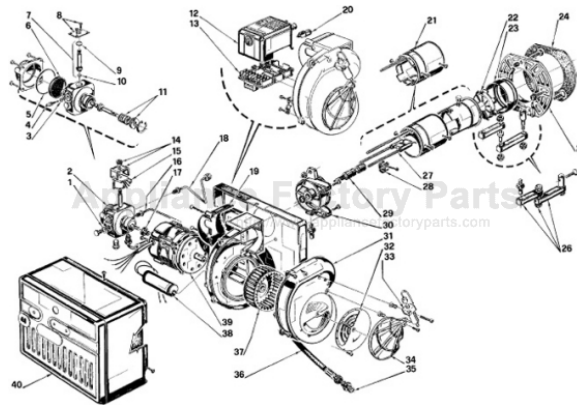


This Owner's Manual is provided and hosted by [Appliance Factory Parts](http://Appliance Factory Parts).



# AUTOFLO ESU-20 Owner's Manual

[Shop genuine replacement parts for AUTOFLO ESU-20](#)



[Find Your AUTOFLO Humidifier Parts - Select From 42 Models](#)

----- Manual continues below -----

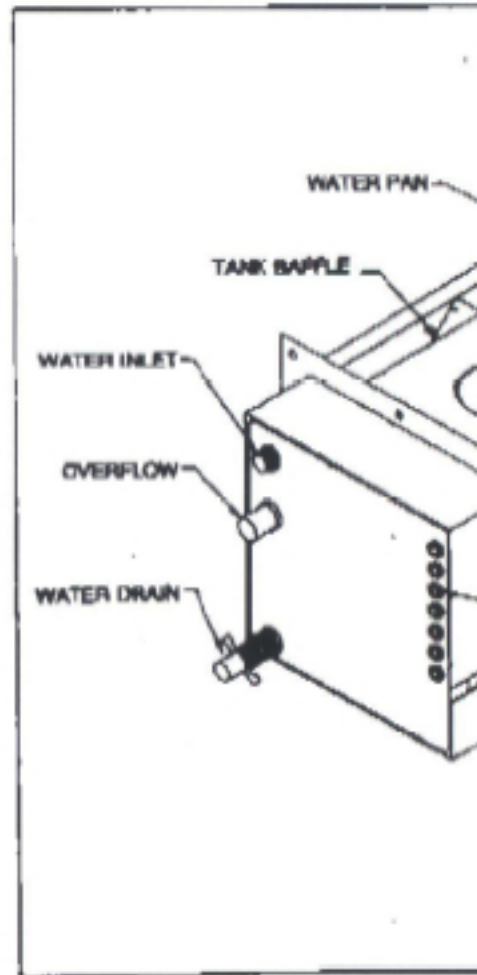
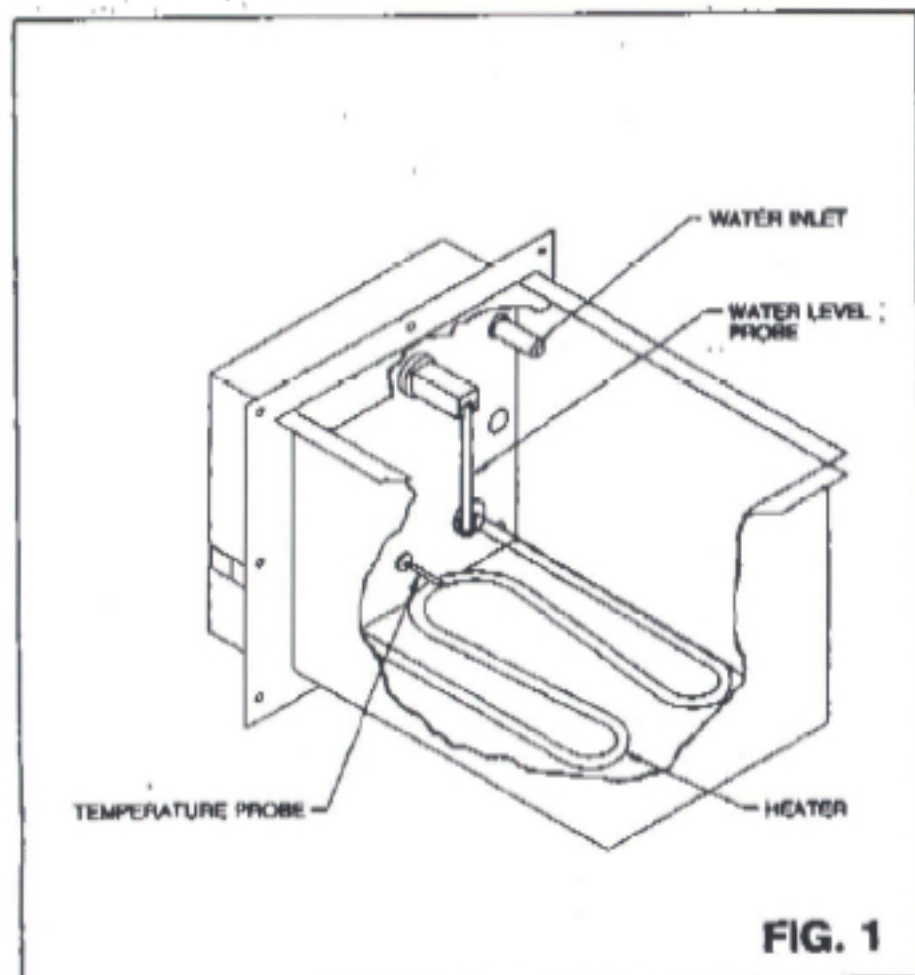
# Installation Instructions & Owner's Manual

## AUTOFLO ELECTRONIC STEAM UNIT - POWER MODELS ESU-14 AND ESU-20

FOR GAS OR OIL FORCED AIR FURNACES, HEAT PUMPS AND ELECTRIC FURNACES

The AutoFlo Power Humidifier you have purchased has been designed to be simple to operate and maintain.

Familiarizing yourself with the diagrams 1 and 2 will assist you in installing the AutoFlo Power Humidifier.



# SIMPLIFIED INSTALLATION INSTR

1. Insulate the water reservoir.
2. Select the mounting location and tape on the mounting template.
3. Punch or drill the (7) 1/8" mounting holes.
4. Cut out the humidifier opening in the duct.
5. Insert the humidifier into the opening and screw in place.

6. Connect the water line.
7. Connect an overflow drain.
8. Make 24 VAC electrical connection and lock.
9. Install and connect the humidifier.
10. Plug power cord into a grounded outlet for ESU-14 (240 VA).

## DETAILED INSTALLATION INSTR

### 1. INSULATE WATER RESERVOIR

With insulation foil side down, remove adhesive backing. Align humidifier so that front side of unit meets long edge of insulation. Fold insulation up onto sides of humidifier and press firmly. Cut and apply 5 continuous strips from the tape provided to seal the foil as shown. The tape will prevent the sharp duct edges from damaging the foil.

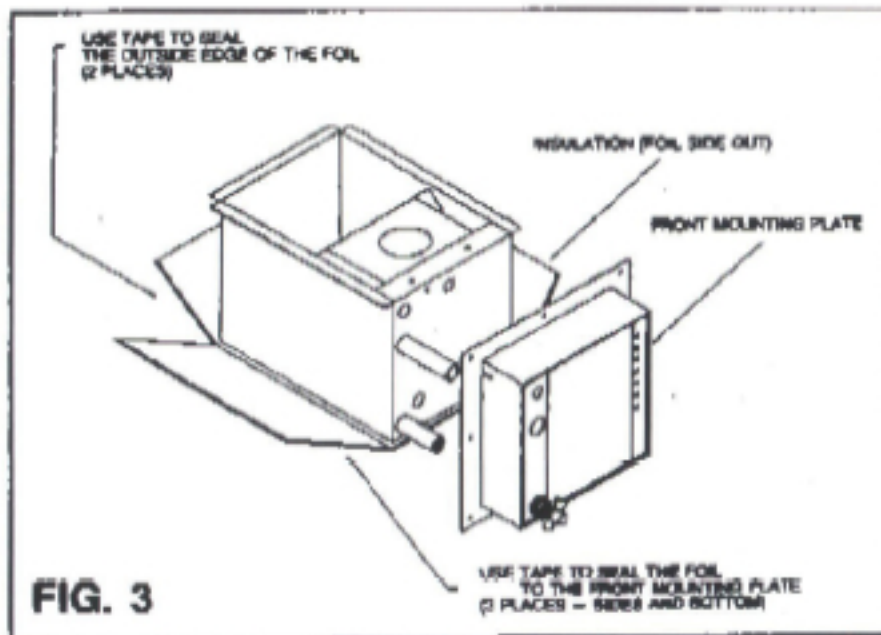


FIG. 3

### 2. LOCATION

The ESU humidifier can be installed in either warm air supply or the cold air return ducts; however the preferred location would be in the warm air supply duct of the heating and air conditioning system. This humidifier does not require warm air to evaporate the water in order to provide humidity, but it will operate more efficiently in the warm air duct and less condensate is likely to form.

When selecting a location on the duct, be certain that there is enough room in the duct for the ESU water reservoir. There should be at least five (5) inches

ESU mounting plate. The

NOTE: The ESU must be installed in a location where the 120 VAC (240 VA) electrical connections can be made with a power cord.

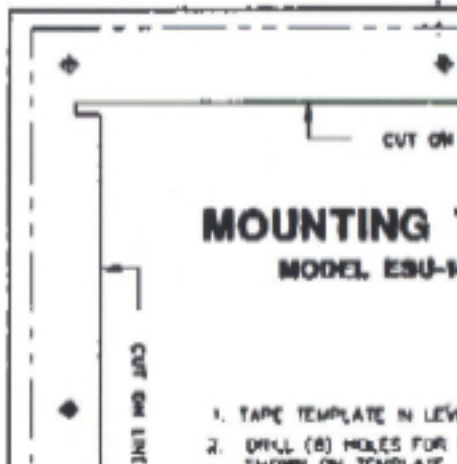
### 3. MOUNTING TEMPLATE

Tape the mounting template to the duct. The template must be leveled on the template. The template must be positioned so that the bottom of the reservoir is flush with the inside of the bottom of the duct. Since most ducts are rectangular, a space, about one (1) inch, should be left when determining the location of the reservoir cut-out.

### 4. DRILL HOLES AND CUT

Use an electric drill, with a 1/8" drill bit, to drill seven (7) mounting holes in the duct. These can be drilled at the locations indicated on the mounting template.

A saber saw or tin snips should be used to cut the water reservoir opening.



## 5. WATER CONNECTIONS

### A. WATER SUPPLY USING THE SADDLE VALVE FURNISHED WITH UNIT

Installation instructions for the saddle valve are printed on the plastic bag containing the saddle valve and its components.

**NOTE:** Never install the saddle valve on the bottom of the water pipe. Sediment in the water pipe may clog the saddle valve.

**NOTE:** Do not use any line connected to an air conditioning system. Lines connected to air conditioners generally carry refrigerant and are not water lines.

**NOTE:** Do not use any line which is served by a water softener. If home has a water softener, make the water connections to a water line upstream from the water softener. A water softener is not a demineralizer. It merely exchanges various hard ions for soft ions in the water. These soft ions, or minerals, will build up in the humidifier, causing the need for frequent servicing. The evaporation of softened water may also produce a white powder which may be carried into the duct system and, ultimately, into your home.

When tightening the hex compression nut, tighten only enough to assure there are no leaks.

### B. OVERFLOW DRAIN

The use of an overflow drain is always required.

Use 5/8" ID high temperature rubber tubing, such as automotive heater hose or dishwasher drain hose. Slip the hose over the 5/8" drain fitting and use a hose clamp to secure.

Route the hose to a suitable drain. **DO NOT** route the hose above the bottom of the humidifier. Failure to install the overflow drain line will result in steam leaking out the overflow opening into the appliance room under normal operating conditions.

## 6. MOUNTING THE ESU HUMIDIFIER

Place the humidifier reservoir into the opening in the duct and secure with seven (7) sheet metal screws.

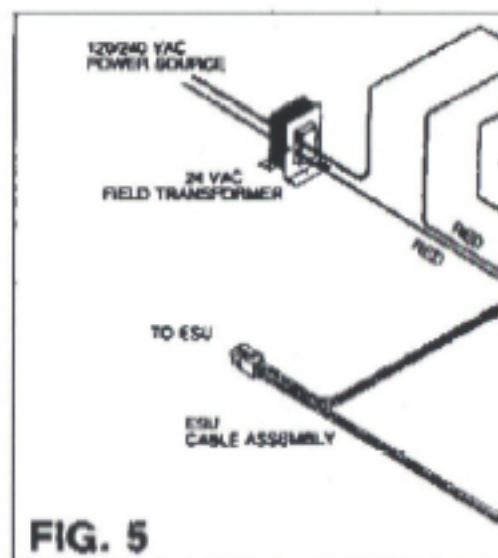
**NOTE:** If the ductwork will not support the unit in a level position with a water pan full of water the ductwork must be locally reinforced.

A temperature sensor is mounted in the reservoir to sense the water temperature. When the water temperature increases, the ESU computer closes the blower relay contacts. When the water cools, the ESU computer will open the blower relay contacts and the voltage cable assembly red wire will be wired only with 24 VAC levels. The relay contacts control the system blower.

## 8. WIRING THE ESU HUMIDIFIER

### A. INSTALLING AND WIRING THE HUMIDISTAT

A humidistat, such as the 062000, is required for the Humidifier. The humidistat is installed in the living space. See the instructions for installation of the humidistat.



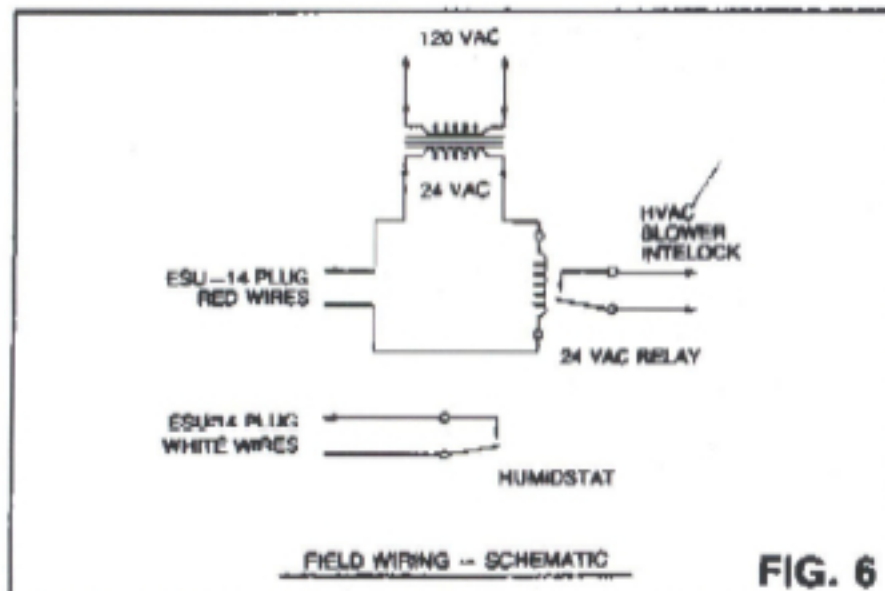
**IMPORTANT:** If the humidistat is installed on the ESU, it should be located at least three feet from the furnace or heat pump. If installed in the return air duct, it must be located at least three feet from the humidifier.

The humidistat has two terminals. The red wire should be connected to the terminal with the plug white wires. (Figure 5)

### B. FIELD WIRING

required in order to connect the ESU-14 to the furnace fan switch, air conditioning or heat pump blower circuitry.

The "field" relay must be mounted inside the furnace and the transformer may be part of existing furnace controls.



Connect field wiring as shown in Figures 5 & 6 to the red wires.

Interlocking may be performed on some heating systems that provide a 24 VAC NEC Class II terminal for blower control. In this case the red wires from the cable assembly may be used without field installed components.

Interlocking the ESU conditioning compressor assure that the compressor does not operate the humidifier. A field relay (AutoFlo Model 1549) may be required. On some compressors, an additional "lock-out" relay may be required.

In the case of heat pump systems energized by the system, interlocking may be required in the summer months to occur at the same time as the living space cooling. The interlock circuitry may be added to the living space cooling to prevent the compressor and the blower pump and HVAC system from operating. To prevent a "standard" interlocking the ESU Humidifier, the installer should evaluate the interlock circuitry for a specific installation. The installer should ensure that the humidifier operates in both summer and winter (heating and cooling) modes compatible with the ESU blower without energizing the compressor.

## 9. SETTING THE HUMIDITY

It is recommended that the relative humidity be set at 30-40% not be exceeded.

# RELATIVE HUMIDITY CHART

Outside Temperature	Outside Relative Humidity	Indoor Relative Humidity When Outside Air Is Heated To 72 Degrees F	Relative Humidity
-10 Deg. F	40%	1%	
	60%	2%	
	80%	2%	
0 Deg. F	40%	2%	
	60%	2%	
	80%	5%	
10 Deg. F	40%	4%	
	60%	5%	

during very cold outside temperatures, the humidistat should be lowered.

The maximum recommended relative humidity for your home depends upon factors such as outdoor air temperature, type and placement of insulation, vapor barriers, effectiveness of weather stripping, type of windows and doors (including frames and jambs) and whether or not storm windows and doors are used. With all these variables it is nearly impossible to recommend a proper humidity setting. The best humidistat setting is one that you are comfortable with. Also, as the outdoor temperature fluctuates, it may be necessary to adjust the humidity level of your system a few times during the heating season.

Refer to the "Relative Humidity Chart" as a starting point for your proper humidistat setting. Generally, in a tighter and better insulated house, the humidistat may be set higher than in a drafty, un-insulated house.

## 0. INITIAL START-UP

Once the ESU Humidifier has been installed and the water, humidistat and blower interlock connections completed, the humidifier may be initially started.

- A. Turn "ON" the water supply to the ESU Humidifier.
- B. Set the humidistat to a high or "on" position.
- C. Plug the ESU-14 Humidifier line cord into a 120 VAC, 15 amp source (240 VAC, 10 amp for ESU-20).
- D. The Green "POWER" LED should slowly flash and the "Water On" LED should be illuminated. Water should begin to fill the Water Pan.
- E. When the water level has reached the preset level the "Water On" lamp and fill valve will be turned off and the "Humidifying" lamp and heater will be turned on.
- F. If the above steps have been successfully completed the humidifier is operating properly.

## 1. ESU OPERATING SEQUENCE

- A. **POWER:** In normal standby mode, when the humidistat is not calling for humidity and the power cord is plugged in, the POWER light should be blinking slowly. If the green POWER light is not flashing, when there is power to the

illuminated, and the POWER light will be illuminated, and the WATER ON light will be illuminated.

- D. **BLOWER ON:** When the water level reaches approximately 1/2 inch, the BLOWER ON light will be illuminated. The BLOWER ON light should turn the system on. The BLOWER ON light will be illuminated upon the water and air being blown into the pan. The BLOWER ON light will take anywhere from 10 to 15 minutes to heat the water to heat to 170°F. When the water is heated, the BLOWER ON light will be illuminated. The BLOWER ON light will be illuminated and the POWER light will be illuminated.
- E. The WATER ON light will be illuminated when the water reservoir will refill and the water level will be one half inch (ESU-20) after the water level probe. Depending on the water temperature, the BLOWER ON light will be illuminated or may go off when the water level is reached. The HUMIDIFYING light will be illuminated unless the humidifier enters the CYCLE OFF mode.
- F. **CYCLE Off:** This light will be illuminated when the microprocessor cycles the humidifier into the CYCLE OFF mode. This mode will be entered when the microprocessor detects the water level in the ESU. This will occur every seven hours to let the water level in the pan to contract so that thermal deposits that have built up in the ESU may also enter this mode. The microprocessor does not recognize the water level parameters for boiling off the water in the reservoir. The microprocessor will enter the CYCLE-Off for a period of real time that the ESU has been in the two out-of-time situations. The single twenty-seven hour light will be illuminated.
- G. **SERVICE:** When service is required, the SERVICE light will either flash off and on or be illuminated. If the ESU enters this mode, it can be reset by disconnecting the power cord. **SERVICE flashing:** This light will be illuminated when the water reservoir is not filling up with water fast enough or the microprocessor detects that the water is touching the heater. **SERVICE continuous:** This light will be illuminated when the water is not boiling off enough or the microprocessor enters the "boiling off" cycle or the microprocessor enters the "boiling off" cycle.

after 6 weeks of initial operation and the amount of mineral buildup used to estimate future cleaning cycles.

Maintenance and inspection of the ESU requires removal of the humidifier from the duct. This can be done following these steps.

- A. Unplug the power cord from the 120 volt source for ESU-14 (240 volt for ESU-20) and allow the water to cool for at least 30 minutes prior to removal.
- B. Turn off the water supply at the saddle tapping valve.
- C. Remove the 4 cable assembly wire plug from the side of the plastic control housing. Press in the locking tab on the rear of the plug and pull straight out.
- D. Drain the water with the drain valve. **NOTE:** The drain valve will be hot if the ESU has not been allowed to cool.
- E. Disconnect the water and drain lines. **NOTE:** Some water may drain out of the water line. Have a small container ready to catch the water.

**NOTE:** Although the water has been drained, some water may still remain in the humidifier reservoir along with sediment. Take care to not tip the ESU over when removing the screws in the following step.

- F. Remove the seven (7) screws around the front mounting plate.
- G. Slide the humidifier out of the duct.
- H. Remove the two (2) screws holding the tank baffle to the pan flange and remove the baffle from the unit. Scrape all mineral deposits from the baffle and wash baffle off as described in step J.

- I. Use a putty knife to scrape the minerals from the sides and bottom of the water reservoir. **DO NOT** scrape on the small temperature probe located between the heater legs in the water pan.

Carefully scrape the Water Level Probe and the heater element to remove mineral deposits.

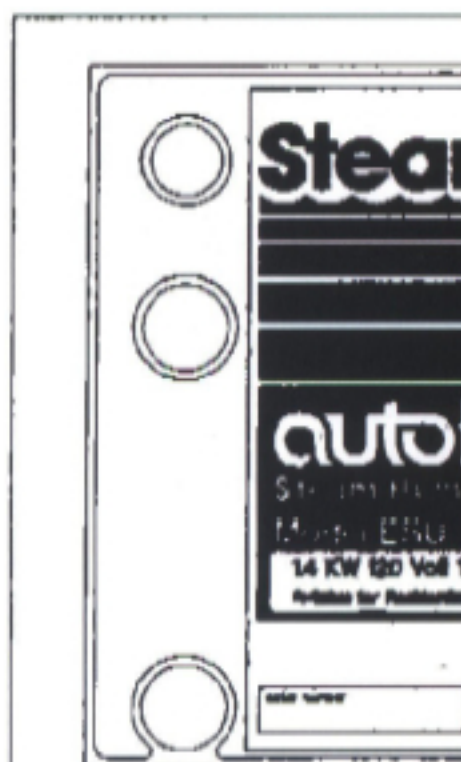
- J. Clean the Water Probe Insulator, inside the pan, with a cloth and vinegar and rinse with fresh water. Inspect for any mineral deposits on the plastic insulator. Repeat cleaning if necessary and thoroughly dry.

water line, the drain.

- N. Turn on the water supply at the saddle tapping valve and check the connections and drain filter.
- O. Plug-in the ESU-14 power cord (240 VAC for ESU-20) and use an extension cord if necessary.
  - a. The green POWER LED will illuminate.
  - b. If the humidistat is set, the water valve will open and the water pan will begin to fill.
  - c. The water should be at the desired level in about 2 minutes.

### 13. TROUBLE SHOOTING

Seven LED lamps provide visual status and indicate the functional status of the ESU. Figure 7 below.



		LED Lamp	
1. Power On	Green	Blinking	System
2. Cycle Off	Amber	On	Day
3. Service	Red	Blinking	Blow
Service	Red	On	5
4. Over Temp.	Red	Blinking	over
5. Blower ON	Amber	On	170
6. Humidifying	Amber	On	On
7. Water On	Amber	On	On

2. The humidifier is defective, return to factory for service.

B. The "Humidifying" light does not illuminate. The humidistat is not closed calling for humidity or the humidistat is wired incorrectly. Or the unit is on its once a day shutdown.

C. The HVAC Blower will not operate, but the "Blower" light on the ESU is illuminated.

1. The blower "Field" wiring and/or interlock circuitry is incorrect.

2. The HVAC electric power is disconnected.

3. The ESU internal "Blower" relay is defective, return to the factory for servicing.

D. The HVAC Blower will not operate and the "Blower" light on the ESU is not illuminated.

The water pan temperature has not reached a high enough temperature to activate the "Blower" relay, about 170 degrees Fahrenheit. This takes several minutes after the "Humidifying" lamp is illuminated. Depending on the water temperature and the surrounding condition. This may take up to 7 minutes. If the problem continues, the Water Pan temperature sensor may be defective — return to the factory for servicing.

E. Red Service Light is lighted constantly and Green Power light blinking.

This is an indication that the Water Level Probe has become electrically conductive to ground, sensing an indication that the water level is correct.

This indication may result when the plastic Water Level Probe Insulator, inside the water pan, becomes covered with mineral deposits. Perform the cleaning procedures detailed in Section 12, Maintenance, paragraphs H, I, J & K.

This condition can also result when mineral deposits have built up on the "water level probe". Simply clean the probe as described in maintenance section.

F. Red "Service" Light and the Green "Power" light are blinking at the same time.

This indication is a result of the "Fill" time has been exceeded. The water level did not reach the water probe in the given amount of time.

(c.) The water valve removes the water. check the screen on the valve.

(d.) The water valve must be replaced.

G. Red "Over Temp" Light are blinking.

1. The ESU has detected a temperature in excess of 230 degrees Fahrenheit and has shut down all the heaters.

This can happen if there is too much water in the pan or the heater relay malfunctioned and overheats the water pan element is out of the pan.

If this condition occurs, return to the factory for servicing.

2. The thermister probe must be replaced.

H. If the electric solenoid valve does not close when it closes — change the copper to plastic tubing to avoid shock.

I. If the humidifier seems to be operating in a manner that doesn't seem to be described in the conditions, check the following:

1. Check to see if the humidifier is in the proper location. See figure 5 for reference.

2. Check to see that the humidifier is connected to the humidifier control terminal voltage added to the blower control circuit.

3. Check to see if no mineral deposits have been added to the red humidifier blower control circuit.

4. Check to make sure the humidifier connect the white wires to the humidistat are separate from the multi-wire bundle used for the thermostat or any other control. The associated wiring create an induced voltage in the wiring.



# 14. SERVICE AND REPLACEMENT PARTS

ITEM	ESU-14 PART #	ESU-20 PART #	
1	402105		120
1		402106	240
2	402107		120
2		402113	240
3	402230	402230	WA
4	402110	402110	TH
5	402108		120
5		402109	240
6	402112	402112	OU
7	402200	402200	TAN
8	402088	402088	LINE
9	402281	402281	INS

