push PLUS to let the Thawer know that the CHILLER is turned ON.

**VERY IMPORTANT.** The bath recirculating pump must always be ON when the CHILLER is ON.

**NOTES:**

When turning OFF the Thawer, the CHILLER must be turned off first. Then the THAWER can be turned off. Always wait 3 minutes after you turn the CHILLER OFF, before turning the CHILLER back ON

The unit will cool until it reaches 6°C (The target temperature is adjustable. See PROGRAM MODE). The CHILLER will stay on constantly and the display will show “HEAT ON” when the unit is heating to control temperature.

Add lab algacide to the water to keep the water clear.

**OPERATION**

Wait for the water to cool to 6.0°C. You can speed cooling by adding ice to the bath water.

The plasma bag can be thawed with or without an overwrap bag because the bag ports are kept sterile out of the water.

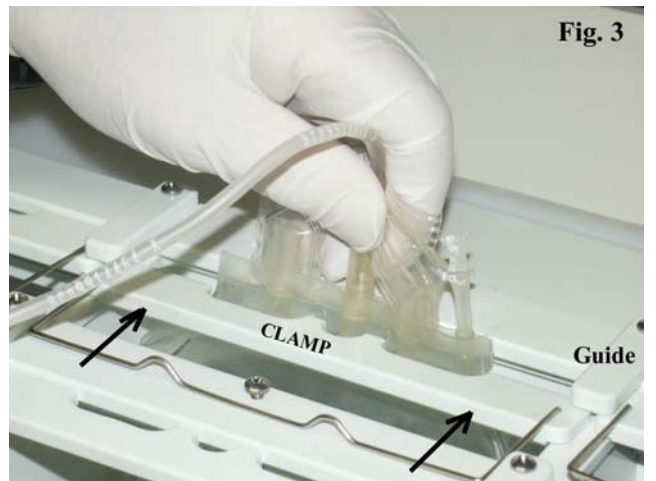
Position the plasma bag in the slot in the RACK so that the end of the bag is against the back side of the RACK and the ports of the bag are in the air. Fig. 2. Load from the back row first .

Guide the CLAMP under the Guides and push it forward to hold the plasma bag. Fig. 3. Lock the CLAMP in place by pushing the SPRING over the SCREW. Fig. 4. The SPRING force can be adjusted by bending the SPRING out.

Place the SATELLITE bag in the SATELLITE BAG HOLDER. Fig. 5

Overwrap bags 15 cm. wide by 30 cm. (6” x 12”) long are available from US Plastics 1390 Neubrech Rd. Lima OH 45801 Tel. 800 537-9724. Part #47352.

Push START to begin thawing for the programmed time (pre-programmed to 50 minutes). The Rocking Motor will turn on. Use PLUS or MINUS to increase or decrease the thawing time. When the time is finished, the buzzer will call the operator back. The STOP switch ends the thawing. If more thawing time is needed, hold PLUS while pushing START and the unit will thaw for another 3 minutes.



## **LEAKY PLASMA BAG**

If a Plasma bag leaks and you used an overwrap bag the bath water will not be contaminated. If you did not use an overwrap bag, you will need to clean the bath.

## **CLEANING the BATH**

### **Clean the BATH**

1. Remove the RACK, clean under running water and wipe with bleach towelettes or a 10% bleach solution. Rinse off the bleach with water.
2. Drain the bath by attaching the provided tubing to the DRAIN valve and turning the valve handle clockwise to vertical. Drain as much water as possible through the drain valve. Lift the BATH and place it on the table with the PIVOTS in front of the ARMS. Disconnect the umbilical connector. Carry the bath to the sink and pour out the remaining water in the BATH.
3. Wipe the BATH with bleach towelettes or a 10% bleach solution. Use only water and bleach towelettes or a 10% bleach solutions for cleaning. **DO NOT USE CONCENTRATED BLEACH.** Use alcohol for removing oil or grease. **DO NOT IMMERSER THE WHOLE BATH. WIPE THE PUMP SCREEN FROM THE OUTSIDE ONLY. DO NOT REMOVE THE SCREWS.** Rinse off the bleach with water. Close the DRAIN valve. Fill the bath with water. If you use deionized or distilled water add a little pinch ( about 0.01 gr.) of table salt. Mount the RACK. Add 8 ml. of Algacide Part #ALG240 (1.0 ml. per 4 liters of water) . Available USA only) to the water.

### **Flush out the water in the Chiller.**

Keep Chiller OFF. Reassemble the unit, fill the bath with water, connect the pump outlet tube fitting of the bath to one of the thick tubes of the Chiller. Put the end of the second thick tube into a bucket. Plug the control unit in and turn ON the unit. The display will say "push Enter if Chiller is connected", even though only one hose is connected, push Enter. Water will pump from the bath through the Chiller and into the bucket. Let it pump for a few seconds and when the water coming out of the chiller looks clean, turn the unit OFF. Reconnect the second Chiller tube to the bath.

## **SWITCH FUNCTIONS**

There are 6 switches on the front panel:

**START.** Starts function.

**STOP.** Stops function.

**ENTER.** Records parameter changes.

**PLUS.** Steps through parameters and increases value of parameter.

**MINUS.** Allows change in parameter and decreases value of parameter.

Sketch of FIN logo. Not currently used. Future expansion

## **MODES**

**STANDBY MODE.** The unit maintains 6.0°C, but does not rock. Holding ENTER will turn on the rocking motor.

**THAWING MODE.** The unit rocks the bath and recirculates the tempered water. The display counts down the remaining time. Pushing START starts thawing. Pushing STOP stops thawing.

**DIAGNOSTIC MODE.** Hold MINUS as you turn the unit on.

1. To restore the unit to initial factory settings, press ENTER while still holding MINUS. The unit displays “UNIT RESET”. Turn the unit off. You have to re-calibrate the temperature after resetting the unit.
2. Work the pump and the rocker motor. When in DIAGNOSTICS release MINUS then push ENTER to verify that you are a technician. The display shows “PUMP TEST”. MINUS turns on the pump, ENTER turns on the rocker motor. Push PLUS to go to next function.
3. ALARM TEST (OVERTEMP). Push ENTER, the heater will heat continuously and the pumps will turn on. When the temperature reaches 1.0°C above the target temperature the alarm will sound. Turn Off the unit. If alarm does not sound, contact CytoTherm. Alarm test should be performed every 3 months as part of unit maintenance.

**PROGRAM MODE** allows you to:

1. Program the thawing time.
2. Calibrate the temperature.
3. Set the target thawing temperature. The Alarm temperature is 1.0°C above the target temperature.

Enter PROGRAM MODE by holding ENTER while turning the unit ON. Follow the displayed instructions to program.

**Programming the Thawing Time.** When the thawing time is displayed, press MINUS because you want to change the time. Use PLUS or MINUS to set the desired new thawing time, press ENTER to program in the new time. Turn the unit off.

**Calibrating Temperature.** Turn the unit on. Wait until the unit cools to 6.0°C. Check the displayed temperature with your own certified or calibrated accurate thermometer. If the displayed temperature needs to be changed, turn the unit off. Enter PROGRAMMING MODE by holding ENTER as you turn the unit on. When the thawing time is displayed push PLUS until the display shows “CALIBRATE TEMPERATURE”. Push MINUS because you want to change the displayed temperature. Use PLUS or MINUS to make the displayed temperature agree with your thermometer. Push ENTER to record the calibration. Turn the unit off.

**Programming the Target Thawing Temperature.** When the thawing temperature is displayed, press MINUS because you want to change the temperature. Use PLUS or MINUS to set the desired new thawing temperature, press ENTER to program in the new temperature. Turn the unit off.

**Lowest temperature Programming.** When the Lowest temperature is displayed, press MINUS because you want to change the lowest temperature. Press plus to change the lowest temperature. There are two choices: 5.0°C, which is recommended and 4.0°C. Test have shown that the Factor VIII yields are lower when thawed at 4.0°C.

## **TROUBLESHOOTING**

English: Unit should be opened by qualified technicians only.

French: Ne puet etre ouvert que un techicien autorize.

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Bath is "dead"	Verify that you are plugged into a live, grounded outlet.  Have qualified technician check if fuse is blown or connectors are loose. The 120 VAC model unit uses 2 x 8A 3AG fuses. The 240 VAC model uses 2 x 5A 3AG fuses.
Chiller is "dead"	Check fuse on panel. 5A Slow Blow 3AG fuse.
Unit is not responding, but the display is backlit.	Turn the unit off for 10 seconds and then turn it back on. (Reboot)
Display says "low water" but there is water.	The unit is not sensing that water is present. a. Make sure you are using tap water or adding salt to deionized water to make it conductive. b. The level sensor (screw 2 cm. above the stainless tube temperature sensor) inside the bath is dirty.  Scrape it and then clean with alcohol.
Unit does not heat but "heating" is displayed	Check the Safety thermostat (#C-TH) and the heaters (#14-77) for continuity.  Check for loose connections in the umbilical connector.
6C will be out of range during calibration.	Check TP on circuit board. Should be 0.205 Vdc. It is marked 0.395 on board for 37°C calibration.
Temperature calibration changed unexpectedly.	Replace temperature sensor (#CT4-TS).
Pump does not circulate. No hum.	No power to pump or pump winding open. Check the umbilical connector. Check the pump (#14-PM). DO NOT DISASSEMBLE the pump.
Pump does not circulate. Makes humming noise.	Blow air through pump outlet tubing to clear small debris. Check pump (#14-PM). DO NOT DISASSEMBLE. Any evidence of leaking on motor side means pump must be replaced.
Waterbath not rocking.	Check if cam is loose on motor. Check the rocking motor (#C-RM).
Chiller lamp ON, but compressor not working.	Anti-Freeze thermostat tripped. Turn off and allow Chiller heat exchanger to thaw overnight. See SETTING-UP page 2.

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## **MESSAGES, Troubleshooting**

**TOO HOT** is an audible and displayed alarm condition that indicates that the bath temperature is 1.0°C higher than the set temperature. This message will not sound until the bath is cooled to the thawing temperature the first time. After that if the temperature rises above the thawing temperature the alarm will activate.

**LOW WATER** First make sure that a pinch ( 0.01 gr) of salt was added if deionized water was used. Pour water into the BATH to the correct level (see SETTING UP).

## **MAINTENANCE**

**Daily: Wipe off the unit.**

**Every Week:**

### **Clean the BATH**

- 1. Remove the RACK, clean under running water and wipe with bleach towelettes or a 10% bleach solution. Rinse off the bleach with water.**
- 2. Drain the bath by attaching the provided tubing to the DRAIN valve and turning the valve handle clockwise to vertical. Drain as much water as possible through the drain valve. Lift the BATH and place it on the table with the PIVOTS in front of the ARMS. Disconnect the umbilical connector. Carry the bath to the sink and pour out the remaining water in the BATH.**
- 3. Wipe the BATH with bleach towelettes or a 10% bleach solution. Use only water and bleach towelettes or a 10% bleach solutions for cleaning. DO NOT USE CONCENTRATED BLEACH. Use alcohol for removing oil or grease. DO NOT IMMERSE THE WHOLE BATH. WIPE THE PUMP SCREEN FROM THE OUTSIDE ONLY. DO NOT REMOVE THE SCREWS. Rinse off the bleach with water. Close the DRAIN valve. Fill the bath with water. If you use deionized or distilled water add a little pinch ( about 0.01 gr.) of table salt. Mount the RACK. Add 8 ml. of Algacide Part #ALG240 (1.0 ml. per 4 liters of water) . Available USA only) to the water.**

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### **Every 3 Months:**

**Temperature Calibration. Run temperature calibration at least every 3 months or more often if your institution procedures or regulations require. See PROGRAM MODE > TEMPERATURE CALIBRATION.**

**Overtemperature Alarm Test. Have a technician run the ALARM TEST. See DIAGNOSTIC MODE > ALARM TEST**

**PARTS LIST CT-4T.6C**

<b>CDR-MP6</b>	<b>Pump, Magnetic</b>	<b>\$198.-</b>	<b>DP-SW</b>	<b>Switch, 2-pole</b>	<b>\$ 20.</b>
<b>14-77</b>	<b>Heater (2 needed)</b>	<b>72.-</b>	<b>C-TH</b>	<b>Safety Thermostat</b>	<b>39.-</b>
<b>CT4-PC</b>	<b>Printed Circuit Board</b>	<b>400.-</b>	<b>C4-DISP</b>	<b>Display</b>	<b>80.-</b>
<b>C6C-BTH</b>	<b>Bath Section</b>	<b>800.-</b>	<b>C4-UMB</b>	<b>Wiring Harness</b>	<b>120.-</b>
<b>C-RM</b>	<b>Rocking Motor</b>	<b>160.-</b>	<b>C6C-PM</b>	<b>Program Module</b>	<b>100.-</b>
<b>C4-TS</b>	<b>Temperature Sensor</b>	<b>80.-</b>	<b>C5C-CLM</b>	<b>Clamp ( bag to rack)</b>	<b>14.-</b>
<b>ALG240</b>	<b>Algaecide (USA only)</b>	<b>66.-</b>	<b>C6C-RK</b>	<b>Rack (12 units)</b>	<b>1,150.-</b>
<b>CDR-VLV</b>	<b>Valve</b>	<b>54.-</b>	<b>C6C-CHLR</b>	<b>Chiller</b>	<b>2,300.-</b>
<b>C4-TR</b>	<b>Transformer (120V)</b>	<b>60.-</b>	<b>C6C-DRTR</b>	<b>Condensate DRip TRay</b>	<b>60.-</b>
<b>C4-TR2</b>	<b>Transformer (240 V)</b>	<b>85.-</b>			

**Always specify model and serial number when ordering. Prices subject to change Jan 08**

**SOURCES for SUPPLIES**

BAGS overwrap 15 cm. wide by 30 cm. (6" x 12") long are available from US Plastics 1390 Neubrecht Rd. Lima OH 45801 Tel. 800 537-9724. Part #47352.

**SAFETY FEATURES**

**SAFETY TESTING.** This unit is equipped with a Line Filter and safety MOVs whose impedance draws about 180 uA. This is not leakage. Any leakage current measurement should have the 180 uA subtracted from the reading.

**WATER LEVEL SENSOR.** The unit will sound an alarm and not heat if there is not enough water to cover the level sensor, a screw located 2 cm. above the temperature sensor. The water must be conductive. Use tap water or add a few salt crystals if you use de-ionized or distilled water.

**OVERTEMP ALARM.** An alarm will sound and the heater is turned off if the temperature reaches 1.0°C above the thawing temperature. An independent safety thermostat will turn off the heaters if the temperature goes above 45 °C.

**FUSING.** There are 2 fuses located on the circuit board inside the CONTROL PANEL. Use a standard 8A (5A for 240Volt) AG3 fuse. Correct the cause of the blown fuse.

**ISOLATION.** The circuitry is isolated from the power lines by a transformer and from the heaters by an opto-coupled solid state relay.

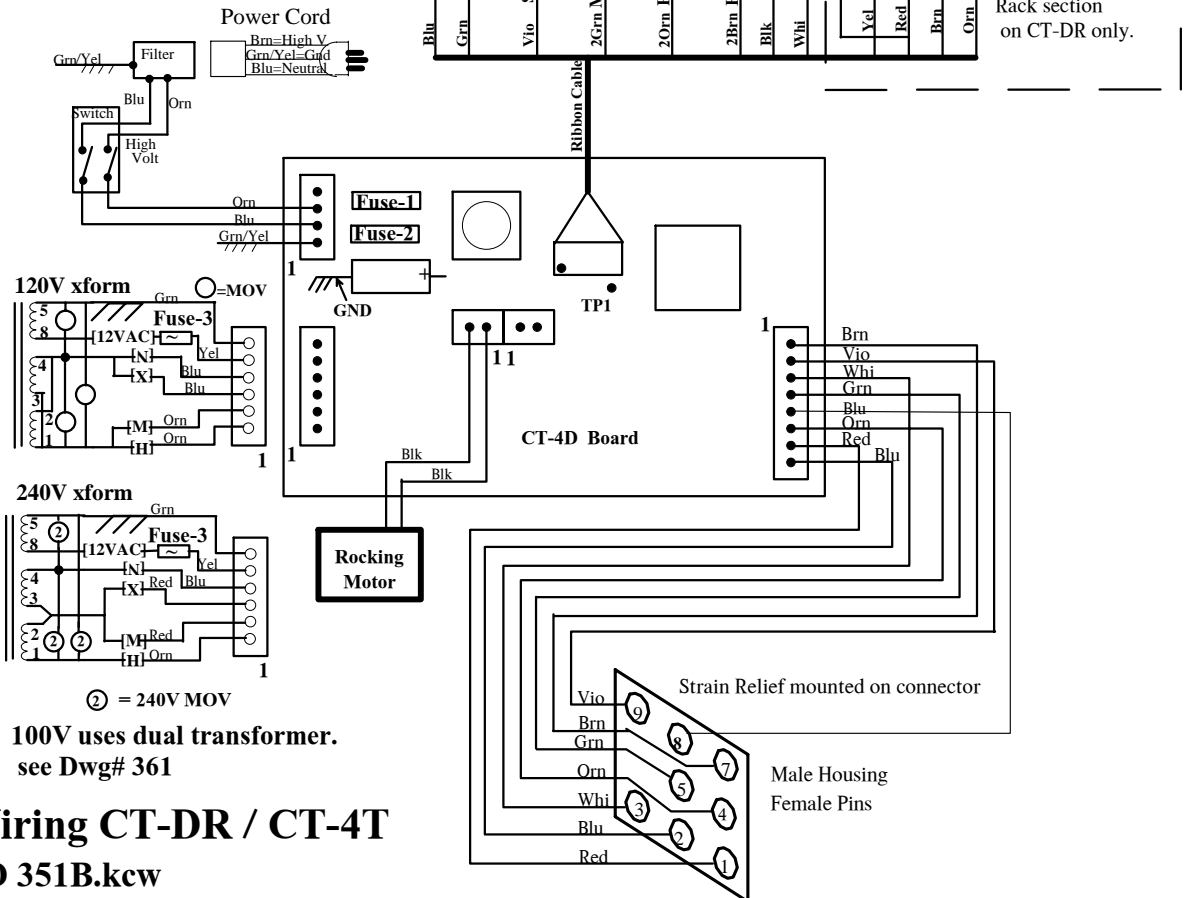
**POWER OUTAGE.** In case of a temporary power outage the chiller will remain on, but the CT-4T.C will reset with the pump off. It will wait for 30 seconds before sounding an alarm to "Turn off Chiller". The Chiller must be off when the pump is off.

**Revisions**

- 6 Nov 08 Ver P. New Pictures of satellite holder.
- 28 Oct 08 Ver N. Adjustable lowest temperature. 5C or 4C.
- 13 Oct 08 Ver M Overwrap optional as per AABB Technical Manual 16<sup>th</sup> Edition p 956.
- 25 Jan 08 Ver. L. Alarm test describe in Diagnostics
- 8 Aug 07 Ver. JFDA No prices. 1 Oct 07 Add Drip Tray. 21 Oct 07 Ver. K. No resistor test in maintenance. Prices.
- 26 Apr 07 Ver H FDA Corrections. 31 Mar 07 Ver G FDA FDA Corrections
- 1 Mar 07. Ver. G. No bleach
- 20 Aug 06 Add weekly maintenance. Resistance test. Ver. F
- 27 March 06. Instruct book ver. CT4T6CinsE.doc. Add Chiller flush to Cleaning. Drop Cloth Evaporation cover. No Glycerine
- Sep 05. Condensate drip trays sent to all customers
- 1Mar 05. Freeze Thermostats on Chillers. Chiller VC0020.

Rev 25 June 06 Fuse Table & TP1  
 Rev 5 June 04 add 3/4A slow blow fuse to 12 Vac Xform lead. See D 467.

Fuse	Amps	Vac	Type
1 & 2	8	120	Fast
1 & 2	5	240	Fast
3	3/4	12	Slow Blow



② = 240V MOV  
 100V uses dual transformer.  
 see Dwg# 361

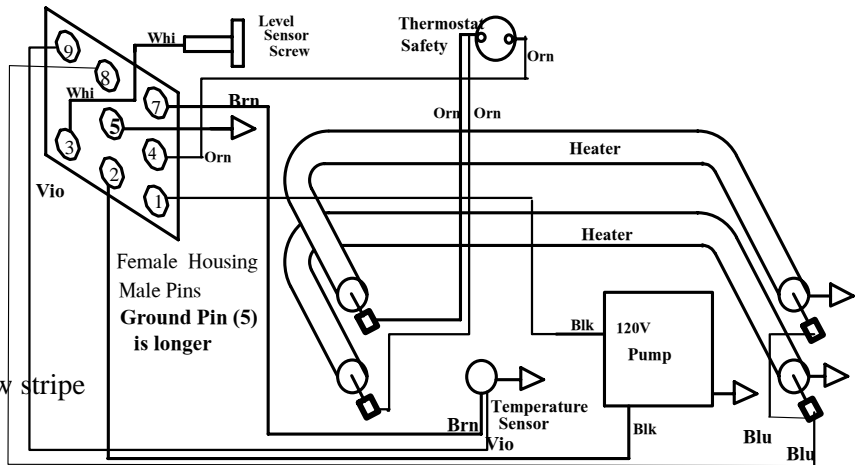
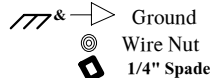
## Wiring CT-DR / CT-4T D 351B.kcw

File \Draw#\D#351.kcw Home Test Point 1: 0.395 for 37C. Models CT-DR & CT-4T  
 30 Nov 2000 : 0.205 for 6C Model CT-4T.6C  
 1 Jul 02. 8A Fuses for 120/100

120/100V wired as shown  
 240V the 2 heaters are in series

- Rev B. 4 Jan 04
1. Add separate Neutral wire from Bath Conn# 5 to 9-pin conn #8. Wire separate neutral wires to heaters & pump.
  2. Spade connectors on heaters.
  3. CT-DR & 4T on one drwg.
- 100V units
4. Move heater wires to 1/4" spade connectors from BATH connector.
  5. Remove SWITCH conn. & solder wires directly to board.

Ground is Green with Yellow stripe



OFF.