



Heat Wave & Aero Temp



POOL & SPA HEAT PUMP INSTALLATION & SERVICE MANUAL

• Heating Only Models •

Heat Wave

H 1 0 0

H 1 2 0

Aero Temp

A T 1 0 0

A T 1 2 0

NOTE: THIS MANUAL ALSO APPLIES TO XL100, XL120, SB120, & APS120 MODELS

ATTENTION INSTALLER: This Manual is to Remain Inside Heater in Document Packet

[illegible]

Table of Contents

SAFETY INFORMATION	5
PHYSICAL CHARACTERISTICS & PERFORMANCE	6
100/120 Series Dimensional Information.....	6
Specifications	7
INSTALLATION	7
Placement of Heater	7
Indoor Installations:	7
Outdoor Installations:	8
Recommended Installation Clearances	8
Irrigation, Rainwater Runoff, and Landscape Features:	9
Equipment Pad Requirements:	9
Anchoring Heater to Pad:	9
Plumbing Requirements	9
Overview:	9
Parts and Materials:	9
Connections to Heat Pump:	10
Retaining Ability to Winterize:.....	10
Maximum Operating Water Pressure: 50-PSI	10
Minimum/Maximum Water Flow Rates:	10
Schematics of Typical Plumbing Designs	11
Water IN & OUT Connections:	13
Electrical Requirements.....	13
General Electrical Requirements:.....	13
Code Requirements:	14
Requirements of Equipment Data Plate:	14
SET-UP PROGRAMMING, START-UP, and EXTERNAL CONTROLLERS	15
TROUBLESHOOTING.....	15
Non-Refrigerant Circuit Issues.....	15
Heat Pump Not Running:.....	15
Heat Pump Running but Not Heating:	15
Water Coming from the Heat Pump:	16
Refrigerant Circuit Performance	16

Refrigerant Circuit Pressure-temperature Charts	16
Troubleshooting Refrigerant Circuit.....	18
MAINTENANCE.....	19
Planned Maintenance Program:	19
General Maintenance:	19
Maintaining Proper Water Flow	20
Maintaining Proper Clearances Around Heater.....	21
SEASONAL USE & SHUTDOWN.....	21
During the Swim Season:.....	21
Freeze Protection (Light Freeze Climates):	21
Winterizing (Hard Freeze Climates):	22
To Winterize a Heat Pump Equipped with an Internal Drain	22
To Winterize a Heat Pump Equipped with an External Drain	23
REPLACEMENT PARTS	25
CONTACTING THE FACTORY	26

SAFETY INFORMATION

Used and maintained properly, heat pumps will provide year-upon-year of safe and economical service. However, as with any mechanical or electrical device, to get the most from a heat pump—*while ensuring personal safety for the installer, service technician, owner, and others*—certain critical safety factors must be observed.

Likewise, excepting a few minor owner-capable maintenance items, repair and service of the heat pump must be performed only by experienced service personnel. Should you, the Installer or Service Technician, suspect the heat pump is not performing properly, by referring to the section in this manual entitled: “Troubleshooting”, you will be able to work through common site-related problems. Performing work on the electrical and mechanical (refrigerant circuit) requires special skills, training, and experience; unqualified individuals must NOT attempt troubleshooting or repairs outside of their normal everyday line-of-work. Warranties may be voided, and safety risks created, if the heater has been maintained or repaired improperly. AquaCal Customer and Technical Support personnel stand ready to assist you at: (800) 786-7751. For questions concerning installation, modifications, operation, service, and upkeep, please contact AquaCal.

Throughout this manual the following two safety signals are placed where particular care is required. Please note: “WARNING” relates to personal safety, while “CAUTION” signals promote avoiding damage to equipment:

WARNING !

Failure to heed the following may result in permanent injury or death.

This “Warning” symbol appears in this manual where special attention is required for personal safety. *Specific instructions will appear in this box.*

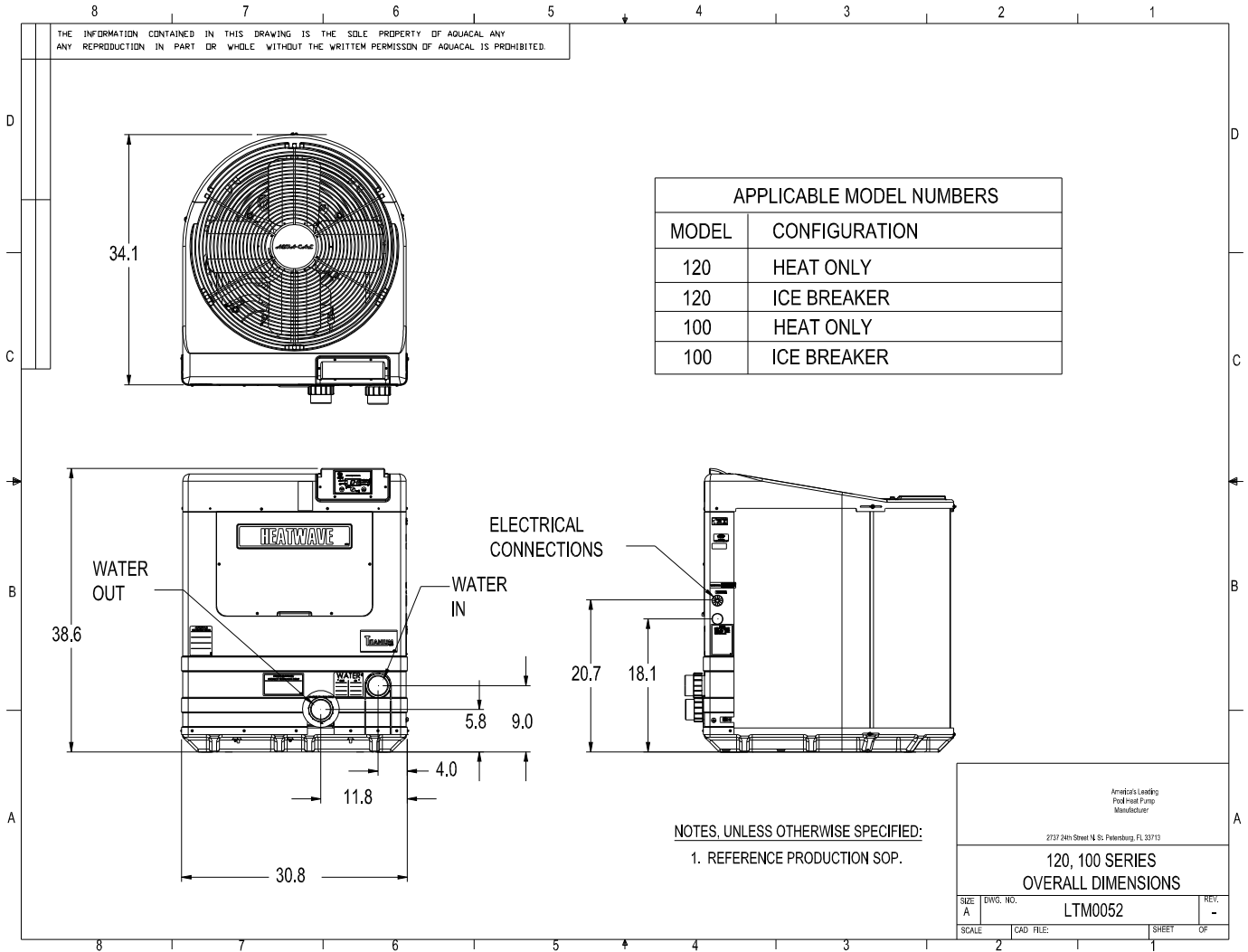
CAUTION!

Failure to heed the following can result in damage to equipment.

This “Caution” symbol appears in this manual where special care is required to avoid equipment damage. *Specific instructions will appear in this box.*

PHYSICAL CHARACTERISTICS & PERFORMANCE

100/120 SERIES DIMENSIONAL INFORMATION



SPECIFICATIONS

MODELS:	H100"X"-A (AT100)	H100"X"-B (AT100)	H120"X"-A (AT120)	H120"X"-B (AT120)
BTU - 80%RH				
Air °F / Air °F... 80/50	90,000/64,000	90,000/64,000	109,000/74,000	109,000/74,000
COP	5.8/4.3	5.8/4.3	5.6/4.1	5.6/4.1
BTU - 63% RH				
Air °F / Air °F... 80/50	85,000/58,000	85,000/58,000	104,000/71,000	104,000/71,000
COP	5.5/4.0	5.5/4.0	5.2/3.9	5.2/3.9
Kilowatt Input (80% RH)	4.5	4.5	5.7	5.7
Voltage/Hz/Phase	208-230/60/1	208-230/60/3	208-230/60/1	208-230/60/3
Min. Circuit Ampacity	38.20	22.10	38.35	27.10
Recommended Fuse Size	40	30	40	30
Max. Fuse or Breaker Size	60	40	60	50
Min-Max Water Flow (gpm)	20-70	20-70	20-70	20-70
Shipping weight (lbs)	300	300	323	323
Shipping Size (l x w x h)	30.5" X 34" X 36"	30.5" X 34" X 36"	30.5" X 34" X 36"	30.5" X 34" X 36"
Uncrated Weight (lbs)	273	273	296	296

INSTALLATION

WARNING !

Failure to heed the following may result in permanent injury or death.

Installation by unqualified persons can result in hazards to the installer and others. Installation SHALL conform to all applicable local, state, and national codes and standards. The information contained in this manual is intended for use by qualified installation and service personnel, familiar with necessary safety procedures and equipped with proper tools and equipment. Failure to carefully follow the instructions in this manual can result in equipment that fails to function dependably, damage to property, and personal injury or death.

PLACEMENT OF HEATER

Indoor Installations:

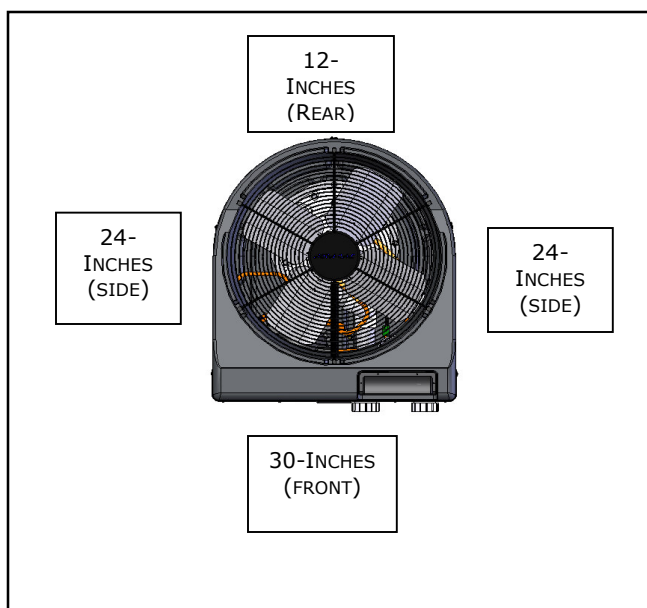
Indoor installations can be problematic, and for that reason are discouraged. However, if no viable alternative exists, indoor installations can be successfully accomplished provided very exacting criteria is addressed. Every indoor installation is unique; therefore, there are no specific guidelines for this type of installation. If considering an indoor installation, you are strongly urged to contact our Engineering or Technical department (800-786-7751) prior to proceeding; they will assist you with your specific needs.

Outdoor Installations:

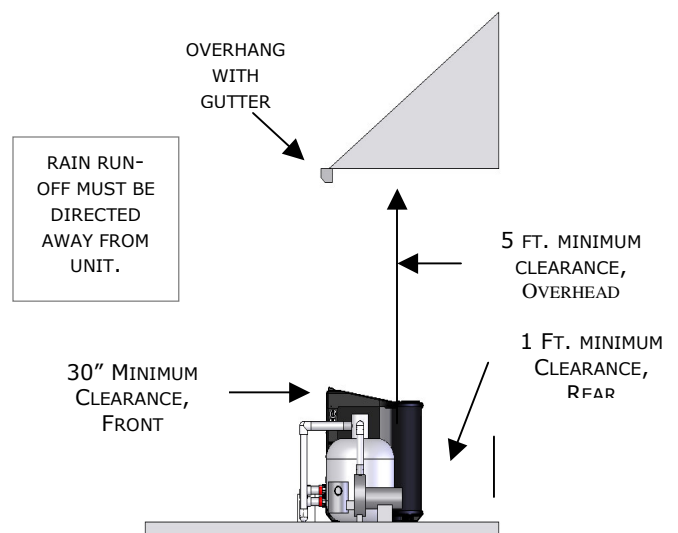
Service and Operational Clearances:

- Refer to recommended clearance drawings, below. Allow 24" clearance between the heat collection surfaces and walls, fences, shrubs or other objects. For efficiency, the heat pump requires large volumes of air moving over the heat collector.
- Allow five (5) feet of vertical clearance between the top of the heat pump and any roof overhang or other obstruction. This clearance prevents cold discharge air from re-circulating back into the evaporator coils (air re-circulation, if permitted, will reduce the performance and efficiency of the heat pump).
- Provide at least 30" open area in front of the main access panel. The electrical panel will need to be accessed during installation and service; avoid placing plumbing obstructions that will restrict free access.

Recommended Installation Clearances



FRONT-SIDES-REAR



FRONT-REAR-OVERHEAD

Code required Clearances:

In addition to previously mentioned clearance requirements, all applicable local, state, and national requirements, relative to spacing from other objects or equipment, must be followed.

Irrigation, Rainwater Runoff, and Landscape Features:

Place the heat pump away from direct rain runoff from roofs. A gutter or rain shield may be required on the roof edge above the heat pump.

Relocate or adjust irrigation to avoid water spray directly onto the heat pump. Do not locate the heat pump directly adjacent to plants, shrubs, or bushes. Doing so will prevent proper air circulation into the unit, and may inhibit access to the heater when service is needed. Consult Drawings on previous page (*Recommended Installation Clearances*) for proper spacing to other objects.

Equipment Pad Requirements:

The equipment pad should be constructed of concrete, pressure treated wood, or other material intended for the use. The pad shall be elevated and placed to provide adequate drainage and support to the base of the heat pump. The pad should be essentially level with just enough pitch to drain condensate and any other water away from the heater. In addition, the pad shall extend—in all directions—(at least) 3" beyond the base of the heat pump. In no instance shall the heater be installed directly onto the earth.

Anchoring Heater to Pad:

Follow all relevant local, state, or national requirements regarding wind load anchoring. When anchoring is required, use AquaCal optional Hurricane Anchoring Kit, PN: STK0001. AquaCal anchoring kits completely satisfy the very stringent Florida Building Code Section 301.13 wind anchoring requirements. As necessary, contact AquaCal Technical Support, 800-786-7751, for assistance in determining best method of compliance.

PLUMBING REQUIREMENTS

Overview:

When planning plumbing system layout, reference the plumbing schematics following this section as a guide to the sequence of equipment, valves, fittings, etc. The plumbing configurations for typical installations are diagrammed. In operation, it is imperative the heat pump receive water flow within the minimum-maximum ranges specified for the particular heat pump. Should the system design under consideration not closely match any of the schematics, contact AquaCal Technical Support for advice and guidance: (800) 786-7751.

Parts and Materials:

Industry technology changes much too rapidly for AquaCal to specify, with exactness, any items outside and beyond the heat pump. What is specified is that the heater must be installed in accordance with all applicable local, state, or national codes & standards.

Connections to Heat Pump:

All Heat Wave and AeroTemp heat pumps come equipped with 2" PVC, plumbing unions. Connection to site plumbing is made via PVC solvent cement to the female slip socket of the plumbing unions.

Retaining Ability to Winterize:

In regions where hard winters are typical, the unions mentioned above allow for easy disconnection/reconnection of the heater from the plumbing system. Caution: Do not defeat the function of the unions—use no glue on the threaded portion of the unions.

Maximum Operating Water Pressure: 50-PSI

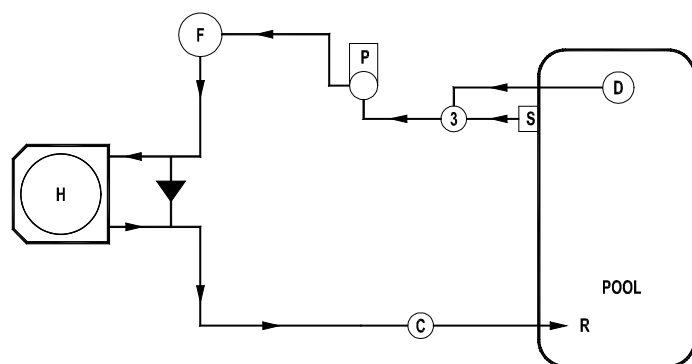
Minimum/Maximum Water Flow Rates:

All Heat Wave and AeroTemp models are designed to operate successfully between flow rates of 20-to-70 gallons-per-minute (GPM). Design the plumbing system to maintain at least 20-GPM flow through the heater; the heat pump will not operate correctly, nor reliably, with less than 20-GPM of water flow supplied. If water flow rates through the heater will exceed 70-GPM, a 5-lb spring-check bypass valve (AquaCal PN: 2556) will be required; generally speaking, most residential pools and spas will not require a bypass unless a pump of 2-HP or larger is used (for bypass valve placement details, see plumbing schematic below, "...Flow Greater than 70-GPM").

CAUTION!

Failure to heed the following can result in damage to equipment.

Use of the incorrect spring check valve may compromise the heat pump's efficiency, reliability, and may void the factory warranty. When installing a bypass check valve, order and install only an AquaCal PN: 2556 check valve.

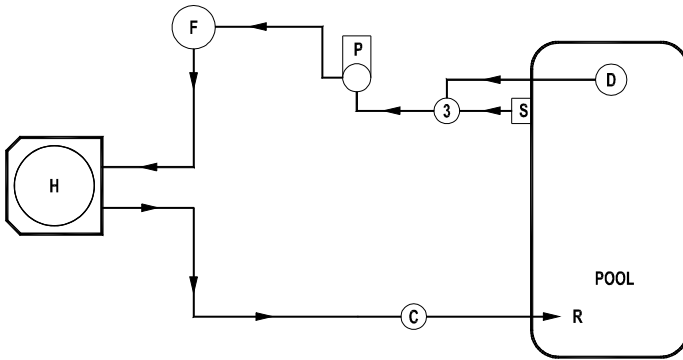


LEGEND

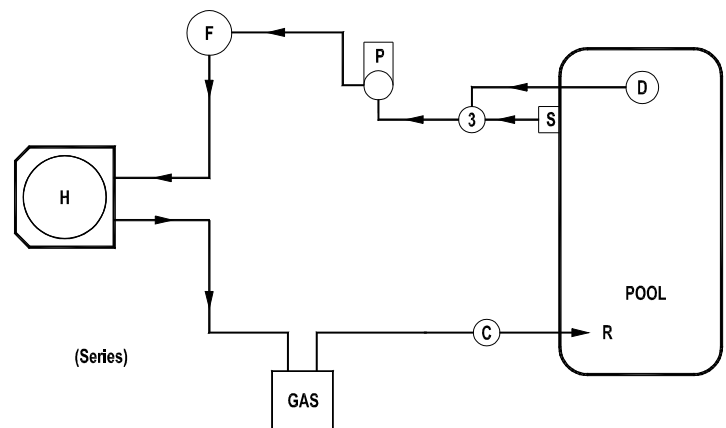
- | | |
|---------------------------|---------------------------|
| 3 - 3 way valve | ▴ - Flow Switch (ADT Kit) |
| C - Chlorinator (if used) | ▴ - Throttle valve |
| D - Drain | ⊕ - Thermometer |
| F - Filter | ▴ - By-Pass Check Valve * |
| H - Heat pump | ▮ - Flow meter |
| P - Pump | |
| R - Return | |
| S - Skimmer | |

Typical Pool - Flow greater than 70 g.p.m. - (2 HP Pump)

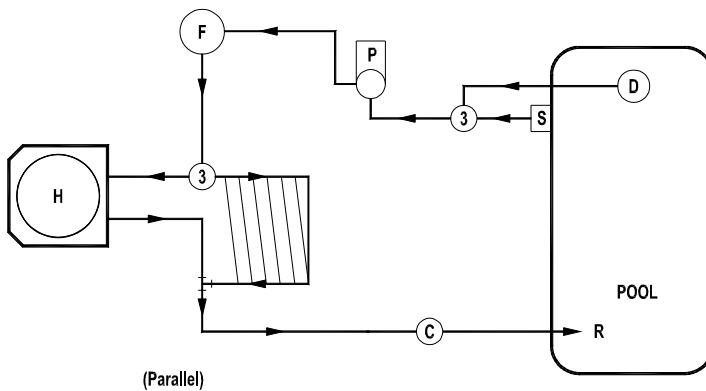
Schematics of Typical Plumbing Designs



Typical Pool - Flow less than 70 g.p.m.



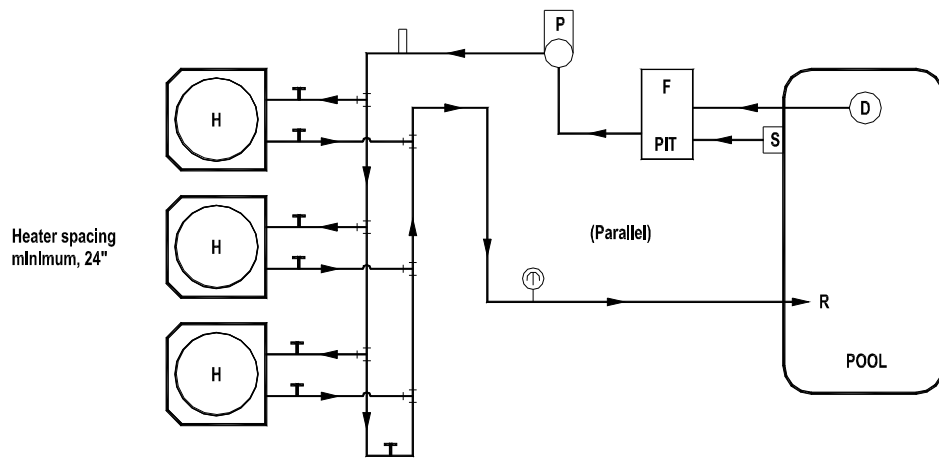
Heat Pump w/ Gas Heater backup



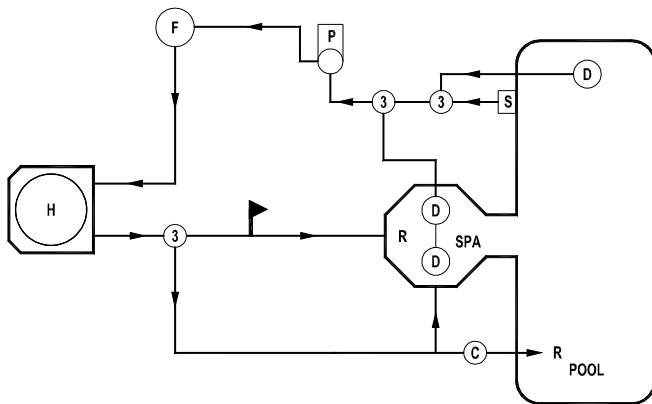
Heat Pump w/ Solar Panels

LEGEND

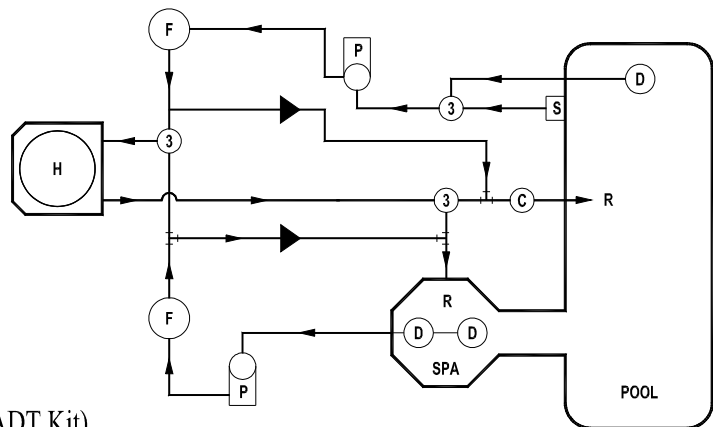
- | | |
|---------------------------|---------------------------|
| 3 - 3 way valve | ► - Flow Switch (ADT Kit) |
| C - Chlorinator (if used) | T - Throttle valve |
| D - Drain | ⊕ - Thermometer |
| F - Filter | ► - By-Pass Check Valve |
| H - Heat pump | ⏏ - Flow meter |
| P - Pump | |
| R - Return | |
| S - Skimmer | |



Multiple Heat Pump Installation



Pool/Spill over Spa - One Pump System



Pool/Spill over Spa - Two Pump System

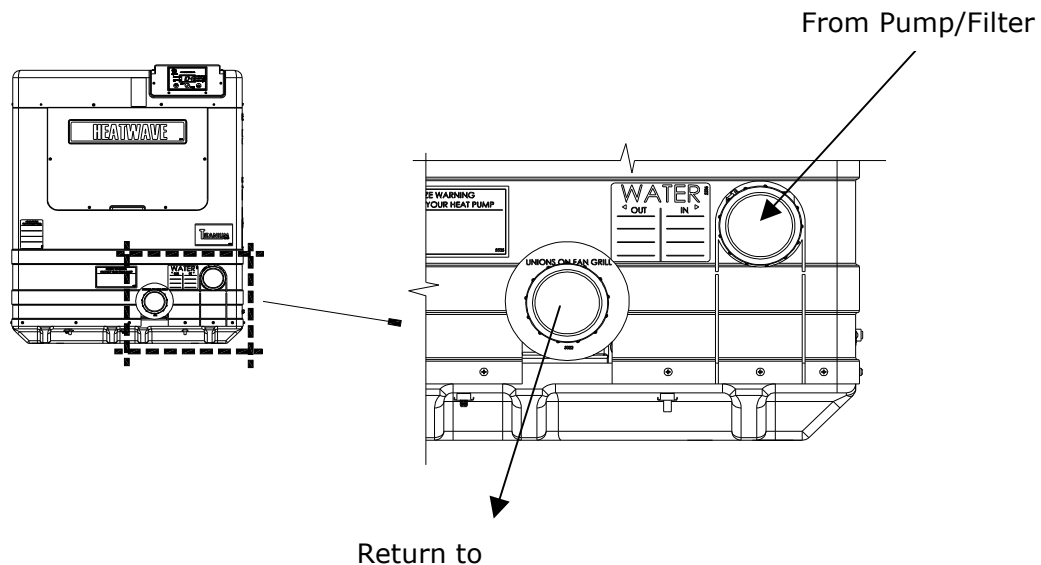
LEGEND

- | | |
|---------------------------|---------------------------|
| 3 - 3 way valve | ▶ - Flow Switch (ADT Kit) |
| C - Chlorinator (if used) | T - Throttle valve |
| D - Drain | ⊕ - Thermometer |
| F - Filter | ▶ - By-Pass Check Valve |
| H - Heat pump | ⏏ - Flow meter |
| P - Pump | |
| R - Return | |
| S - Skimmer | |

Water IN & OUT Connections:

For proper operation and maximum efficiency, piping coming from the pump and filter MUST be connected to the "IN" port of the heater. Likewise, connect piping returning to the pool/spa to the "OUT" port of the heater. See drawing below.

PLUMBING CONNECTION DETAIL



ELECTRICAL REQUIREMENTS

WARNING !

Failure to heed the following may result in permanent injury or death.

Installation made by unqualified persons can result in hazards to the installer and others. The information contained in this Electrical Installation section is intended for use by qualified electrical installation technicians, familiar with accepted electrical service industry standards and methods. Electrical installation to be performed by qualified individuals only.

General Electrical Requirements:

- When possible, locate the equipment disconnect means within arm's reach of the heater's electrical enclosure, or as close as possible to the heater. Always satisfy applicable codes and standards.
- All AquaCal heat pumps are designed for copper conductors, only.
- In sizing power wiring, be especially aware of up-sizing requirements required due to wiring distances. Always satisfy applicable codes and standards.

- (*General Electrical Requirements, continued*) Multiple heaters installed at same site generally require special sequencing controls (AquaCal PN: ASC-(+number of heaters)); if yours is a multi-heater installation, contact AquaCal Technical Support (800-786-7751) for application assistance .
- Electrical installation should be by licensed electrician only.
- **Connecting External Controllers:** See document entitled "Connecting External Controllers to AquaCal Heat Pumps". These instructions are shipped inside heater, accompanying the electrical schematic.

Code Requirements:

- The electrical installation must conform to the most current version of the National Electrical Code- NFPA No. 70, and all applicable local and state codes.
- National Electrical Code, article 680; Swimming Pools, Fountains, and Similar Installations, shall apply.
- National Electrical Code, article 440, Air-Conditioning and Refrigeration Equipment, shall apply.

Requirements of Equipment Data Plate:

- All Heat Wave and AeroTemp Heat Pumps have two (2) identical data plates affixed: one can be found outside the unit, on right front side of fan top; the second data plate is located within the unit, on the electrical enclosure cover. Refer to (either) equipment data plate for unit-specific electrical power and over-current protection requirements. Based on data plate information; size wiring, devices, and over-current protection per applicable codes and standards.
- See drawing below for data plate details specific to Electrical Installation Requirements. The numbered areas (1-8) will contain the necessary information required in sizing electrical service and over current protection devices.

MINIMUM CIRCUIT AMPACITY	#1	Hz	#2	MADE IN THE USA
ELEC. SERVICE:	Vac ~	#3	PHASE	#4
MAXIMUM TIME DELAY FUSE OR HACR BREAKER			#5	
COMPRESSOR Vac		R.L.A.	#6	L.R.A.
FAN MOTOR Vac		H.P.		F.L.A.
REFRIGERANT: Factory charged R-22 Only				oz/Kg
Tested to 500 psig High side / 150 psig Low side				
INDOOR / OUTSIDE USE				
		MODEL NUMBER		
		BAR CODE		
		SERIAL NO.		

SET-UP PROGRAMMING, START-UP, and EXTERNAL CONTROLLERS

Refer to Document Entitled:

*Operating & Service Instructions
for
HP7 Microprocessor Controller
(PN: LTP0003)*

- This document is shipped with heater, within document packet on inside of front access panel. This document details both Owner & Installer controller programming, troubleshooting, and connection of external controllers.
- Should reorder of the above referenced document become necessary, ask for the document by part number (LTP0003). Contact AquaCal Customer Support: 1-800-821-7471.

TROUBLESHOOTING

NON-REFRIGERANT CIRCUIT ISSUES

(Also See HP-7 Manual- within document packet on inside of front access panel)

Heat Pump Not Running:

- Is the display lit? If not, ensure the main breaker (*located at the power supply panel*) and the disconnect switch (*located near the heat pump*) are both turned ON.
- Does the display read "Flo"? If so, check to be sure that the circulating pump is operating and the filter is clean. There may also be a valve positioned incorrectly allowing water to by-pass the heat pump; be sure water is flowing through the heater.
- Does the display read "OFF"? If so the desired water temperature is set below 60°F. Raise the desired water temperature above the actual water temperature and the unit should start after a 3-to-4 minute delay.

If the display is showing any other fault codes, or is blank, for assistance, contact AquaCal Technical Support: 800-786-7751.

Heat Pump Running but Not Heating:

- Is the air blowing out of the top of the unit noticeably cooler than the surrounding air? (*A 9°F to 12°F difference is typical.*) If not, there *may* be a problem in the refrigerant circuit and the refrigerant circuit will require

troubleshooting. If not a qualified HVAC service technician/center, call AquaCal for service at 800-786-7751.

- Be sure all air coil surfaces are free from obstructions; low roof overhangs, landscaping, walls, fences, etc. The heat pump needs good airflow to operate at peak efficiency.
- How many hours per day is the circulating pump running? The heater cannot operate unless the pump is running. Cooler weather conditions, or heating to a higher temperature, may necessitate running the heat pump for a longer period of time. A pool blanket can be useful in permitting shorter run times; was the heater sized for use with a blanket?
- What is the air temperature? The heat pump may be in the defrost mode if air temperatures are below 50°F. The digital display will read "FS" if the unit is defrosting or air temperatures are too cold for normal operation.

Water Coming from the Heat Pump:

(Is it a leak or just condensation from normal operation? Here's how to find out).

- Shut off the heat pump, leaving the pool pump running. In a couple of hours there should be a marked reduction in the amount of water around the bottom of the heat pump.
- Or, as an alternate method to check for a water leak, test the water draining out the base for the presence of the sanitizer being used in the pool or spa. Use a water test kit, or a test strip, to check a sample of the water for chlorine or bromine. If the sample tests positive for sanitizer, there is likely water leaking from within the heater; the leak must be located and repaired immediately. If the test is negative, the water is probably harmless condensate.

NOTE:

If the installation is using an ionizer or ozone generator to produce sanitizer, the sanitizer test method will not be effective.

REFRIGERANT CIRCUIT PERFORMANCE

Refrigerant Circuit Pressure-temperature Charts

WARNING !

Failure to heed the following may result in permanent injury or death.

Heat pump contains refrigerant under high pressure. Access, service, or repairs to refrigerant circuit must be performed only by qualified HVAC service technician. Recover refrigerant—to relieve internal pressure—prior to opening system.

Use of Charts- Information for the Technician:

The charts are intended for use by trained and qualified air-conditioning and refrigeration technicians. The charts are compiled specifically for evaluation and diagnostic purposes, and are NOT designed for use as charging charts. To apply the chart data to actual conditions: gather the operating pressures, suction tube superheat & liquid line sub cooling values, water temperature change through the heater, and the total unit amps. Locate a chart below that most closely represents current and actual conditions. Readings obtained that differ from the charts in excess of 10% (+ or -), may indicate a problem within the mechanical refrigeration system.

Reference: Troubleshooting Refrigerant Circuit Problems, following the charts. Some interpolation between charts will be necessary should actual conditions not align reasonably well with chart conditions. Should refrigerant circuit readings appear normal, but not the Water ΔT value, the likely cause will be water flow above or below 45-GPM. (Heat Wave/AeroTemp model refrigerant circuits will perform acceptably with condenser water flow between 20-to-70-GPM.)

For use with Troubleshooting Refrigerant Circuit Problems guide, following.

Low Condition: Water @ 80°F & 45 GPM, Ent. Air: 50 °F - 63% R.H.							
Model	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
H/AT100"X"- "X"	208	41	5	23	2.36	19	Ending)
H/AT120"X"- "X"	193	46	6	20	3.20	22	
High Humidity Condition: Water @ 80°F & 45 GPM, Ent. Air: 80 °F-80% R.H.							
Model	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
H/AT100"X"- "X"	216	84	13	17	3.98	21	Ending)
H/AT120"X"- "X"	(Pending)	85	13	(Pending)	4.92	26	
Spa Condition: Water @ 104°F & 45 GPM, Ent. Air: 80 °F - 63% R.H.							
Model	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
H/AT100"X"- "X"	290	81	10	16	3.70	26	Pending)
H/AT120"X"- "X"	(Pending)	(Pending)	(Pending)	(Pending)	(Pending)	(P)	
Standard Condition: Water @ 80°F & 45 GPM, Ent. Air: 80 °F - 63% R.H.							
Model	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
H/AT100"X"- "X"	213	76	12	18	3.69	21	Pending)
H/AT120"X"- "X"	196	80	10	12	4.91	25	

TROUBLESHOOTING REFRIGERANT CIRCUIT

NOTE:

These guidelines are for use only by experienced, EPA certified, HVAC technicians, and were developed specifically for use with AquaCal heat pumps. Use these guidelines while referencing Refrigerant Circuit Performance Charts contained earlier in this manual.

Possible Conditions

Unit Overcharged:

- Head pressure will be above normal;
- Suction pressure will be normal or slightly high (high, only if grossly overcharged);
- Unit amperage will be somewhat high;
- Liquid Sub-Cooling will be higher than normal;
- Superheat will be normal to low (low, only if grossly overcharged).

Explanation: Excess liquid refrigerant backs up in the condenser (into discharge line if grossly overcharged). Elevated head pressure & high liquid sub-cooling, with near normal suction pressure and superheat, will be present. Unless grossly overcharged, the TXV will hold back the overcharge, maintaining near normal suction pressure and superheat.

Unit Undercharged:

- Head pressure will be below normal;
- Suction pressure will be slightly low, to very low (depending on degree of undercharge);
- Amperage will be low;
- Liquid Sub-Cooling will be very low or non-existent;
- Superheat will be higher than normal.

Explanation: A full column of liquid may not be consistently present at the TXV inlet. This condition results in low suction pressure with higher than normal superheat. The liquid sub-cooling will be low, as will be the head pressure.

TXV Stuck Closed:

- Head pressure will be excessive;
- Suction pressure will be lower than normal;
- Amperage will be high;
- Liquid Sub-Cooling will be higher than normal;
- Superheat will be higher than normal;
- Distributor lines may be frosted, iced, or very cold to touch.

Explanation: The flow of refrigerant is (mostly) stopped at the TXV. This results in a low suction reading with high superheat. As liquid refrigerant “backs up” in the condenser, there is less room for high-pressure vapor coming from the compressor. Therefore, head pressure increases above normal (Heat Wave & AeroTemp models do not have sufficient space on the high-side to store the entire charge). With little refrigerant flowing, more heat is being removed in the condenser than is being added at the evaporator—result: higher than normal liquid sub-cooling.

TXV Stuck Open:

- Head pressure will be slightly to moderately low;
- Suction pressure will be slightly high to very high;
- Amperage (not a reliable indicator of this condition);
- Liquid Sub-Cooling will be lower than normal;
- Superheat will be minimal or non-existent;
- Suction line, and possibly a large portion of compressor, will be very cold and possibly "sweating";

Explanation: Refrigerant is flowing through the system too quickly; heat cannot be added in the evaporator in sufficient quantities to boil off all of the liquid refrigerant. The main effect is to flood the suction line and compressor with liquid refrigerant. The primary indicator of this condition is little or no suction line superheat. Also, as the TXV is not holding back the required amount of refrigerant, there may be flash gas (high-pressure vapor) present in the liquid line; this is indicated by reduced liquid sub-cooling.

Insufficient Condenser Water Flow:

- Head pressure will moderately high to very high;
- Suction pressure may be normal to slightly high;
- Amperage will be higher than normal;
- Liquid Sub-Cooling will be absent; the liquid line will be very warm or even hot to touch...When combined with low condenser water flow (see next bullet item), this condition is a prime indicator of insufficient condenser water flow;
- Condenser entering-leaving water temperature difference (water Delta-T) will be higher than normal... This condition is a prime indicator of insufficient condenser water flow;
- Superheat will be high-normal to high;

Explanation: Heat is not being removed in the condenser in quantities sufficient to produce appreciable amounts of liquid refrigerant. With no liquid seal occurring in the condenser, the liquid line—in essence—becomes an extended discharge line. Keys to diagnosis: very warm to hot liquid line, and a high condenser water Delta-T.

MAINTENANCE

Planned Maintenance Program:

AquaCal offers a very reasonably priced, professionally performed, Planned Maintenance Program (PMP)....Contact AquaCal Customer Support (1-800-786-7751) for full details.

General Maintenance:

- The heat pump should be inspected and maintained on an annual basis by a qualified pool heat pump specialist. Additionally, if the heat pump is located on the beach, or at a sea wall where salt spray and sand can affect the unit, more frequent service will be necessary. If the heater is not covered under the AquaCal Planned Maintenance Program, rinsing the coil down regularly, and keeping the base of the unit clear of leaves and debris is a must.

WARNING !

Failure to heed the following may result in permanent injury or death.

POSSIBLE ELECTRIC SHOCK HAZZARD...Should you decide to wash the unit via water hose, disconnect all power to the pool equipment pad- including, but not limited to: The heat pump, water pump, and any and all other electrical equipment. Do NOT spray water directly into electrical components. Do NOT restore electrical power until such a time as all water has dried completely.

CAUTION !

Failure to heed the following can result in damage to equipment.

Do not use a pressure cleaner to wash heat pump....Damage to evaporator fins, as well as other components will result.

- Control Irrigation: In regions where wells are used for irrigation, water quality is sometimes less than poor, and water spray can damage heater components. Regardless of water quality, it is recommended that sprinklers be directed away from the heat pump.
- Prevent rainwater run-off, from roofs, from pouring directly into the heater. The heater is designed to withstand normal rainfall, but solid streams of water from roof drip-lines may eventually damage heat pump components. If the heat pump resides beneath a roof edge, to promote heat pump longevity, a rain leader (gutter) or rain shield will be necessary.
- Drainage: The heat pump may produce abundant condensation under certain conditions; this is considered normal operation. Accordingly, keep the drain holes at the base of the heat pump free of grass, weeds, dirt, or other obstructions, allowing for free and complete drainage around the heater.
- If the unit is located under trees where leaves fall and accumulate in the bottom of the heat pump, a qualified technician should periodically remove accumulated leaves.

Maintaining Proper Water Flow

- It is important to operate and maintain the filter according to the manufacturer's specifications. As a filter gets dirty, the water flow to the heat pump is reduced. The higher the pressure on the filter gauge, the lower the flow rate.
- Similar to a dirty filter, large amounts of debris in the pump basket can reduce water flow...Keep basket free of debris.
- Check for improper valve settings. A partially closed valve after the filter, or a full-open bypass around the heater, will cause insufficient water flow through the heater.

- If the conditions listed above remain unresolved, the water flow through the heater may be reduced to a point where internal safety devices shut the heater off. For example, should an "HP" or "Flo" code be observed on the display—either will prevent the heater from operating—insufficient water flow could be the cause. Before calling for service, always check the filter, the pump basket, and water valve positions. If the problem persists, call AquaCal Customer Support at: 1-800-786-7751.
- NOTE: During pool refinishing or acid washing, the water flow through the pool heater must be shut off until the process is completed, and the pool chemistry is once again in balance.

Maintaining Proper Clearances Around Heater

- For maximum efficiency, proper airflow clearances around heater must be maintained.
- It is important to keep the area around the heat pump clear of items such as shrubs and bushes, lawn furniture, chemicals containers, etc. These items can prevent air from circulating properly through the heater, and will result in inefficient operation or damage to components inside the heat pump. Do not allow objects to be placed on top of the heat pump; doing so will block the air from exiting the heater, and will result in damage to the compressor and fan motor.
- Proper clearances are also necessary in order to access the working parts of the heater. Encourage owner to maintain proper clearances (per measurements shown in INSTALLATION section, drawings entitled: Recommended Installation Clearances).

SEASONAL USE & SHUTDOWN

During the Swim Season:

- During the swim season, even if the pool or spa is not in use, allow water to flow through the heater.
- This eliminates the need to reposition valves when need arises to heat the pool or spa.

Freeze Protection (Light Freeze Climates):

- In areas where freezing conditions are a rare occurrence, allow the filtration system to run continually through the freeze period. During light freeze conditions circulating water typically will not freeze.
- In areas where freezing conditions are prevalent, refer to winterizing instructions following this section.

WARNING !

Failure to heed the following may result in permanent injury or death.

To avoid injury from rotating equipment (*fan blade*), disconnect electrical power to heat pump before proceeding with INTERNAL DRAIN winterizing process.

CAUTION !

Failure to heed the following can result in damage to equipment and/or property.

Failure to properly winterize unit may result in freeze damage to the heat pump. Freeze damage is not covered under the unit warranty.

Winterizing (Hard Freeze Climates):

To Winterize a Heat Pump Equipped with an Internal Drain

(Per Figures 1 & 2)

1. Disconnect all electrical power to the heater; turn OFF circulating pump.
2. At the two (2) connection unions, disconnect the plumbing to the heater (removal is counter-clockwise).
3. Remove the front plastic panel by removing the screws shown in Figure-1.
4. Locate the drain plug at base of the titanium condenser and remove (removal is counter-clockwise). See Figure-2.
5. Permit all of the water to drain out of the condenser and then, threading clockwise, replace the plug finger-tight.
6. Reinstall the heater front cover and secure with attaching screws previously removed.
7. To prevent insects and vermin from entering the plumbing during the winterized period, partially reconnect the two (2) plumbing connection unions: couple each union one or two threads; this will permit condensation to drain, but will prevent most insects and animals from entering the plumbing circuit.
8. Next Season: to ready the heat pump for use, simply re-tighten plumbing connection unions. Hand-tight is generally sufficient.

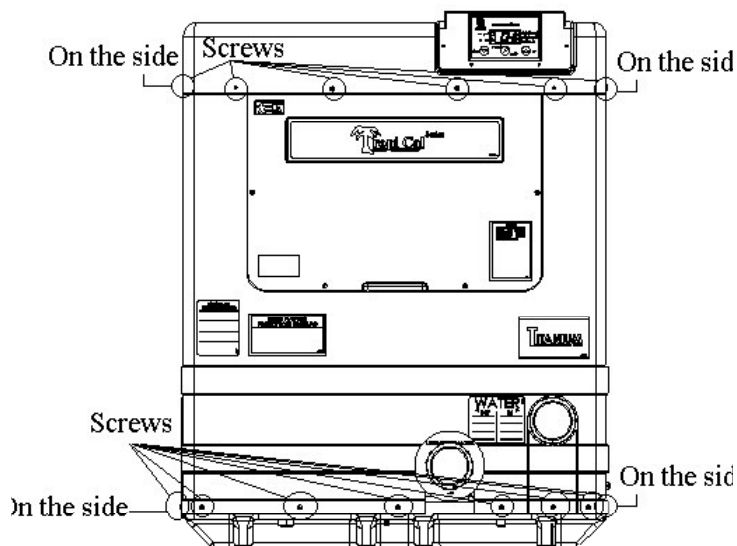


Figure 1

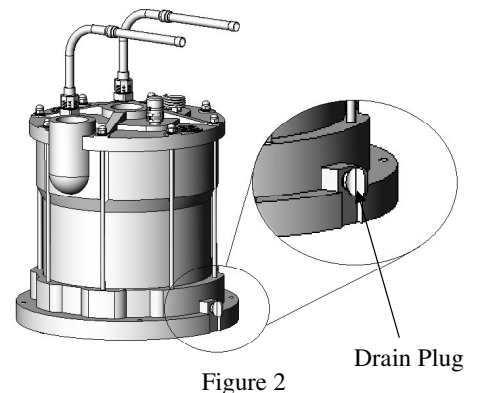


Figure 2

Internal Winterizing Drain

To Winterize a Heat Pump Equipped with an External Drain

(Per Figure-3)

1. Disconnect all electrical power to the heater; turn OFF circulating pump.
2. At the two (2) connection unions, disconnect the plumbing to the heater (removal is counter-clockwise).
3. Locate the drain plug at lower, right-hand, front corner of heater. See Figure-3.
4. Using a 5/8", box-end wrench, remove the drain plug (removal is counter-clockwise).
5. Permit all of the water to drain out of the condenser, and then replace the plug: thread the plug in clockwise until just snug, then apply an additional 1/8 turn.
6. To prevent insects and vermin from entering the plumbing during the winterized period, partially reconnect the two (2) plumbing connection unions: couple each union one or two threads; this will permit condensation to drain, but will prevent most insects and animals from entering the plumbing circuit.
7. Next Season: to ready the heat pump for use, simply re-tighten plumbing connection unions. Hand-tight is generally sufficient.

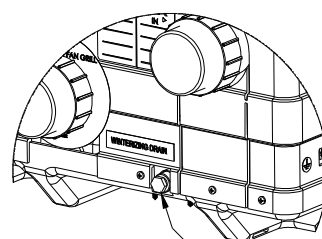
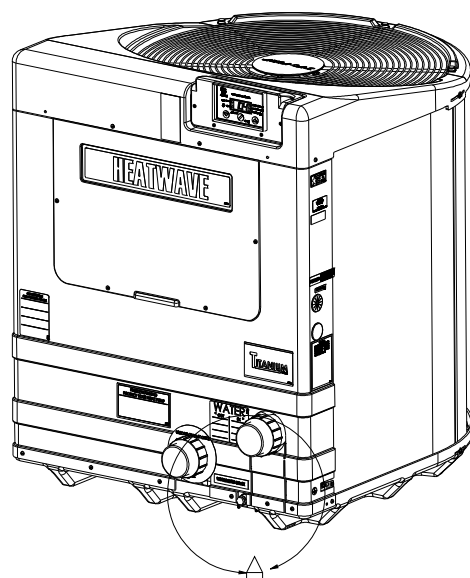


FIGURE 3

WINTERIZING
DRAIN

External Winterizing Drain

CAUTION !

Failure to heed the following can result in damage to equipment and/or property.

While the plumbing connections are in the winterized condition (*not fully tightened*), it is imperative pool-spa water not be circulated through the heat pump. Loss of water through loose plumbing connections may result in damage to circulating pump, pool-spa structure, and/or other equipment.

REPLACEMENT PARTS

Heat Wave/AeroTemp (Heating Only) 100/120-Series A & B Voltage

MODEL ►	H120"X"-A	H120"X"-B	H100"X"-A	H100"X"-B
PART DESCRIPTION	PART NUMBER			
WATER IN MANIFOLD	PLA0201	PLA0201	PLA0203	PLA0203
WATER OUT MANIFOLD	PLA0200	PLA0200	PLA0202	PLA0202
CONDENSER	TI6565S01D	TI6565S01D	TI5555S01D	TI5555S01D
COMPRESSOR	H20R723ABC	H20R723DBY	H22R583ABC	H20R583DBY
BASE	PCP0015	PCP0015	PCP0015	PCP0015
EVAPORATOR	ACP0001	ACP0001	ACP0001	ACP0001
SUCTION LINE	CPA0201	CPA0201	CPA0212	CPA0212
LOW PRESSURE SWITCH	6034	6034	6034	6034
DISCHARGE LINE	CPA0202	CPA0202	CPA0211	CPA0211
HIGH PRESSURE SWITCH	6032	6032	6032	6032
LIQUID LINE	CPA0200	CPA0200	CPA0200	CPA0200
EXPANSION VALVE	REP0001	REP0001	REP0001	REP0001
FILTER DRIER	2036	2036	2036	2036
TOUCH PAD	7052	7052	7052	7052
CONTROL PANEL PLASTIC	7058	7058	7058	7058
MODEL ►	H120"X"-A	H120"X"-B	H100"X"-A	H100"X"-B
MICRO DISPLAY BOARD	6200D	6200D	6200D	6200D
MICRO INTERFACE CABLE	6433	71019	71019	71019
MICROPROCESSOR POWER BOARD	6200P	6200P	6200P	6200P
TRANSFORMER	6209	6209	6209	6209
PHASE ROTATION MONITOR	N/A	6035	N/A	6035
RUN CAPACITOR	60010	60010	ECP0003	ECP0003
CONTACTOR	6061	6147	6061	6147
FAN RELAY	ECP0001	ECP0001	ECP0001	ECP0001
WATER PRESSURE SWITCH	6248	6248	6248	6248
FAN BLADE	3104	3104	3104	3104
FAN MOTOR	3114	3114	3114	3114
FAN TOP PLASTIC	7055	7055	7055	7055
FAN GRILLE	71019	71019	71019	71019
LOGO DISK	5319	5319	5319	5319
CONTROL PANEL ASSEMBLY	ECA0204	ECA0204	ECA0204	ECA0204
ACCESS PANEL	HPA0216	HPA0216	HPA0216	HPA0216
FRONT PANEL	HPA0218	HPA0218	HPA0218	HPA0218
ELECTRIC BOX COVER	HPA0214	HPA0214	HPA0214	HPA0214

CONTACTING THE FACTORY

WHAT WE NEED TO KNOW WHEN YOU CALL US

As the installing dealer or authorized service center, if contacting AquaCal for assistance, please have the following information ready when you call.

Model: _____

Serial Number: _____

Installation Date: _____ (If Known)

Full Description of the Problem or Issue

Please telephone us toll-free at: 800-786-7751. Our office hours are 8 a.m. to 5 p.m. EST, Monday through Friday. If calling after hours, our voice-mail service will handle your call. Be sure to leave your name, complete address, and phone number. If you prefer, you may FAX the information to: 727-821-7471.

If requesting product literature, or to report a unit that has failed to operate upon installation, ask for a Customer Support agent. The agent will take the details of the problem and will schedule a factory service call.

If assistance is needed in troubleshooting an operational issue with a heater, telephone the number above and request a Technical Support agent.

Thank you.



2737 24th Street North
St. Petersburg, FL 33713
800-786-7751
www.aquacal.com