



*Perfectemp™ Swimming
Pool
Heat/Cool Heat Pump
OWNER'S MANUAL*



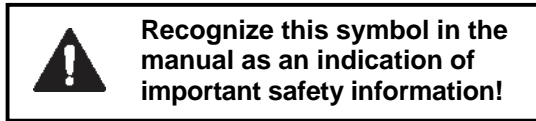
**This manual should be maintained in legible condition
and in a safe place for future use.**

Manufactured by





PRODUCT SAFETY SIGNS AND LABELS



Recognize this symbol in the manual as an indication of important safety information!

This manual, as well as the pool/spa heat pump itself, contains ANSI-approved product safety signs and labels. Please read these signs and labels, as they convey important safety information about hazards that may be potentially present in and around the heat pump. They are classified according to relative seriousness of the hazard potential, from DANGER as the most serious, to WARNING, to CAUTION as the least serious.



Improper chemical content in a swimming pool or spa can damage the heat pump.

DO NOT add pool chemicals to the skimmer. This will damage the heat pump and could void the heat pump warranty. ALWAYS follow the product manufacturer's directions when adding any chemicals to your pool.

WARRANTY CLAIMS

For the Warranty to apply, proper authorization **MUST** be obtained **PRIOR** to making any repairs. This Warranty will be **VOID** if the product is repaired or altered in any way by **ANY** persons or agencies other than those authorized.

The heat pump warranty will be **VOID** if chemical levels are not maintained within the limits stated in the Warranty.



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Introduction



This pool/spa heat pump is an electromechanical machine that incorporates a pressurized refrigerant gas in a sealed system. ONLY trained and qualified service personnel are authorized to install or service this equipment. Without proper training and knowledge of such equipment, any attempt to install or service the unit could result in serious injury or even death.

This manual contains important information on the use, maintenance and troubleshooting of your new heat pump. This unit must be properly installed, maintained and operated for optimal performance. This heat pump is an extremely efficient, economical machine designed specifically for swimming pool heating. It is similar in design and operation to a typical residential air conditioning system. The heat pump employs a hermetic motor/compressor operating in a refrigeration cycle to extract heat from ambient air and deliver it to the circulating pool water.

As with all pool heat pumps, compared to other types of heaters such as gas- or oil-fired, this heat pump has lower heating capacity on a BTU/hr basis. As a result, it will be required to operate longer to accomplish the desired results. It may, at certain times, operate as much as 24 hours per day. However, this should not be of concern to the owner, because the unit is designed to operate continuously. Even though it may operate continuously for many hours, it will still heat the pool with greater economy than other types of fossil fuel heaters.

Place a cover or blanket over the pool at night and other non-use periods. This will keep evaporation, the cause of the greatest heat loss, to a minimum, and will greatly reduce pool heating costs. During warmer weather, the cover may be required only at night.

I. Installation Considerations



Do not install the unit within 3 ft of fossil fuel burning heaters. Air intake along the sides of this heat pump could disturb the combustion process of the unit, and could cause damage or personal injury.

- Mount the unit on a level, sturdy base, preferably a concrete slab or blocks. The size of the base should be at least 3 ft by 3 ft.
- Each side of the unit must be located at least 1 ft from walls, pipes, or other obstructions for unrestricted air intake and service access.



The unit's supporting base must be high enough to keep unit completely free of standing water at all times.

Situate the pool heat pump carefully to minimize installation costs while providing maximum efficiency of operation, and to allow adequate service access, as follows:

- Air flow path: For unrestricted air intake, position the unit at least 1 ft from walls, pipes and other obstructions, but allow **2 ft access to the service panel**.
- The unit is designed for outdoor installation; do NOT install it in an enclosed area such as a shed or garage, unless ventilation is provided to ensure adequate air exchange for proper operation. Recirculation of cold discharge air back into the evaporator coil will greatly reduce the unit's heating capacity and efficiency.
- This unit feature an 'up-flow' discharge for quiet operation. Air is pulled up through the evaporator coil and discharged through the top grill. Allow at least 8 ft clearance above the unit for unrestricted air discharge. Do NOT install the unit under a porch or deck.
- To minimize water piping, locate the unit as close as possible to the existing pool pump and filter.
- When installed in areas where freezing temperatures can be encountered, drain the water circuit to prevent possible freeze-up damage. See Section IX, Freeze Protection.

II. Electrical Connections

Refer to the unit rating plate below the control panel for precise power requirement for your unit, and for ampacity and over-current protection requirements.

This unit is pre-wired to work with external control systems, heat-on-demand options and other external time clock overrides. Refer to the external control system's instructions for installation information.

III. Water Connections



The heat pump inlet and outlet connections are NOT interchangeable. They must be connected as instructed below.

1. Connect the heat pump in the return water line between the filter and the pool/spa. See Plumbing Diagrams.
2. Connect the filter outlet to the fitting marked **WATER IN** at the bottom front of the unit.
3. Connect the fitting marked **WATER OUT** to the return piping to the pool/spa. Unit inlet/outlet connection fittings are PVC unions. Water connections from the heat pump to the main return line can be PVC pipe or flexible pipe approved for the purpose and, in either case, should be at least equal in size to the main pool/spa circulation piping.
4. In cold weather (freeze zone) areas, shutoff valves (ball or gate type) must be installed at the heat pump inlet and outlet to facilitate service and cold weather drain-down.
5. Operate the pump and check the system for leaks.



Install a check valve and/or Hartford loop a minimum of 18 inches higher than the top of the chlorinator BETWEEN the heat pump and any automatic chlorinating devices. Follow the chlorinator manufacturer's instructions. Improper installation of erosion-type automatic chemical feeders can result in serious damage to the heat pump.

IV. Control Panel

Your heat pump incorporates controls and indicators to ensure its safe, reliable operation.

Water Temperature Control: Pool water temperature is controlled by the heat pump thermostat on the unit control panel, which contains a switch and 2 thermostats, one for setting a heat temperature and the other for setting cooling temperature. The switch can operate an optional external control system, or can switch between heat and cool.

NOTE: The heat pump will not run when the Remote position is selected and there is no remote control system attached.

INDICATOR LAMPS

There are 3 indicator lamps located on the unit control panel:



- **Power** (red lamp): When lit, indicates power is applied to the unit.
NOTE: The heat pump will not run when the Remote position is selected and there is no remote control system attached.
- **Heat Light** (Green lamp): When lit, indicates that the unit is in the heating mode
- **Cool Light** (Green lamp): When lit, indicates that the unit is in the cooling mode.



V. Initial Start-Up and Check

1. Verify that the **Power** lamp is ON and that the pool/spa pump is running and circulating properly.
2. Verify that the control panel **Heat-Remote-Cool** switch is in the **Remote** (OFF) position; see the figure.
3. Turn the control switch to Heat and to turn the pool system ON. Raise the thermostat setting above the current water temperature. The fan and compressor should start up and run simultaneously.

NOTE: The heat pump will be OFF when the Remote position is selected on the Heat-Remote-Cool selector switch and there is no remote control system attached.

4. Allow the heat pump to operate for a few minutes to stabilize operating pressures and to allow various component temperatures to normalize.
5. Verify that the discharge air temperature is approximately 8° - 10° cooler than the air entering the unit when heating.

A. Heating Mode

Whether heating or cooling, the unit is designed to operate up to 24 hours a day.

1. Set the **Heat/Cool** switch on the control panel to **Heat** mode
2. Rotate the thermostat control knob to the desired water temperature. Whenever the setting on the thermostat control knob is above the actual water temperature, the fan will run.

NOTE: Whenever the unit is turned OFF, and turned back ON the fan will start but the compressor will not restart for approximately 5 minutes. This delay protects the compressor.

Heating Confirmation - After a few minutes of operation, the unit will begin heating. Again, discharge air temperature should be 8° - 10° cooler than the air entering the unit when heating.

Initial Heating - Check the water temperature and note the time. A heat pumps warms slower but more economically than other heaters. The rate of heating depends on 3 factors:

- How many pounds of water to be heated (10,000 gallons = 83,300 pounds of water).
- How many degrees the water needs to be heated. It takes 1 BTU to heat 1 pound of water 1°.
- How many BTUs the water loses. The warmer the air, the less time it takes to heat the water.

NOTE: Use a pool blanket to reduce BTU loss. Also turn off all fountains, sprays and other water features.

Initial heating time (operating 24 hours per day) may vary from 2 days to 1 week. After initial heating, operating time is reduced to match heat loss.



Daily Heating Cycle

Most heat pumps are sized to operate during the pool filtering cycle time of 8 - 10 hours daily to provide an even, steady flow of warm water over a long period of time. On warmer days, the unit will run less, on cooler days, longer. To accomplish this, set the time clock for longer run times.

Hint: Remember, heating is more efficient during the warmer daylight hours.

Every pool/spa environment is unique in terms of location, use, swimming hours, solar exposure, shade, wind, etc. Therefore, heat pump operating time will differ between pools/spas.

B. Cooling Mode

Utilizing proven heat pump technology, your unit takes heat from the pool/spa water and transfers it to the air the same way your home air conditioner does. In cooling mode, running the unit during the night, when air temperature is the lowest, will give you the highest efficiency.

1. Set the **Heat- Remote-Cool** switch on the control panel to **Cool** mode.
2. Rotate the thermostat control knob to the desired water temperature. Whenever the setting on the thermostat control knob is below the actual water temperature, the unit's fan and compressor should be running.

NOTE: Whenever the unit is turned OFF, the compressor will not restart for 6 minutes. This delay protects the compressor.

Cooling Confirmation - After a few minutes of operation the unit will begin cooling. The discharge air temperature should be warmer than the air entering the unit.

Initial Cooling - Check the water temperature and note the time. The rate of cooling depends on 3 factors:

- How many pounds of water to be cooled (10,000 gallons = 83,300 pounds of water).
- How many degrees the water needs to be cooled. It takes 1 BTU to cool 1 pound of water 1°.
- How many BTUs the unit transfers to the water. The cooler the air, the less time it takes to cool the water.

NOTE: Remove the pool/spa blanket to speed cooling. Also, turn ON fountains, sprays and other water features as that will assist in cooling the pool.

Initial cooling time (operating 24 hours per day) may vary from 2 days to 1 week. After initial cooling, operating time is reduced to match heat gain.

Daily Cooling Cycle

Most heat pumps are sized to operate during the pool filtering cycle time of 8 - 10 hours daily to provide an even, steady flow of cool water over a long period of time. On warmer days, the unit will run longer, on cooler days, less. To accomplish this, set the time clock for longer run times.

Hint: Remember, cooling is more efficient during the cooler nighttime hours.



VI. Seasonal Start-Up or Annual Check

NOTE: At the beginning of the heating season or whenever the pool water temperature is to be raised several degrees, the pool pump and heat pump may need to operate continuously for several days. During summer months, only a few hours per day may be necessary or none at all.

1. Remove leaves, pine needles, etc. from the evaporator coil. Clean the coil by gently applying a mild solution of household liquid soap and water.
2. Gently rinse the coil with water; do NOT use high pressure.
3. Backwash or otherwise clean the pool filter. If necessary, clean the skimmer basket and pump strainer.
4. Set the valves to assure proper water flow through the unit.

NOTE: If the pool pump and heat pump shut OFF before the water temperature is raised to the desired level, you must lengthen the running time of both. To do this, reset the time clock dial for the longer running time, or manually operate the pump with the timer override switch. Since the heat pump capacity and efficiency are both greater at higher ambient air temperatures, run time should be set to take advantage of all daylight hours, when the air is generally warmer.

VII. Heat Pump Running Time

1. Determine the length of pump and heat pump operating time necessary for your particular requirements. Minimum run time should be the required hours to attain proper water filtration. Maximum run time obviously is 24 hours per day, or as required to reach desired water temperature, and depends on such things as weather, pool/spa size, covering, shading, etc.
2. If cooler or warmer water is desired, simply adjust the water temperature control and/or the pump and heat pump operating time until the desired water temperature is reached.

NOTE: At the beginning of the heating season, or whenever the pool/spa water temperature is to be raised several degrees, the pool pump and heat pump may need to operate continuously for several days. During summer months, only a few hours per day may be necessary, or none at all.

VIII. Summer Shutdown

If you do not plan to use the heat pump during the summer months, secure and protect it as follows:

1. From the control panel, turn the control switch to **Remote** (OFF).
2. Turn the heat pump circuit breaker or disconnect switch to OFF.
3. Leave the valves set the way they are unless additional circulation is required. **DO NOT** stop all flow through the heat pump.
4. **IMPORTANT:** Remember to reset the valves before the next heating season, or the heat pump will not operate properly.



IX. Freeze Protection

If the heat pump is installed in a location subject to freezing conditions, it is important to protect the water circuit from freezing, just as should be done for the pump and filter.

System Drain-Down

1. Turn the heat pump circuit breaker or disconnect switch to OFF.
2. From the control panel, turn the control switch to **Remote** (OFF).
3. With the pool pump OFF, close the external shutoff valves and loosen the inlet and outlet water unions to allow water to drain. Use a Shop Vac or air pressure to remove excess water.
4. Re-attach the unions.
5. Cover the heat pump with a waterproof cover.

Continuous Pump Operation

It is also possible in some areas to prevent heat pump freeze damage by operating the pump continuously during freezing weather. However, this results in significantly higher pump operating cost. Further, if a sustained power failure occurs, the heat pump would have to be drained anyway, or freeze damage could result.

X. Maintenance

NOTE: The heat pump MANUFACTURER IS NOT RESPONSIBLE for maintenance adjustments.

The following maintenance procedures are designed to keep your heat pump operating at a high level of reliability. **Maintenance must be performed on a periodic basis to maintain warranty coverage** and prevent system failures and performance degradation.

A. Air Coil Cleaning - Efficient operation depends on free circulation of air through the thin and tightly-spaced fins of the evaporator coils. The evaporator *must* be cleaned whenever it has a buildup of dirt or debris

CAUTION: DO NOT pressure wash which will bend the fins and void the warranty. To clean the fins spray gently with a garden hose.

B. Cabinet Care (optional) - The cabinet is designed for outdoor use and requires little care. However, you can clean it if you wish. Wash the cabinet with soap and water.



C. Unplug Condensation Drain Holes - The heat pump extracts humidity from the air as it passes through the coil, similar to the way a cold drink outside “sweats” on a hot day. This condensation drains from the bottom of the unit.

1. Routinely check to be sure the condensation drain holes in the base of the unit are not plugged with dirt or debris.
2. If condensation becomes a problem, optional drain pans are available from your heat pump distributor or pool dealer.

XI. Troubleshooting

If your heat pump does not operate, or simply does not heat your pool water, the indicator lamps on the front control panel (see Section IV) can provide valuable clues as to what is wrong, and may even indicate precisely what the problem is. Always observe these lamps before calling a service representative. By reporting on the telephone which lamps are ON and OFF, the service rep may be able to solve the problem without the expense of a service call.

A. UNIT IS RUNNING, BUT NOT HEATING

- Is water flow through the unit adequate? Check the unit for obstructions, such as a clogged filter pump strainer, a dirty filter, or valves not positioned correctly.
- Is the ejected air from the unit 8-10° cooler than incoming air? If so, the unit is extracting heat from the air and transferring it to the pool.
- Is water condensing on the evaporator and internal copper pipes? This is also evidence of heat removal from the air. When the air is cool with low humidity, condensation may not be evident.
- How long has the unit been operating? During initial pool heating in cold weather, it may require a week to elevate the water temperature to a comfortable level. Normally, it takes about 4 days.

How many hours per day is the unit operating? **Remember that the heat pump only operates while the pool pump is running.** Set the time clock to permit 24 hour per day operation. After the desired temperature is reached, return the unit to normal operation of 8-10 hours per day.

NOTE: If the pool pump and heat pump shut OFF before the water temperature is raised to the desired level, you must lengthen the running time of both. To do this, reset the time clock dial for the longer running time, or manually operate the pump with the timer override switch. Since the heat pump capacity and efficiency are both greater at higher ambient air temperatures, run time should be set to take advantage of all daylight hours, when the air is generally warmer.

- Is airflow through the unit being obstructed? Restrictions such as shrubbery, tall grass, dirty coils, or any other obstruction to airflow will reduce performance.
- Is the pool blanket/cover being used? Unblanketed pools can lose up to 10 degrees per night compared to 4 degrees or fewer when a blanket is used. Without a blanket, the total heat gained during the day can be lost overnight.
- Are rapid heat losses occurring in some other way, such as high wind, spillage, rainfall, flow through solar panels at nights, or a high water table?



B. UNIT IS NOT RUNNING

- Is the control panel **Power** lamp ON? If not, the circuit breaker may be shut OFF or tripped. Reset the breaker by switching it OFF, then back ON. *Verify that the breaker is set and operating properly before calling for service.*
- Is the thermostat setting and the Heat-Reomte-Cool switch in the proper position? Verify that the temperature has been properly set on the thermostat, and that it is *higher* than the current water temperature.
- **Water Flow** is water flowing through the unit? Improperly positioned valves or a dirty filter could decrease the flow of water required for efficient operation.
- Have you waited approximately 5 minutes for the time delay? After the unit has been running and then shut OFF for any reason, there is a delay before operation can begin again.
- Is the **Heat** lamp ON? If not, then the thermostat setting is not higher than the temperature of the water. Raise the thermostat setting.

C. CONDENSATION SEEMS EXCESSIVE

Heat pumps can produce a large amount of condensation (water) during operation. If you suspect that the heat pump is leaking:

- a. Use a pool chemistry test kit to confirm there is no chlorine in the condensation. *Or,*
- b. Shut the heat pump OFF and leave the filter pump running to see if the water stops dripping. If the water stops dripping, the heat pump is *not* leaking.

XII. Service Call Verification

Before you make a service call, *first* determine if the problem is:

- Warranty Service
- Heat pump operation (power supply, water flow, or time clock adjustment)

NOTE: The MANUFACTURER IS NOT RESPONSIBLE for these adjustments.

POWER SUPPLY

- Verify that all circuit breakers are reset and working properly.
- If the **Power** lamp on the control panel still does not light, contact the installing dealer, since it may be a power problem requiring an electrician.

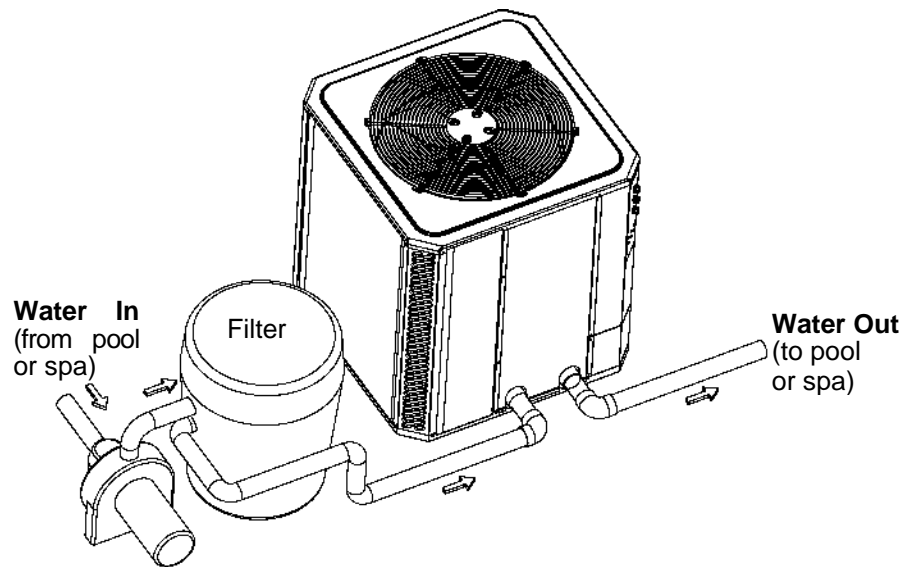
WATER FLOW

- Verify that the pool filter is clean to provide good flow.
- Verify that valves are properly positioned to allow adequate water flow through the heat pump.
- Verify that all valves are positioned correctly.

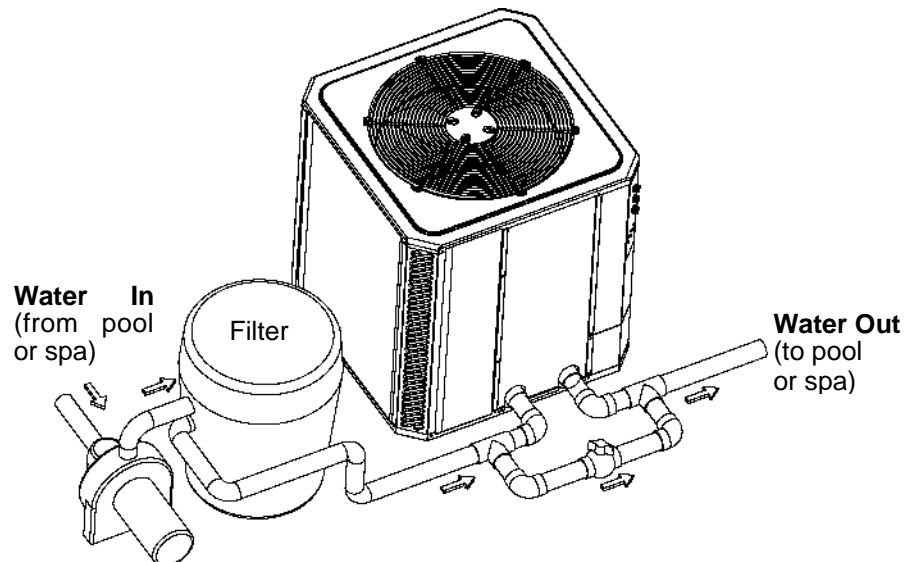
TIME CLOCK ADJUSTMENT

Verify that the time clock is set to permit the unit to run long enough to heat properly.

Plumbing Diagrams



For systems with pumps of less than 2 HP (under 80 gpm), no external bypass is required. Connections are 2-inch unions. Plumb the heat pump **after** the filter and **before** any chlorinators.



For systems with pumps of 2 HP or greater (over 80 gpm), an external bypass is required. Adjust the bypass valve to divert a minimum of 40 gpm through the heat pump. Connections are 2-inch unions. Plumb the heat pump **after** the filter and **before** any chlorinators.