CONAIR
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USERGUIDE
UGH006/1990

Thermolator tempTrac

Water Temperature Controller

⚠ **WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!**

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon. Contact Conair at info@conairgroup.com or 1-800-654-6661 for more current information, warnings, and materials about more recent product manuals containing warnings, information, precautions, and procedures that may be more adequate than those contained in this out-of-date manual.

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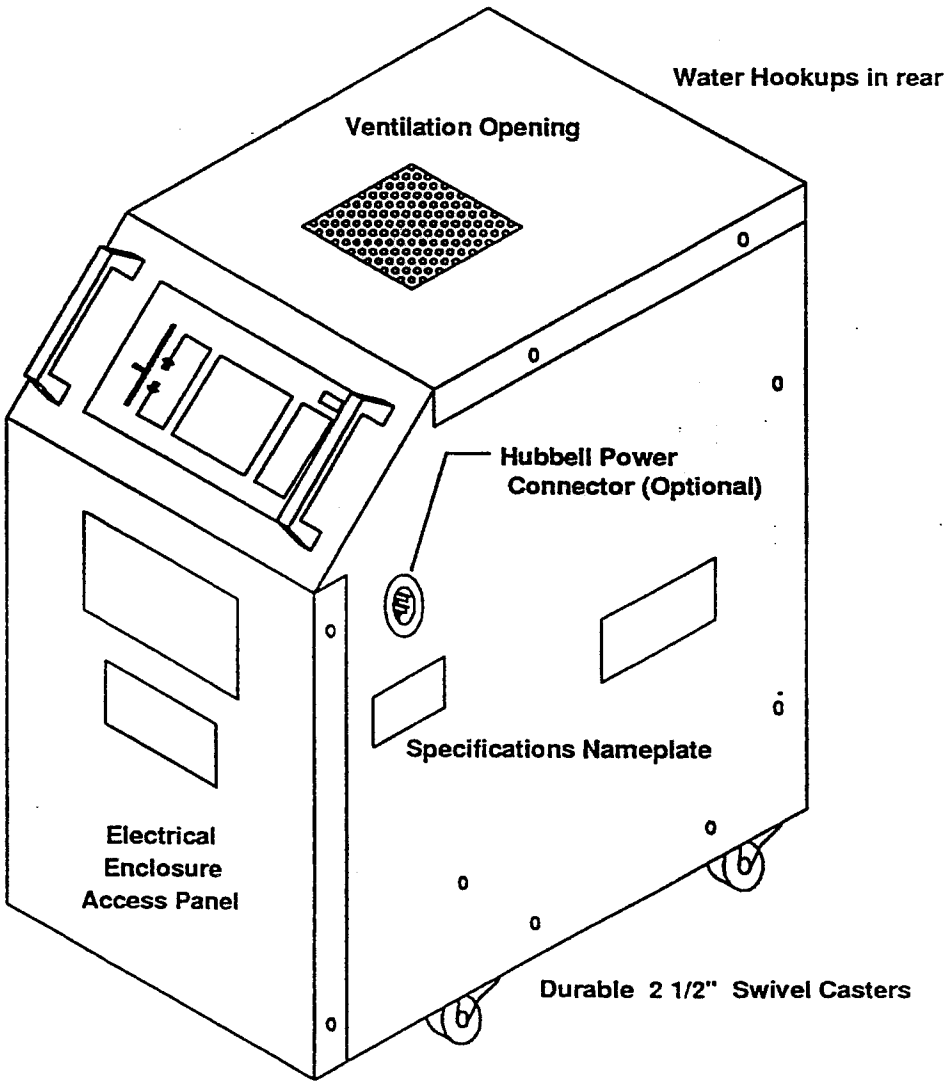
Chapter 1

INTRODUCTION

This is the THERMOLATOR®

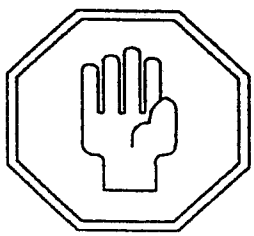


Conventions

The following conventions are used throughout this manual:

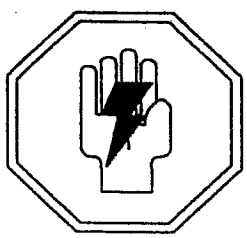
- **BOLD type is used to highlight important information in the text.**
- ***ITALIC type is used for titles that refer to other documentation.***
- Shading is used to set off all tasks and lessons.

CAUTION!



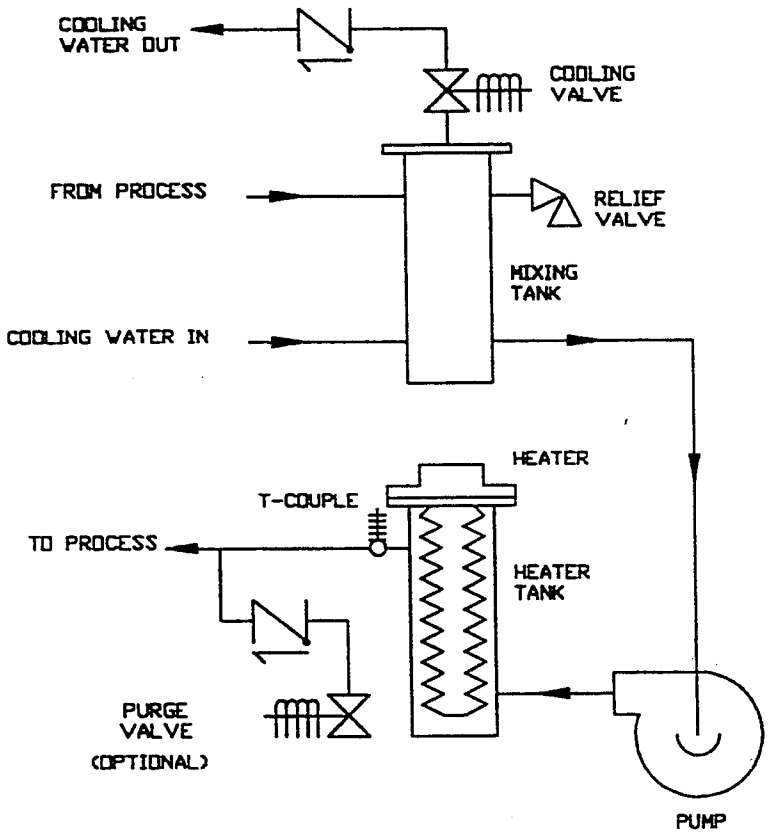
Caution messages appear before procedures which, if not followed, could result in damage to the equipment.

WARNING!



Warning messages indicate when a procedure, if not followed correctly, could result in personal injury.

Intended Uses & Limitations



DIRECT INJECTION

CHECK VALVES INCLUDED WITH
OPTIONAL MOLD PURGE ONLY.

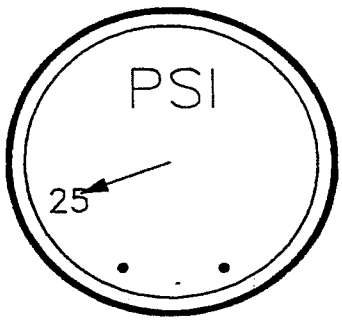
Certain materials and processes require water to be supplied for precise control of the process temperature. In these types of applications water temperature controllers are used to circulate water at temperatures higher than the available water supply, to add or remove heat as needed to maintain a uniform heat balance in the process.

Temperature controllers are self-contained units which have the capability to heat and cool the circulating water. The heaters are electric and cooling is normally supplied by a chiller or cooling tower system. Sensors in the circulating system control the heating and cooling of the water to maintain the process at the required temperature.

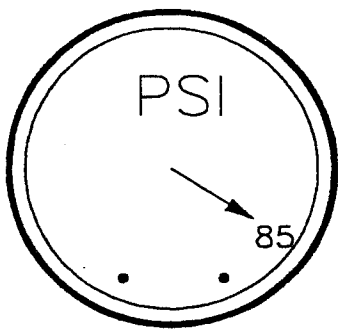
Direct injection temperature controllers circulate water at temperatures up to 250oF (120oC). The temperature of the water is maintained by discharging heated process water and adding cooling water to the circulation loop. This type of unit is recommended for use with chillers, where water quality is generally maintained in a closed loop system.

GETTING STARTED
Requirements for Installation

This unit requires a MINIMUM of 25 PSI on the cooling source feed and can accomodate up to a MAXIMUM of 85 PSI. The piping connection sizes are listed below:



Minimum



Maximum

DIRECT INJECTION

Process Supply.....1 1/4 " NPT

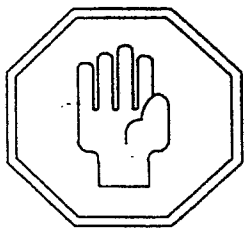
Process Return.....1 1/4" NPT

Cooling Water In.....3/4" NPT

Cooling Water Out.....3/4" NPT

Larger size lines are acceptable as long as they are reduced at the Thermolator® connections. **Smaller lines are not recommended.**

Electrical

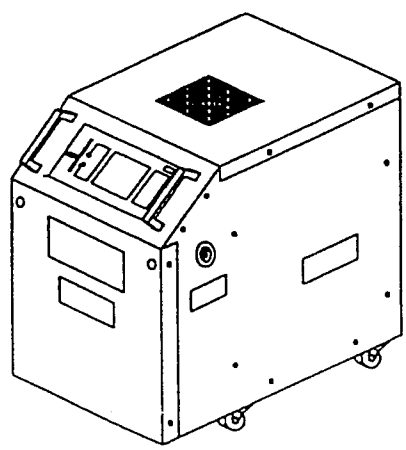


It is strongly recommended that when installing the electrical portion of the Thermolator®, all wiring ,disconnects, and fusing follow the National Electrical Code and any local electrical codes for your area.

ALWAYS maintain a safe GROUND and ALWAYS disconnect the incoming power BEFORE an attempt is made to open the unit or perform nonstandard operating procedures, such as routine maintenance.

The electrical specifications are located on the nameplate mounted on the side of the unit, (see figure below). This will indicate the required voltage, number of phases, frequency, full load amps, disconnect fuse size, and minimum wire connection size for this unit. The electrical hookup should be identical, with a maximum of a +/- 10% variance in voltage.

The electrical hookup should also run through a fused disconnect, sized in accordance with the nameplate amperage and conforming to *Article 250 of the National Electrical Code.*



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MODEL		SERIAL #	
VOLTS	PHASE		HZ
FLA	DISCONNECT FUSE SIZE		
MIN. WIRE CONNECTION SIZE			
WIRING SCHEMATIC #			
CONTROL MODEL		REV	
PUMP MODEL	HP		FLA
HEATER KW		FLA	
COOLING SOLENOID SIZE			
OPERATING TEMP. RANGE			
TESTED BY			

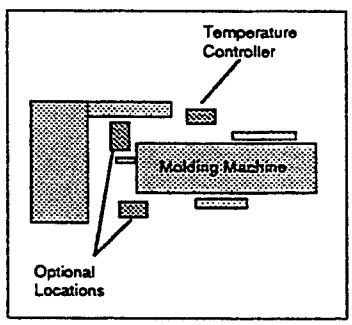
Chapter 3

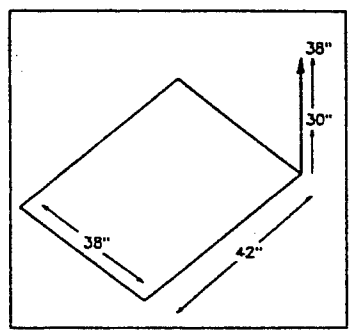
Location

STEP - BY - STEP SET UP PROCEDURE

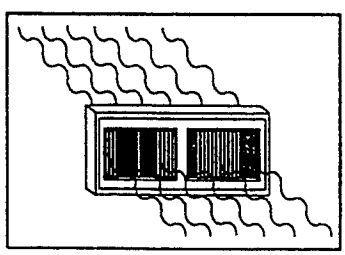
✓ Locate the Thermolator® as close to the process machine as possible. The Thermolator® will require an operating footprint of 42" long, 38" wide, and a minimum of 33" high. Rear clearance is only required to make the necessary water line hookups.

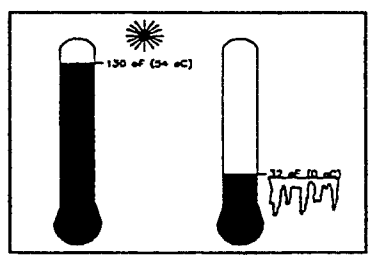
NEVER PLACE ANYTHING ON THE TOP OF THE UNIT! THIS WILL OBSTRUCT THE VENTILATION OPENING FOR THE PUMP MOTOR, CAUSING OVERHEATING AND POSSIBLE DAMAGE TO THE MOTOR.



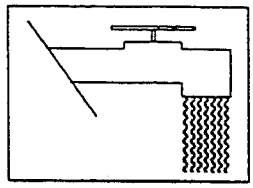


✓ Make sure the unit is in a clean well ventilated environment .



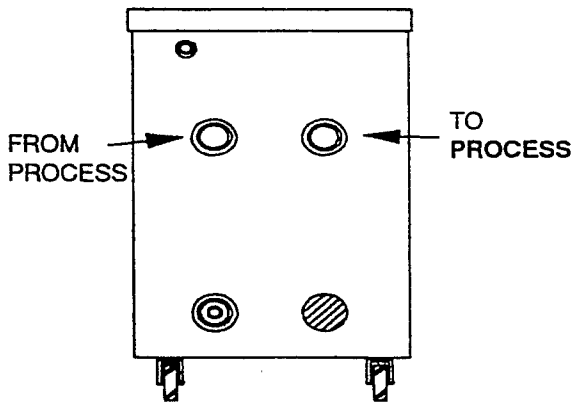


✓ The ambient operating temperature of the Thermolator® must not exceed 130oF (54oC) with 95% relative humidity, noncondensing, or fall below 32oF (0oC). In storage or shipment the unit can withstand a minimum of -40oF (-40oC) if the unit has been drained.

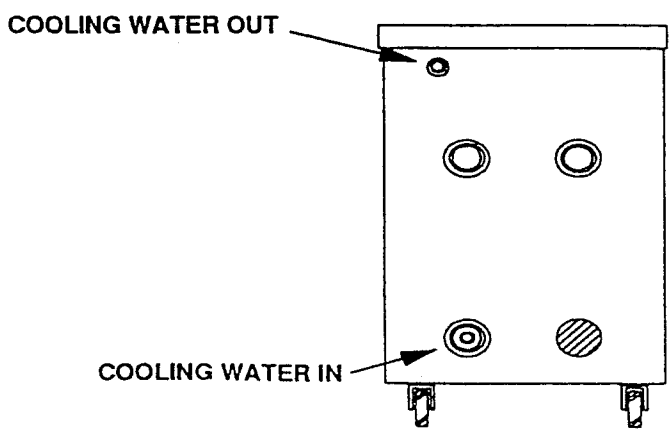


DIRECT INJECTION WATER HOOKUP

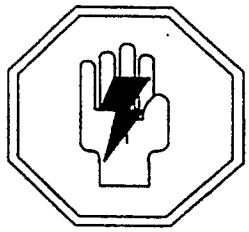
Connect the FROM PROCESS and TO PROCESS hookups to the back of the Thermolator using 1 1/4" NPT piping. Viewed from the rear, the FROM PROCESS hookup is the larger fitting to the left, and is clearly marked **"FROM PROCESS"**. The TO PROCESS hookup is the larger fitting to the right, and is clearly marked **"TO PROCESS"**.



Connect the COOLING WATER IN and COOLING WATER OUT hookups to the rear of the Thermolator® using 3/4" NPT piping. Viewed from the rear, the COOLING WATER IN hookup is the smaller fitting in the lower left corner and is clearly marked **"COOLING WATER IN"**. The COOLING WATER OUT hookup is the smaller fitting in the upper left corner and is clearly marked **"COOLING WATER OUT"**.



Electrical



Before power is initiated to the unit, make sure the proper voltage, phase, frequency, full load amps, disconnect fuse size, and minimum wire size meet the specifications stated on the nameplate mounted on the outside of the unit. Improper power supply could result in damage to the unit as well as serious injury to the operator.

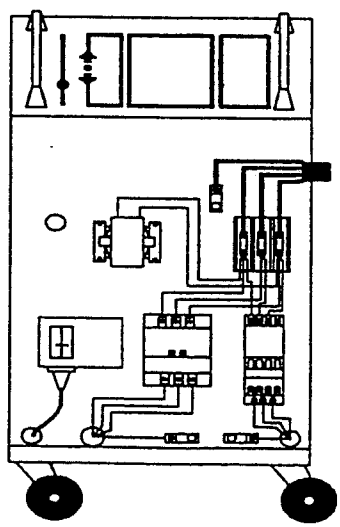
✓ Connect the power feed to the right side of the unit.

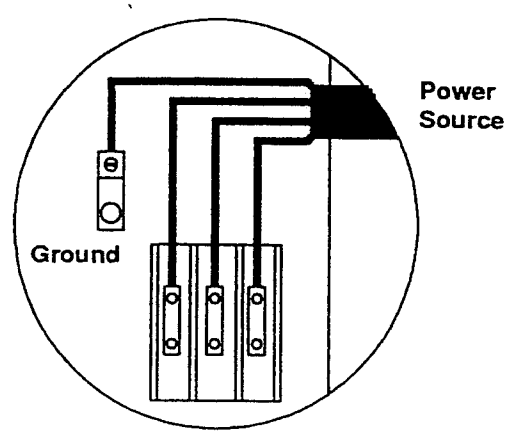
Bring the four wires into the electrical enclosure through the hole on the right side. Connect the three hot wires to L1, L2, and L3 on the terminal block in the upper right corner of the electrical enclosure. Connect the ground wire to the copper grounding mount to the left of the terminal block.

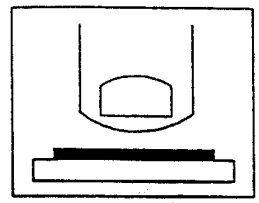
OPTIONAL

If the optional Hubbell power connection has been installed, simply connect the power feed to the right side of the unit.

✓ Initiate power from the fused disconnect.

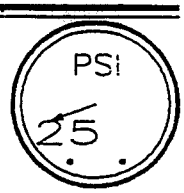




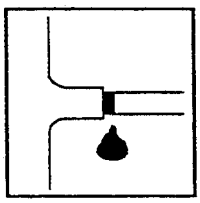


Startup

Initiate the cooling water supply. The cooling water must be at least 25 P.S.I. or the unit will not function and the LOW WATER PRESSURE indicator lamp will light.



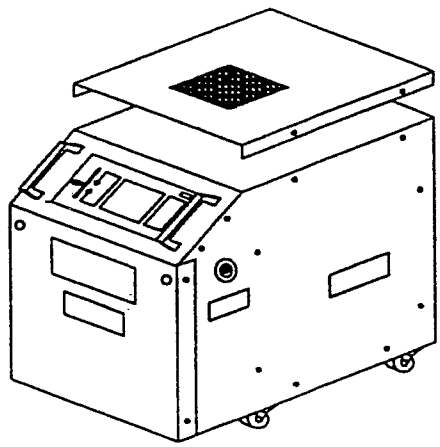
MINIMUM



Check for leaks in your cooling water connections.

Check the pump rotation by either looking down through the ventilation grille on the top of the unit (and using a flashlight to illuminate the pump motor) or by removing the top access panel and viewing the pump motor.

Make sure the Thermolator® has stopped operation and the power supply has been disconnected before attempting this procedure.



If the rotation is incorrect, swap any two of the three power source wires on the entrance block.

The Unit is now Ready For Operation.

Operating Instructions:

Move slider to "VENT" setting at the bottom of the setpoint scale.

Turn the "VENT/POWER OFF/RUN" rocker switch to the "VENT" setting for at least 30 seconds.

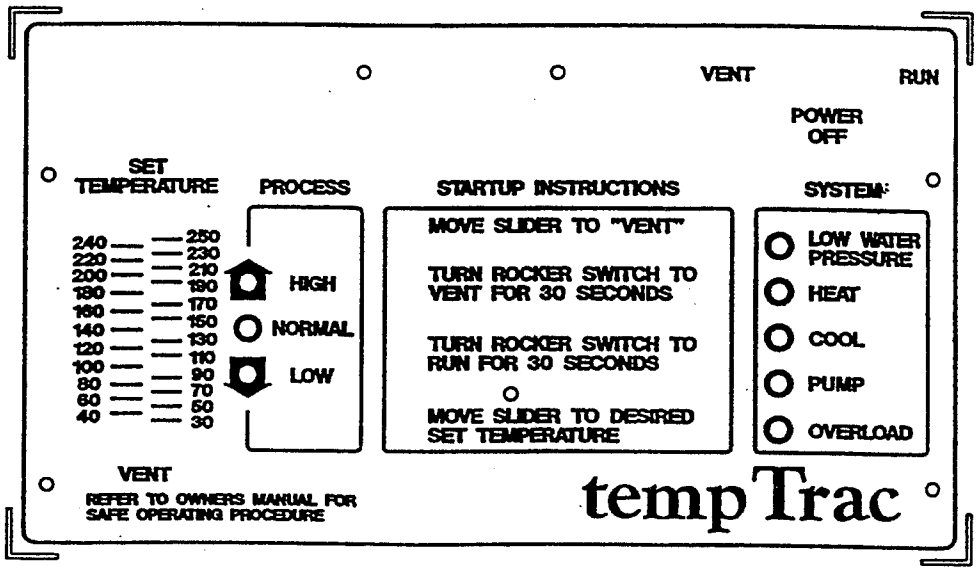
Turn the "VENT/POWER OFF/RUN" switch to the "RUN" setting for at least 30 seconds.

You may now set the "SET TEMPERATURE" slider to the desired temperature setpoint.

Repeat this procedure whenever any of the water lines have been disconnected, or whenever the unit has been drained.

Chapter 4

LAYOUT & FUNCTIONS of the CONTROL PANEL



Set Temperature

Simply choose the desired temperature by moving the slider to that setting on either side of the slider control.

Process

The three indicating lights contained in this area of the Control Panel show the operator the status of the water temperature in relation to the selected setpoint. The **HIGH** and **LOW** indicators light up only when the temperature is ten (10) degrees above or below the setpoint.

Control Panel

The indicator lamps that show a problem has occured are:

LOW WATER PRESSURE and **OVERLOAD**

LOW WATER PRESSURE

This indicates that the pressure of the cooling water in has dropped below 15 P.S.I., causing the unit to cease operation. Once adequate pressure exists (25 P.S.I. OR MORE), the light will go out and the unit will restart on its own.

HEAT

The HEAT lamp will light, indicating the heater has been turned on by the tempTrac controller.

COOL

The COOL lamp will light, indicating the cooling solenoid has been opened by the tempTrac controller.

PUMP

The PUMP lamp indicator will light when the Thermolator's pump is turned on by the tempTrac controller.

OVERLOAD

This indicates that the amperage on the three phase circuit of the pump motor has exceeded the factory setting.

PURGE (OPTIONAL)

This mode evacuates all water from the unit and the mold process. It is recommended that air pressure of 80 to 100 p.s.i. be hooked up for this option. This mode is activated WHEN THE UNIT IS SHUT OFF and the PURGE button is pressed. This mode will last as long as the white PURGE button is held down. This button is located on the left side of the electrical enclosure.

When initiating the purge, the cooling water in line must be closed, or air may enter the cooling water source or water may enter the air line.

Chapter 5

BASIC OPERATIONS & EXTRA FEATURES

Shut Down of the Thermolator®

There are six reasons to shut down the Thermolator® Temperature Control Unit: to change the hookups, when the process machine is shut down, to purge the system of water, to relocate or ship the unit, to perform routine or preventative maintenance, and if a trouble condition occurs.

When attempting maintenance of any kind on the Thermolator®, move the VENT/POWER OFF/RUN switch to the "POWER OFF" position and then disconnect the power supply and let the unit cool to less than 125oF before any other action is taken.

Shut Down for Hookup Change

To shut down the Thermolator® to change the water hookups, set the switch to "POWER OFF" to cease operation of the unit. The unit should also be drained of all water. This can be accomplished through use of the two bottom connection openings located on the back of the unit, or through the optional mold purge. Once the unit is cool and drained the water hookups can be removed.

Shut Down for Purge (Optional)

To prepare for a purge, all that is required is that the switch be set to "POWER OFF", to cease operation of the unit, and the cooling water feed is closed.

Shut Down for Relocation or Shipment

When relocating the Thermolator® within the same general area, set the switch to "POWER OFF", to cease operation of the unit. The water feeds may or may not need to be disconnected, depending on the relocation.

Shut Down Procedures

If the Thermolator® is to be shipped or stored, the unit must be disconnected from the power supply and all water feeds. The unit must also be drained of all water. In shipment or storage the Thermolator® can withstand an environment between -40oF (-40oC) and 150oF (65oC) with 95% relative humidity non-condensing.

When attempting maintenance of any kind on the Thermolator®, set the switch to "POWER OFF" and then disconnect the power supply and let the unit cool to less than 125oF before any other action is taken.

Shut Down for Routine / Preventative Maintenance

The water feed may or may not need to be disconnected, depending on the type of maintenance preformed. Chapter 6 of this manual gives step by step instructions on routine and preventative maintenance procedures.

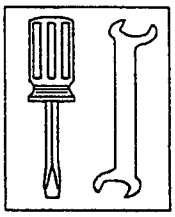
Shut Down for Trouble Shooting

When shutting down the Thermolator® due to a trouble condition, the very first step is to switch to "POWER OFF" and then disconnect the power supply. Make a note of the units action prior to the trouble. Chapter 7, Trouble Shooting, details trouble conditions and suggested courses of action.

Chapter 6

PREVENTATIVE & ROUTINE MAINTENANCE

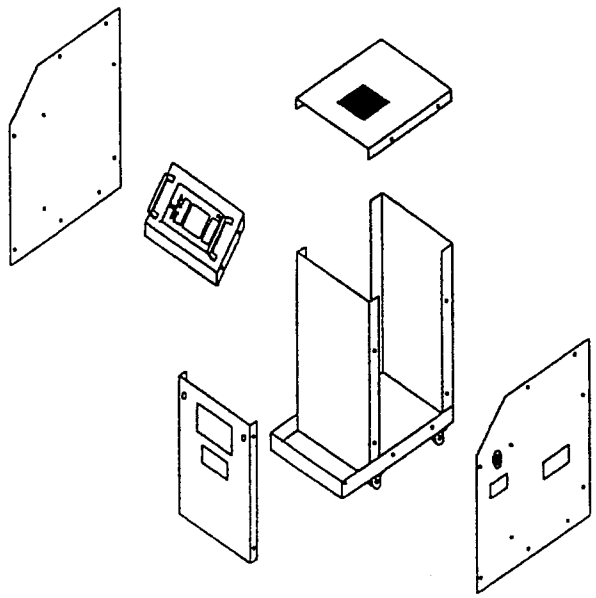
The only preventative maintenance that the Thermolator® requires is greasing of the motor bearings on the 3,5, and 7 1/2 hp. pump models. These bearings should be greased once every three months.



The tools that are required for this operation are:

A Grease Gun
A 5/16" (across the Flats) Nutdriver
A Medium Flat-blade Screwdriver

Make sure the Thermolator® has stopped operation and the power supply has been disconnected.

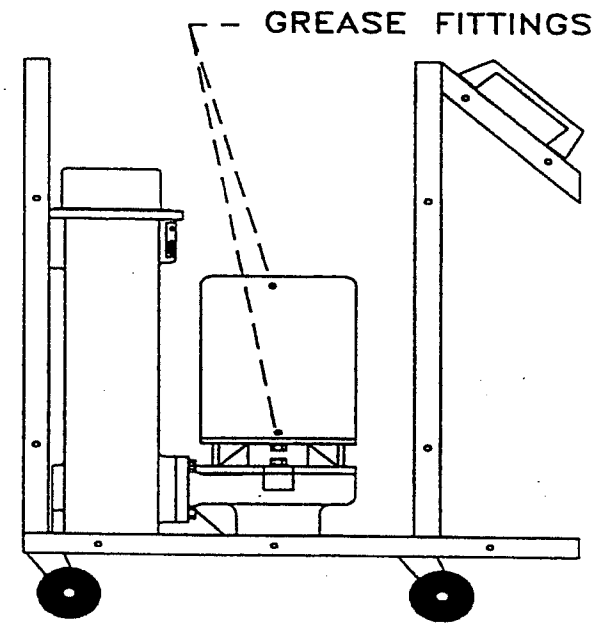


Preventative & Routine Maintenance

Remove the electrical enclosure access cover (at the front of the unit), with the screwdriver.

Remove the top panel, using the nutdriver.

Remove the side panels, using the nutdriver.



There are two grease fittings, viewed from the front of the unit, one is on the upper left side of the pump, the other is on the lower back of the pump.

- ✓ Place the grease gun connector over the first grease fitting and pump 1 or 2 times. Do not over pump.
- ✓ Place the grease gun connector over the second grease fitting and pump 1 or 2 times. Do not over pump.
- ✓ Replace the side panels, then the top panel, and finally the front electrical enclosure access panel. Use care when reseating any of the sheetmetal fasteners.
- ✓ Reconnect the power supply and start the unit.

DO NOT OPERATE THE UNIT WITHOUT THE SHEETMETAL FASTENERS IN PLACE!

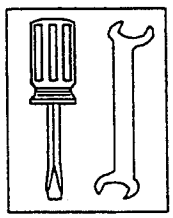
Chapter 7

TROUBLE SHOOTING

UNIT SYMPTOM	PROBABLE CAUSE	REMEDY
Nothing happens, display does not light up.	Unit not plugged in, or wired in.	Check power supply wiring.
	Disconnect switch not in "ON" position.	Turn disconnect to the "ON" position.
	One or more fuses "OPEN" in disconnect.	Check fuse, and check for wiring problems
	Wrong voltage applied to unit.	Check power supply.
	Circuit board failure.	Call CONAIR TEMPRO Customer Service number.
Unit will not start, low water pressure lamp is on.	No "Cooling Water In", or less than 25 P.S.I.	Initiate "Cooling Water In" above 25 P.S.I.
Unit will not heat to set point.	Solenoid valve fouled or heater contact failure.	Check for cooling water out when cool solenoid is not open.
PUMP OVERLOAD lamp is on.	Pump Overload.	Determine cause of overload and reset.
INCORRECT ROTATION	Incoming phase reversed.	Swap any two phases at incoming power.

Chapter 8

DISASSEMBLY & REASSEMBLY PROCEDURES



The Thermolator® can be disassembled and reassembled using the following tools:

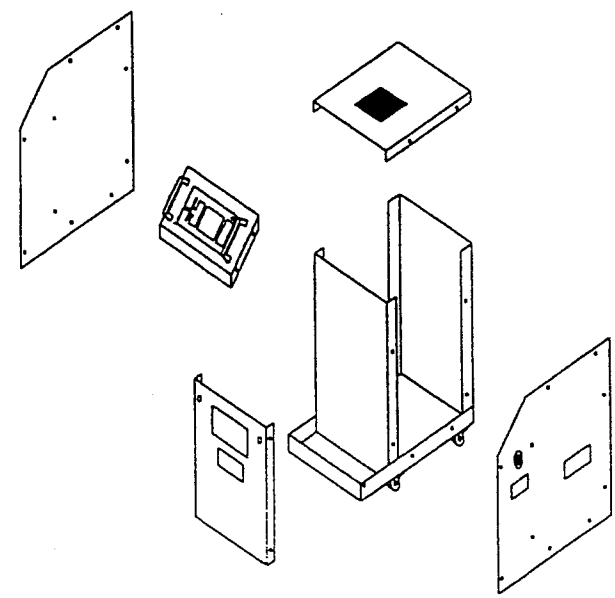
9/16" crows foot wrench
3/8" (1/4" drive) and ratchet
15/16" (1/2" drive) and ratchet
1/4" allen wrench (key)
5/16" nutdriver
10" pipe wrench
Medium flat-blade screwdriver
1/4" open end wrench
1/2" open end wrench
9/16" open end wrench
1/4" box wrench

Make sure the Thermolator® has stopped operation, and has cooled below 125oF, and the power supply has been disconnected before any attempt is made to disassemble.

Enclosure Access

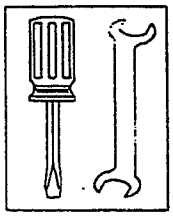
Using the 5/16" nutdriver and medium flat-blade screwdriver, remove the following panels (in this order): The front electrical enclosure access panel, the top panel, the side panels. This gives access to all of the components within the unit.

Follow the instructions in the rest of this chapter to remove the individual components.



Disassembly & Reassembly Procedures

Wiring Harness Removal



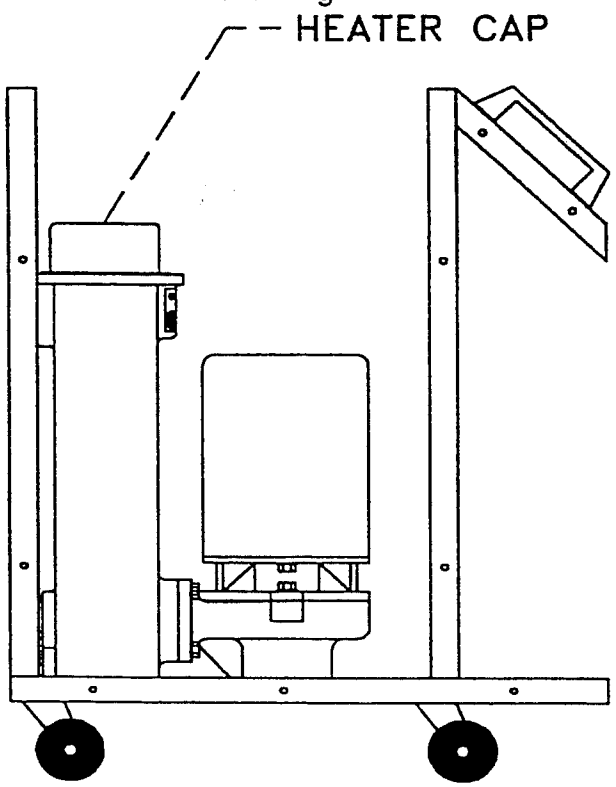
The tools required for this procedure are:

Medium size blade type screw driver
1/4" open end wrench

Using the 1/4" open end wrench remove the three bolts that hold the orange heater cap.

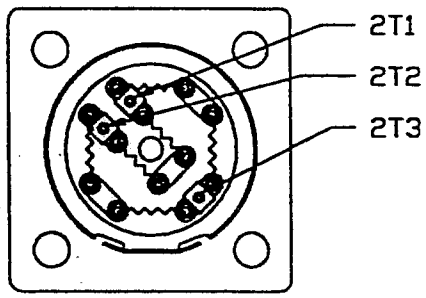
Remove the heater cap.

Mark down your wiring layout of the heater, the wires are labeled; 2T1, 2T2, 2T3. It will be one of the following.

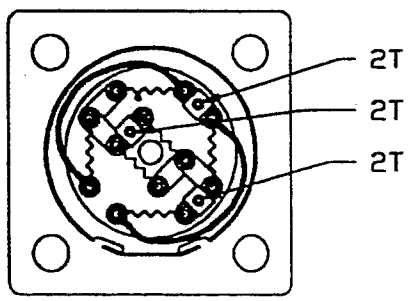


HEATER CONNECTIONS

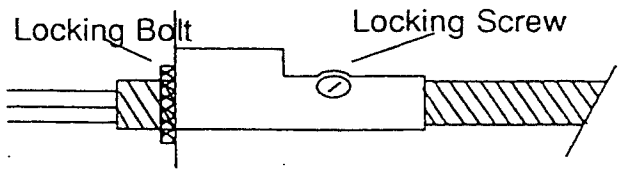
460/3/60



208-230/3/60



Unscrew the locking screw on the wiring harness. Using the same screw driver release the locking bolt opposite the locking screw just removed.



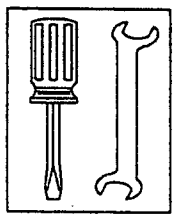
Disassembly & Reassembly Procedures

Using the 3/8" socket and 1/4" drive, loosen the bolts holding the heater wires, 2T1, 2T2, 2T3, and disconnect the wires.

Remove the wiring harness and move it clear of the unit.

To reassemble the wiring harness, reverse this procedure.

Heater Removal



The tools required for this procedure are:

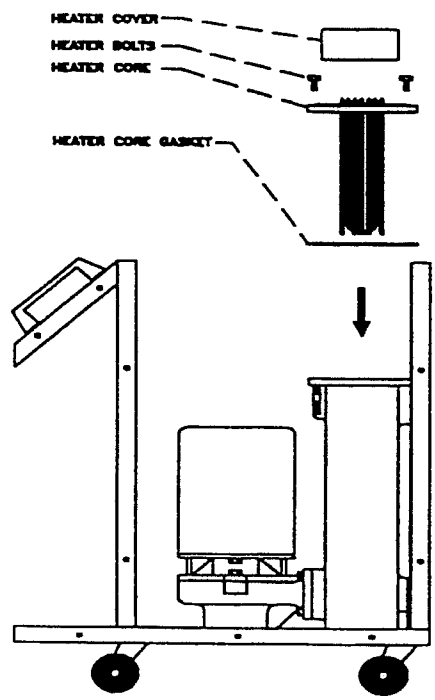
15/16" socket with 1/2" drive

Remove the wiring harness as previously stated.

Drain the unit of all water through the lower water connections that are located in the rear of the unit.

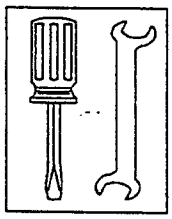
Using the 15/16" socket and 1/2" drive remove the four bolts that secure the heater. Lift the heating element straight up out of the heater tube. Be sure not to misplace the heater gasket.

To reassemble the heater, reverse this procedure



Disassembly & Reassembly Procedures

Solenoid Removal

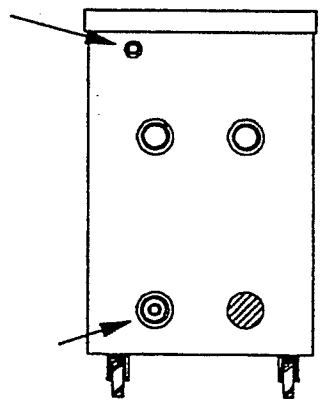


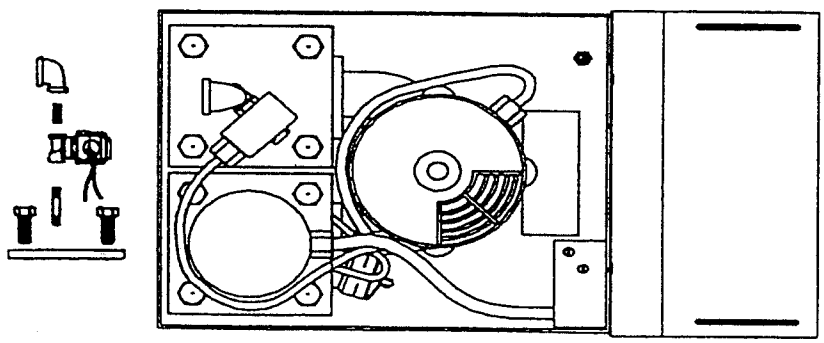
The tools required for this procedure are:

10" pipe wrench
Medium blade type screw driver
5/16" nutdriver

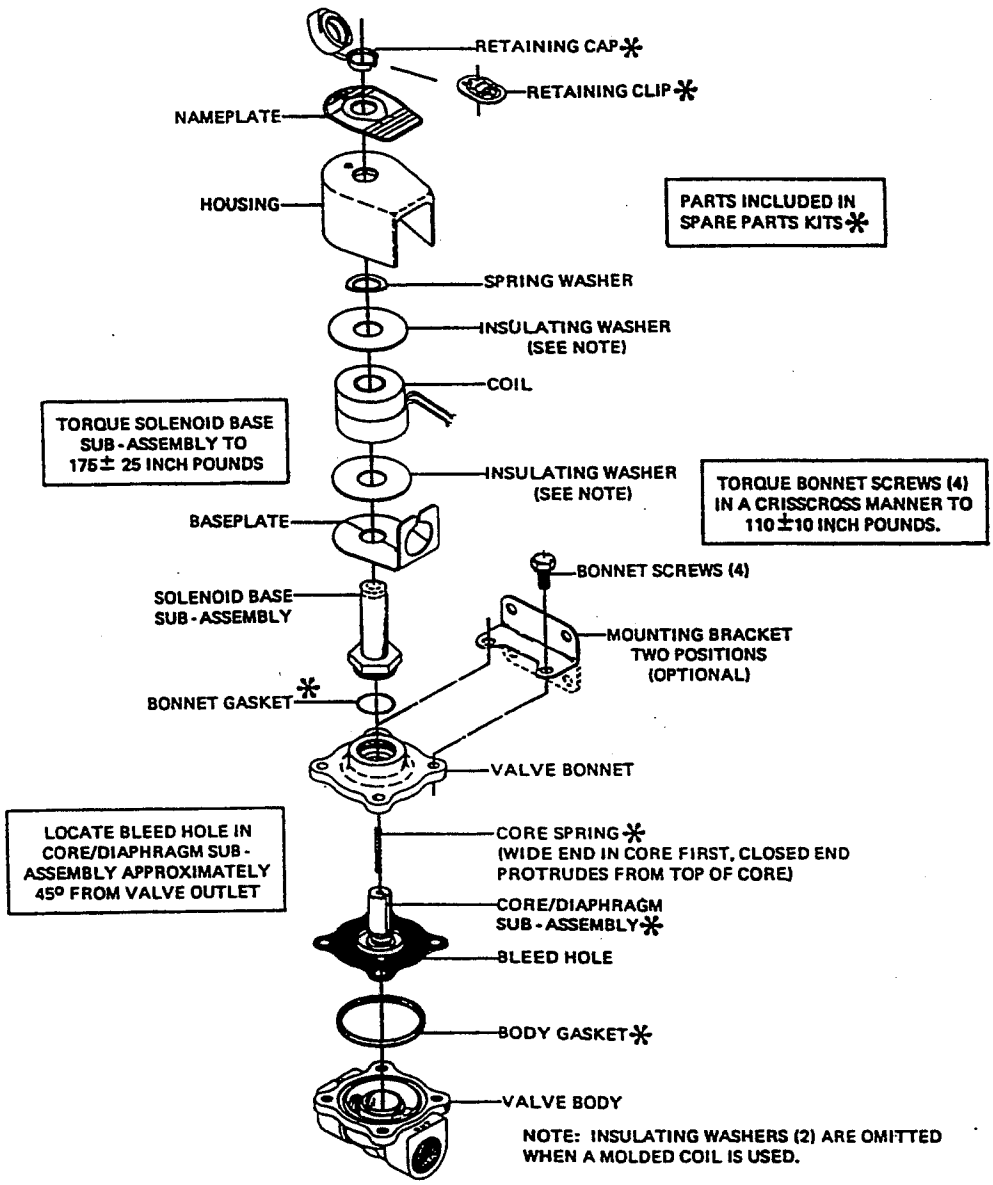
- Shut off the cooling water in feed.
- Drain the unit of all water and remove the access panels.
- Using the 10" pipe wrench, remove the cooling water out feed.
- Using the 10" pipe wrench, disassemble the solenoid assembly as per the drawing below.

The solenoid valve itself may be disassembled using the screw driver as per the exploded drawing on page 26.





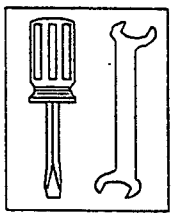
Disassembly & Reassembly Procedures



To reassemble, reverse this procedure. Make sure all pipe fittings are properly sealed with pipe dope. Check your connections for leaks upon startup.

Disassembly & Reassembly Procedures

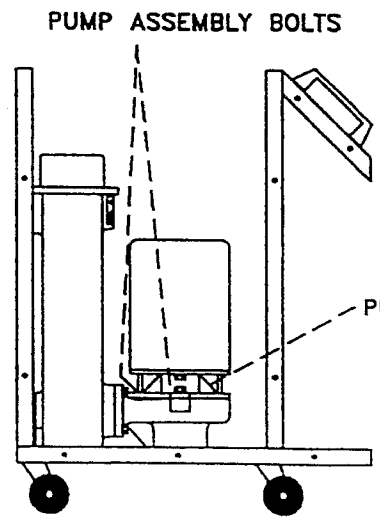
Pump Removal



The tools required for this procedure are:

2 medium blade type screw drivers
1/2" open end wrench
9/16" open end or box wrench
9/16" crows foot wrench
assorted sockets with 1/4" drive
10" Pipe wrench
5/16" nutdriver

- ✓ Shut off the cooling water in feed.
- ✓ Drain the unit of all water and remove the access panels.
- ✓ Use the 1/2" open end wrench to remove the vent line connected to the pump adapter.



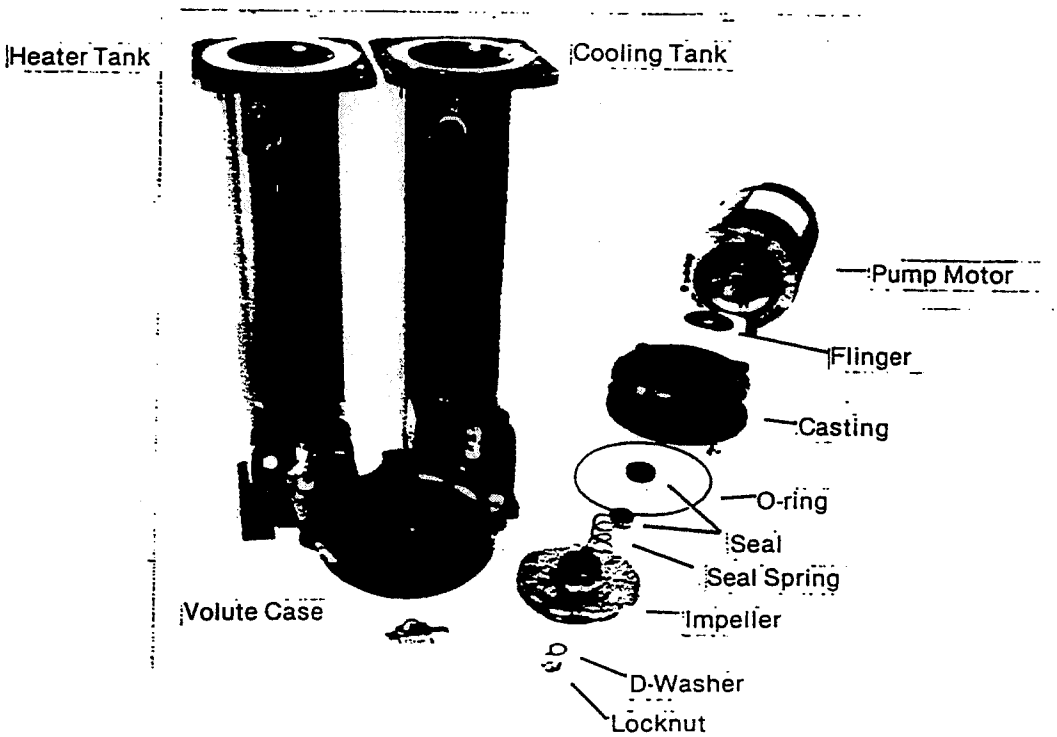
- ✓ Use the 9/16" open end box wrench to remove the four bolts securing the pump assembly to the volute case. The one bolt in the rear will require a 9/16" crows foot wrench.
- ✓ Remove the pump assembly by lifting straight up.

Disassembly & Reassembly Procedures

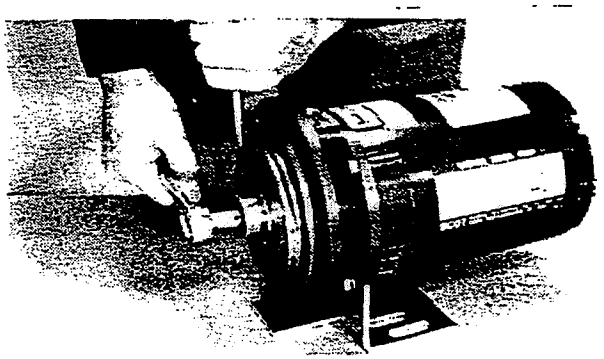
Disassembly and Reassembly of the 12C pump.

Remove the four bolts holding the pump to the casting.

Remove the pump motor and rotating element from the casting.

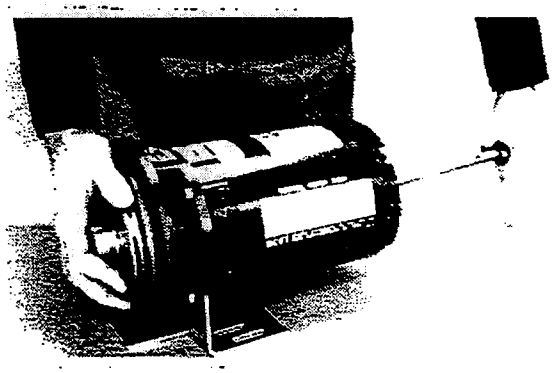


Insert a screwdriver in one of the impeller waterway passages and back off the impeller nut as shown.

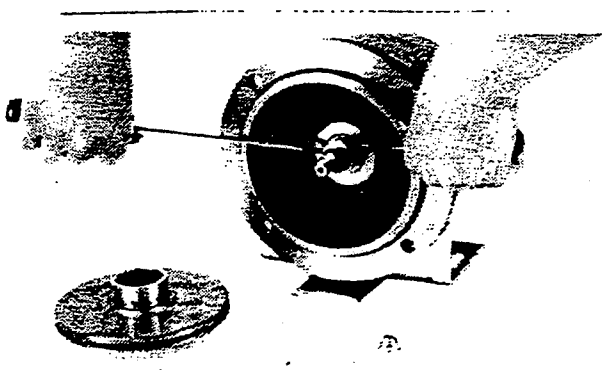


Disassembly & Reassembly Procedures

- Remove the motor shaft end cap. Insert a screwdriver in the slot of motor shaft. While holding shaft against rotation, unscrew impleller from shaft by turning counterclockwise when facing impleller.



- Pry off rotating member of the mechanical seal from shaft by using two screw drivers.



- Remove bolts holding adapter to motor and take off adapter.

- Place adapter on a flat surface and push out stationary part of mechanical seal.

Disassembly & Reassembly Procedures

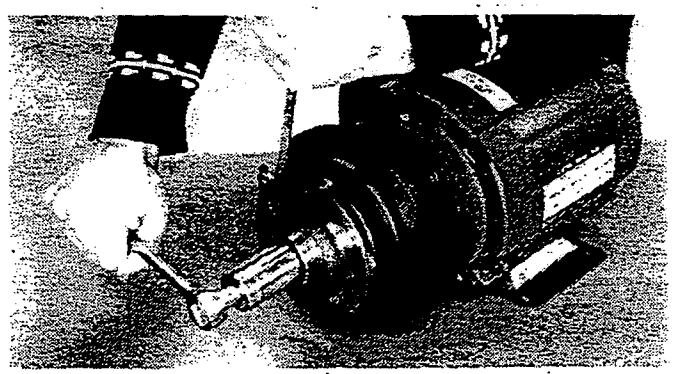
Reassembly of the Pump

- Clean gasket and flange faces, seal seat cavity and shaft, in particular, shaft shoulder fitting against impeller.
- Lubricate seal seat cavity of adapter and rubber cup or O-ring of stationary seal with soapy water solution. Press the stationary seat in seal seat cavity squarely and evenly. Use caution not to chip or scratch the lapped face of seat.
- Remount the adapter on motor, making sure the motor shaft does not dislocate or chip the stationary seat of the seal.
- Apply a soapy water solution to the motor shaft and the rubber bellows of the rotary seal. Set the rotating member of the mechanical seal on the motor shaft. Be sure the rotating seal face stays in the holding collar durring installation. Also take extra care not to chip or scratch the lapped seal faces.
- Hold the shaft against rotation as descibed previously in the disassembly procedure, and thread the impeller on the shaft unril it is tight against the shaft shoulder.
- Replace D-Washer and impeller nut holding the impeller against rotation as previously indicated in the disassembly procedure. (3 phase motors only)
- Remove any burrs caused by the screwdriver on the vane of the impeller in the waterway passage.
- Replace the motor and rotation element in the casting. Be sure that any damaged O-ring or gasket is replaced.
- Tighten casting bolts alternately and evenly.
- Replace hold-down bolts.
- Check for free rotation after assembly is completed.
- Replace the motor shaft end cap.
- Close all drain openings using pipe sealant on threads.
- Reprime before starting. Do not start until pump is completely filled with water.

Disassembly & Reassembly Procedures

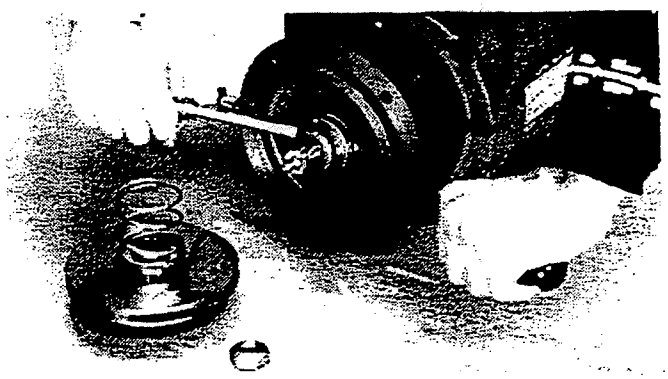
Disassembly and Reassembly for the 50C pump.

- Insert a screwdriver in one of the impeller waterway passages and back off the impeller retaining assembly with a socket wrench, as shown.



- Remove impeller from shaft, being careful not to lose the impeller key, spring and seal retainer. The impeller is difficult to remove, it may be necessary to use a bearing puller to pull off the impeller.

- Pry off rotating member of mechanical seal from sleeve or stub shaft by using two screw drivers.



- Remove bolts holding casting adapter to motor and take off casting adapter.

- Place casting adapter on a flat surface and push out stationary part of mechanical seal.

- Inspect the shaft sleeve or stub shaft. If damaged, or worn, remove from the shaft and replace with a new one.

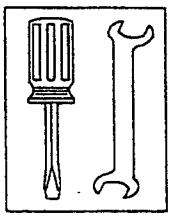
Disassembly & Reassembly Procedures

Reassembly of 50c pump:

- ✓ Clean gasket and flange faces, seal seat cavity, shaft sleeve or stub shaft and motor shaft.
- ✓ Lubricate the seal seat cavity squarely and evenly, with caution not to chip or scratch the lapped face of the seat.
- ✓ With the motor preferably in vertical position, remount the casting adapter on the motor, making sure the motor shaft does not dislocate or chip the stationary seat of the seal.
- ✓ Apply a soapy water solution to the sleeve or stub shaft and the rubber bellows of the rotary seal. Slide the rotating member of the mechanical seal over the sleeve or stub shaft. Replace the seal spring and seal retainer. Be sure the rotating seal face stays in the holding collar during installation. Also take extra care not to chip or scratch the seal lapped faces.
- ✓ Place key in key seat and slide the impeller on the shaft. Replace the impeller retaining nut.
- ✓ Insert a screw driver in a waterway passage of the impeller holding it against rotation and tighten nut.
- ✓ Remove any burrs caused by screw driver on the vane of the impeller in the waterway passage.
- ✓ Slide the motor and rotating element in casing. Be sure that any damaged O-ring or gasket is replaced.
- ✓ Tighten casing bolts alternately and evenly.
- ✓ Replace hold-down bolts.
- ✓ Check for free rotation after assembly is completed.
- ✓ Close all drain openings, using pipe sealant on threads.
- ✓ Reprime before starting. Do not start until pump is competely filled with water.

Disassembly & Reassembly Procedures

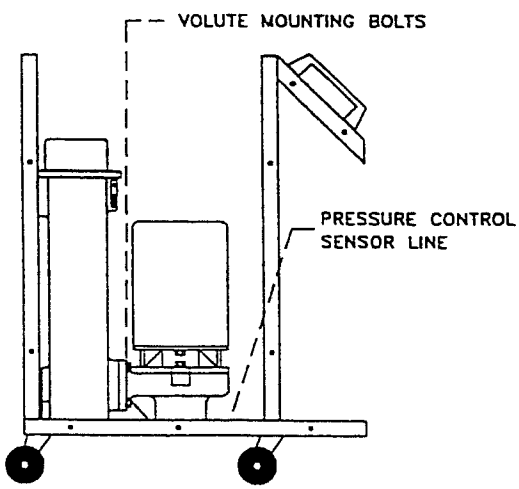
Volute Removal

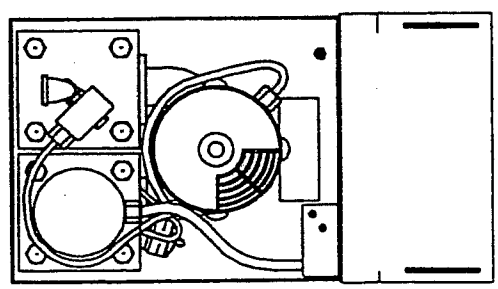


The tools required for this procedure are:

1/2" open face wrench
9/16" open face wrench
9/16" socket with 1/2" drive
medium flat blade screwdriver
5/16" nutdriver

- ✓ Drain the unit of all water and remove the access panels.
- ✓ Remove the pump assembly as previously stated.
- ✓ Remove the pressure control sensor line using the 9/16" open face wrench.
- ✓ Remove the 8 bolts mounting the volute to the heater and cooling tubes. Be careful not to misplace the O-rings mounted on the tubes.

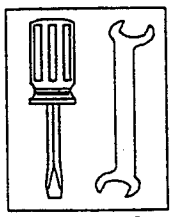




Reassembly of the volute.

- ✓ Make sure the O-rings are in place on the tubes and reverse the previous procedure.

Disassembly & Reassembly Procedures



Tube Removal

The tools required for this procedure are:

1/2" open face wrench
9/16" open face wrench

Drain the unit of all water through the bottom water connection points located in the rear of the unit.

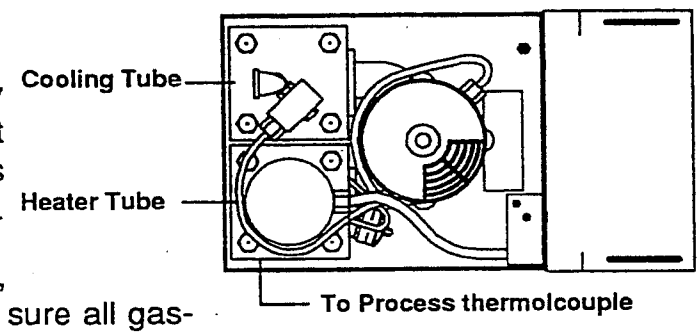
Remove the pump assembly and volute assembly as previously stated.

To remove the heater tube

Remove the wiring harness and heater as previously stated.

Remove the "TO PROCESS" thermocouple using the 1/2" open face wrench.

The heater tube is released by removing the bolt in the far left corner. This bolt also mounts the left rear caster to the body.

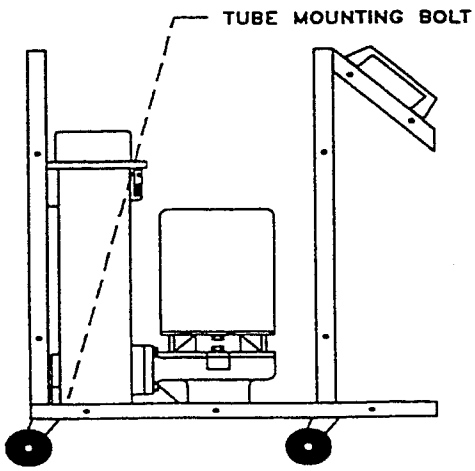


To reassemble the heater tube, reverse this procedure. Make sure all gaskets and O-rings have been replaced and are in good condition.

To remove the Cooling Tube

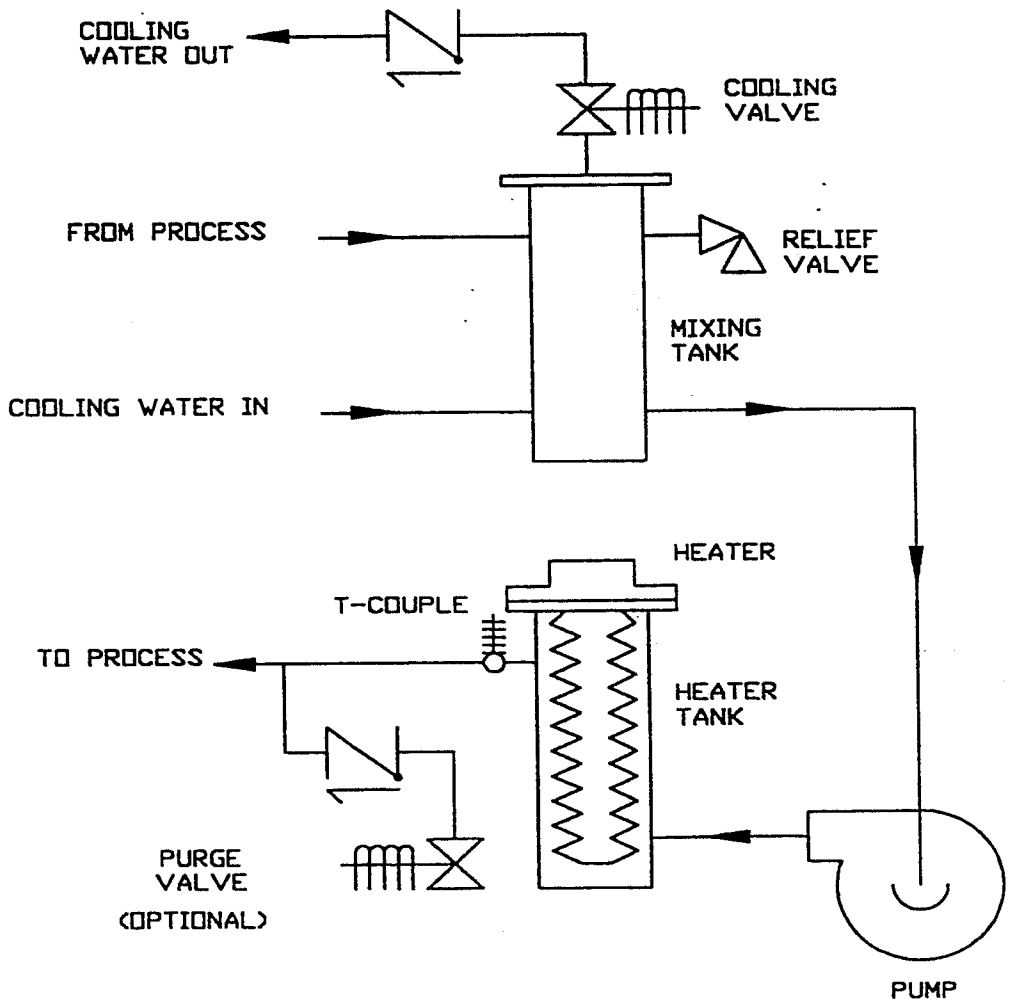
Remove the cooling solenoid assembly as previously stated.

The cooling tube is released by removing the bolt in the far right corner. This bolt also mounts the right rear caster to the body.



TECHNICAL INFORMATION

Plumbing Diagram

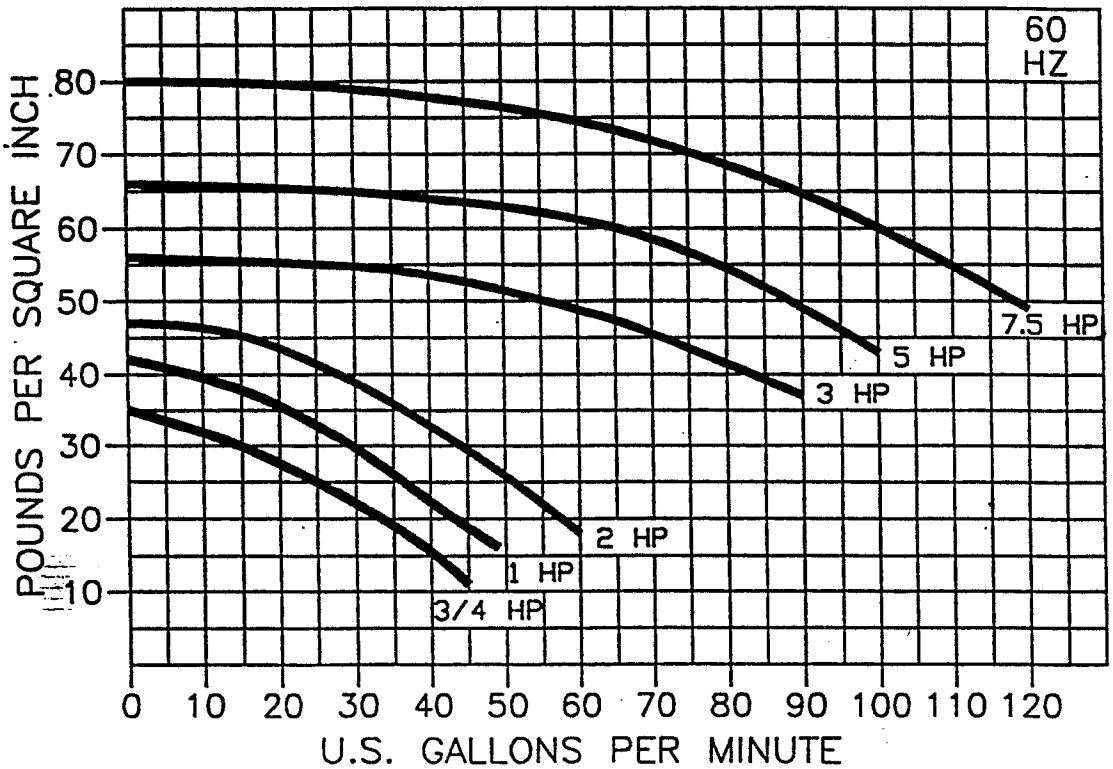


DIRECT INJECTION

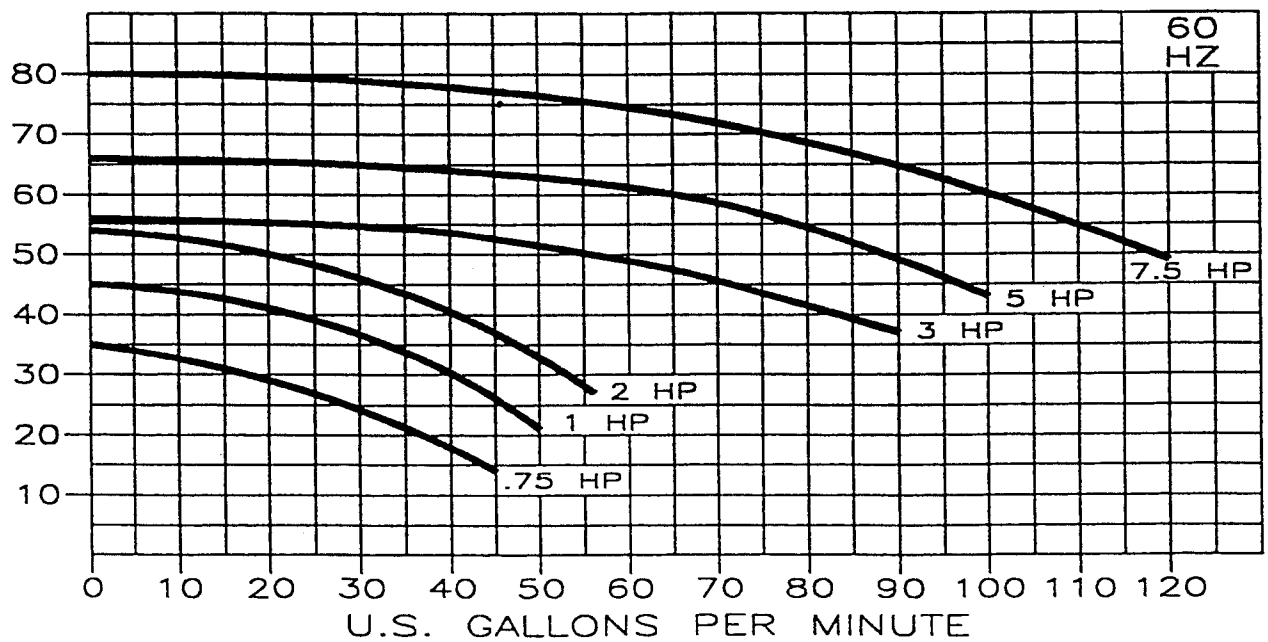
CHECK VALVES INCLUDED WITH
OPTIONAL MOLD PURGE ONLY.

Technical Information

High Performance Pump Curves

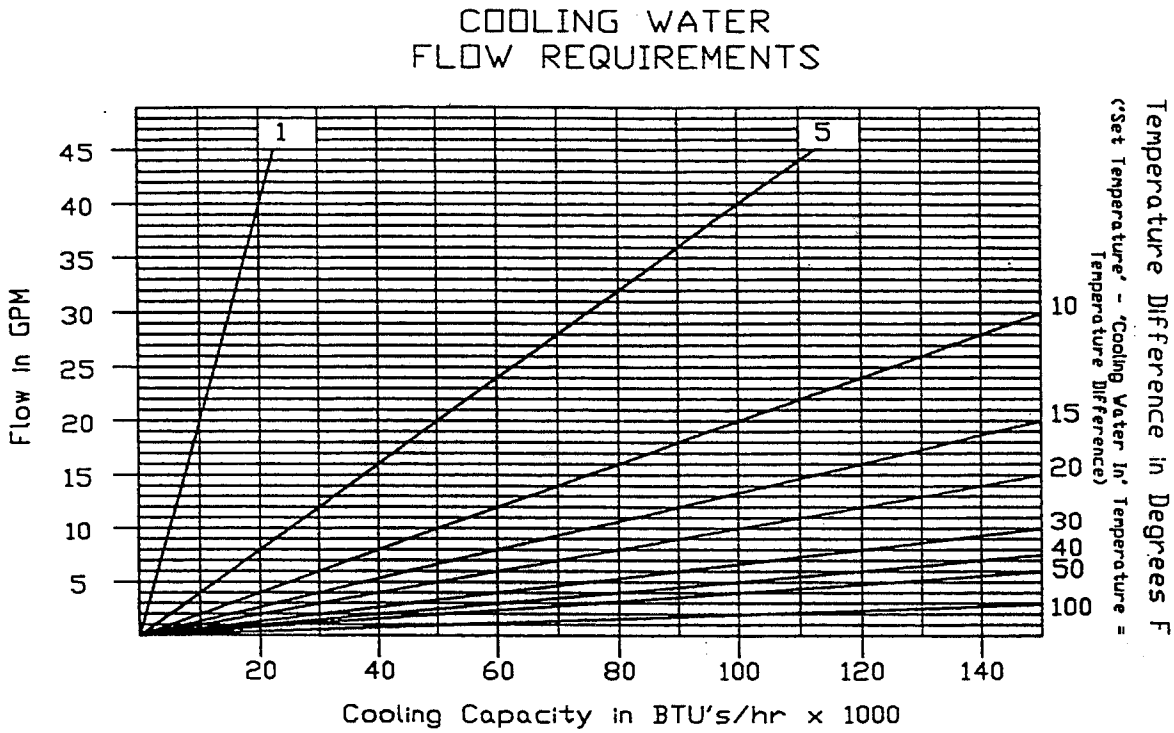


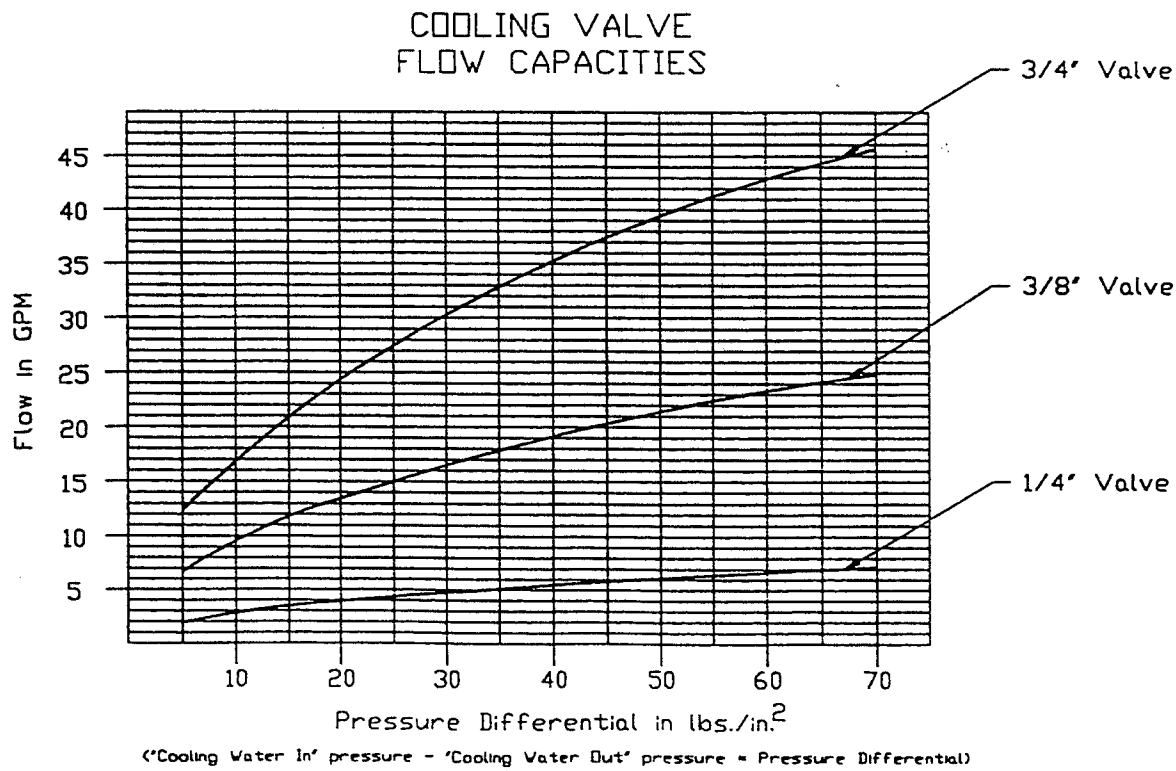
Ultra Performance Pump Curves



Technical Information

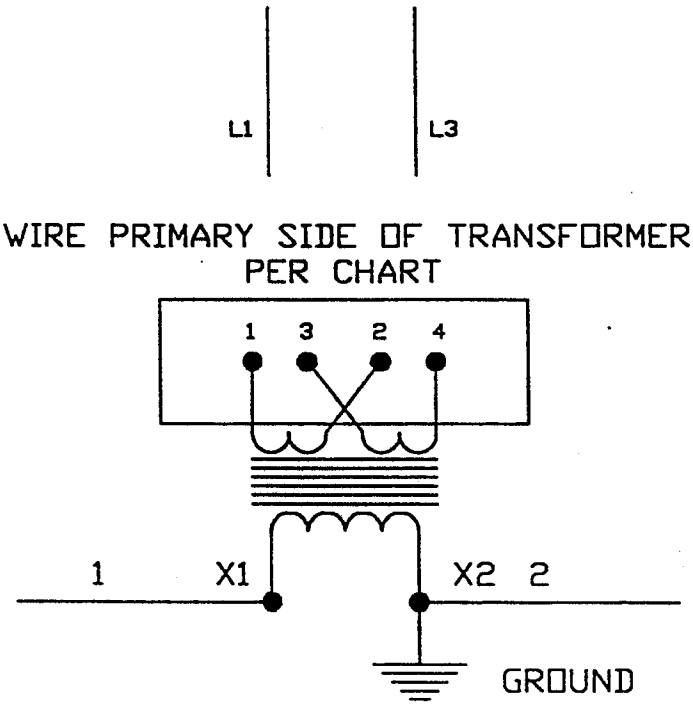
COOLING CURVES

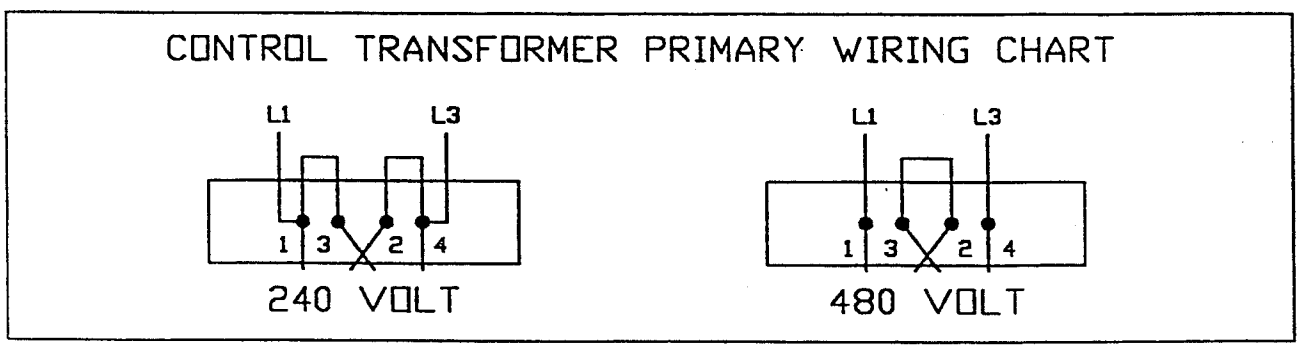




Technical Information

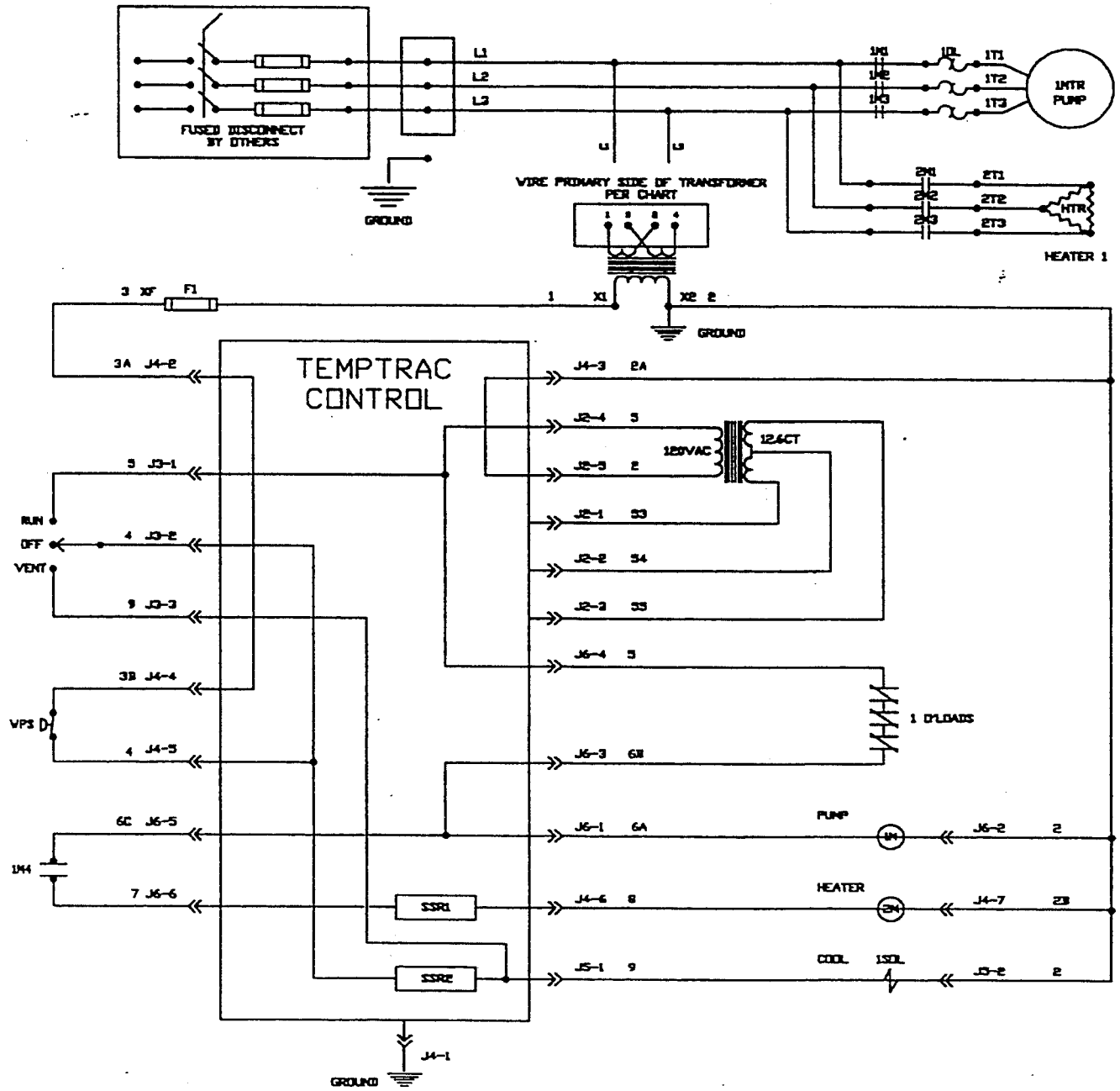
Transformer Wiring Diagram





Technical Information

Unit Wiring Diagram



Parts List

Thermolator® Temperature Control Units
Recommended Spare Parts

	Part Number
1. Ultra Performance Pump Seal Overhaul Kit	
1.A 3/4 through 2 H.P.	
1.A.1 Seal, silicon carbide 1.A.2 O-ring, volute 1.A.3 O-ring, suct./disch. - qty.2	09000358
1.B 3 through 7.5 H.P.	
1.B.1 Seal, silicon carbide 1.B.2 Gasket, volute 1.B.3 O-ring, suct./disch. - qty.2	09000359
2. High Performance Pump Seal Overhaul Kit	
2.A 3/4 through 2 H.P.	
2.A.1 Seal, carbon niresist 2.A.2 O-ring, volute 2.A.3 O-ring, suct./disch. - qty. 2	09000751
2.B 3 through 7.5 H.P.	
2.B.1 Seal, carbon niresist 2.B.2 Gasket, volute 2.B.3 O-ring, suct./disch., - qty. 2	09000752
3. Cooling / Vent solenoid overhaul kits	
3.A 1/4" valve (includes)	
Plunger O-ring Spring	09000360
3.B 3/8" valve (includes)	
Plunger O-ring Spring	09000361
3.C 3/4" valve (includes)	
Plunger O-ring Spring Diaphragm	09000362

Parts List

4. Heaters (specific to unit)	
9kw 460 & 230/3/60	11009000
12KW 460 & 230/3/60	09000363
12KW 208/3/60	09000364
12KW 200/3/50	09000365
12KW 380/3/50	09000366
12KW 575/3/60	09000367
(All of the above include necessary gasket)	
5. Heat Exchanger Overhaul Kit (includes) Bonnet Gasket Flange Gasket 1/4" vent valve overhaul kit 3/4" cooling valve overhaul kit	09000368
6. Heat Exchanger replacement kit (includes) Heat Exchanger, 4 sq. ft. Bonnet Gasket Flange Gasket 1/4" vent valve overhaul kit 3/4" cooling valve overhaul kit	09000369
7. Spare Control Board fuse (qty. 1)	09000672
8. Control Board and Control Enclosure	05000170
9. Control Board and Control Enclosure w/ optional temperature gauge.	055000171
10. Cable, seven pin	05000165
11. Cable, six pin	05000166
12. Thermocouple with half union (qty. 1)	11000400

Parts List

12. Water pressure switch	11000050
13. Motor starter (specific to unit)	-
14. Heater contactor (specific to unit)	-
15. Electrical panel transformer (line to 115/1/60 volts)	09000663
16. Relief valve	09000328
17. Caster	09040000

Parts List

19. Pumps (includes suct./disch. O-ring - qty.2)	
3/4 H.P. 208-230-460/3/60	09000393
3/4 H.P. 575/3/60	09000394
3/4 H.P. 200-380/3/60	09000395
1 H.P. 208-230-460/3/60	09000396
1 H.P. 575/3/60	09000397
1 H.P. 200-380/3/60	09000398
2 H.P. 208-230-460/3/60	09000399
2 H.P. 575/3/60	09000400
2 H.P. 200-380/3/60	09000401
3 H.P. 208-230-460/3/60	09000402
3 H.P. 575/3/60	09000403
3 H.P. 200-380/3/50	09000404
5 H.P. 208-230-460/3/60	09000405
5 H.P. 575/3/60	09000406
5 H.P. 200-380/3/50	09000407
7.5 H.P 208-230-460/3/60	09000408
7.5 H.P. 575/3/60	09000409
7.5 H.P. 200-380/3/50	09000410
20. Pump motors	
3/4 H.P. 208-230-460/3/60	09000375
3/4 H.P. 575/3/60	09000376
3/4 H.P. 200-380/3/60	09000377
1 H.P. 208-230-460/3/60	09000378
1 H.P. 575/3/60	09000379
1 H.P. 200-380/3/60	09000380
2 H.P. 208-230-460/3/60	09000381
2 H.P. 575/3/60	09000382
2 H.P. 200-380/3/60	09000383
3 H.P. 208-230-460/3/60	09000384
3 H.P. 575/3/60	09000385
3 H.P. 200-380/3/50	09000386
5 H.P. 208-230-460/3/60	09000387
5 H.P. 575/3/60	09000388
5 H.P. 200-380/3/50	09000389
7.5 H.P 208-230-460/3/60	09000390
7.5 H.P. 575/3/60	09000391
7.5 H.P. 200-380/3/50	09000392

Low Water Safety Switch Setting

SWITCH SETTINGS:

Minimum Cut in setting = 25 PSI
Maximum Differential setting = 10 PSI

ANY CHANGES TO THE SAFETY SWITCH SETTINGS COULD RESULT IN INJURY TO PERSONNEL AND/OR DAMAGE TO THE EQUIPMENT!

PURPOSE OF THIS SWITCH:

Due to the properties of steam (see steam table excerpt) this switch is required. Its function is to prevent the cooling water from turning into steam at higher operating temperatures.

If the cooling water were to turn to steam, a steam flash could possibly cause:

1) Damage to the equipment being cooled.
2) Injury to the personnel operating the equipment.
3) Damage to the Water Temperature Controller.

Specific damage to the Water Temperature Controller could be:

1) Pump damage, due to running without lubrication.
2) Casting damage.

PROPERTIES OF SATURATED STEAM

Pressure lb Gauge	Pressure lb Absolute	Temperature Deg Fahr	v_g Specific Volume Cu ft per lb	h_f Heat of Liquid	h_{fg} Latent Heat of Evaporation	h_g Total Heat of Steam	s_f Entropy of Water	s_g Entropy of Steam
0	14.7	212.	26.79	180.0	970.4	1150.4	.3118	1.7565
1	15.7	215.3	25.23	183.4	968.2	1151.6	.3168	1.7511
5	19.7	227.2	20.38	195.3	960.6	1155.9	.3343	1.7332
10	24.7	239.4	16.49	207.7	952.5	1160.2	.3522	1.7146
15	29.7	249.7	13.88	218.2	945.5	1163.7	.3672	1.6999
20	34.7	258.8	11.99	227.4	939.3	1166.7	.3801	1.6875
25	39.7	266.9	10.57	235.6	933.7	1169.3	.3914	1.6767
30	44.7	274.1	9.45	243.0	928.5	1171.5	.4015	1.6670
35	49.7	280.6	8.56	249.7	923.8	1173.5	.4108	1.6586
40	54.7	286.7	7.82	255.9	919.4	1175.3	.4191	1.6510
45	59.7	292.4	7.20	261.8	915.1	1176.9	.4268	1.6436
50	64.7	297.7	6.68	267.2	911.2	1178.4	.4340	1.6372
55	69.7	302.6	6.23	272.3	907.4	1179.7	.4407	1.6311
60	74.7	307.3	5.83	277.1	903.9	1181.0	.4471	1.6255
65	79.7	311.8	5.49	281.7	900.5	1182.2	.4531	1.6203
70	84.7	316.0	5.18	286.1	897.2	1183.3	.4587	1.6154
75	89.7	320.1	4.91	290.3	894.0	1184.3	.4641	1.6108
80	94.7	323.9	4.67	294.3	891.0	1185.3	.4691	1.6063
85	99.7	327.8	4.441	298.1	888.2	1186.3	.4740	1.6022
90	104.7	331.2	4.241	301.8	885.3	1187.1	.4786	1.5982
95	109.7	334.6	4.058	305.4	882.6	1188.0	.4831	1.5944
100	114.7	337.9	3.890	308.8	880.0	1188.8	.4875	1.5909

CALIBRATION OF TEMPTRAC CONTROLS

STEP 1: ZERO METER ADJUSTMENT

With power off adjust the zero-adjust screw located on the face of the analog temperature display meter so that the needle points to zero.

STEP 2: HIGH LIMIT CALIBRATION

Apply power and start the unit. Best calibration is obtained by operating the unit at the highest set-point; 240 F. If the system cannot operate with this temperature fluid, adjust set-point to the highest allowable temperature. Allow the unit to stabilize at the set-point; heat indicator should be consistently off. Access the potentiometer on the back bottom of the meter. Adjust the potentiometer so that the meter reading matches the operating set-point.

CALIBRATION IS NOW COMPLETE

We're Here to Help

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

How to Contact Customer Service

To contact Customer Service personnel, call:

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

Before You Call ...

If you do have a problem, please complete the following checklist before calling Conair:

- ❒ Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- ❒ Make sure power is supplied to the equipment.
- ❒ Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- ❒ Check the troubleshooting guide of this manual for a solution.
- ❒ Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- ❒ Check that the equipment has been operated as described in this manual.
- ❒ Check accompanying schematic drawings for information on special considerations.

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

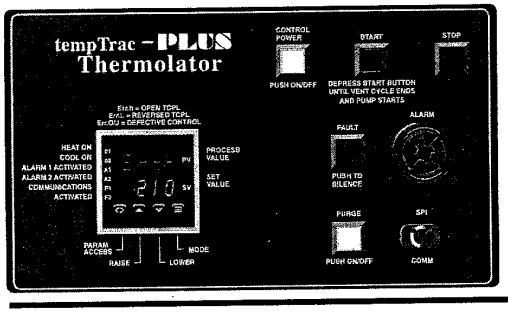
- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.

TROUBLESHOOTING



The Thermolator provides indicator lights and alarm messages to help you diagnose most problems. If a problem occurs:

1 **Check the indicator lights and messages** to help determine the cause of the problem.

2 **Press FAULT to silence the optional audible alarm.**

> ⚠ **WARNING: Before servicing the Thermolator®**
> Allow the unit cool to below 100° F. Disconnect and lockout the main power source. Disconnect water and air supply lines.

Shut down alarms

The Thermolator has shut down automatically to prevent damage to equipment or personnel. Fix the problem and then restart the Thermolator.

Err.H / 210 **The thermocouple has failed. The circuit between the thermocouple and temperature controller is open.**

1. Verify that the thermocouple wires are attached to terminals 9 and 10 on the back of the temperature controller.
2. Check the thermocouple. Replace, if it is damaged.

Err.L / 210 **The thermocouple wires to the temperature controller are reversed.**

1. Loosen terminals 9 and 10 on the back of the temperature controller, and switch the two thermocouple wires.

Err.O / 210 **The temperature controller is defective. Replace the controller.**

Err.J / 210 **The temperature controller is defective. Replace the controller.**

FAULT **The pump has stopped and the START light is no longer on. The pump overload has tripped. Reset the pump overload to restart.**

1. Verify that the correct voltage is supplied to the motor.
2. Verify that the pump overload is set to the full-load value displayed on the pump motor nameplate and that the current draw is less than the full-load.
3. Water flow may be more than the pump can handle. Check motor current against the motor rating. Decrease flow as needed.

NOTE: The following Shut Down alarms will reset automatically if the problem corrects itself.

FAULT **The supply water is off, or the supply water pressure is less than 25 psi.**

1. Verify that the water supply is turned on.
2. Increase supply water pressure to the inlet.

FAULT **The actual temperature of water supplied to the mold exceeds the 260° F temperature safety limit.**

1. The unit is not running. Start the Thermolator.
2. Water has stopped flowing between the supply outlet and return inlet. Check for closed valve or plugged line.
3. Check the 01 status light. If it is not on and the heater is running, the contactor failed. Disconnect and lockout power, then replace contactor.

Warning alarms

The Thermolator continues operating, but this problem could lead to shutdown if not corrected.

ALARM 2 ACTIVATED (A2)

Actual temperature of water supplied to the mold is lower than the setpoint deviation limit allows.

1. The heater failed. Check for a bad heating element or a heater contact that failed in the open position.
2. The cooling valve is stuck open. Clean valve as needed.
3. Low deviation temperature is set too low. Increase.

ALARM 1 ACTIVATED (A1)

Actual temperature of water supplied to the mold is higher than the setpoint deviation limit allows.

1. Water has stopped flowing between supply outlet and return inlet. Check for plugged pipe or failed cooling valve.
2. The heater contact failed. Replace the contact.
3. High deviation temperature is set too low. Increase.

⚠ **WARNING:** This card provides basic troubleshooting and operation information. Users must be familiar with all safety information and procedures described in the User Guide.

Quick Card

Basic

Operation

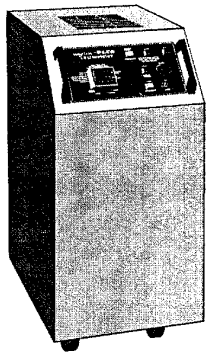
Troubleshooting

Instant Access
Parts & Service
(800) 458-
(814) 437-

www.conairnet.com

Thermolator® tempTrac Plus

Water Temperature Controller



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The Conair Group, Inc.
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QCH011/1197

THE TEMPTRAC PLUS CONTROL

Process value display
The window displays the actual temperature of fluid entering the to-process line. The window also will flash an error message, if there is a problem with the temperature controller.

Setpoint display
The window displays the fluid temperature setpoint during normal operation. The window also displays menu access codes, modes and parameters when or is pressed.

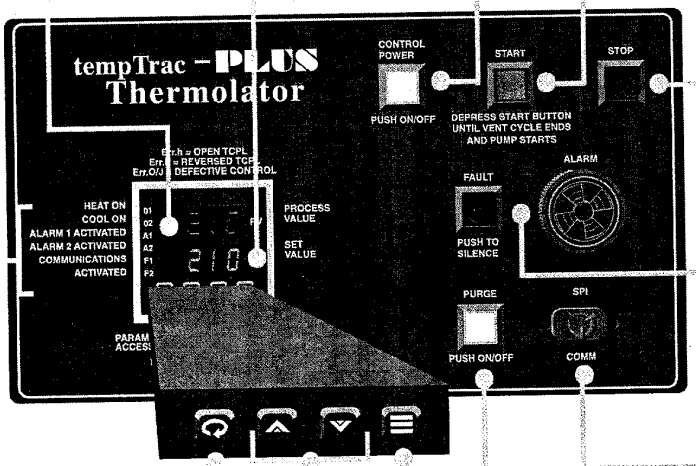
Control Power
Press to turn power to the control on or off. The button lights when power is on.

Start button
Press and hold to begin normal operation. The button lights when the unit is running.

Stop button
Press the STOP button to stop the Thermolator.

Status lights
The lights indicate the operating status of the listed components.

- = Off or inactive
- = On or active
- **(01):** Heat cycle on or off
- **(02):** Cooling cycle on or off
- **(A1):** High deviation alarm
- **(A2):** Low deviation alarm
- **(F1), (F2):** SPI Communication status



Fault light and audible alarm (Optional)
Press the red FAULT button to acknowledge the alarm light and silence the optional audible alarm. The optional alarm light remains on until the cause of the alarm condition is fixed.

The red alarm light flashes to indicate high/low deviation, low water pressure, pump overload or high temperature safety.

SPI communications port (Optional)
Plug the SPI communications cable in here.

Parameter / Access button
Use to access menu levels and scroll through lists of parameters that can be programmed. Accessing menus and changing parameters is not necessary during normal operation.

CAUTION: See the User Guide for information on menu and parameter selection. Changing menus and parameters incorrectly can result in improper operation of the Thermolator.

Purge (Optional)
The purge uses compressed air to clear fluid from the mold and lines before a mold change. Press once to turn Purge on. Press again to turn it off.

WARNING: Shut off the supply to cooling water inlet before purging.

Setpoint adjustment buttons
Used to enter the setpoint temperature or adjust other parameters. Press to increase a value. Press to decrease a value.

TIP: Press and hold the button for faster scrolling speed.

Mode button
Use to exit menu levels and to access Standby or Tune modes. These modes are used for programming and tuning the temperature controller. They are not used during normal operation. See the User Guide for information on correctly using the different modes.

OPERATION

Starting the Thermolator.

1. **Turn on main power to the Thermolator.**
2. **Press CONTROL POWER .**
   - The power button lights up to indicate the control has power.
   - The temperature controller begins a brief self test. The controller turns on all status lights, displays the software version and then shows the actual process temperature and most recently entered setpoint.

3. **Turn on the water supply to the unit.**
   The water pressure must be at least 25 psi.
4. **Press and hold START until the venting cycle ends and the pump starts.**
   - The START button lights.
   - The unit initiates a venting sequence.
   - The pump starts.
5. **Enter the temperature setpoint.**
   Press to increase the setpoint or to decrease it.

If an alarm light turns on or the pump stops and the START light goes out, see the Troubleshooting section.

Stopping the Thermolator.

1. **Press STOP .**
   - The pump stops but power is still present.

WARNING: The STOP button does not shut off power to the Thermolator. Always disconnect and lock out the main power source before opening the unit or servicing.

To purge mold and lines

You must have optional purge piping installed on the unit to use this feature.

1. **Press STOP .**
2. **Shut off the supply to the cooling water inlet.**
3. **Press PURGE to begin purging.**
4. **Press PURGE again to stop purging.**