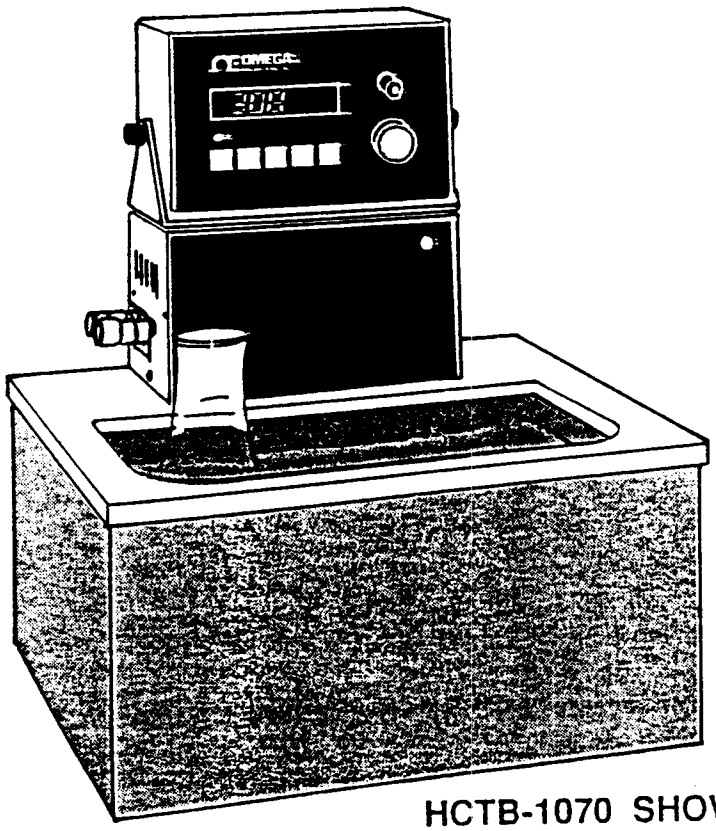
HCTB-1070, HCTB-1072 and HCTB-1074

Constant Temperature Circulating Bath



HCTB-1070 SHOWN

OMEGA®

An OMEGA Technologies Company

Operator's Manual
M1343/0392

TABLE OF CONTENTS
HCTB-1070, HCTB-1072, HCTB-1074
CONSTANT TEMPERATURE CIRCULATING BATH

SECTION 1 INTRODUCTION

1.1 DESCRIPTION

OMEGA'S HCTB-1070 Series (HCTB-1070, HCTB-1072, HCTB-1074) Heated Circulating Baths offer the user digital temperature control of liquids to meet the needs of today's research. This series regulates temperatures to ±0.01°C within a temperature range of ambient +10°C to 130°C and provides internal and external circulation. A seal-less, stainless steel pump circulates liquids externally at a rate of 12 liters per minute @ 0' Head. These compact units will locate on or under your counter freeing up valuable work space when used for external circulation.

1.2 FEATURES

*Temperature range of ambient + 5° to 130°C
*Temperature control sensitivity ±0.01°C
*External pumping capacity 12 liters/minute @ 0' head
*Precise push-to-set controls
*Deep drawn, one piece stainless steel chamber
*DuPont corian top
*Tracking safety controls automatically set 5°C above set point
*Upper electronics housing can be remotely located from the bath

1.3 AVAILABLE MODELS

The following models are available from OMEGA Engineering, Inc.

PART NUMBER	DESCRIPTION
HCTB-1070	Constant temperature circulating bath 5.9 liters
HCTB-1072	Constant temperature circulating bath 13.2 liters
HCTB-1074	Constant temperature circulating bath 18.9 liters
	(115, 220 and 100V models available)

Figure 1-1 shows Models HCTB-1070, HCTB-1072, HCTB-1074

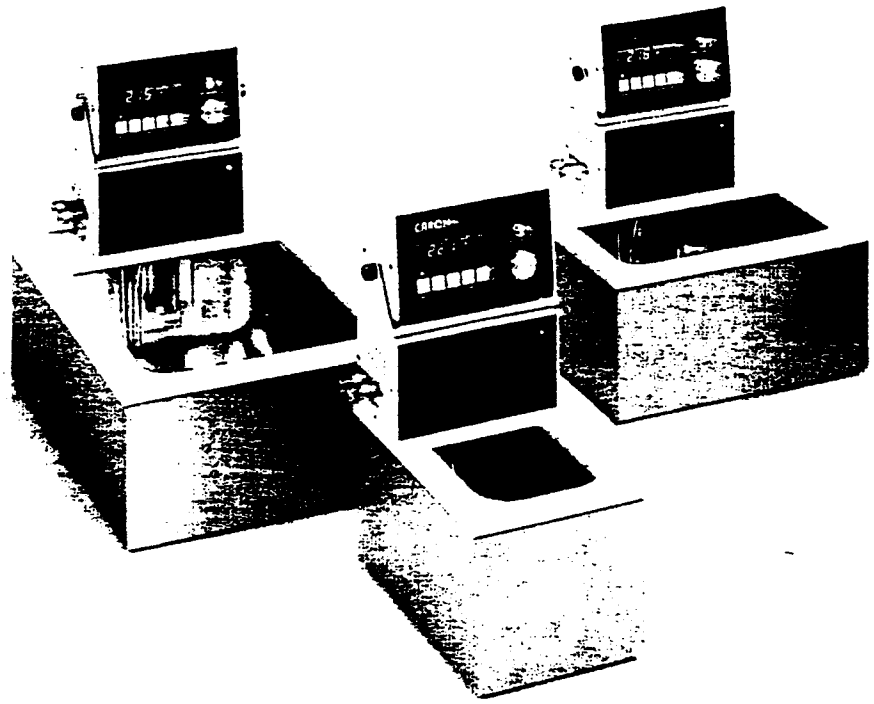


Figure 1-1. L-R Model HCTB-1074, HCTB-1070 and HCTB-1072

SECTION 2 UNPACKING

Remove the Packing List and verify that all equipment has been received. If there are any questions about the shipment, please call the OMEGA Customer Service Department at 1-800-622-2378 or (203) 359-1660.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Take particular note of any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

Make sure you have the following in your packing carton:

QTY	DESCRIPTION
1	Top control housing
1	Bath with lower housing portion
1	Stainless steel cover for reservoir
1	Operator's Manual
2	2½" Stainless steel tubes
2	Sets of ferrules
1	Nut

SECTION 3 SAFETY CONSIDERATIONS

LOCATION: Locating the HCTB-1070 Series Baths
The bath must be located in a dry, clean, and level area. It is also important that air is allowed to move freely from the top of the bath through the unit and out the back freely. This will help provide years of trouble-free operation.

POWER: PLEASE READ CAREFULLY!
For personal safety this bath must be properly grounded. The power cord of this bath is equipped with a grounded plug which mates with a standard grounded wall outlet to minimize the possibility of electrical shock hazard from this cabinet. Have the wall outlet checked by a qualified electrician to make certain the outlet is properly grounded.

USE: WARNING!
Do not operate this bath without liquid or damage may occur.

SECTION 4 PARTS OF THE BATH

Figure 4-1 shows the front of the bath (HCTB-1072).

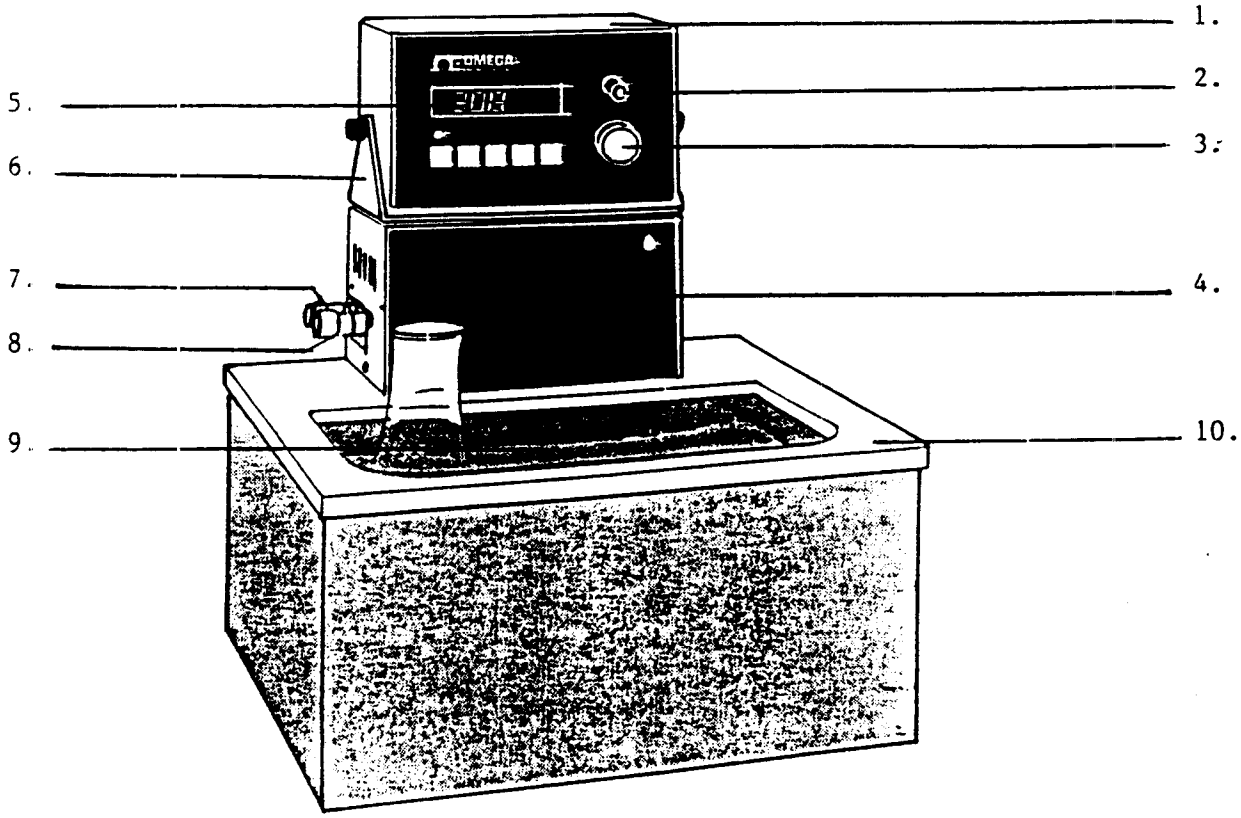


Figure 4-1. Front of the HCTB-1072

KEY	ITEM	DESCRIPTION
1	Top Control Housing	Houses electronic temperature controls for the unit and fine tuning
2	Fine Tune Temperature Control	Control to enhance the temperature control to the exact operating temperature desired after setting the main temperature control
3	Main Temperature Control	For setting operating temperature
4	Lower Pump Housing	Houses power supply, pump and motor assembly
5	Digital Temperature Display	LED display for set point and actual temperature readings

KEY	ITEM	DESCRIPTION
6	Top Control Bracket	Allows user to remove top control housing for remote operation. Also swivels and tilts.
7	Inlet	3/8" OD stainless steel compression fittings for return liquid flow.
8	Outlet	3/8" OD stainless steel compression fittings for external liquid flow out
9	Reservoir	Liquid reservoir with temperature safety probe and pump for internal and external circulation; all stainless steel.
10	Top	DuPont corian top will not rust.

KEY	ITEM	DESCRIPTION
1	Main Temperature Control	Used for setting main operating temperature
2	Fine Tune Temperature Control	Control to enhance the temperature control to the exact operating temperature desired after setting the main temperature control
3	Power Switch	Controls power to the unit. Pilot light above switch indicates "on"
4	Alarm Switch	When power is first applied to the unit, if the liquid temperature in the bath is higher than the set point, the alarm will sound. Simply push the switch, this will turn off the audible alarm.
5	Set Switch	This switch must be pushed to set or change the desired operating temperature.

Figure 4-2. Shows the front of the control panel.

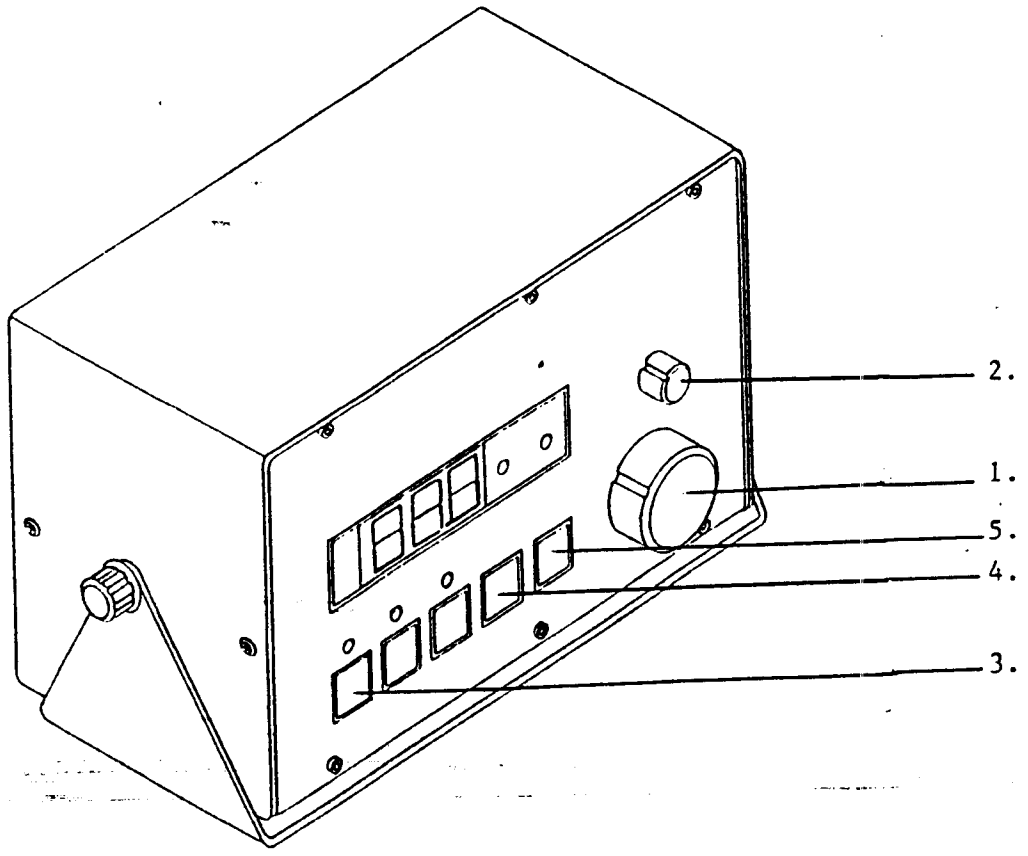


Figure 4-2. Front Control Panel

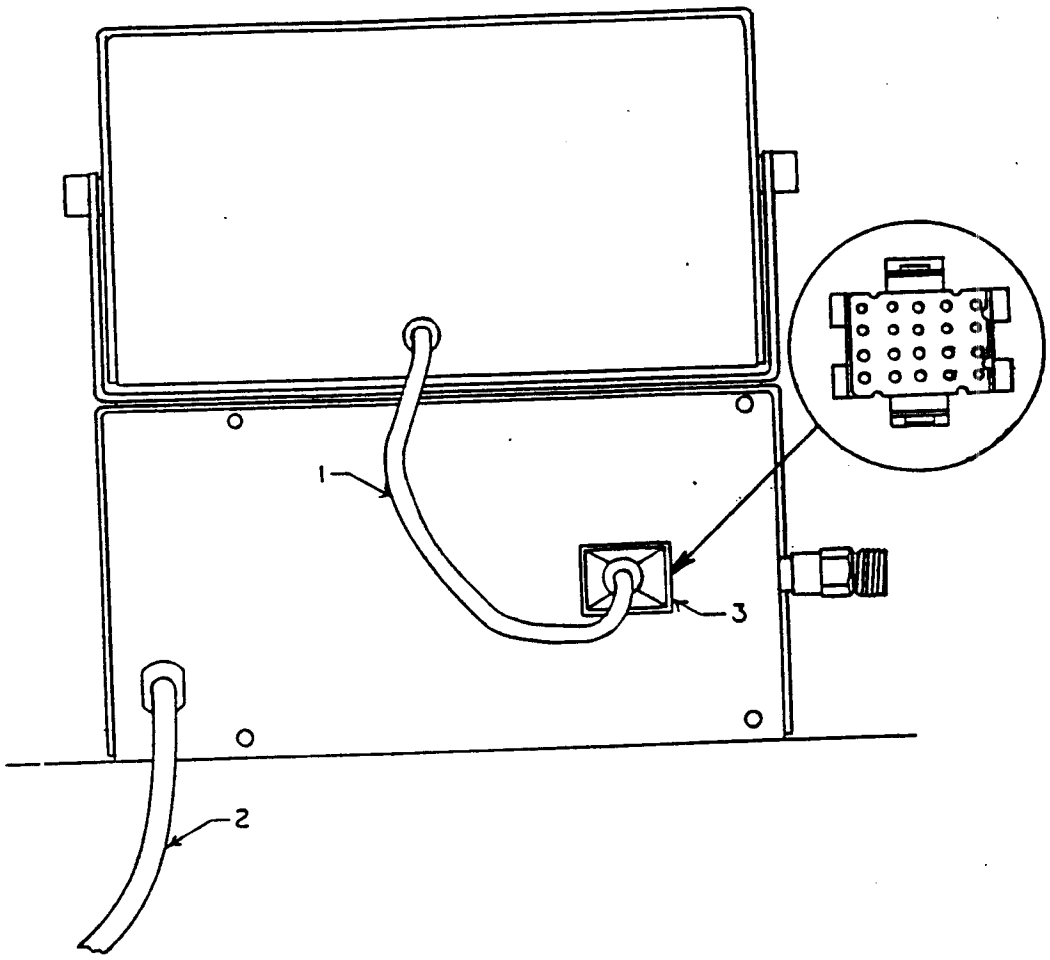


Figure 4-3 Control Panel Rear View Connection

KEY	ITEM	DESCRIPTION
1	Dual Control Power Line Cord	For electrical connection of top and bottom control housing
2	Power Cord	For connecting to standard power outlet
3	Plug Assembly	For connecting electrical lines

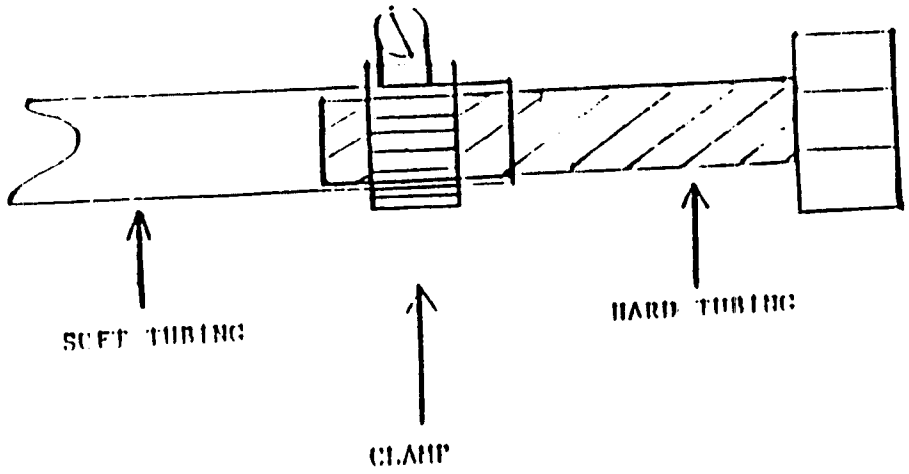
SECTION 5 SET-UP

5.1 ASSEMBLING THE CIRCULATING BATH

Remove the controller and bath portions, attach the top part of the bath by fitting the spring clip of the top controller onto the stud in the lower pump housing. Connect the cable connector to the rear of the controller unit. Refer to Figure 4-3.
DO NOT ATTEMPT TO TURN THE BATH ON.

5.2 HOSE CONNECTIONS

These are located on the left side of the pump housing. This bath incorporates 3/8" Stainless Steel compression fittings which are marked Inlet and Outlet. Refer to Figure 5-2.
The Outlet connection is fitted with a black rubber block to prevent accidental spraying of the bath liquid from the outlet.
Note: For external circulation remove block; unscrew the cap nut B. Then remove black rubber block.
For maximum pump efficiency, it is recommended that short pieces of 3/8" O.D. Stainless Steel Tubing should be locked into the fittings.
Note: Two pieces of tubing and ferrules are supplied with the bath
A piece of tygon can then be clamped on as shown in Figure 5-2.
The ferrules must be used on all connections. Hard tubing can be fitted directly onto the connections.



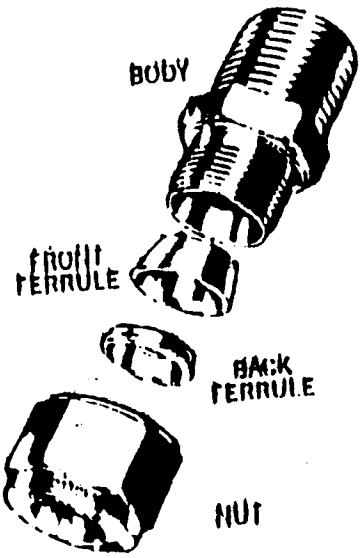


Figure 5-2. Tubing

5.3 TUBING

Proper tubing is critical for operation. Flexible tubing should be thick-walled or reinforced. Check the temperature capabilities of your tubing for the operation range you will be running. Extreme temperatures can cause cracking or melting of improper tubing. Avoid using silicone based tubing with high temperature silicone oil, since like material may become unsafe after prolonged use.
Make certain all connections are securely clamped and lines are as short as possible. All external tubing should be insulated. This will enhance cooling capacity, improve temperature stability and prevent sweating.

5.4 FILLING THE BATH WITH PROPER FLUID

NOTE: Do not overfill bath. Please allow for the addition of product.
Make sure the tank is clean before filling.
Fill the bath to within 1/2 to 1" from the top of the tank.

For operation below 10°C, use a 50/50 mixture of laboratory grade ethylene glycol and distilled or deionized water. Operation of the unit below 10°C without ethylene glycol and water result in severe damage and will void your warranty.

For operation above 10°C to 100°C, fill the bath with distilled or deionized water.

For operation above 100°C, a high temperature silicone oil is recommended. When filling the bath, allow 2 to 2½" from the top of the bath for expansion of the oil. Once the temperature has been reached, the level can be adjusted to suit the user's needs.

Silicone oil does not conduct heat away from the heater. The surface temperature of the heater tends to be much higher than the fluid. This may cause the bath's high temperature cut-out to be activated if the set point is above 115°C and the heater is in full cycle. This can be overcome by setting the bath temperature at 115°C and allowing time to stabilize. After stabilizing, move the control 3° to 4°C higher and allow for stabilization. Adjust the control another 3° to 4°C and stabilize until the desired temperature is reached.

5.5 AC WIRING

For your specific bath's electrical requirements, see the electrical data on the serial number plate mounted at the rear of the unit. Refer to Section 3 for safety information.

NOTE: Do not turn the bath on at this point

5.6 CONNECTION POWER

Check all switches to be sure they are in the "OFF" position.

Plug the power cord into a properly grounded wall outlet which mates with the plug. This will minimize possible electrical shock hazard from the bath.

SECTION 6 OPERATION

Follow Set-Up Instructions, Section 5, for assembling bath, connecting hoses, and filling the bath with proper fluid.
Set the Main Control to the desired operating temperature.
Turn the power switch on.
Allow time for stabilization of temperature (35-40 minutes)

SECTION 7 CALIBRATION

The HCTB-1070, HCTB-1072, HCTB-1074 are completely factory calibrated. These units can not be field calibrated. However, if you are experiencing difficulties with your bath refer to Section 8, Trouble Shooting Guide and/or call OMEGA's Customer Service Department.

SECTION 8 TROUBLE SHOOTING

Problem: Bath power will not energize.

Possible Causes:
1) Line cord not plugged in
2) No current at receptacle
3) Defective line cord
4) Defective power switch
5) Built-in breaker defective

Problem: Bath will not heat.

Possible Causes:
1) Control set incorrectly
2) Defective temperature control
3) Heater burned out

Problem: Overtemp safety energized.

Possible Causes:
1) Incorrectly set
2) Low bath liquid level
3) Defective control

Problem: Digital temp-display not energized

Possible Causes:
1) Power wiring loose
2) Digital thermometer transformer defective

Problem: Erratic control

Possible Causes:
1) Inadequate circulation
2) Defective control

SECTION 9 MAINTENANCE

9.1 Cleaning the bath interior.
The stainless steel interior should be cleaned at least every three months using a general purpose laboratory disinfectant, and a mild soapy solution with a soft clean cloth.

9.2 Preventing algae build-up
Algae build-up can be prevented by using algicide chlormin-t in a solution of 0.2-0.3 grams/liter (1gram/gallon).

9.3 Cleaning the stainless steel exterior.
Stainless steel will not rust but should be thoroughly cleaned periodically with a non-abrasive stainless cleaner.

SECTION 10 SPECIFICATIONS

TEMPERATURE RANGE:	+5° above ambient to 130°C (266°F)
TEMPERATURE CONTROL:	±0.01°C
RESERVOIR VOLUME:	HCTB-1070 5.9 liters HCTB-1072 13.2 liters HCTB-1074 18.9 liters
HEATER:	750 watts, all stainless steel
THERMOMETER:	Digital, (standard)
PUMP TYPE:	High capacity, seal-less, stainless steel
INTERNAL DIMENSIONS	HCTB-1070 5.5"W x 7.5"L x 6"D HCTB-1072 12.3"W x 7.4"L x 6"D HCTB-1074 11.3"W x 15"L x 6"D
EXTERNAL DIMENSIONS:	HCTB-1070 8.4"W x 14.9"L x 17.25"H HCTB-1072 15.25"W x 14.0"L x 17.25"H HCTB-1074 15.25"W x 22.0"L x 17.25"H
INSULATION:	Non-Hygroscopic fiberglass
SAFETY CONTROL:	Low water/overtemperature control with automatic tracking safety @ 5°C above set point
POWER REQUIREMENTS:	115VAC, 50/60Hz, 9A 100VAC, 50/60Hz, 11A 220VAC, 50Hz, 1A
DUAL HOUSING:	Top portion houses electronics, lower portion houses pump and motor. Top portion is removable for remote operation and has spring and pivot pin assembly for turning controller and convenient location.
CABINET MATERIALS:	Cold rolled steel with polyurethane paint DuPont corian top
SHIPPING WEIGHT:	HCTB-1070 20 lbs HCTB-1072 30 lbs HCTB-1074 40 lbs

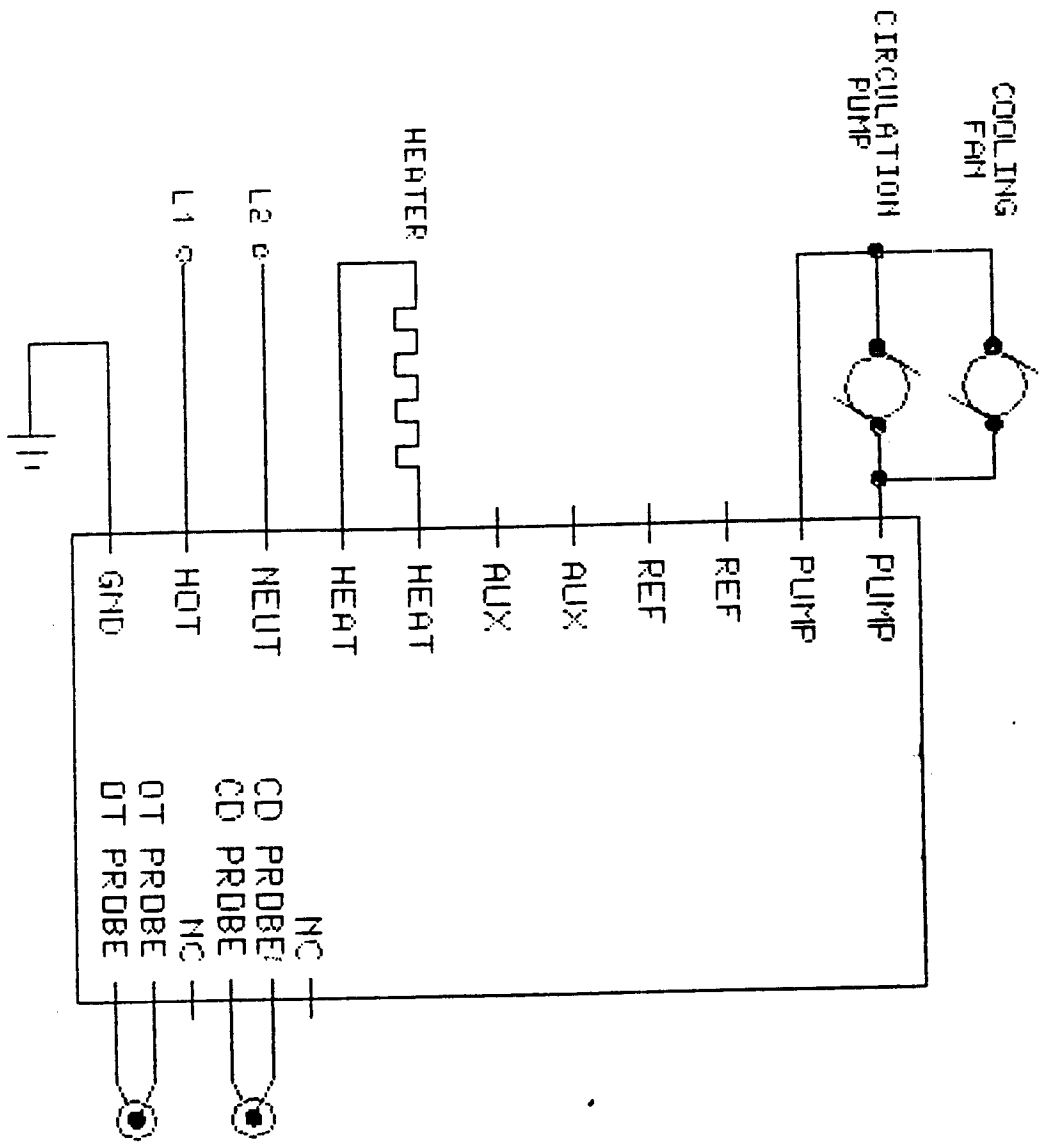


FIGURE 10-1
INTERNAL ELECTRICAL DIAGRAM
(POWER BOARD)

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