

# **OWNER'S MANUAL**

## **Installation, Operation and Service**

### **HEAT PUMP STYLE POOL / SPA HEATERS**

**HAYWARD®**

**HEAT PUMPS FOR POOLS & SPAS**

# Owner's Manual

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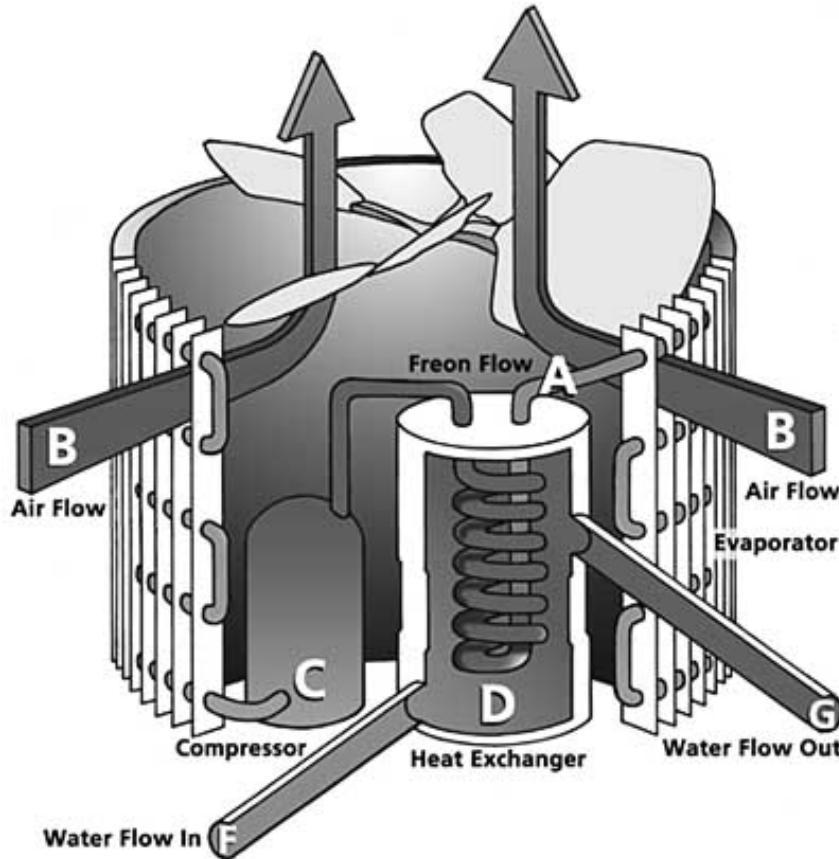
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## How a Heat Pump Works



Hayward Heat Pumps take heat from the environment and use it to heat your pool water. During heat pump operation, liquid freon from inside the unit is pumped through the system (A) and is turned into a heated gas. This happens when heat is taken from the surrounding air (B) as it is drawn through the evaporator by the fan. The compressor (C) receives this warmer gas and compresses it to a higher pressure, resulting in the freon reaching even higher temperatures. As the unit sends the heated gas through the heat exchanger, the gas gives up its heat to the surrounding water (D). The freon reverts to a liquid state as it gives up the heat to the pool water, which completes the cycle (A). The water (F), which is being forced through the heat exchanger (D) by your pool pump, is heated by three to five degrees as it passes through and returned to your pool as heated water. (G) This process can also be reversed to *remove* heat from pool water.

A heat pump can transform 4 to 6 units of heat energy (BTU's) for every 1 equivalent unit of electrical energy it consumes. This results in a coefficient of performance between 4 and 6. The specific performance coefficient depends on your heater model, ambient air temperature and climatic conditions, as well as incoming pool water temperatures.

## Get Familiar with Your Heat Pump

### **Safety Features**

Hayward heat pumps are equipped with safeguards that will stop operation to protect your unit in case of the following events:

- Excessively high refrigerant pressure
- Excessively high water temperature
- Loss of refrigerant
- Fan Motor Failure
- Evaporator Freeze-up
- Low Ambient Temperature
- Refrigerant line blockage or overcharging

### **High / Low Refrigerant Pressure Switches**

- The high-pressure switch senses the refrigerant pressure in the sealed refrigeration system and shuts the heater down in the event unsafe operating pressures are reached. The heat pump will automatically reset after the system pressure drops back to normal operating pressures. When this switch is tripped, digital displays will read "HP"
- The low-pressure switch senses the refrigerant pressure in the sealed refrigeration system to protect against certain conditions that could be detrimental to compressor life. The switch shuts the unit down in the event of loss of refrigerant, fan motor failure, evaporator freeze-up and airflow blockage. The switch automatically resets when the pressure rises to normal operating pressures. The display will show "LP" if this switch is tripped.

### **Evaporator Freezing**

The low-pressure switch will shut the heat pump down when the evaporator starts to freeze. When the unit starts to freeze the low-pressure switch will be tripped, causing the display to read "LP". This will prevent the evaporator from becoming damaged or deformed.

### **Water Pressure Switch**

The water pressure switch contacts close when pressure is applied as pool water flows through the heat exchanger. Low flow rates as well as no flow will let these contacts open and this will cause the unit to shut down. The display will read "PS" if the water pressure is not sufficient.

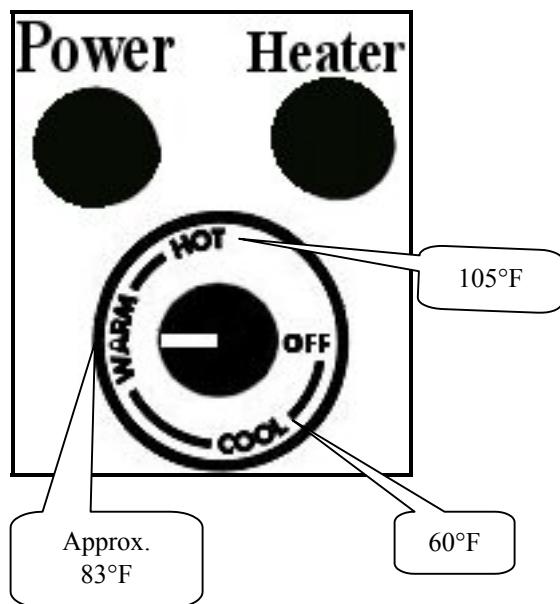
### **Time Delay**

All models use a 5-minute time delay to prevent repeated tripping of the compressor thermal overload, which is caused by attempting startup before system pressures are equalized. Any interruptions, outside of power loss, will result in a 5-minute time delay.

### **Low Ambient Temperature**

If the air outside the heat pump is not warm enough to produce heat, the system will shut down. The actual point at which your unit will shut down due to low temperature varies depending on which model you purchased, current weather conditions, and the amount of sunlight reaching the heat pump. The shutdown can occur anywhere within a wide range of temperatures, usually 45°F-55°F. This is not a "fixed" range. We stress that climate conditions, sunlight, and various models respond quite differently to low ambient temperature. A shutdown occurs because low temperatures will activate the systems low-pressure safeguard switch (digital thermostats will display a code "LP"). The unit will start up again when the temperature has raised enough to reset this switch. ***Note: Low ambient temperature does not necessarily affect the Chiller models or the cooling cycle of the heat/cool units.***

## Analog Thermostat



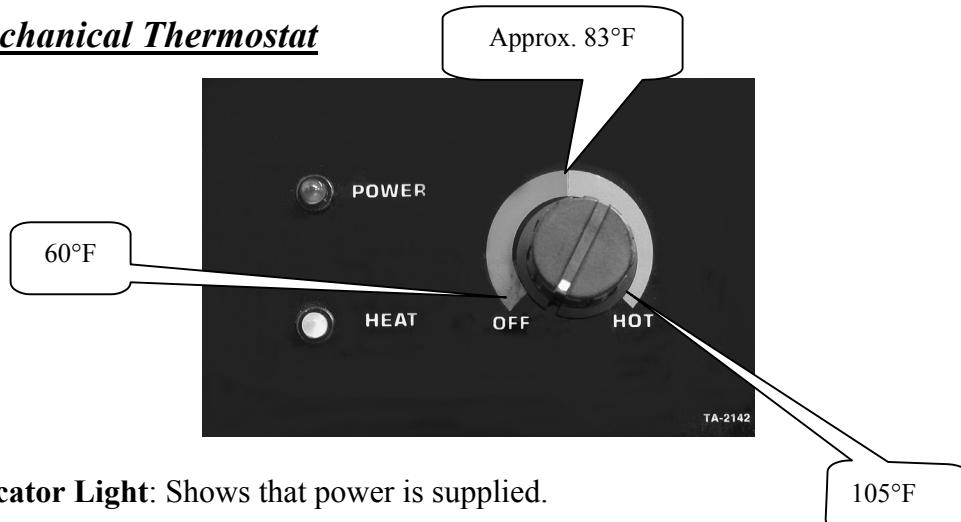
**Power Indicator Light:** Shows that proper power is supplied.

**Heater Indicator Light:** Shows the unit is operating normally and the thermostat is making a demand for heat.

**Temperature Control Knob:** Adjust knob to desired range, using the diagram on the left as a guide. The thermostat has a temperature range from 60°F – 105°F(approx.  $\pm 5^{\circ}$  at the mid point.) Once you have the dial is set to the preferred temperature, the unit will achieve and maintain this temperature.

**For help with this type of control, refer to the troubleshooting guide.**

## Single Mechanical Thermostat



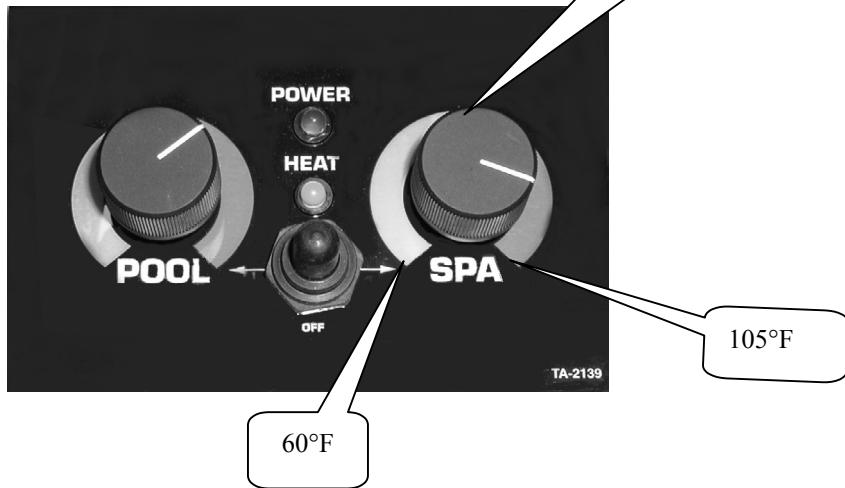
**Power Indicator Light:** Shows that power is supplied.

**Heat Indicator Light:** Shows the unit is operating normally and the thermostat is making a demand for heat.

**Temperature Control Knob:** Adjust knob to desired range, using the diagram above as a guide. The thermostat has a temperature range from 60°F – 105°F. Once the dial is set to a preferred temperature, the unit will achieve and maintain this temperature.

\*\* The Single Mechanical Thermostat models do not turn off under 60 degrees F. This model was designed to come on automatically if your water temperature is below 60 degrees to prevent the pool from becoming excessively cool and creating long recovery times. If your application dictates the need to turn the heater off for extended periods of time, use the circuit breaker.

**For help with this type of control, refer to **Troubleshooting Guide for MECHANICAL Thermostat Control** in the back of the owner's manual.**

**Dual Mechanical Thermostat**

**Power Indicator Light:** Shows that power is supplied.

**Heat Indicator Light:** Shows that the unit is operating normally and the thermostat is making a demand for heat.

**Temperature Control:** Adjust knob pool or spa to desired range, using the diagram above as a guide. The thermostat has a temperature range from 60°F – 105°F. Once the dial is set to a preferred temperature, the unit will achieve and maintain this temperature.

**Mode Toggle Switch:** *Off:* Middle position, sets the unit to a “no-heating” mode.

*Pool:* Flip the switch toward the *pool* control knob (left). This sets the unit into *pool* mode. The unit will maintain the preferred temperature set point for your pool.

*Spa:* Flip the toggle switch toward the *spa* control knob (right). The unit will maintain the preferred temperature set point for your spa.

**For help with this type of control, refer to **Troubleshooting Guide for MECHANICAL Thermostat Control** in the back of the owner's manual.**

## **PST-1**

### **Power Indicator Light:**

Indicates that power is supplied to the heat pump but *does not indicate that the unit is in operation.*

### **Heating Indicator Light:**

Shows the unit is operating normally and the thermostat is making a demand for heat.

### **Display:**

When power is supplied to the unit, the display will either show temperature, diagnostic code (such as "PS"), or rolling dots.

### **On/Off:**

This control does not have a true on/off feature. The unit uses *standby* mode instead. Rolling dots in the display indicate standby. *Standby* mode serves two functions. (1) It serves as an "off" mode, which keeps the heat pump from transferring heat into your pool water. (2) *Standby* allows a pool owner with remote controlling systems, such as Jandy or ComPool, to maintain pool and spa temperatures via their remote.

### To enter *standby* mode:

If *pool* mode is active (indicated by the green led over the *pool* button), press the *pool* button once. Rolling dots should appear on the display.

If *spa* mode is active (indicated by the green led over the *spa* button), press the *spa* button once. Rolling dots should appear on the display.

### To exit *standby* mode:

Press either the *pool* or *spa* mode button.

### **Mode Selection:**

Selecting the desired mode of operation (*spa* or *pool*) is accomplished using the POOL / SPA buttons. A green LED above buttons designates the active mode. When the *pool* mode is active, any displays or adjustments apply only to the *pool* mode. Adjustments for *spa* mode must be made while the *spa* button is activated. A user can switch between modes without turning the control to *standby* first.

### **Temperature**

#### **Setpoint:**

*Pool* mode range is 70-98°F (21-37°C).

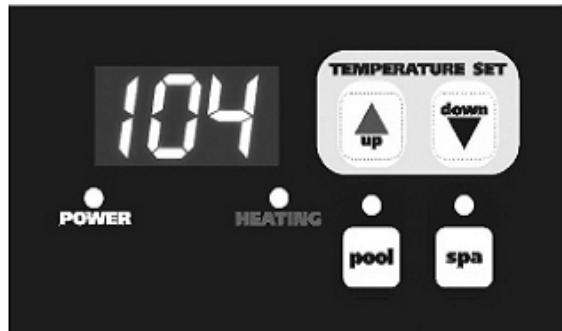
*Spa* mode range is 70-105°F (21- 41°C).

**Adjust the setpoint:** Continuing to hold the *up* or *down* button will scroll the setpoint value until the desired setpoint is reached. When the desired value has been reached, release the button. The new setpoint will flash to indicate a new value has been recognized and the display will revert back to water temperature as indicated by a steady display.

**Note:** The temperature reading displayed when the unit is in operation (heating indicator light is present) displays the *current water temperature*.

**To display the setpoint:** Press and release the Temperature Set *up* or *down* button once will display the current setpoint for 3 seconds.

**For help troubleshooting this type of control, refer to the **Troubleshooting Guide for DIGITAL Thermostat Control** in the back of this manual.**



**PST-4**

The PST-4 temperature control is similar to the PST-1 shown above, with two differences. (1) The PST-4 has a Time Clock Override. (2) The PST-4 has no power indicator light.



*Please read the data for the PST-1 on the previous page before continuing. It will provide you with descriptions of button functions and setpoint programming.*

**Time Clock Override:****Notes:**

1. An electrician must wire the TCO function to your pool system before it will work.
2. The 2-hour TCO checking interval cannot be adjusted.

*This feature must be connected by an electrician.* TCO provides a method of maintaining the pool temperature when a time clock has the pool filter pump turned off. TCO function then controls the pool filter pump via the PST-4. TCO will automatically turn the pool filter pump on after 2 hours of “off time”. It will run the filter pump for 10 minutes while monitoring the water temperature. If there is more than a 2-degree difference between the setpoint and the actual pool temperature the heat pump will energize and continue to run until the setpoint is satisfied.

A user may temporarily override the TCO. An example would be that you want to use your pool between 9:00 and 10:00 pm. The control may be programmed to energize the filter pump, which will engage the heat pump to maintain the pool temperature. This is a temporary measure that can be initiated in 30-minute increments, for a period up to 3 hours.

**Programming for Temporary Pump Override:**

- 1) Push and hold *up* and *down* buttons simultaneously – Display reads **P0.0**
- 2) Release buttons.
- 3) Push *up* button – display reads **P0.5** (Each time the *up* Arrow engages, the display will increase by .5 increments. Each .5 increment equals 30 minutes, 3 hours is the max.).
- 4) Push *down* button to decrease the temporary override time.

**Example of typical TCO cycle:** When the time clock turns off the filter pump, a “PS” will show on the display. A timer starts inside the controller. After 2 hours, the heater will start the filter pump to circulate water. “PS” is removed from the display and if a demand for more heat is made, the heater goes back to normal operation. When the water is brought back to temperature, the TCO turns off the filter pump and the heat pump will shut-down, displaying “PS”. The 2-hour timer is reset and the cycle will begin anew.

**For help troubleshooting this type of control, refer to the Troubleshooting Guide for DIGITAL Thermostat Control in the back of this manual.**

**PST-5**  
**Heat/Cool**



The PST-5 is an upgrade of the PST-4 with the addition of an *AUTO* function. This allows the heat pump to heat or cool the water automatically to maintain the setpoint. The PST-5 also has an optional Time Clock Override (TCO-*This feature must be connected by an electrician to operate.*)

***Read the instructions for the PST-1 and PST-4 fully before continuing. . The PST-1 page will provide you with descriptions of button functions and setpoint programming. If you have purchased the TCO option, the PST-4 page will provide TCO functionality and programming procedures.***

**Run indicator light:** Serves the same function as the “heating” indicator on the PST-1 and PST-4.

**Setting the AUTO function:**

1. Disengage the AUTO mode (the AUTO mode indicator light will be off.)
2. Program your desired temperature setpoint.
3. Press the *AUTO* button to activate the automatic heat / cool function. (*AUTO* mode indicator will light.)
4. “AC5” should show on the display (set at the factory). “AC” indicates that the cooling function is enabled and the “5”means that when the water temperature is 5°F above the setpoint, the unit will energize to cool your pool or spa.  
By using the *up* and *down* keys, the AC5 can be changed to values ranging from AC3 to AC9.

**Setting unit to cool only:**

Engage the *AUTO* mode and use the *up* button to scroll past “AC9”. You will notice that after the display of “AC9” an “ACP” (AUTO Cool Primary) will be displayed. When “ACP” is displayed, the unit will only cool the pool and will not go into the heating mode, no matter how cool the pool gets.

***NOTE: The RUN light will flash during cooling cycles.***

**Time Clock Override:** Refer to TCO information on the previous page. (PST-4)

**If troubleshooting this controller, refer to the  
Troubleshooting Guide for **DIGITAL** Thermostat Control.**

## **Installation Specifications**

### **Receipt Inspection of Unit**

Inspect the heat pump pool heater carton upon receipt for possible damage in shipment. Check the "Tip-n-Tell" indicator attached to the outside of the box. A punctured or oil-soaked area of the carton could indicate **damage to the sealed refrigeration system**. If damage has been incurred or is suspected, bring it to the immediate attention of the delivering carrier. The carton bears specific warnings stating "DO NOT DROP OR TAILGATE", as well as arrows indicating the correct vertical positioning. THE POOL HEATER **MUST NOT** BE TIPPED OR TRANSPORTED ON ITS SIDE AS EVAPORATOR "OIL LOGGING" MAY OCCUR.

Upon arrival at the installation site, the unit should be carefully unpacked and again inspection for any damage that may have occurred in transit. Minor indentations to the aluminum evaporator fins will not affect performance of the unit.

**THE MANUFACTURER CANNOT ACCEPT RESPONSIBILITY FOR  
DAMAGE INCURRED OR REPAIRS NECESSITATED DUE TO IMPROPER  
HANDLING OF OUR EQUIPMENT.**

### **Determining Optimum Location**

**THE LOCATION OF THE HEAT PUMP POOL HEATER IS VERY IMPORTANT FOR EFFICIENT OPERATION.**

In order of importance, the installer must consider the following conditions:

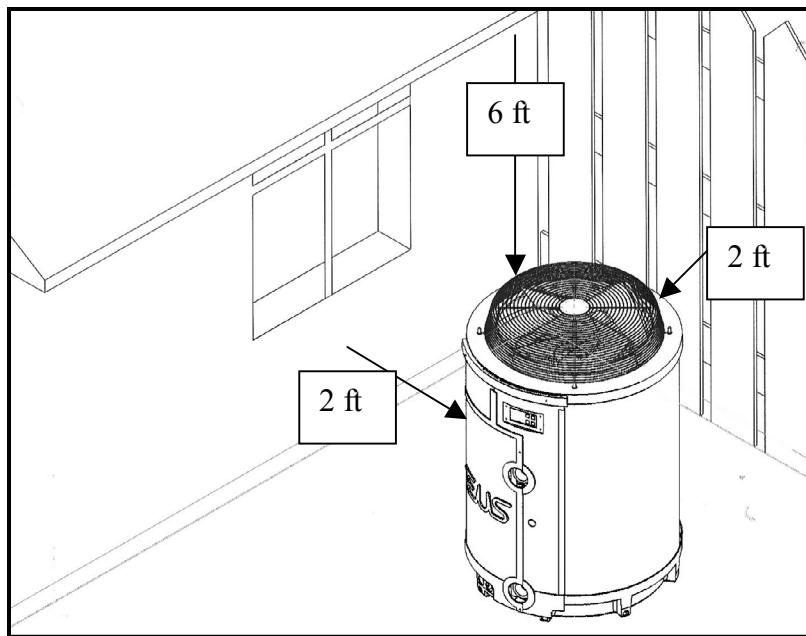
- The heat pump will perform more efficiently when placed in **direct sunlight**.
- Ample air intake
- Avoidance of air recirculation
- Accessibility of service panels
- Means of draining condenser in freezing weather (such as union-style fittings)
- Means of draining condenser and rainwater. Insulation of long water lines (over 25 ft.) from heater to pool.

**The installation of the unit in a fully enclosed area (i.e. garage, shed, etc.) is not recommended. Consult HAYWARD for indoor pool application analysis.**

### **Clearance**

A minimum of two feet of clearance from walls, shrubbery, equipment, etc. is required around the entire pump circumference. This allows for ample air intake. No less than 6 feet clearance above the heat pump is required to prevent re-circulation of air. We recommend **not** placing the unit underneath eaves, decks, or porches, as this causes recirculation of discharged air.

**RECIRCULATION OF DISCHARGED AIR BACK INTO THE PUMP WILL GREATLY REDUCE ITS EFFICIENCY.**



### **Level Placement**

The heater should be located on a solid, level surface. The pool heater is exceptionally quiet, but if further noise reduction is desired, the heat pump may be placed on vibration absorbent pads, which are available from most air-conditioning and refrigeration wholesalers.

### **Drainage**

Condensation drain holes are provided in all base pans for adequate removal of condensation and rainwater. Keep the drain holes unobstructed. Clean them regularly (with your finger or a short stick) to remove any debris that may block them.

**HEAT PUMPS GENERATE WATER CONDENSATION DURING  
NORMAL OPERATION. THIS SHOULD NOT BE MISTAKEN FOR A  
LEAK IN THE UNIT.**

The troubleshooting section provides recommendations should you suspect a leak.

**Other Precautions**

The heat pump should not be placed near **sprinkler systems**, especially those where fertilizer is added. This is very corrosive and, over time, will severely damage the unit. If you live in an **oceanfront** area, the heat pump should be placed out of direct spray of sand and salt. This will also clog, damage, and corrode the unit. You may consider protecting your heat pump by planting shrubbery or a privacy fence between the unit and the prevailing beachfront wind.

**Application Guidelines and Maintenance****Climate**

Weather conditions have a significant impact on pool heating. Local weather and climate data are *general* conditions surrounding your pool. The *microclimate* surrounding the pool must also be considered.

Lots of shade, low air temperature, relative humidity, and high wind velocity at the pool surface negatively impact pool heating and will require an increased pool heater output to maintain pool temperature.

**Cleaning Systems**

Some pools have cleaning systems attached to the filter pump intake (i.e. crawlers and skimmers). These devices slow the flow of water entering the heat pump. As low flow rates may damage the heat pump, built-in safeguards will automatically shutdown the unit in instances of low water flow.

**Dirty pool filters slow water flow and may cause a shutdown.**

Familiarize yourself with the pool filter. Know how to check and clean or replace it yourself. Do not completely trust a pool cleaning service to do this task for you.

## **Efficient Practices**

### **Using A Pool Cover**

#### **POOL COVERS ARE STRONGLY RECOMMENDED.**

A pool loses heat in several ways but testing shows that evaporative cooling (the cooling effect created by water evaporating from the surface of the pool) accounts for approximately 75% of a pool's heat loss. However, if a pool is covered when it is not in use, most evaporative cooling can be prevented. If the pool temperature is to be maintained, the pool heating system must replace heat lost. Thus, the use of a pool cover can offer dramatic savings in energy consumption. The cover's approximate effect on pool heat losses is illustrated in the table below:

<u>SOURCE Of Heat Loss</u>	<u>POOL UNCOVERED (USED 12 HRS/DAY)</u>	<u>POOL COVERED</u>
Evaporative cooling	75%	30%
Convection loss to air	15%	10%
Ground loss (dry earth)	(Negligible – less than 1%)	(Negligible)
Re-radiation to environment	9%	9%
Make-up water	1%	1%
<b>Total</b>	<b>100%</b>	<b>50% of uncovered pool losses</b>

As the table shows, a pool cover that prevents evaporative cooling can reduce the heat loss from a pool approximately 50% (which also cuts your power consumption by 50%).

### **Water Flow**

To minimize heating times, make sure all water valves are open completely, that the water level of the pool is at the correct height, and that any fountains or waterfalls are disconnected or turned off. Maintain 30–75 gpm flow rate.

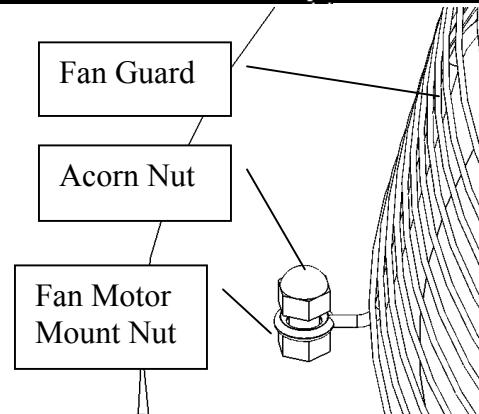
**CHECK YOUR PUMP FILTER WEEKLY. REPLACE OR CLEAN AS NECESSARY TO ENSURE PROPER FLOW RATES.**

### **Chlorine Content**

Chlorine is corrosive, along with other chemicals used in sanitizing pools. Improperly maintained pH alkalinity levels are unhealthy for you and your pool systems. Maintaining proper water pH levels will increase the life of all your pool components, including your heat pump. Automatic chlorinators, if used, **must** be installed downstream of the heat pump (in the return line to the pool) and a check valve installed in a manner that will not allow the raw chlorine to drain back to the heat pump when the water pump is off. **Do not allow pool maintenance people to pour chemicals in skimmer.**

**Cleaning Procedures**

- Disconnect power to the unit (usually at the circuit breaker in your house). Verify that power is off by checking the display for lights. If no lights are present, proceed to the next step.
- Remove the fan guard by removing (4) acorn nuts that retain the fan guard. **DO NOT REMOVE THE NUTS THAT RETAIN THE FAN MOTOR.**
- Using a water hose and spray nozzle, direct water through the evaporator coil fins to flush out debris. Spray from inside the unit to push debris out. Never spray from the outside, as this will lodge debris in the evaporator coil fins. Keep nozzle back 12-18 inches from the evaporator coil surface to prevent deforming the fin surface. **NOTE: Do not aim a water stream directly at the fan motor.**
- Use a rag to remove build-up from the fan blades and the fan motor.
- If necessary, use a shop-vac to remove debris from the base pan and other areas of the unit.
- Replace the fan guard and acorn nuts, securing them tightly.
- Use a rag and soapy water to clean the external plastic panels of the unit. DO NOT wipe across the evaporator coil fins, as this will deform them and affect operational efficiency. Instead use a very soft-bristle brush to gently loosen grit and grime that may have collected.
- Reconnect power to the unit and ensure it is operating correctly.

**Beginning of season**

- Perform the cleaning procedures recommended above.
- Be certain the water lines and the heat pump are reconnected and / or drain valves are closed.
- With the pool heater power **off**, start the pool filter pump. Check for possible water leaks and be certain there is adequate water flow: 30 – 75 GPM.
- Complete your normal preparation and / or cleaning of the pool for the start of the season.
- Turn the heat pump power **on** and set the thermostat to the desired temperature. **TIP:** Setting the thermostat to its highest setting will not heat the water any faster than setting the desired temperature point.

- Allow the heat pump pool heater and the pool filter pump to operate continuously until the desired pool water temperature is reached. This is best accomplished by removing the pool pump timer cogs (stops). This prevents the pump from cycling off and allows for continuous operation. To achieve optimum heating efficiency, a pool cover should be used.

#### Occasional Pool Use

Heat pumps are **NOT** fast pool heaters. You must allow at least 48 hours before swimming for the pool to be noticeably heated.

If you are only using your pool on the weekends, it is more economical to turn the heat pump down a few degrees and cover the pool. When you are ready to swim again, it will require less energy and time to regain a preferred temperature.

**It will take several days of continuous operation for your pool to heat up to temperature. The exact length of time will vary depending on pool size, ambient temperature, wind speed, and use of a cover.**

If you are not planning on swimming for a month or longer, you may choose to turn the heat pump off. In this instance, it is recommended that the heat pump be drained of pool water and bypassed.

#### Summertime Shutdown

During the summer months, when the heat pump is not needed, you can shut the unit off. In this instance, it is recommended that the heat pump be drained of pool water and bypassed. It is also recommended leaving the cover off as well to take advantage of solar warming effects.

#### End of season (Winterizing)

**Many pool service companies offer “winterizing” assistance. We recommend using them for this procedure.**

- Perform the cleaning procedures recommended above.
- Disconnect the power supply (usually at the circuit breaker in your house).
- If you are closing the pool for the winter, **BE ABSOLUTELY CERTAIN TO DISCONNECT THE HEAT PUMP FROM THE UNIONS AND DRAIN ALL WATER LINES.** As an alternative, you may prefer to fill the water lines with a suitable antifreeze solution. Note: the water lines are best drained when compressed air is forced through them.
- Cover the heat pump to protect it from snow and water, which could freeze and damage the unit.
- Some heat pump owners desire their pool heated during the winter months. This is possible when daytime temperatures are above 50° F (10° C). **If nighttime temperatures fall below freezing be certain to keep the pool filter pump operating continuously during this time to prevent freeze damage.**

## **Service Procedures**

### **Before You Call For Service**

If there appears to be a problem, refer to the troubleshooting guide on the following pages. There is an additional troubleshooting chart available at the end of the installation manual containing information for troubleshooting your heat pump.

1. Make sure that the swimming pool filtration system is turned on.
2. Is the main power (circuit breaker) on?
3. Is the "Power" indicator light illuminated?
4. Is the heat pump thermostat set at a high enough level to enable the system to turn on? Adjust the thermostat to a higher setting.
5. Check the outside temperature. HAYWARD heat pumps will not turn on when the outside air temperatures drop near 45 degrees.
6. Make sure that the pump and skimmer baskets are free of debris. Also ensure that the pool filter is clean and supplying proper water flow to the heat pump.
7. The heat pump is not able to maintain your desired temperature? Depending on the time of the year, you may need to adjust your pool filtration systems hours of operation (increase run time).

**Note:** Use a solar blanket/cover on the surface in order to keep a higher level of heat retention.

### **Heat Pumps with Electronic Displays**

1. If diagnostic code "PS" is illuminated, this indicates improper water flow. Ensure that pool filter pump basket, skimmer basket, and filter are free of debris and clean.
2. If diagnostic code "LP" is illuminated, this indicates that the outside air temperature is too low. When this occurs the Heat Pump shuts itself off automatically. When the outside air temperature rises enough the heat pump will automatically turn on.
3. If diagnostic code "HP" is illuminated, this indicates that a low water flow condition may exist. Check to see that the pool pump basket, skimmer basket and pool filter is clean. After checking these items, if the "HP" indicator is still illuminated contact HAYWARD for service.

## **Troubleshooting**

Check the installation of the heat pump first to assure it is installed per the installation manual. Ensure the electrical hook-up is correct by checking the breaker is sized correctly for your unit and the wiring is per the National Electric Code. Reference the installation manual to ensure that the plumbing is installed correctly.

**Circuit Breakers:** if you suspect that a circuit breaker may be tripped, turn the breaker to the “off” position and then back to “on”. Visually checking the breaker is “on” is inadequate, as some switches move only a short distance when they trip. Toggle the switch to “off” then “on” every time you suspect it is tripped.

### **Troubleshooting a Chiller model or cooling cycles of a heat/cool unit:**

If you are troubleshooting problems with a Chiller model or cooling cycles of a heat/cool unit, the following charts cover the majority of issues. If you are unable to resolve or determine a problem, additional info can be obtained by contacting the HAYWARD Service Dept.

<b>Troubleshooting Guide for MECHANICAL Thermostat Control</b>		
<b>Problem</b>	<b>Possible Cause</b>	<b>Possible Solution(s)</b>
<b>Heat pump is not running</b>  <i>(Note: the pool filter pump must be running before the heat pump will operate.)</i>	No power to unit	Make sure power is on.
	Breaker is thrown	Check the breaker / see note above
	Thermostat not turned up high enough	Turn thermostat up until unit comes on
	5 minute delay timer still running	Be sure the 5 minute delay has passed
	Low water flow	Make sure filter is clean
		Make sure filter pump is on
		Unhook cleaning devices (skimmers, crawlers, etc.)
	Outside temperature to low	Check outside ambient temperature / wait for warmer temperatures for unit to operate. (refer to Operating Principles)
<b>Heat pump running but not heating</b>	Fan not functioning	Call HAYWARD for service info.
	Make sure thermostat is high enough	Adjust thermostat for higher heating temperatures. Refer to page 7 to find your thermostat instructions.
	“Heat” or “RUN” does not come on.	Call HAYWARD for service info.
<b>Heat pump runs continually</b>	Thermostat set too high	Turn thermostat down
	Electrical component failure	Turn off the filter pump. If the unit is still running after 2 minutes, turn off the power to the unit and contact HAYWARD for service.
<b>Heat pump is cycling (on / off too quickly)</b>	Bad valve or improper water flow	Check valve settings and ensure water flow is sufficient (is the filter pump running continually?) If heat pump continues to cycle, turn unit off to prevent compressor damage.
	Low refrigerant, low ambient temp, or high humidity with low ambient temp	Check evaporator coil for severe frost. Turn unit off to prevent compressor damage.
		If heat pump continues to cycle, turn unit off to prevent compressor damage.
<b>Water coming from bottom of unit</b>	Condensation	This is normal and there is no reason to be concerned
	Possible water leak	Turn the unit off for at least 2 hours, but leave the filter pump running continuously. If water dries up then it is only condensation. Otherwise there is a possible leak.

Troubleshooting Guide for <b>DIGITAL</b> Thermostat Control					
Lights		Display	Problem	Possible Cause	Solution
Power (red) PST-1 & PST-4 only	Heat (green)				
		(blank)	No power to heat pump	Tripped circuit breaker/ no power supply	Check breaker and insure that the unit is properly installed.
			Faulty electrical component		Call HAYWARD service department for info.
•	•				Call HAYWARD service department for info.
•			High / Low Pressure Switch	Outside temperature too cold.	Check ambient temperature, if lower than 50 F, Unit will not run
•		PS	Water Pressure Switch	Low or no water flow	Check water flow to heat pump. .
					Clean your filter
					. Make sure all valves are open and bypass valve is closed.
					Ensure pool filter pump is on
					Normal operation for TCO function
					Turn off fountains, crawlers, etc.
•		LP	Low Pressure Switch	Outside temperature too cold. (Refer to page 7.)	Check ambient temperature. Wait for warmer temperature (refer to page 7.)
					Loss of refrigerant
					Switch failure
					Fan motor failure
					Coil obstruction
					Perform cleaning procedures described in this manual.
•		HP	High Pressure Switch	Air flow obstruction	Call HAYWARD service department for info.
					Check water flow to heat pump. .
					Clean your filter
					. Make sure all valves are open
				Low water flow	Ensure pool filter pump is on
					Set unit to "ACP" if you have the heat / cool option.
					Refer to text on PST-5 control board.(pg 12)
				High water temp	Check pool temp. Wait until pool needs heat.
					Call HAYWARD service department for info.
					Have a professional adjust to proper levels
•		SF 120	Temperature sensor	Refrigerant is overcharged	Contact HAYWARD for service info.
					Switch Failure
					Contact HAYWARD for service info.
				Failure	2-speed filter pump
					Make sure speed is set to "high"
•		888	Thermostat reset	Failure	Contact HAYWARD for service info.
•					Temporary display. Shows for 1-2 secs when the unit is first turned on.
•		C=1		Internal board identification	Temporary display. Appears intermittently. Ignore unless it does not disappear.
•		RHD		Remote device is controlling the unit.	Refer to owner's manual of the remote device. If you do not have a remote device connected, call HAYWARD for service info.

---

## MANUFACTURER'S LIMITED WARRANTY HEAT PUMP POOL HEATERS

Energy Utilization Systems, Inc. (HAYWARD) warrants to the original installed location, the HAYWARD heat pump pool heater to be free of defects in materials and workmanship for a period of five years. The *compressor part* has a limited ten-year warranty, a pro rata basis for years 6-10. This warranty covers the cost of parts and labor for five years and starts from the date of purchase or within six months of date of manufacture, whichever is first. **HAYWARD will not void this warranty due to improper pool water chemistry.** This warranty is valid only if the product is installed according to the HAYWARD specifications. This warranty is valid only for products sold for use within the state of Florida. Products sold for use outside the state of Florida have a warranty of five years for all parts and one year for labor. Warranty outside of Florida does not include refrigerant or other expendable materials. Note: Lil' HotSpot, HotSpot, and SunSpot units have 5-year parts warranty and 1-year labor warranty everywhere.

This warranty does not include services such as inspection, maintenance, or unnecessary service calls due to erroneous operational reports, external valve position, or electrical service. It also does not include the repair or damage due to negligence, accident, or other conditions beyond the normal intended use of the unit. This warranty is void if the product is repaired or altered in any way by any persons or agencies other than those authorized by HAYWARD, and is in lieu of all other warranties, expressed or implied, written or oral. There are no implied warranties of merchantability or fitness for a particular purpose that apply to this product. This warranty applies only within the continental USA. For warranty outside the continental USA, contact HAYWARD.

At its option, HAYWARD will replace or repair any HAYWARD part that proves defective if such parts are returned to our factory, freight collect, within the warranty period. It is agreed that such replacement or repair is the exclusive remedy available from HAYWARD. Unless authorized by HAYWARD and performed by a factory authorized service center, HAYWARD is not liable for any labor involved in the removal of defective parts or the installation of replacement parts. HAYWARD is not liable for damages of any sort whatsoever, including incidental and consequential damages. Parts returned and services performed under terms of this warranty must be approved by HAYWARD. All parts returned under terms of this warranty will be repaired or replaced and returned transportation charges prepaid, by best and most economical means.

**This warranty applies to units shipped after July 1,2002.**

# Installation Guide

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## **Electrical Connections**

All units are equipped with an electrical wiring schematic inside the electrical panel. If one is not provided, please contact the factory at 1-800-432-8387 to obtain one.

### **Warning!**

**Disengage main power disconnect before attempting installation.**

**Power connections supplied to the unit must be in accordance with national and local electric code.**

- Use an approved flexible conduit to supply power to the heat pump where appropriate to code.
- Electrical Grounding must be supplied congruent to national and local code.
- If the unit is installed within 15 feet of the pool, the National Electric Code requires the use of Ground Fault Interrupter (GFI) circuit protection on all installations regardless of their location.
- An outdoor waterproof disconnect should be mounted adjacent to the heat pump for service safety.
- Refer to charts below for electrical ratings / recommendations:

Model / Type	Operating Specs		Model / Type	Operating Specs	
HP-4	Volts	230	PE-42	Volts	230
	Hz	60		Hz	60
	Phase	1		Phase	1
	Compressor Nom. Amps	19.9A		Compressor Nom. Amps	19.9A
	Compressor LRA	115A		Compressor LRA	115A
	Fan Motor RLA	1.7A		Fan Motor RLA	1.7A
	Fan Motor HP	1/4		Fan Motor HP	1/4
	Minimum Circuit Ampacity	30		Minimum Circuit Ampacity	30
	<b>Max Fuse</b>	30A		<b>Max Fuse</b>	30A
HP-5	Volts	230	PE-52	Volts	230
	Hz	60		Hz	60
	Phase	1		Phase	1
	Compressor Nom. Amps	27.9A		Compressor Nom. Amps	27.9A
	Compressor LRA	129A		Compressor LRA	129A
	Fan Motor RLA	2.9A		Fan Motor RLA	3.3A
	Fan Motor HP	1/2		Fan Motor HP	1/2
	Minimum Circuit Ampacity	40		Minimum Circuit Ampacity	40
	<b>Max Fuse</b>	50A		<b>Max Fuse</b>	50A

### Wiring Recommendations

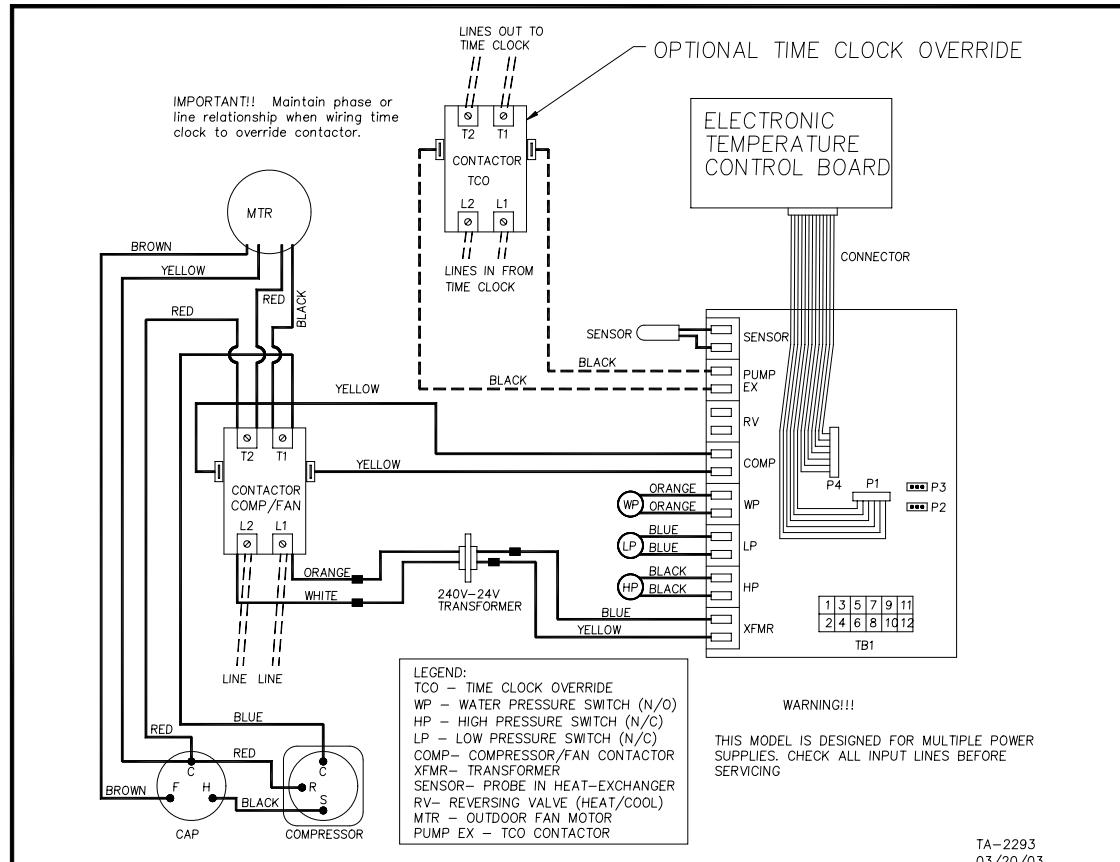
	HP- 4**	HP- 5**	PE- 42**	PE- 52**
Min Wire Ga.	10	8	10	8
Min. Wire Ga. For runs over 50 ft.	10	6	10	6
Wire alloy	Copper	Copper	Copper	Copper
Fuse- HACR or Time Delayed	30	50	30	50
Power consumption -Watts	3450	5800	3450	5800

### Note:

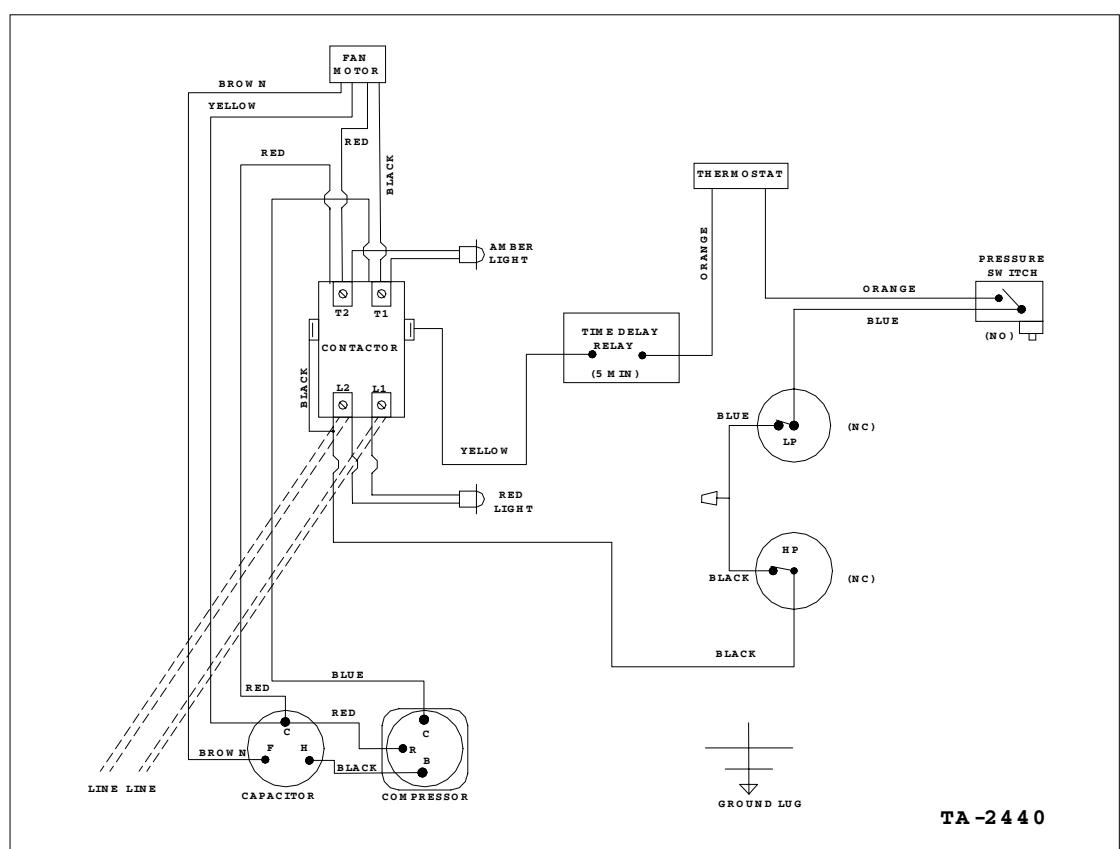
It is not necessary to remove the entire front panel to make electrical connections. Doing so can damage sensitive electronic controls and can void the warranty.

**DO NOT TOUCH OR ALLOW LOOSE WIRES TO TOUCH THE THERMOSTAT CIRCUIT BOARDS DURING INSTALLATION.**

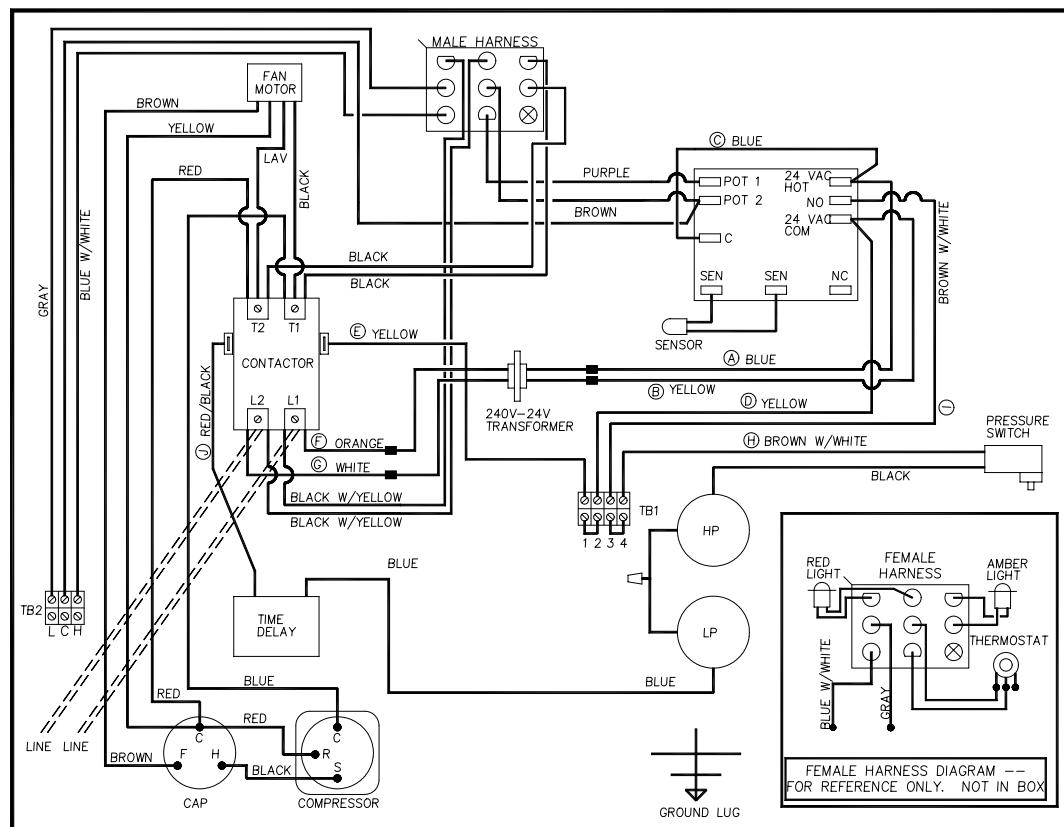
This wiring diagram is for use with all units that have ***digital thermostats***. It is also for use with units that have the optional ***TCO***.



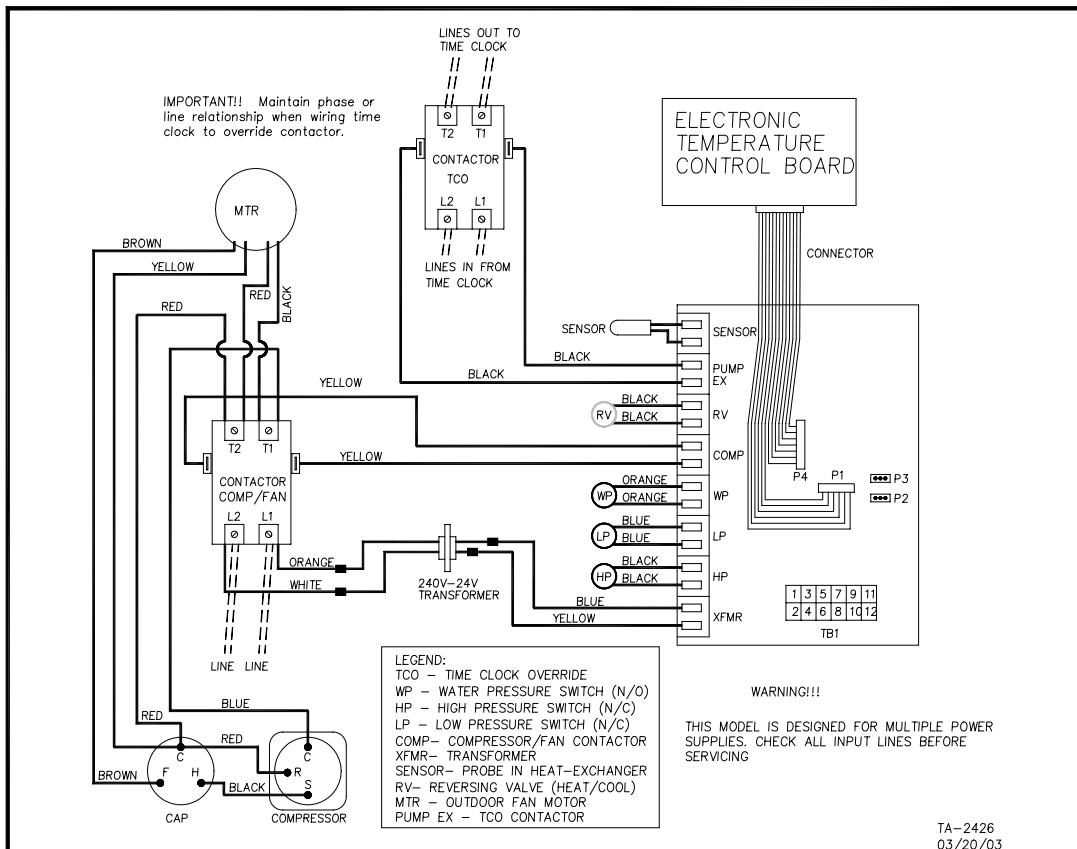
This wiring diagram is for ***Lil' HotSpot*** units only.



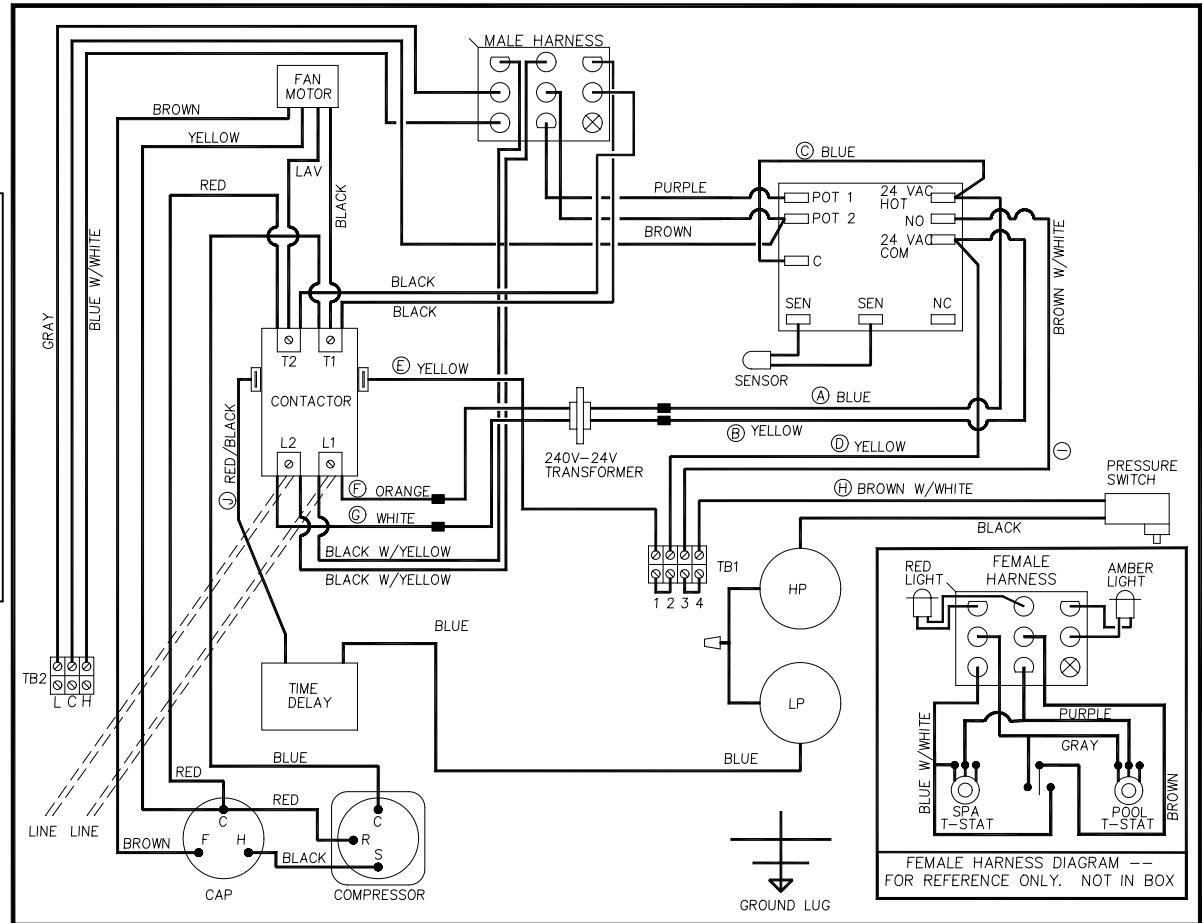
This wiring diagram is for use with all units that have ***mechanical single thermostats***.



This wiring diagram is for use with **H/C** units.



This wiring diagram is for use with all units that have ***mechanical dual thermostats***.



## Plumbing Specifications

### Typical Installation Layout

#### PIPING CONNECTIONS

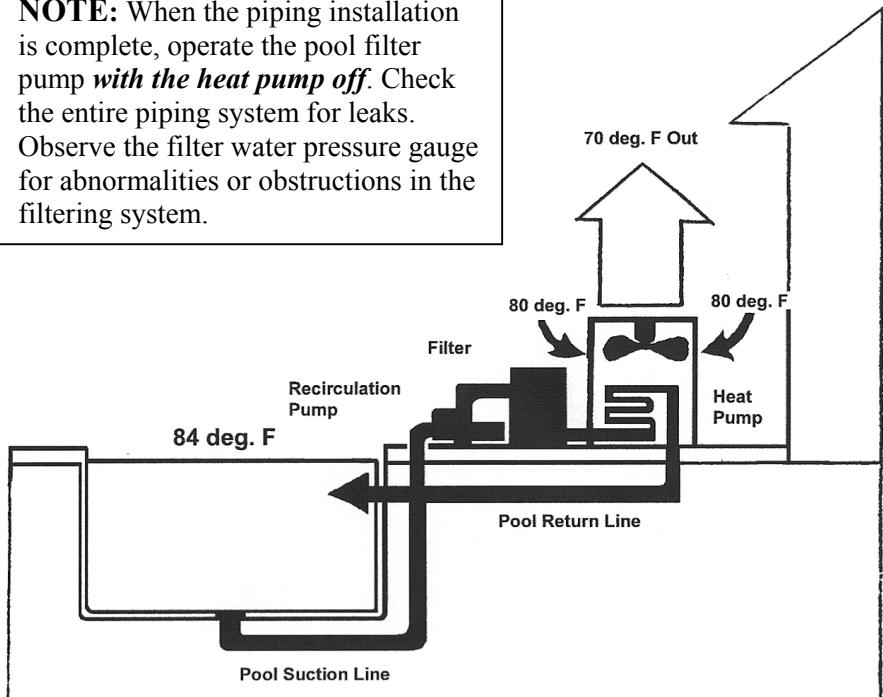
**Note:** A detachable connection (union) must be utilized immediately adjacent the heater to facilitate servicing and winterizing the unit. (See example on next page)

- The heat pump pool heater is designed for easy piping connections into the pool water filtering system. The pool heater condenser (heat exchanger) is provided with 1 ½" female fittings which are easily adapted to rigid poly vinyl chloride (PVC) or flexible plastic tubing.
- Use 2" PVC Schedule 40 piping and 2" fittings and components for building the piping system. Components under this size will impede water flow rates and hinder the efficiency of the unit. Utilize a 2" - 1 ½" reducer to enter the heat pump.
- Pipefittings such as reducers, tees, and elbows cause pressure to drop as water flows through them. Plan the plumbing layout carefully, using as few fittings as possible to connect your heat pump.
- PIPING TO THE POOL HEATER MUST BE IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL CODES.
- It is important that the pool heater be connected **downstream** from the pool pump and filter in the return line to the pool. Connect the pipe from the filter outlet to the fitting near the bottom of the pool heater marked "COLD WATER IN FROM PUMP"
- THE WATER TO BE HEATED MUST ENTER THE BOTTOM OF THE HEAT EXCHANGER TO AVOID THERMOSTAT "SHORT-CYCLING".
- Connect the fitting near the top of the pool heater marked "HOT WATER OUT TO POOL" to the return piping to the pool. Long runs of piping to and from pool (over 25 feet) should be insulated to prevent heat loss to ground or air.

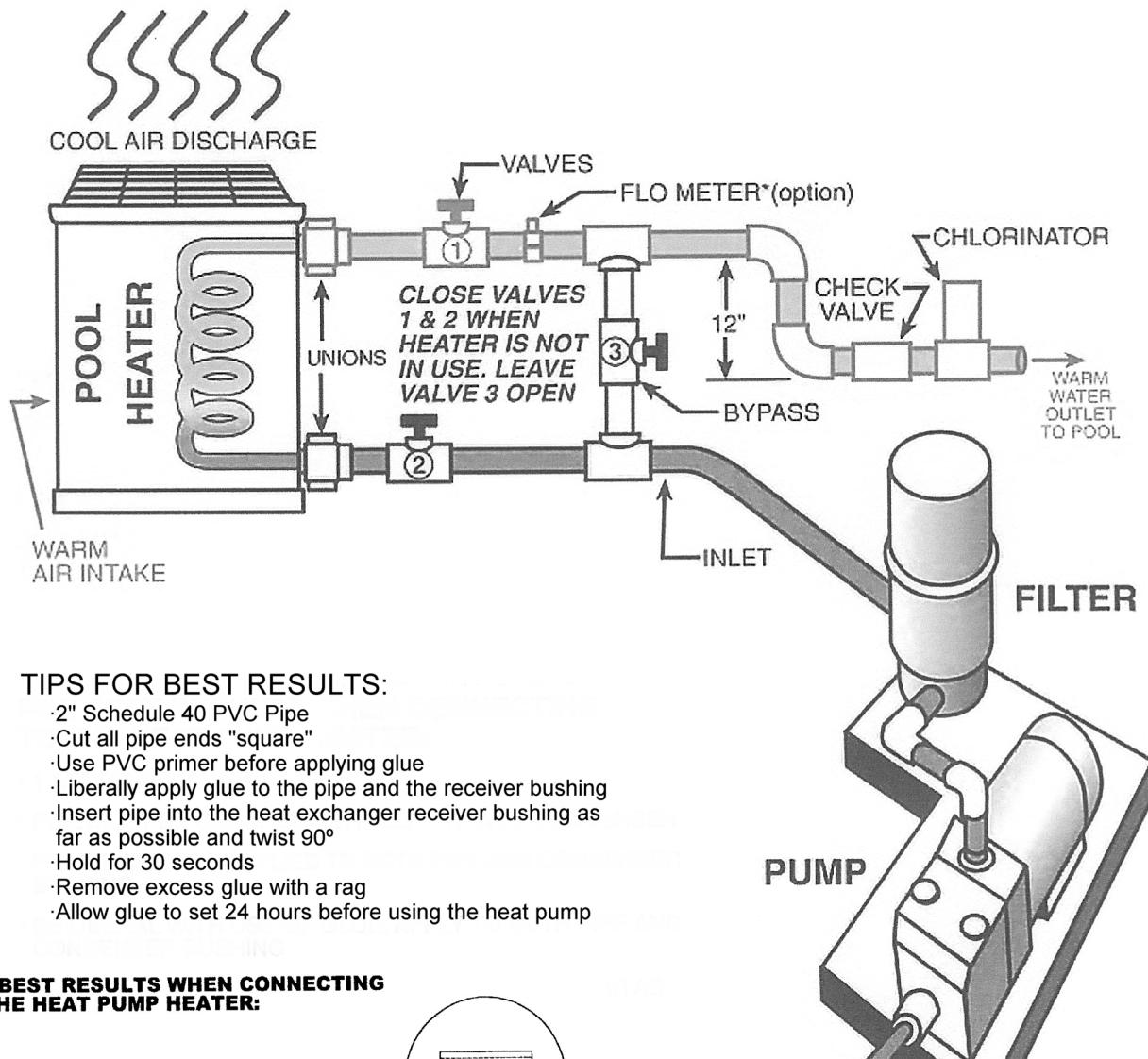
#### **CAUTION:**

Automatic erosion type chlorinators, if used, **must** be installed **downstream** (between the heat pump and the pool) of the heat pump and a check valve (or Hartford Loop) installed in a manner that will not allow the raw chlorine to drain back to the heat pump when the water pump is off. **Do not allow pool maintenance people to pour chemicals in skimmer. Damage to your system and the heat pump could result.**

**NOTE:** When the piping installation is complete, operate the pool filter pump **with the heat pump off**. Check the entire piping system for leaks. Observe the filter water pressure gauge for abnormalities or obstructions in the filtering system.



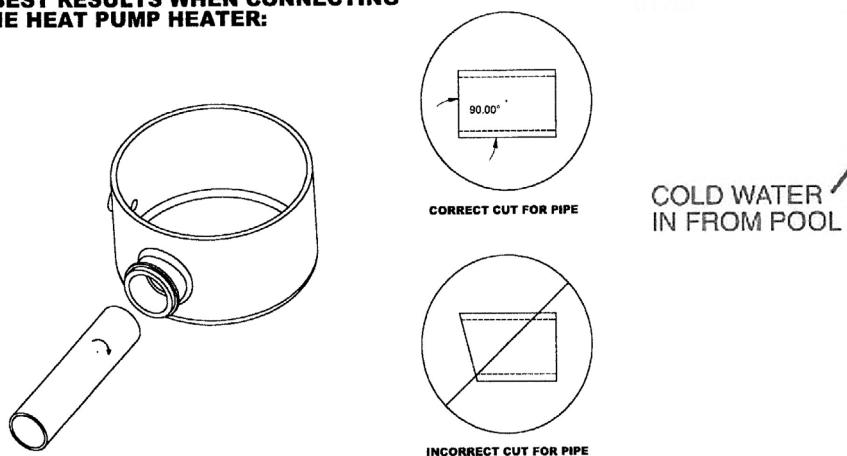
# TYPICAL POOL HEATER INSTALLATION LAYOUT



## TIPS FOR BEST RESULTS:

- 2" Schedule 40 PVC Pipe
- Cut all pipe ends "square"
- Use PVC primer before applying glue
- Liberally apply glue to the pipe and the receiver bushing
- Insert pipe into the heat exchanger receiver bushing as far as possible and twist 90°
- Hold for 30 seconds
- Remove excess glue with a rag
- Allow glue to set 24 hours before using the heat pump

## FOR BEST RESULTS WHEN CONNECTING TO THE HEAT PUMP HEATER:



## FLOWRATE

**MODELS:** PE 42\*\* / PE22\*\* / HP-4\* / PE 32\*\*

The 3 1/4 HP is designed for nominal water flow of 45 gpm through the condenser. A minimum flow of 20 gpm is required to insure sufficient heat removal from the condenser, thus avoiding overheating the unit. Flow rates above 75 gpm will begin to create excessive pressure drop through the condenser and require unnecessarily high pumping energy.

**MODELS:** PE 52\*\* / HP-5\*

The 5 HP is designed for nominal water flow of 55 gpm through the condenser. A minimum flow of 30 gpm is required to insure sufficient heat removal from the condenser, thus avoiding overheating the unit. Flow rates above 75 gpm will begin to create excessive pressure drop through the condenser and require unnecessarily high pumping energy.

## EXTERNAL BYPASS

If the flow rate exceeds 75 gpm, a bypass loop must be installed around the heat pump (refer to page 20). The bypass loop piping should be sized to provide approximately 40-60 gpm to the heat pump. Pump capacity versus backpressure performance curves for the pump used in the pool system should be consulted to determine the flow rate. This may require a pressure or flow gauge measurement at the pump discharge.

## UNIONS

A detachable connection (union) **must** be utilized immediately adjacent the heater to facilitate servicing and winterizing the unit. (See example on previous page)

## INSTALLATION OF POOL HEATER ABOVE POOL SURFACE

If the pool heater is installed more than three feet above the surface of the pool water install directional flow fittings on the end of the return water line to the pool. This will create adequate backpressure at the heater to operate an important water pressure switch. A pool supply company can help you with directional flow fittings.

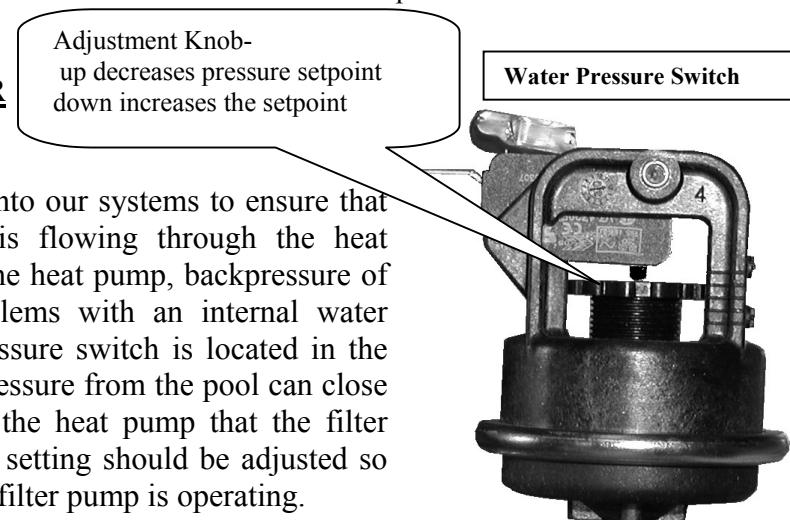
In some cases, such as when the heater 6-8 feet above the pool surface, it may be necessary to install a positive flow switch such as AQUALARMTM in the water line instead of the pressure switch.

## INSTALLATION OF POOL HEATER

### BELow POOL SURFACE

A water pressure switch is integrated into our systems to ensure that the unit only operates when water is flowing through the heat exchanger. If a pool surface is above the heat pump, backpressure of water from the pool can cause problems with an internal water pressure switch setting. The water pressure switch is located in the control panel of the heat pump. Backpressure from the pool can close this switch, whose function is to tell the heat pump that the filter pump is running. This pressure switch setting should be adjusted so that the unit is running only while pool filter pump is operating.

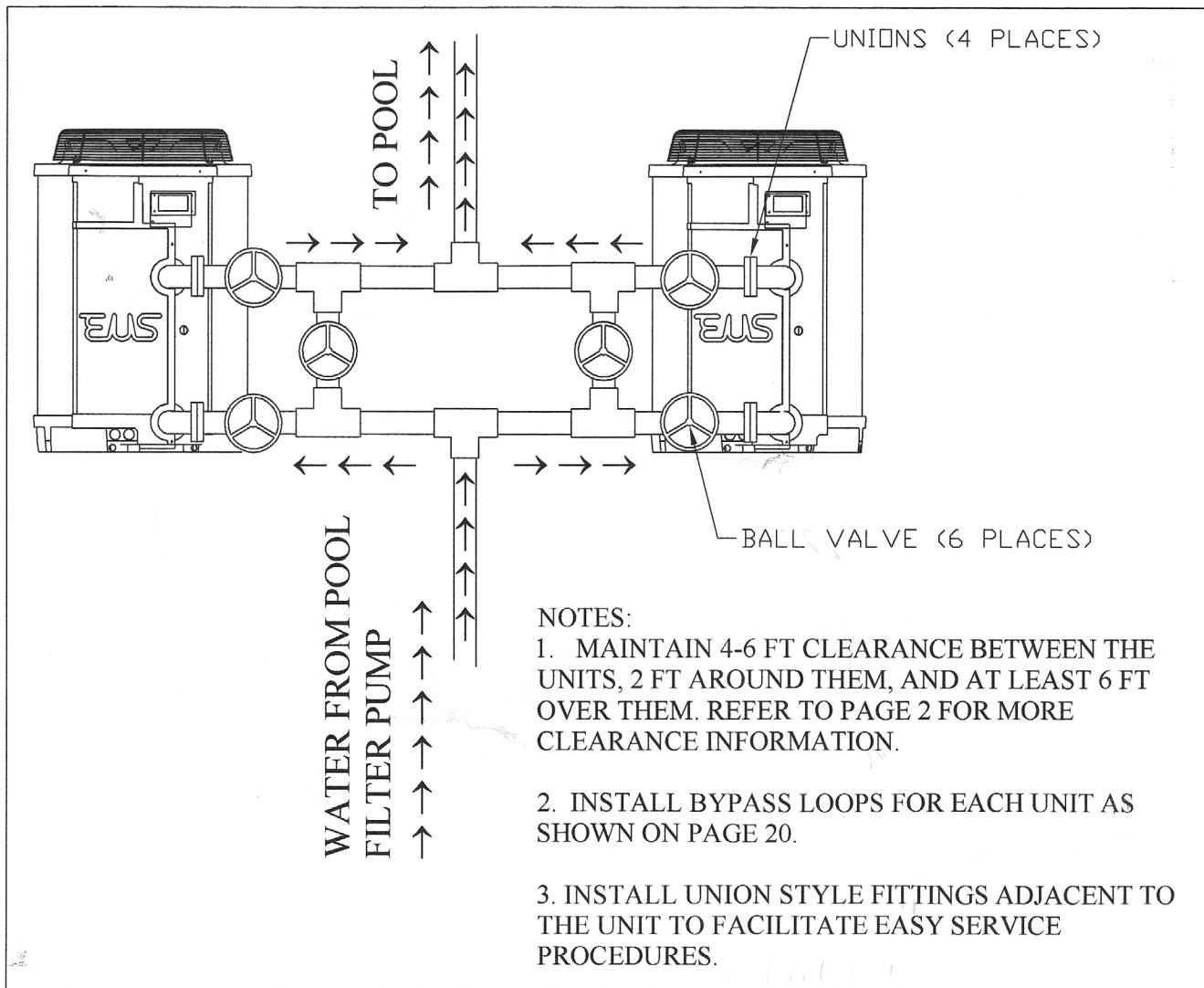
**Caution:** If the heat pump runs for more than a couple of minutes without the filter pump in combination, the unit will overheat and be damaged.



## **INSTALLATION OF MULTIPLE HEAT PUMPS**

If a heat pump pool heater sizing calculation indicates that two or more pool heaters will be required to heat a single pool, the units are to be *installed for parallel operation*. Series plumbing reduces efficiencies of each heat pump downstream.

The diagram below shows installation of two units in parallel. Contact HAYWARD for additional information if installing more than two units.

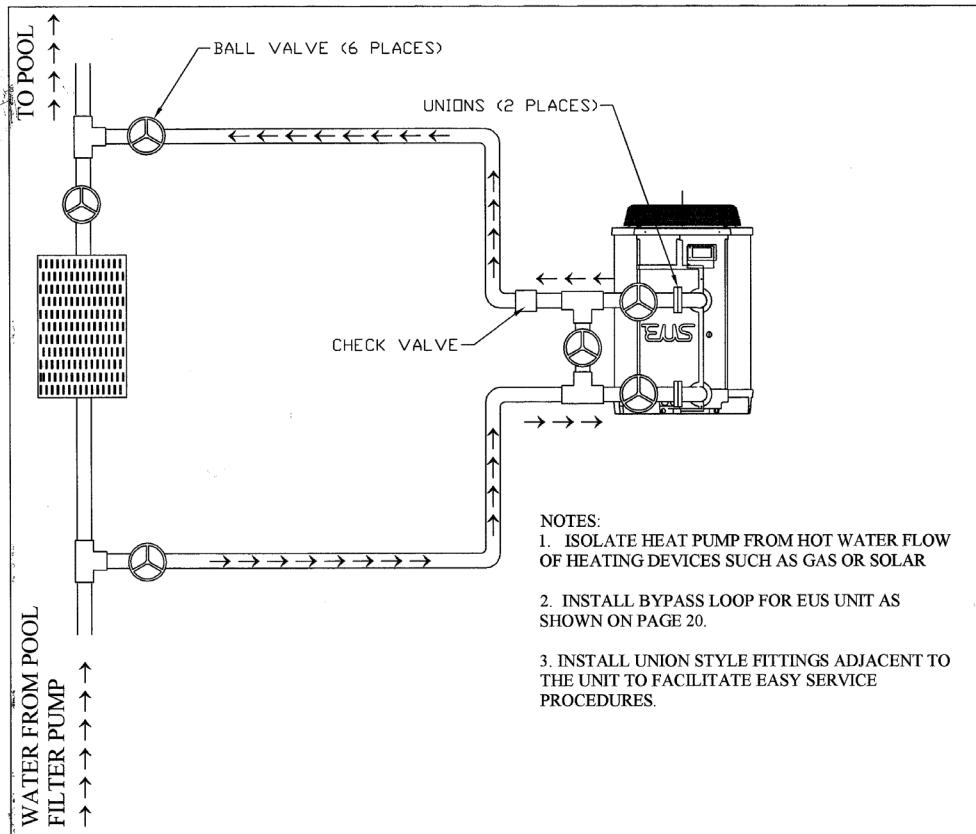


**INSTALLATION IN COMBINATION WITH SOLAR OR GAS HEATERS**

If you are installing a heat pump in combination with any other type of heating device, please call the HAYWARD service department. We will advise you of installation practices that will help keep your warranty valid.

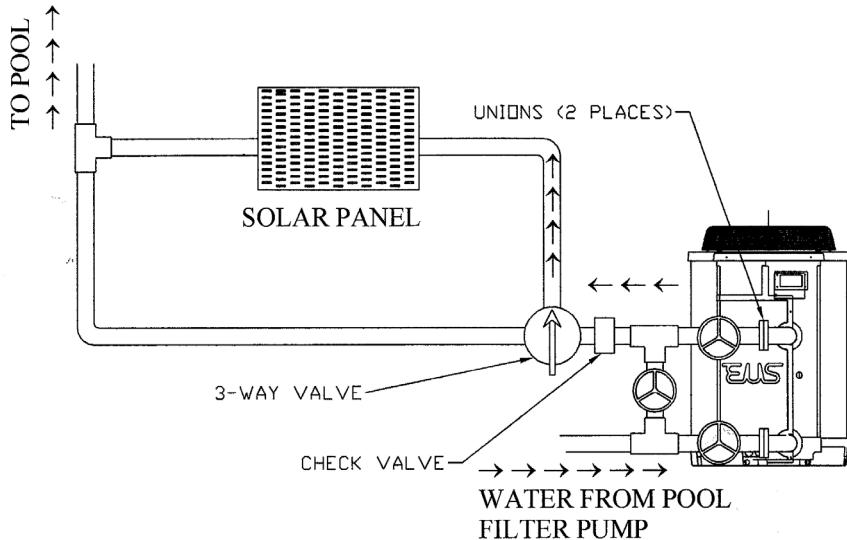
If you are installing other pool heaters, such as gas-powered or solar-powered devices:

1. They **must be installed in a parallel circuit and operated independently (only one at a time) for your warranty to stay valid.** Because of the intense heat that can be generated by gas and solar units, the heat pump is protected by isolating it with shut-off valves and a check valve when gas or solar is in operation.



***OR***

2. Installation of a heat pump and solar unit in series is achieved by plumbing to this diagram. If you wish to only run the secondary heater, you can turn the heat pump to "off" and still allow water to flow through it. ***Placing a check valve in the line to prevent backflow of hot water from the secondary heater is critical to the warranty and life of your heat pump.***



## **INITIAL START-UP** - (Electronic Control Systems Only)

After completing the electrical and piping connections to the pool heater, follow the procedures outlined below to insure that the pool heater is functioning properly.

Before proceeding, **MAKE CERTAIN** there are no air or water leaks in any plumbing connections or piping and water flow is within the proper flow rate ranges:

MODEL PE 42:      20 gpm min. – 70 gpm max.  
MODEL PE 52:      30 gpm min. – 75 gpm max.

**NOTE: Damage caused by flow rates outside this range will void your warranty.**

1. Check to see that pool heater thermostat is in the "OFF" or "Standby" position.
2. Apply power to the pool heater by plugging in the fused disconnect block or moving the circuit breaker to the "ON" position.
3. With the pool filter pump operating, set the pool heater thermostat to the desired temperature.
4. When the pool heater starts, disconnect power to the pool filter pump. The pool heater should instantly cease operation. **IF THE POOL HEATER CONTINUES TO OPERATE, THE WATER PRESSURE SWITCH MUST BE ADJUSTED (see page 30).** If the pool heater ceases operation when power to the filter pump is disconnected, the water pressure switch adjustment is correct for this installation.
5. Restore power to the pool filter pump. There is a five (5) minute time delay period that will prevent the heat pump from restarting. Wait for a few minutes for the heat pump to restart. If the restart doesn't occur, refer to the troubleshooting section.
6. When the unit starts, visually check the fan is operating and air is being discharged upward from the unit. Listen for the sound of the compressor starting. If you are not familiar with, or are unsure of exactly what sound the compressor makes, take an amp reading around one incoming power wire near the contactor. The amp reading should be 20 amps or above when the compressor is running (even at low ambient and/or water temperature.)
7. If both the fan and compressor are operating, allow the pool heater to operate for 10 - 15 minutes in order for system pressures to stabilize.
8. Using a thermometer, check to see if the discharge air is 5°F - 128F cooler than the ambient air temperature. If discharge air does not have a noticeable temperature change, refer to troubleshooting section.

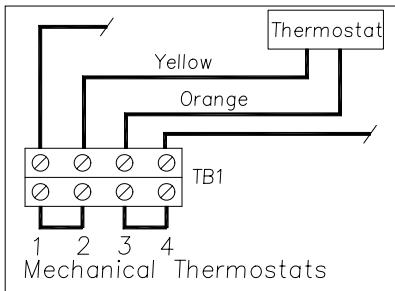
### **Connecting to Remote Systems**

Most HAYWARD heat pumps are compatible with one or more of the remote systems in the pool and spa industry. The single mechanical thermostat units are compatible with the Jandy AquaLink, Compool, and Hayward remote systems, but are not compatible with the Intermatic or Jandy AquaSwitch remote systems. The dual mechanical thermostat units and all of the digital thermostat units are compatible with all known remote systems in the industry. **Note:** HotSpot and Lil' HotSpot models require special connections. The HAYWARD engineering staff can advise you on methods of connecting remotely.

Examples of connecting with three popular remote systems are listed below. Thoroughly read the installation instructions of the remote system before connecting to your heat pump.

#### **A. The diagram below shows how to connect HAYWARD single/dual mechanical and all digital thermostats to the Jandy AquaLink:**

Note: on units with optional cooling modes, the Aqualink controls only heating cycles.



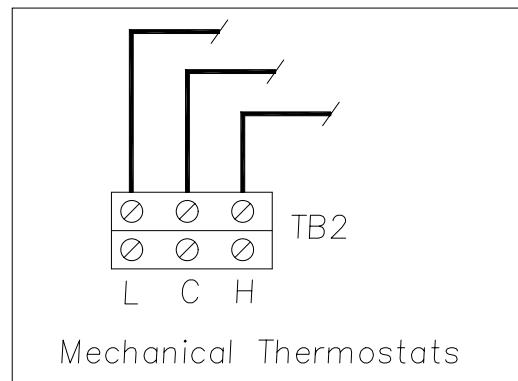
#### INSTRUCTIONS: JANDY AQUALINK BEZEL

1. Determine if your heat pump uses a mechanical or digital thermostat.
2. Locate TB1, which is located in the control box of the heat pump.  
For Mechanical— Remove the jumper on terminals 1 & 2 from the bottom of the terminal block TB1.
3. Connect two wires (consult your National Electric Code for size) to TB1:  
For mechanical— use terminals 1 & 2  
For digital— use terminals 4 & 11
4. Connect the other end of the wires to terminals 1 and 2 on the J.A. Bezel (green 10 pole terminal strip).

**B.** The instructions below tell how to connect **dual mechanical units** to **Intermatic or AquaSwitch** remote systems:

1. Bring the three wires marked as *pool*, *spa*, and *common* from the remote system to TB2 in the control box of the heat pump.
2. Connect the pool wire to “L”
3. Connect the spa wire to “H”
4. Connect the common wire to “C”
5. Place the toggle switch in the “OFF” position

**Note:** The thermostats on the heater still control the temperature of the water.



**C.** The diagram below shows where to connect all of the remote systems to the HAYWARD heaters with digital thermostats.

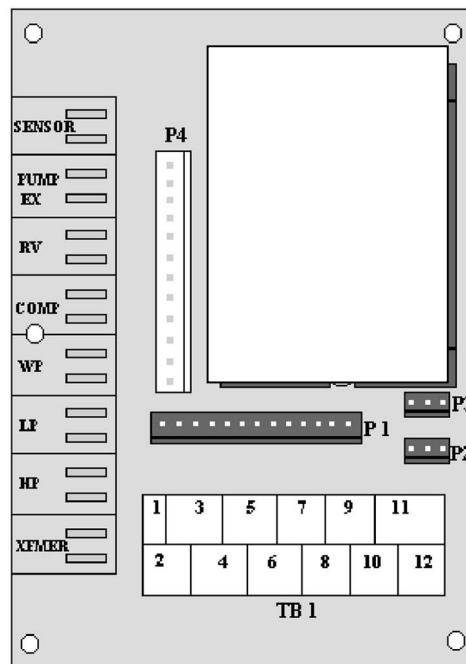
Thermostat Interface Board in the unit control box

#### Connection to AquaLink, Compool, and Hayward Remote Systems:

- Bring two wires (24 VAC) from the remote system. In the TB1 area of the HAYWARD thermostat, place one wire into terminal 11, the other is placed into terminal 4.
- The thermostat on the heat pump must be in the “Standby” (OFF) mode for the remote system to control the unit.

#### Connection to Aqua Switch and Intermatic:

- Bring three wires marked as *pool*, *spa*, and *common* from the remote system to TB1:
  - Terminal 7 = Pool
  - Terminal 9 = Spa
  - Terminal 2 = Common
- The thermostat on the heat pump will control the water temperature.



## **Time Clock Override (TCO) Function**

### **Purpose:**

This function provides another way to maintain pool temperature. Most pool systems use a time clock to control the pool's filter pump. The time clock may have the filter pump off for several hours at a time. Since the filter pump must be flowing water through the heat pump for heating of the water to occur, the Time Clock Override (TCO) function allows a user to control the pool filter pump by temporarily bypassing the time clock.

The TCO function is designed to automatically turn the pump on after 2 hours of "off-time". It will run the pump for 10 minutes while the heat pump thermostat monitors the pool temperature. If there is more than a 2-degree difference between the thermostat setpoint and the actual pool temperature, the heat pump will energize and continue to run until the setpoint is satisfied. The TCO will then disengage and allow the time clock to control the filter pump. If the time clock doesn't start the filter pump within 2 hours, the TCO will begin this cycle again.

### **Wiring the TCO Function:**

- 1) Refer to the wiring diagrams located on the next page.
- 2) Wire the pool filter pump power in parallel using the TCO contactor located in the heat pump control box.
- 3) Wiring shall comply with the 1996 National Electrical Code and all state and local requirements of the Authority Having Jurisdiction.
- 4) Maximum Load: 25 FLA at Volts: 240,1 ph.

### **Note to electrician / installer:**

Use the TCO override feature described below to test for correct installation of the TCO function wiring.

### **TCO Override:**

A user may *temporarily* override the TCO. An example would be that you want to use your pool between 9:00 and 10:00 pm. The heat pump control may be programmed to energize the filter pump, which will engage the heat pump to maintain the pool temperature. In other words, you can force the heat pump and filter pump to work on demand. This is a temporary measure that can be initiated in 30-minute increments, for a period up to 3 hours.

### **Programming Instructions for TCO Override:**

1. Push and hold *up* and *down* buttons simultaneously – Display will read "**P0.0**"
2. Release buttons.
3. Push *up* button – display reads **P0.5**  
Note: Each time the *up* Arrow engages, the display will increase in ".5" increments. Each increment equals 30 minutes, 3 hours (**P3.0**) is the maximum.
4. Push *down* button to decrease the temporary override time. Continue decreasing the time until reaching **P0.0** to turn the override off.

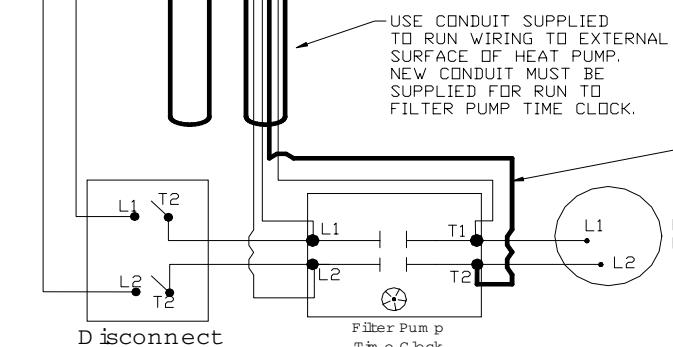
### RECOMMENDED WIRING FOR TIME CLOCK OVERRIDE - AWS MODELS

NOTE: THE  
T C O  
CONTACTOR  
IS RATED  
FOR 25A  
MAXIMUM  
LOAD .

CONNECT  
MAIN  
POWER  
HERE

"230V, 1ph.  
25amp Max"  
Supply

L1 L2



CAPACITOR

ELECTRONIC  
TEMPERATURE  
CONTROL BOARD

AWS CONTROL  
BOX

AWS CONTROL  
BOX DOOR

**CAUTION !!!**  
THIS MODEL IS  
DESIGNED FOR  
MORE THAN ONE  
POWER SOURCE.  
DISCONNECT ALL  
POWER BEFORE  
SERVICING .

**CAUTION!!!**  
DO NOT CROSS T1 AND T2  
A SHORT IN THE FILTER  
PUMP TIME CLOCK WILL  
OCCUR.

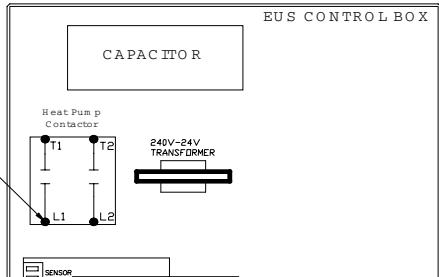
NOTE: THIS DIAGRAM  
INTENDED FOR TCO HOOKUP  
ONLY. REFER TO NORMAL  
WIRE DIAGRAM FOR MORE  
INFORMATION .



### RECOMMENDED WIRING FOR TIME CLOCK OVERRIDE - EUS MODELS

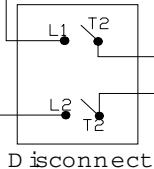
CONNECT  
MAIN  
POWER  
HERE

NOTE:  
THE T C O  
CONTACTOR  
IS RATED  
FOR 25A  
MAXIMUM  
LOAD .



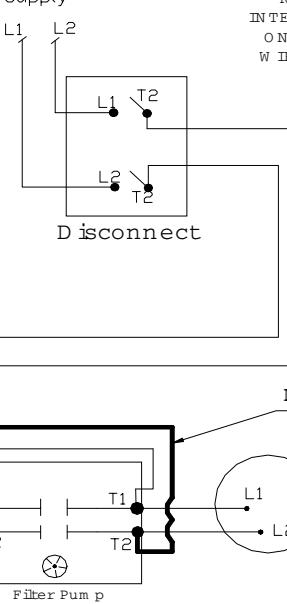
"230V, 1ph.  
25amp Max"  
Supply

L1 L2



**CAUTION !!!**  
THIS MODEL IS  
DESIGNED FOR  
MORE THAN ONE  
POWER SOURCE.  
DISCONNECT ALL  
POWER BEFORE  
SERVICING .

NOTE: THIS DIAGRAM  
INTENDED FOR TCO HOOKUP  
ONLY. REFER TO NORMAL  
WIRE DIAGRAM FOR MORE  
INFORMATION .



Filter Pump  
Time Clock

**CAUTION!!!**  
DO NOT CROSS T1 AND T2  
A SHORT IN THE FILTER  
PUMP TIME CLOCK WILL  
OCCUR.



## Troubleshooting Guide

**First check the installation of the unit to assure it is installed following the recommendations detailed in the installation guide.**

**Check the electrical hook-up. Make sure the breaker or disconnect is sized correctly and is on. Verify that the wiring is per the National Electric Code (see Electrical Specifications section.)**

A second troubleshooting chart containing additional information is available at the end of the owner's manual.

### **Unit does not start after installation:**

- If the heat pump pool heater was exposed to subfreezing temperature during shipment, the low-temperature switch may be deactivated. The unit must then be exposed to ambient air temperatures above 48°F and direct sunlight for several hours in order to activate the switch and allow start-up of the unit.

### **Unit is not running:**

- Check for the power light or any display on a digital thermostat. If the light is not on, check the breaker or disconnect box. Are fuses good?
- Make sure the filter pump is on. The heat pump will not operate until the filter pump is flowing an adequate amount of water through the unit. Make sure the pool filter is clean (see section **Flowrate**.)
- If the water pressure is low, you may need to adjust the water pressure switch (see section **Installation of Heater Below Pool Surface**)
- Check the thermostat. If the filter pump is flowing water through the unit, turn up the thermostat and see if the unit comes on.
- Make sure the 5-minute time delay, which protects the compressor, has timed-out.
- Check the outside ambient temperature. Unit will not operate when the ambient temperature is below 45° F

If the heat pump pool heater is installed in an area where the air temperature will fall below 44°F (+/- 3°F), the unit will shut off at these lower temperatures. In addition, if the relative humidity is high, some frosting of the evaporator may occur. As higher air temperatures return to the area, the unit will come back on.

### **Unit is running but not heating:**

- Is the fan turning?
- Is the air coming out of the top cooler than ambient air temperature?
- Check the thermostat. Make sure it is turned up high enough.

If the heat pump does not appear to be heating because it is not detectable to the touch, remember the difference at any given flow rate may be only a degree or two. A quick and simple way to see if the unit is actually heating, is to check the air temperature (ambient air) being drawn into the unit and compare it to the air being blown out of the top. If the air coming in is 70° F and the air coming out is 65° F, there is a 5° F difference – which is going into the water. If the two temperatures are the same, there may be a problem and you should contact the manufacturer.

### **Unit runs continuously:**

- First, turn off the thermostat. If the unit turns off, the thermostat was set too high.
- Second, if the unit is still running after you turn off the thermostat, turn off the filter pump. If the unit is still running after approximately 2 minutes, disconnect power. The main contactor may have failed or the water switch may have failed.
- To check to the water pressure switch, make sure that power is disconnected from the heat pump. Turn on the filter pump and check across the wire terminals of the water pressure switch with an Ohmmeter. If the ohmmeter indicates an open circuit, try adjusting the knob on the switch. If it “closes”, leave the knob at this setting and re-check the heat pump operation.

### **Unit is cycling:**

- Is the water flow rate within acceptable ranges? (See section **Flowrate**.) Check the filters and the valves to ensure they are clean and fully open. The water pressure switch may have to be adjusted (see section **Installation of Heater Below Pool Surface**.)
- Check the evaporator coil for severe frost.
- If the unit continues to cycle, turn power off to the heat pump to keep the cycling from effecting the compressor.

### **Unit is noisy:**

- If the heat pump seems noisy at start-up and then returns to normal sound levels, this is not cause for concern. Such noise may occur when the unit has been off for a longer-than-normal period of time.

## **OBTAINING SERVICE ASSISTANCE**

### **Before You Call For Service**

If there appears to be a problem, refer to the installation troubleshooting guide above. There is an additional troubleshooting chart available at the end of the owner's manual containing information for troubleshooting your heat pump.

1. Make sure that the swimming pool filtration system is turned on.
2. Is the main power (circuit breaker) on?
3. Is the "Power" indicator light illuminated?
4. Is the Heat Pump Thermostat set at a high enough level to enable the system to turn on? Adjust the thermostat to a higher setting.
5. Check the outside temperature. HAYWARD Heat Pumps will not turn on when the outside air temperatures drop near 45 degrees.
6. Make sure that the pump and skimmer baskets are free off debris. Also ensure that the pool filter is clean and supplying proper water flow to the Heat Pump.
7. The heat pump is not able to maintain your desired temperature? Depending on the time of the year, you may need to adjust your pool filtration systems hours of operation (increase run time).

**Note:** Use a solar blanket/cover on the surface in order to keep a higher level of heat retention.

### **Heat Pumps with Electronic Displays**

1. If diagnostic code "PS" is illuminated, this indicates improper water flow. Ensure that pool filter pump basket, skimmer basket, and filter are free of debris and clean.
2. If diagnostic code "LP" is illuminated, this indicates that the outside air temperature is too low. When this occurs the Heat Pump shuts itself off automatically. When the outside air temperature rises enough the heat pump will automatically turn on.
3. If diagnostic code "HP" is illuminated, this indicates that a low water flow condition may exist. Check to see that the pool pump basket, skimmer basket and pool filter is clean. After checking these items, if the "HP" indicator is still illuminated contact HAYWARD for service.

***Service Information***  
Hayward Pool Products  
1-800-432-8387

Hayward Pool Products  
1 Hayward Industrial Drive  
Clemmons, NC 27012

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**Notes:**

**Notes:**

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**Notes:**

**Warranty Card**

1. Fill out the reverse side of this card.
2. Cut card along the edges and drop it in the mail to us.

CUT  
ALONG  
EDGES

PLACE  
POSTAGE  
HERE

**Hayward Pool Products**  
1 Hayward Industrial Drive  
Clemmons, NC 27012

ATTN: HEAT PUMP WARRANTY DEPT.

Celsius	is	Fahrenheit	Celsius	is	Fahrenheit
0		32	23		73
1		34	24		75
2		36	25		77
3		37	26		79
4		39	27		81
5		41	28		82
6		43	29		84
7		45	30		86
8		46	31		88
9		48	32		90
10		50	33		91
11		52	34		93
12		54	35		95
13		55	36		97
14		57	37		99
15		59	38		100
16		61	39		102
17		63	40		104
18		64	41		106
19		66	42		108
20		68	43		109
21		70	44		111
22		72	45		113

**HEAT PUMP POOL HEATER  
WARRANTY INFORMATION CARD**

CUSTOMER \_\_\_\_\_

ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

CUSTOMER PHONE (\_\_\_\_\_) \_\_\_\_-\_\_\_\_ DATE OF PURCHASE \_\_\_\_ / \_\_\_\_ / \_\_\_\_

DEALER \_\_\_\_\_ PHONE \_\_\_\_\_

ADDRESS \_\_\_\_\_ CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

UNIT MODEL# \_\_\_\_\_ / \_\_\_\_\_ SERIAL # \_\_\_\_\_

INSTALLED BY:  DEALER  CUSTOMER  OTHER NAME \_\_\_\_\_

SIZE OF POOL \_\_\_\_\_ FT. X \_\_\_\_\_ FT. IS POOL COVER USED?  YES  NO

NEW INSTALLATION?  YES  NO REPLACEMENT POOL HEATER?  YES  NO