



**LESLIE**  
CONTROLS, INC.

A subsidiary of CIRCOR International, Inc.

12501 Telecom Drive, Tampa Florida 33637

**Installation, Operating and  
Maintenance Instructions  
Supplement**

**90/0.5.0.A  
Rev. 0**

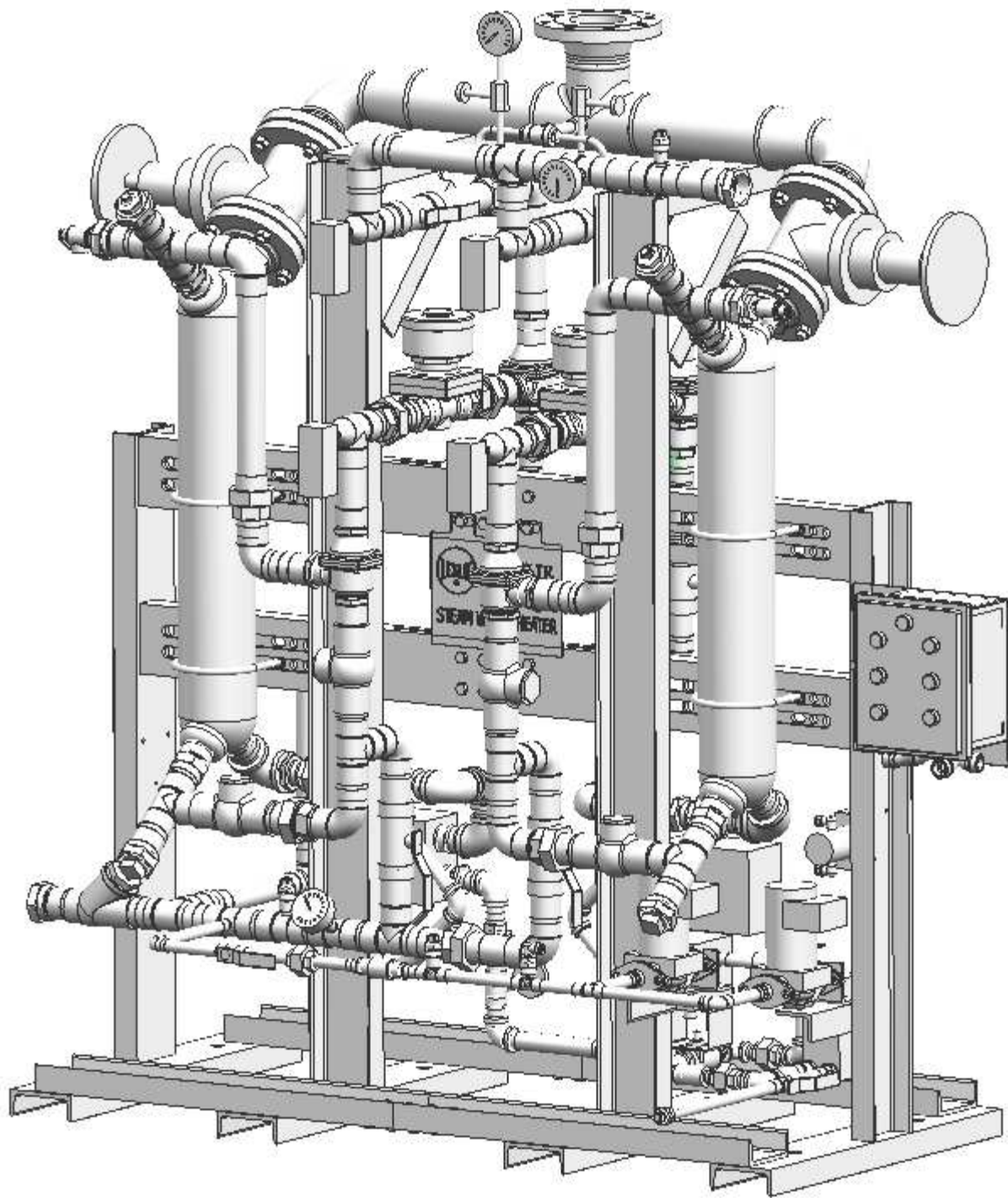
**DOUBLE SHELL & TUBE HEAT EXCHANGER  
SUPPLEMENT**

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**Figure 1 - Typical Heater Illustration**

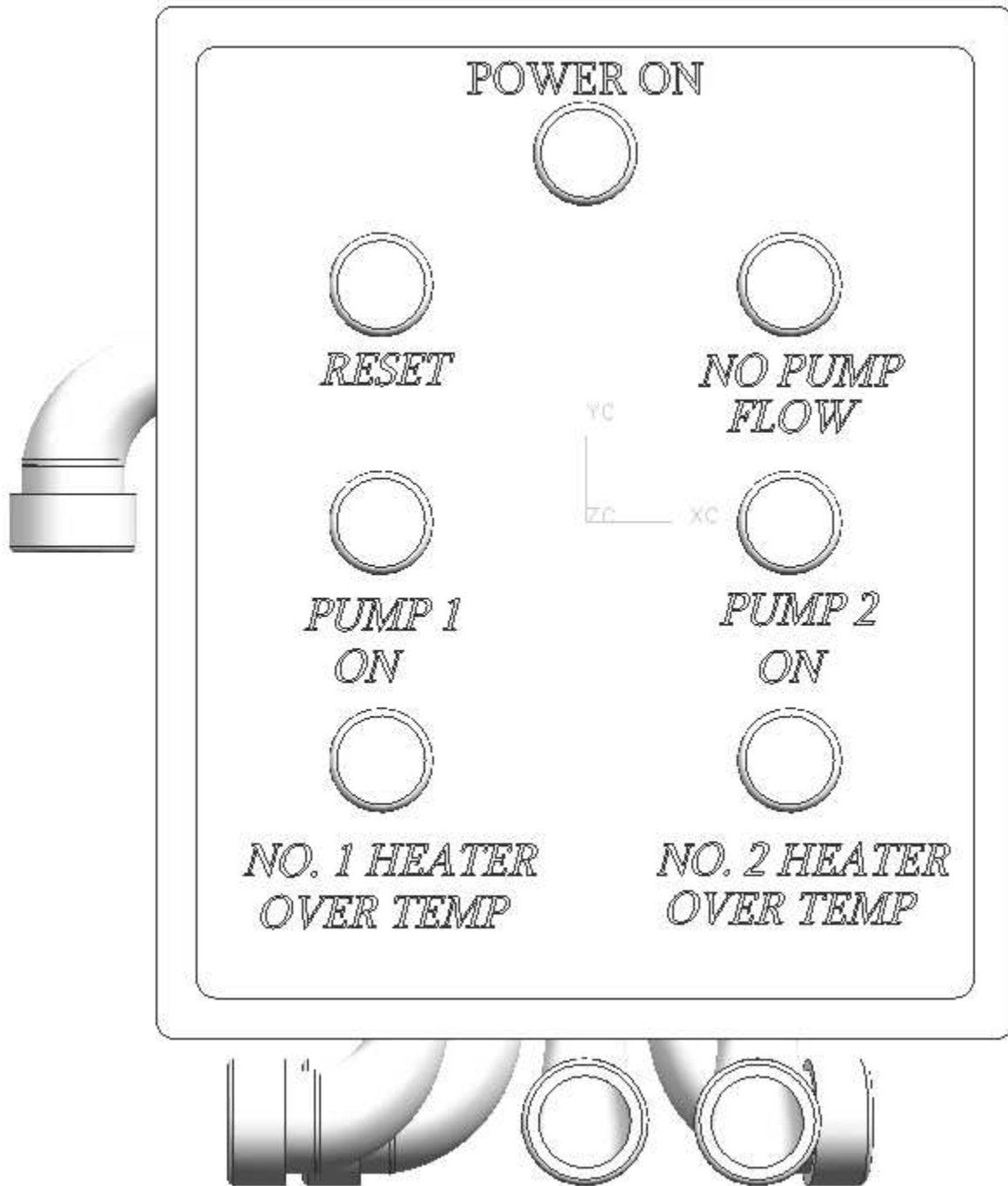
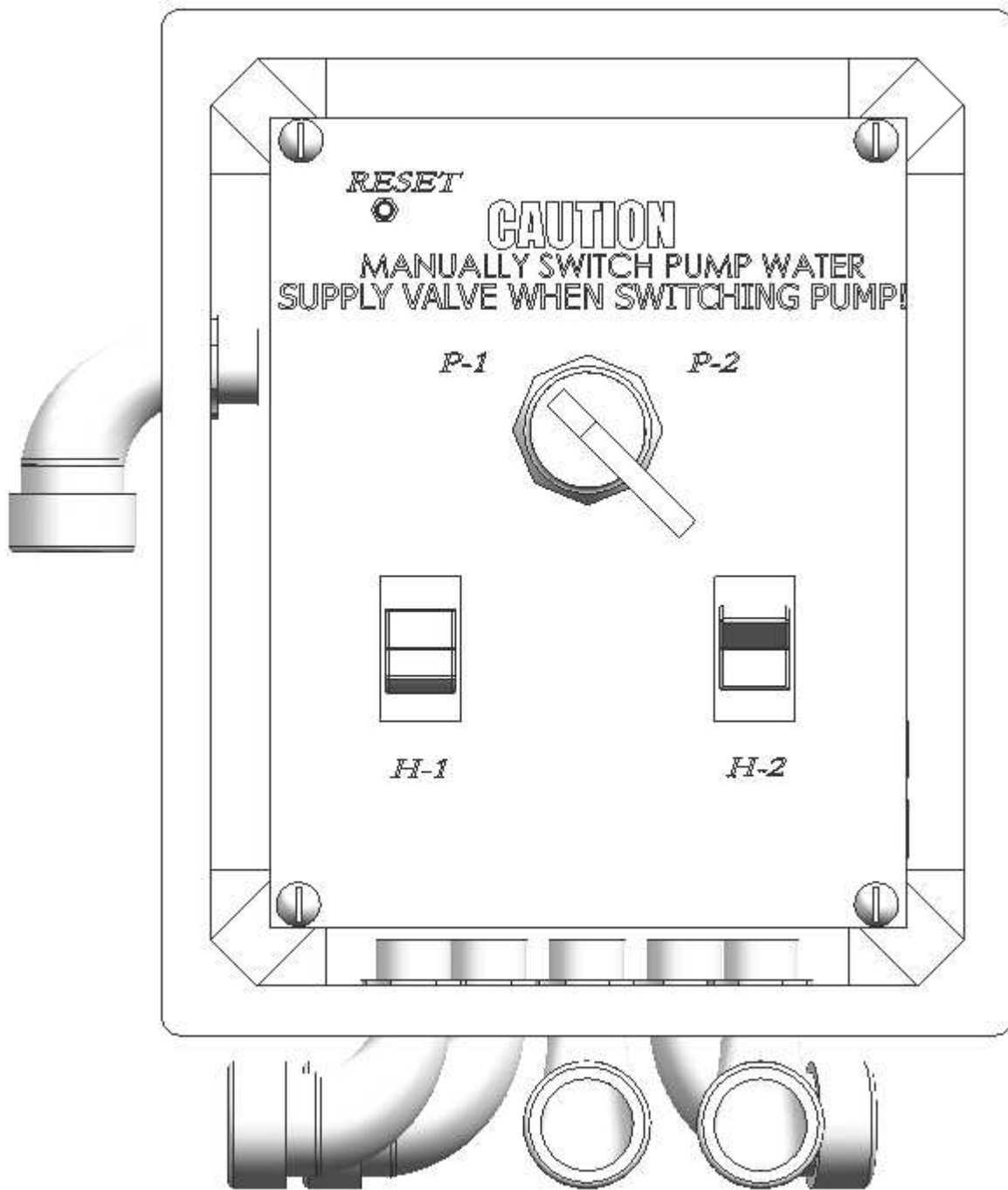


Figure 2 – Heater Control Box



**Figure 3 – Inside Control Box**

## **WARNING!**

Injury or death can occur due to failure to completely isolate component from all sources of pressure before beginning disassembly. Do not proceed until component has been completely isolated from process stream and vented to atmosphere.

## **WARNING!**

**Injury can occur due to adjusting secondary temperature switches higher than 130 degrees F. Check this setting before supplying steam to the unit.**

# **INTRODUCTION**

This addition to Installation, Operation, and Maintenance Manual is intended to be as complete and up to date as possible. It covers installation, operation, and maintenance procedures for Leslie Controls, Inc. Double Shell Tube. Leslie reserves right to update this manual and or product information concerning installation, operation, and/or maintenance, at any time and without obligation to notify product owners of such changes.

Leslie is not responsible for inaccuracies in specifications, procedures and/or content of product literature, supplied by manufacturers of components used in Leslie Controls, Inc. Double Shell Tube, Leslie strives to use only highest quality components; however, Leslie has no direct control over manufacturer, or its consistent quality.

Leslie is not responsible for injury to personnel or product damage due to improper installation, operation, and/or maintenance of Leslie Controls, Inc. Double Shell Tube. Trained/certified personnel should only perform all installation, operation, and maintenance procedures. Personnel should be trained in and familiar with correct piping and electrical procedures and methods, and should be experienced in working with hot/boiler water systems and steam systems. All personnel performing procedures should completely and carefully read and understand all supplied materials before attempting procedures. All personnel should pay strict attention to all Notes, Cautions, and Warnings that appear within procedures detailed in this manual.

Leslie welcomes user's input as to suggestions for product or manual improvement.

Contact Information

For information concerning warranties, or for questions pertaining to installation, operation or maintenance of Leslie products, contact:

Leslie Controls Inc.  
12501 Telecom Drive  
Tampa, FL 33637  
USA Phone: (813) 978-1000  
USA Fax: (813) 978-0984  
www.LeslieControls.com

To order replacement parts, contact Leslie Controls at address listed above, or call toll free:

USA/Canada/Caribbean Phone: (800) 323-8366

**Note: Please include model and serial number of unit for which parts are being ordered. If ordering by phone, please have this information readily available.**

## **GENERAL NOTES AND WARNINGS**

### Notes:

- If questions are not answered by this manual, or if specific installation, operation, and/or maintenance procedures are not clearly understood, contact Leslie Controls, Inc. for clarification before proceeding.
- If unit is damaged during installation, operation, or maintenance, complete following steps:
  1. Turn off and lock out electric power supply to unit in an approved manner.
  2. Turn off all incoming valves.
  3. Contact in-house maintenance personnel or Leslie Controls, Inc. for instructions.

**Note: Throughout this manual, BOXES will denote warnings and cautions**

# **INSPECTION**

## **A. VISUAL**

1. After checking that cold water supply is connected and turned on to the unit
2. Check that the steam supply is turned on both sides and steam pressure is 8 to 10 psig.
3. Reset light is off. Pump 1 or Pump 2 Light is on.
4. No. 1 and No. 2 heater light is off. No over temperature condition exists.

5. Output temperature gauge reads 120 degrees F.
6. Temperature switches are set for 180 degrees F for the first switch and 130 degrees F for the second switch.
7. If step 1 or two is not correct then correct condition and wait for 10 minutes while the unit sets to normal conditions.
8. If any or all of steps 3, 4 5 or 6 are not correct then continue with this troubleshooting guide.

## B. OPERATION DUE TO OVER TEMPERATURE CONDITIONS

### **IMPORTANT!**

**TO TROUBLESHOOT THE SYSTEM SHUT ONE SIDE OF THE SYSTEM DOWN, FOLLOW THE CHECKS BELOW AND REPEAT ON THE OPPOSITE SIDE OF THE SYSTEM.**

1. Check that temperature switches are properly set.  
First switch = 180 degrees F  
Second switch = 130 degrees F

### **CAUTION!**

**Never set temperature switches higher than recommended setting. Doing so will damage the solenoid valves and the mixing valves.**

2. If unit is in over temperature condition, then turn off steam supply to side not working properly and wait 10 minutes for unit to cool down. Reset light is out, No pump flow light is out and both No. 1 and No. 2 heater over temperature lights are out and either Pump 1 or Pump 2 light is on.
3. Once the unit has cooled down turn the steam supply back on.
4. Insure that there is some flow in building by turning on a hot water tap.
5. Temperature of the outlet water should slowly increase. Water temperature will, for a short time, run over 120 degrees F. It will come down after 5 minutes.
6. If water temperature does not increase then go to Section C. If water temperature continues to increase then go to Section D.

## C. WATER TEMPERTURE NOT GETTING WARM

1. Check that pipes before solenoid valves are hot.
2. If pipes or pipe is not hot, then check cold water supply valve to heat exchangers is turned on. If not then turn it on. Read note below.
3. Check condensate drains and steam traps are clear and not backing up to heat exchanger.

### **IMPORTANT!**

1. **Slowly supply water pressure to primary blend valves after full water pressure is reached then open up cold water supply to secondary blend valves slowly. Not doing so will cause solenoid valve seat to come unseated. An unseated solenoid can cause temperature to fluctuate up and down or cause a no hot water condition.**

4. Check that pipes after the solenoid valves are hot.
5. If not hot, then isolate the side and remove, inspect and replace the solenoid seat if it is damaged.
6. If hot then check gain valves to insure they are not fully open.
7. If gain valve settings are correct then remove and replace final blend valve element.

## D. OVER TEMPERATURE WATER

### **NOTE**

**Gain adjuster valves, are used to adjust cold water to final blend valve to insure holding set temperature over flow range of unit. Valves are generally set at 4.5 turns from full open position, however they should be adjusted for each installation since each building has its own characteristics. Valves should be re-adjusted when season changes from winter to summer.**

1. Check that gain valves are set properly. See "Gain Valve Procedure" following this section.
2. Check temperature switch settings.
3. Isolate system to side that is over temperature.
4. If temperature is changing quickly then shut down and replace solenoid seat for this side.
5. If primary temperature switch is tripping then change element of primary blend valve. If secondary switch is tripping then check and or change secondary element.

### **GAIN VALVE PROCEEDURE**

1. Insure all connection are made and unit is running at specified maximum flow.
2. Turn off supply of water to one side. Half of specified maximum flow is now being delivered.
3. Check outlet water temperature and insure it is 120 degrees F.
4. If warmer then turn gain valve handle counterclockwise for ¼ turn.
5. Recheck water temperature and repeat until reaching desired temperature.
6. Note: Temperature will not change quickly and must be left to seek it's normal setting.
7. If the water was colder then turn the gain valve handle clockwise for ¼ turn.
8. Recheck water temperature and repeat until reaching desired temperature.
9. Turn back on the supply of water to side turned off. Wait for the system to stabilize.
10. Repeat step 2 through 9 for the second side.

8. Turn off H1 and H2.
9. Reset light goes on, No pump flow light goes on, No. 1 heater over temp light and No. 2 heater over temp light go on.
10. Look to see if condensate ball valve actuator is moving to divert the condensate around cooler.
11. If condensate ball valve actuator is not moving then see wiring diagram and diagnose electrical connections.
12. Turn both H1 and H2 switches on.
13. Reset light will stay on until the condensate ball valve actuator has returned to is normal condition and flows condensate through the cooler.
14. No pump-flow light will go out. If pump one light is on then check that pump one is turning. If pump two light is on then check that pump two is turning. If either pump is turning, and NO flow light is on then bleed input and output pressure lines to differential pressure switch to insure that there is no air in piping. If this does not work then adjust differential pressure switch.

## **FINAL CHECK**

### **A. RESET**

1. After full unit has reached temperature and has been working for 5 minutes, push H1 switch in control box to off position.
2. No. 1 Heater light will come on, just as it will in an over temperature condition.
3. Check that pipe after solenoid for side one cools. If not then repeat for side two. If both sides do not shut off then, see wiring diagram and diagnose electrical connections.
4. Turn H1 switch back on.
5. No. 1 Heater light will go off.
6. Check that pipe after solenoid for side one gets warm. If not change solenoids seat.
7. Repeat for side two.

### Trouble Shooting Quick Check

Condition	Possible Cause	Fix
No Hot water	No Steam/Low Steam	Adjust steam regulator.
	Blocked tubes in heat exchanger	Flush Heat exchanger.
	Drain valves from steam traps are shut	Open drain valves.
	Condensate drain line is blocked or valves are turned off	Clear line and turn on valves.
	Solenoid is tripped	Turn on Manual switches "H-1" and H-2"
	Blend valve element defective	Test blend valve element and replace if necessary.
	Over temperature condition was reached and Thermo Switches are still engaged.	Find out why over temperature happened and let Thermo Switches reset.
System Tripped	Shut of the Gain adjusters	Cold water main from street is shut off. Reset Gain Valves (39)
	Steam pressure above 15 psi	Steam adjust steam pressure or fix steam regulator.
	Steam Traps broken and steam is being sent to the condensate cooler	Fix Steam traps.
	Blend valve element defective.	Test blend valve element and replace if necessary.
Water temperature fluctuates or is colder than required	Blockage in condensate line causing condensate to back up into heat exchangers. Gain adjusters not adjusted correctly	Check the temperature of heat exchanger outside casing. If top is hot and bottom is warm or cold, shut unit off and check draining of condensate.
Water temperature can not be maintained at 120 F	Solenoid valves were back pressured and solenoid plug is blocking flow.	Shut down unit, disassemble and inspect solenoid units.
Pump 1 or Pump 2 Light is lit and No flow light is on. Can see Pump is turning and water is re-circulating.	Water was drained from system and tubing to differential pressure switch was not bled of air .	Run pump and then loosen inlet compression fitting and bleed line until all air is out of line. Do same with outlet compression fitting.
	New differential pressure switch installed and not adjusted.	Run pump and then loosen inlet compression fitting and bleed line until all air is out of line. Do same with outlet compression fitting. If light is still on then adjust pressure switch according to manufactures instructions.





*It is solely responsibility of system designer and user to select products and materials suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Assistance shall be afforded with selection of materials based on technical information supplied to Leslie Controls Inc.; however, system designer and user retain final responsibility. Designer should consider applicable Codes, material compatibility, product ratings and application details in selection and application. Improper selection, application or use of products described herein can cause personal injury or property damage. If designer or user intends to use product for an application or use other than originally specified, he must reconfirm tat selection is suitable for new operating conditions. Life expectancy for this product defaults to warranty period of sales contract.*