



Pool and Spa
Heat Pump
Owner's Manual
and
Installation Guide

PN: LTP0009
01/12/04



Models:
T65
T115
T135

(Also Applies to All C115 Models)



ATTENTION INSTALLER:

THIS DOCUMENT IS PURCHASER'S PROPERTY AND IS TO REMAIN WITH THE HEAT PUMP OWNER

AQ Technical, 9/24/04

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Welcome to the **T**eam



Dear Owner:

Congratulations on your wise decision to make an AquaCal heat pump part of your home. Since 1981, AquaCal has maintained the worldwide lead in the manufacture of swimming pool & spa heat pumps. Your new heat pump is not only a great investment, but also the most cost effective method available for heating pools and spas. For example, as a means to heat pool or spa water, your heat pump is up to 400% more efficient than gas, and, when compared to electric resistance heat, your heat pump is nearly 600% more effective. You can rest assured that your new heat pump is of the highest quality and efficiency, and is designed and built to provide years of trouble-free operation.

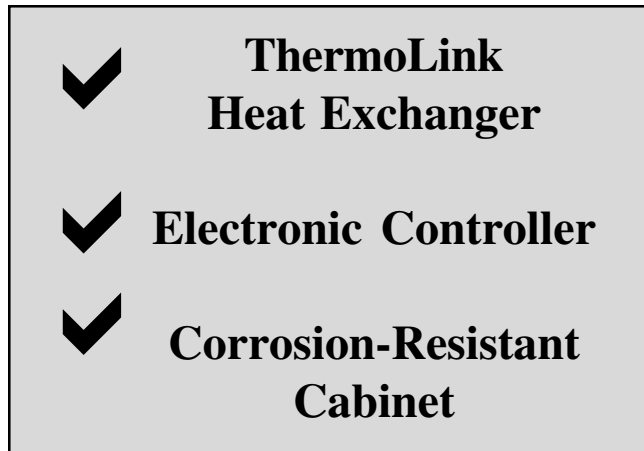
Moreover, should you decide you would like AquaCal to provide regular inspection and maintenance for your heat pump—which we do recommend—you will find AquaCal has the largest and best-qualified service staff in the pool & spa heat pump industry.

“You can rest assured that your new heat pump is of the highest quality and efficiency, and is designed and built to provide years of trouble-free operation.”

IMPORTANT FEATURES OF YOUR NEW HEAT PUMP

ThermoLink Heat Exchanger:

The heart of your heat pump is the patented ThermoLink heat exchanger. The primary cause of premature heat pump demise is the failure of the heat exchanger. Ordinary heat exchangers are made from a cupronickel alloy. This cupronickel material is susceptible to attack from the sanitizers used in pools and spas, and from other related water chemistry conditions. Once the heat exchanger fails, the heat pump is ruined. The ThermoLink heat exchanger tube is made from titanium, and is virtually impervious to water-chemistry damage.



Electronic Controller:

State-of-the-art, solid-state electronic controller, maintains water temperature within 1°F of set point. Controller also permits user to predefine different Pool and Spa water temperature set points.

Corrosion-Resistant Cabinet:

Hybrid design utilizes the best features of finished aluminum and resilient ABS plastic. The base, being ABS material, will never rust or corrode. The remainder of the cabinet is constructed from sturdy, marine-grade, powder-coated aluminum.



PLEASE SPEND A FEW MINUTES READING FURTHER TO BECOME FAMILIAR WITH ALL THE FEATURES, THE SAFE OPERATION, AND THE CARE OF YOUR NEW HEAT PUMP.

SAFETY INFORMATION

Used and maintained properly, your heat pump will provide year-upon-year of safe and economical service. However, as with any mechanical or electrical device, to get the most from your heat pump—while insuring personal safety for you and others—certain operational and maintenance factors must be observed.

Likewise, excepting a few minor owner-capable maintenance items (explained later in this manual), repair and service of your heat pump must be performed only by experienced service personnel. Should you, the owner, suspect your heat pump is not performing properly, by referring to the section in this manual entitled: "Troubleshooting", you will be able to determine if a call for service is required. Your installer can be one source of service, or AquaCal Customer Support personnel stand ready to assist you at: (800) 786-7751. For questions concerning installation, modifications, operation, service and upkeep, please contact your installer or AquaCal Customer Support. Warranties may be voided if the heater has been used, maintained, or repaired improperly.

In addition to possible voiding of warranties: unapproved installation methods, nonstandard modifications, poor or incorrect maintenance, service by unqualified personnel, or improper use of this unit, may result in personal injury and/or property damage. For personal safety and to avoid damage to equipment, it is important that safety instructions displayed on the heat pump, and within this manual, are read, understood, and followed.

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 may 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.

Water Temperature Safety

WARNING !

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

Prolonged immersion in water warmer than normal body temperature may cause a condition known as HYPERTHERMIA. The symptoms of hyperthermia include: unawareness of impending hazard, failure to perceive heat, failure to recognize the need to exit the spa and unconsciousness. The use of alcohol, drugs, or medication can greatly increase the risk of fatal hyperthermia. In addition, persons having an adverse medical history, or pregnant women should consult a physician before using a hot tub or spa. Children and the extreme elderly should be supervised by a responsible adult.

Heater NOT Repairable by Owner

WARNING !

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

Heat pumps contain no owner-repairable components. Repairs must not be attempted by untrained and/or unqualified individuals. If service is deemed necessary, contact installing dealer or AquaCal Customer Support at (800) 786-7751.

Refrigerant Circuit Service Only by Qualified, EPA Certified Technician

WARNING !

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

Heater contains refrigerant under high pressure. Repairs to the refrigerant circuit must not be attempted by untrained and/or unqualified individuals. Service must be performed only by qualified HVAC technicians. Recover refrigerant to relieve pressure before opening system.

Water Chemistry Safety

WARNING !

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

Improper water chemistry can present a serious health hazard. To avoid possible hazards, maintain Pool-Spa water per standards below.

CAUTION !

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

While your heat pump's titanium-based heat exchanger provides nearly impervious protection against poor water chemistry, improper water chemistry may cause expensive damage to pump, filter, pool shell, etc. To avoid equipment damage, maintain Pool-Spa water per standards below.

RECOMMENDED WATER CHEMISTRY STANDARDS

Chlorine	1.0 – 3.0 ppm in pools, 1.5 – 3.0 ppm in spas
Bromine	2.0 – 4.0 ppm in pools, 3.0 – 5.0 ppm in spas
pH	7.4 – 7.6 ppm in pools, 7.2 – 7.8 ppm in spas
Total Alkalinity	80 – 140 ppm in pools, 80 – 120 ppm in spas
Calcium Hardness	200 – 400 ppm in pools and spas
Total Dissolved Solids	1,000 – 2,000 ppm in pools, 1,500 ppm above start-up TDS in spas

QUICK START & STOP

This brief information is provided as an aide to installers, service personnel, and owners. The intent of this section is to provide rapid access to (only) very basic operational information. Individuals who will be routinely using, installing, maintaining and servicing this heat pump are strongly encouraged to read this entire manual. If uncertain about any instructions given herein, AquaCal Customer Support (800-786-7751) should be contacted for additional information.

Start Up

1. Set pump controls to allow for temporary, continuous operation.
2. With pump OFF, position water valves to heat the POOL or SPA.
3. Rotate both thermostats counterclockwise to lowest temperature setting.
4. Depending on valve settings (per #2, above), position the POOL/OFF/SPA toggle switch to point at either the POOL or SPA thermostat knob.
5. Ensure power is supplied to the heater, then start the water pump; the POWER and FLOW lights should now both be lit. Permit the water pump to operate for five (5) minutes before proceeding

How to Operate the Controls - Pool or Spa

1. Turn the selected pool or spa thermostat dial clockwise to its highest setting.
2. The heat pump will start and begin to heat the pool or spa.
NOTE: The heat pump has a time delay so if it shuts down for any reason, it will not restart for approximately five (5) minutes.
3. The typical spa may take several hours to initially heat up, while a pool may take several days. Heating time will depend on the volume of water, water temperature, and the climatic conditions at the time of start-up. (Also see Calculating Initial Heating Time.)
4. When the pool or spa reaches the desired temperature, *slowly rotate* the thermostat knob counterclockwise until the heat pump (just) stops. The thermostat is now set to automatically maintain this temperature.

Time Clock Programming

Once the heat pump has brought the pool or spa up to temperature, it will be necessary to reset the pump controls. Be sure to allow enough running time for the heat pump to replace lost heat. This time will vary depending upon the time of year. Colder months require longer running times—usually eight to twelve hours.

Manual Switching From Pool to Spa

NOTE: It is best to stop the pump while repositioning valves.

1. Open spa valves and close pool valves.
2. With the spa filter pump running for at least five minutes, move the POOL/OFF/SPA toggle switch from the Pool Setting to the Spa Setting.
3. Turn the Spa thermostat clockwise until it stops (104 F).
4. The typical spa may take several hours to initially heat up. Heating time all depends on the volume of water, water temperature and the climatic conditions at the time of start-up.
5. When the spa reaches the desired temperature (104 F is maximum), *slowly rotate* the thermostat knob counterclockwise until the heat pump (just) stops. The spa thermostat is now set to automatically maintain this temperature any time the spa thermostat has been selected.

To Stop the Heat Pump

The unit can be stopped by switching off the electrical supply or by setting the desired temperature lower than the actual water temperature.

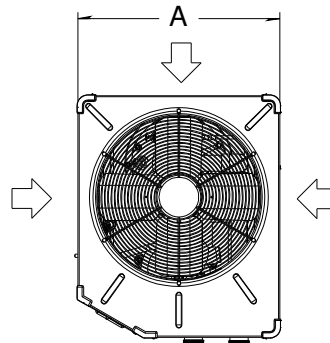
PHYSICAL CHARACTERISTICS & PERFORMANCE

Dimensional Information - TropiCal Models T65 and T115

NOTES:

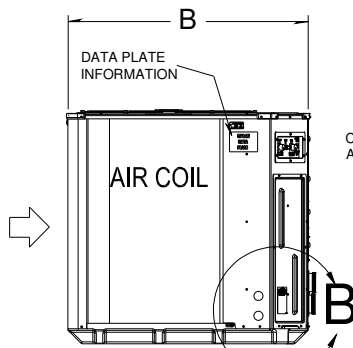
1. ALL DIMENSIONS IN INCHES
2. MIN. CLEARANCE 24" FROM AIR COIL

➔ DIRECTION OF AIR FLOW

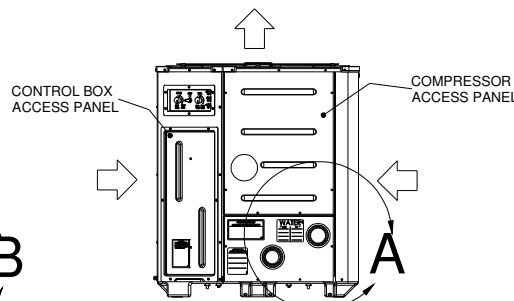


TOP VIEW

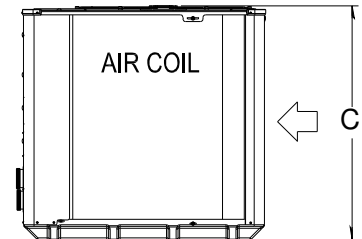
DIMENSION	065	115
A	30.50	30.50
B	36.25	36.25
C	35.31	35.31
D	13.00	13.00
E	6.00	6.00
F	6.00	6.00
G	9.25	9.25
H	7.50	7.50
J	4.22	4.22
K	7.22	7.22



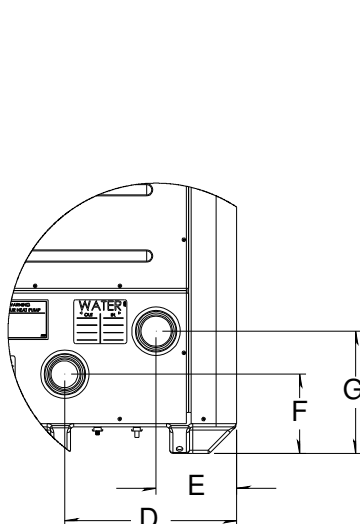
LEFT SIDE VIEW



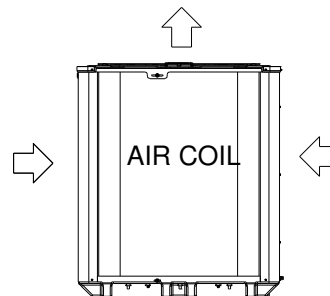
FRONT VIEW



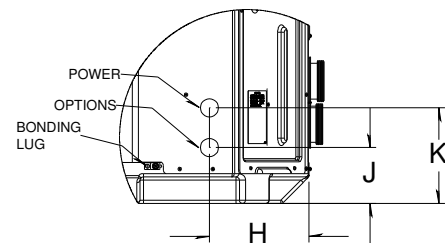
RIGHT SIDE VIEW



WATER CONNECTIONS
DETAIL A
SCALE 1 : 12



REAR VIEW



POWER / OPTIONS ENTRY K.O.
(DUAL K.O. -1.375 & Ø 1.125)
DETAIL B
SCALE 1 : 12

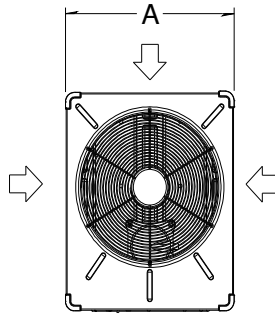
Dimensional Information - TropiCal Model T135

NOTES:

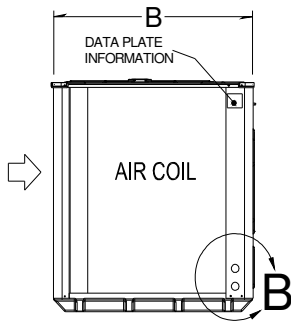
1. ALL DIMENSIONS IN INCHES
2. MIN. CLEARANCE 24" FROM AIR COIL

⇨ DIRECTION OF AIR FLOW

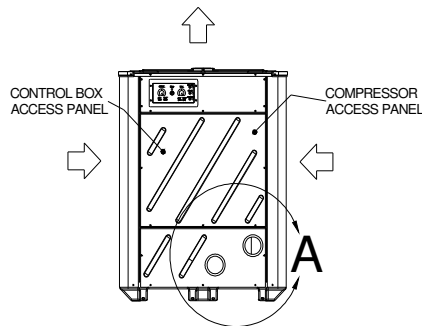
DIMENSION	135
A	30.50
B	36.25
C	39.00
D	13.00
E	6.00
F	6.00
G	9.25
H	3.25
J	4.25
K	7.25



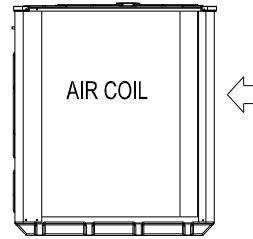
TOP VIEW



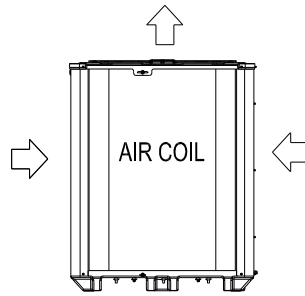
LEFT SIDE VIEW



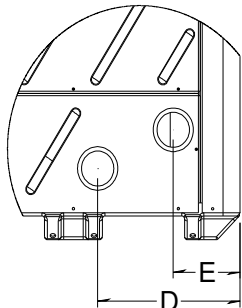
FRONT VIEW



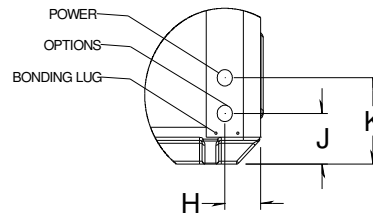
RIGHT SIDE VIEW



REAR VIEW



WATER CONNECTIONS
DETAIL A
SCALE 1 : 12



POWER / OPTIONS ENTRY K.O.
(DUAL K.O. -1.375 & Ø 1.125)
DETAIL B
SCALE 1 : 12

TropiCal: Table of Specifications

MODELS:	T65"X"-A	T65"X"-B	T115 "X"-A	T115 "X"-B	T135 "X"-A	T135 "X"-B
BTU - 80%RH						
Air °F / Air °F... 80/50	55000/37000	55000/37000	104,000/70,000	104,000/70,000	126,000/82000	126,000/82000
COP	4.8/3.7	4.8/3.7	4.3/3.2	4.3/3.2	5.7/4.0	5.7/4.0
BTU - 63% RH						
Air °F / Air °F... 80/50	51000/34000	51000/34000	97,000/65,000	97,000/65,000	119000/77000	119000/77000
COP	4.5/3.6	4.5/3.6	4/3.1	4/3.1	5.4/3.8	5.4/3.8
Kilowatt Input (80% RH)	3.4	3.4	7.1	7.1	6.5	6.5
Voltage/Hz/Phase	208-230/60/1	208-230/60/3	208-230/60/1	208-230/60/3	208-230/60/1	208-230/60/3
Min. Circuit Ampacity	20.01	14.04	40.56	26.14	37.36	30.14
Recommended Fuse Size	20	15.00	40	30	40	35
Max. Fuse or Breaker Size	30	20.00	70	40	60	50
Min-Max Water Flow (gpm)	20-70	20-70	20-70	20-70	20-70	20-70
Shipping weight (lbs)	250	250	270	270	300	300
Shipping Size (l x w x h)	36" X 30" X 35"	36" X 30" X 35"	36" X 30" X 35"	36" X 30" X 35"	36"X30"X42	36"X30"X42
Uncrated Weight (lbs)	223	223	243	243	273	273

Refrigerant Circuit Performance Charts

Use of Charts- Information for the Technician:

The charts are intended for use by trained and qualified air-conditioning and refrigeration technicians only. 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 subcooling values, water temperature change through the heater, and the total unit amps. Locate a chart that most closely represents current 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 the charts. Should refrigerant circuit readings appear normal, but not the Water ΔT value, the likely cause will be water flow above or below 45 GPM. (TropiCal refrigerant circuits will perform acceptably with condenser water flow between 20 to 70 GPM.)

Performance Charts Follow

Refrigerant Circuit Performance Charts

For use with Troubleshooting Refrigerant Circuit Problems guide, following charts.

Spa Condition: Water @ 104°F & 45 GPM, Ent. Air: 80 °F - 63% R.H.							
Unit	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
T135"X"- "X"	278	81	16	17	5.0	35	(Reserved)
T115"X"- "X"	295	83	9	18	4.0	32	
T65"X"- "X"	294	95	15	16	2.4	19	

Standard Condition: Water @ 80°F & 45 GPM, Ent. Air: 80 °F - 63% R.H.							
Unit	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
T135"X"- "X"	200	75	18	16	5.0	29	(Reserved)
T115"X"- "X"	222	78	12	20	4.4	28	
T65"X"- "X"	216	92	16	15	2.8	17	

Low Condition: Water @ 80°F & 45 GPM, Ent. Air: 50 °F - 63% R.H.							
Unit	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
T135"X"- "X"	198	42	15	25	3.4	26	(Reserved)
T115"X"- "X"	214	49	5	25	3.0	25	
T65"X"- "X"	212	53	13	25	1.6	15	

High Humidity Condition: Water @ 80°F & 45 GPM, Ent. Air: 80 °F - 80% R.H.							
Unit	Discharge Pres. PSIG	Suction Pres. PSIG	Superheat °F	Subcooling °F	Water ΔT °F	Nominal Unit Amps	
						1-Ph	3-Ph
T135"X"- "X"	201	80	18	15	5.5	29	(Reserved)
T115"X"- "X"	227	86	12	19	4.7	29	
T65"X"- "X"	219	97	17	16	2.9	17	

Guide: Troubleshooting Refrigerant Circuit Problems

Refrigerant Circuit Service Only by Qualified, EPA Certified Technician

WARNING !

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

Heater contains refrigerant under high pressure. Repairs to the refrigerant circuit must not be attempted by untrained and/or unqualified individuals. Service must be performed only by qualified HVAC technicians. Recover Refrigerant to relieve pressure before opening system.

NOTE: These guidelines are for use only by experienced, EPA certified, HVAC technicians, and were developed specifically for use with AquaCal heat pumps, and for use with 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 nonexistent;
- 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 (TropiCal 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 nonexistent;
- 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; enough heat cannot be added in the evaporator to boil off all 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 high condenser water ΔT (see next bullet item), this condition is a prime indicator of insufficient condenser water flow;
- Condenser entering-leaving water temperature difference (water ΔT) 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 ΔT .

INSTALLATION

Placement of Heater

Indoor Installation

Every indoor installation is unique, therefore, there are no specific guidelines for this type of installation. For assistance, please contact AquaCal's Engineering or Technical department at (800) 786-7751; they will assist you with your specific needs.

Outdoor Installation

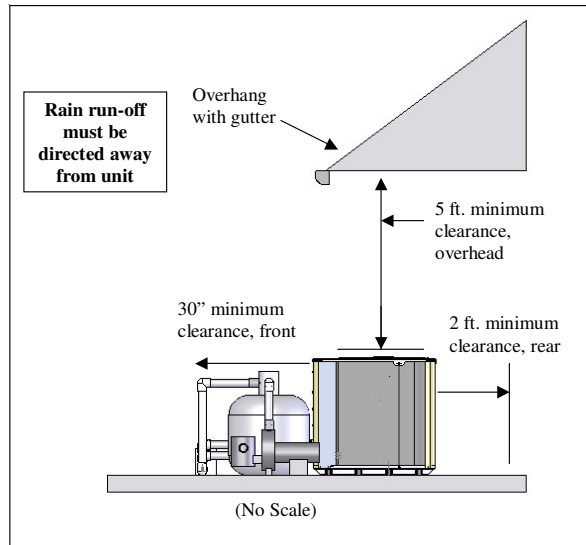
Service and Operational Clearances:

- ◆ Refer to recommended clearance drawings following this section. Allow 24" clearance between the heat collection surfaces and walls, fences, shrubs, or other objects. The heat pump requires large volumes of air moving over the heat collector.
- ◆ Allow 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 recirculating back into the evaporator coils (recirculation would reduce the overall performance 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, so avoid any plumbing obstructions that will restrict easy access.

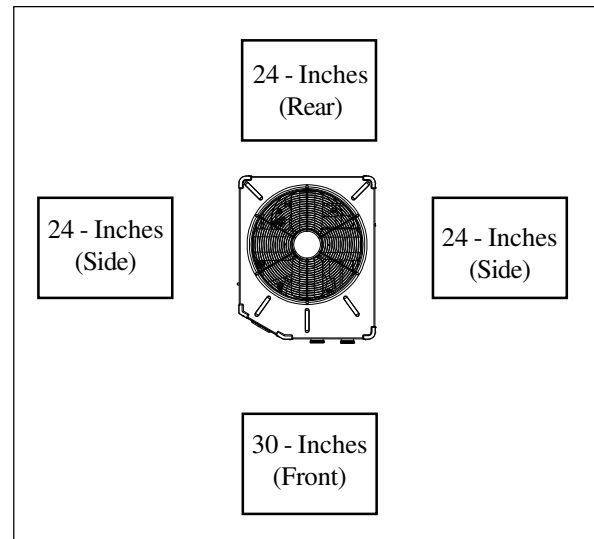
Code Required Clearances:

- ◆ In addition to the previously stated clearance requirements, follow all applicable local, state, and national requirements relative to spacing from other objects or equipment.

Typical Installation Clearances



Front, Rear, and Overhead



Front, Side and Rear

Irrigation, Rainwater Runoff, and Landscape Features

Place the heat pump away from rain runoff from the roof. 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 plant shrubs or bushes directly adjacent to heat pumps. Doing so will prevent proper air circulation into the unit, and may inhibit access to the heater when service is needed. Consult drawings above for proper clearances.

Equipment Pad Requirements

The equipment pad should be constructed to provide adequate drainage and support to the base of the heat pump (see Table below). The pad should be essentially level with just enough pitch to drain condensate and any other water away from the heater.

Model	Minimum Pad Size
T135	36" X 42"
T115	36" X 42"
T65	36" X 42"

Anchoring Heater to Pad

Follow all relevant local, state, or national requirements regarding wind load anchoring (use hurricane anchoring kit, part #STK0010). 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 installation 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 heat pump must be installed in accordance with all applicable local, state, or national codes & standards.

Connection to Heat Pump:

All TropiCal 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.

Ability to Winterize:

In regions where hard winters are typical, the unions mentioned above allow for easy disconnection/reconnecting 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 Pressure: 50 PSI

Minimum/Maximum Water Flow Rates:

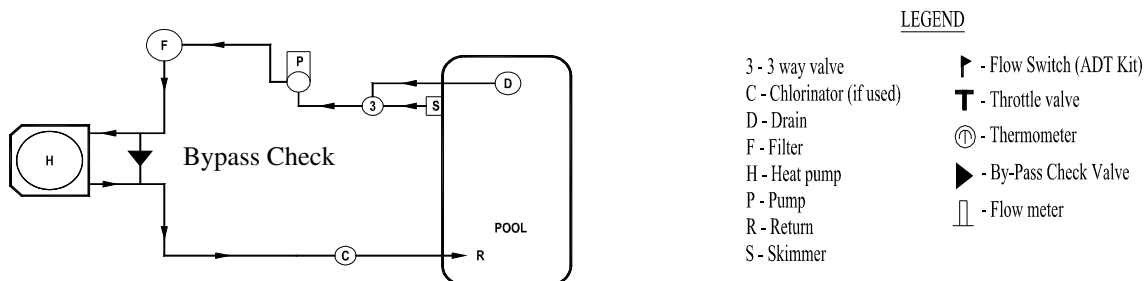
All TropiCal models are designed to operate successfully between flow rates of 20 to 70 gallons-per-minute (GPM) . Design the plumbing system to maintain at least 20 GPM flow through the heater; the heat pump will not operate correctly, nor reliably, with less than 20 GPM of water flow supplied. If water flow rates through the heater will exceed 70 GPM, a spring-check bypass valve 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 details, see information and plumbing schematic, following).

External Bypass Check Valve Requirement

For installations where flow rates exceed 70 gpm an additional spring bypass check valve must be installed.

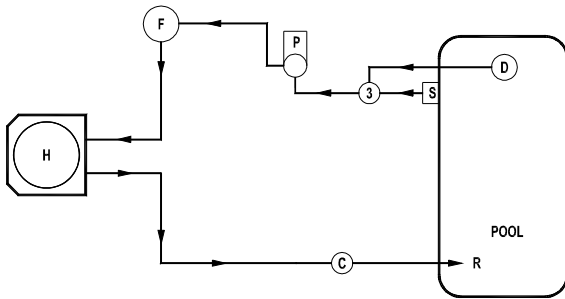
NOTE:

Use of the wrong size check valve may compromise the heat pump's efficiency, reliability, and may void the factory warranty. For models T135, T115 & T65, a 5 lb. Spring check valve is required. (AquaCal Part #2556.)

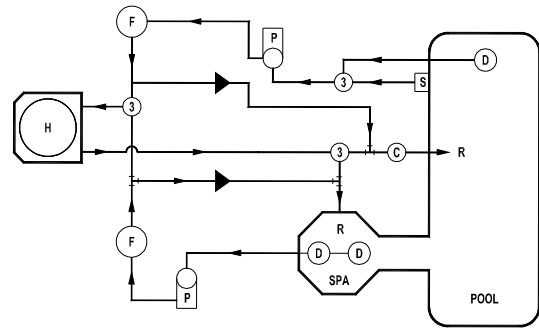


Typical Pool - Flow greater than 70 g.p.m. - (2 HP Pump)

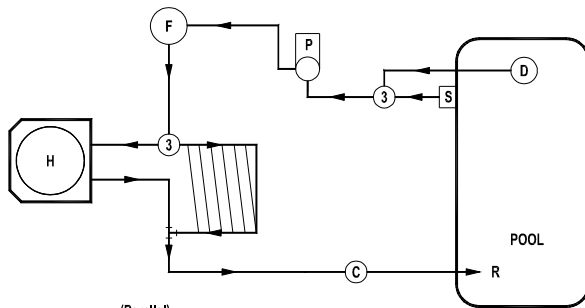
Plumbing Schematics



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

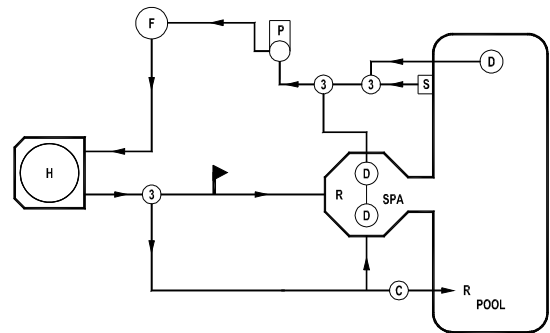


Pool/Spill over Spa - Two Pump System

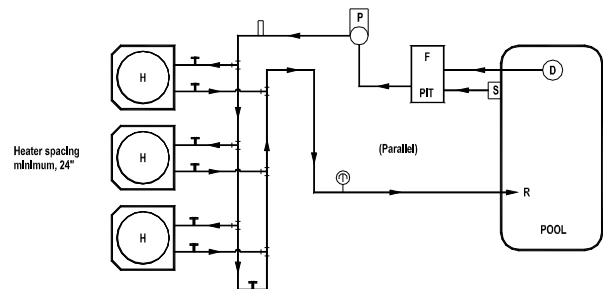


(Parallel)

Heat Pump w/ Solar Panels

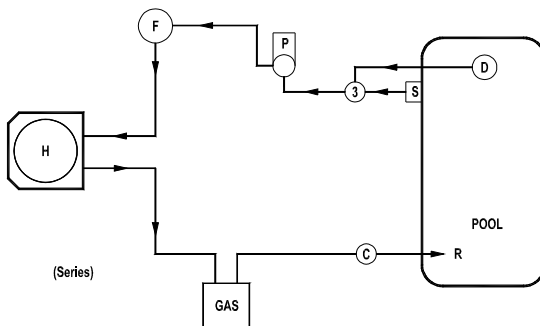


Pool/Spill over Spa - One Pump System



Heater spacing
minimum, 24"

Multiple Heat Pump Installation



(Series)

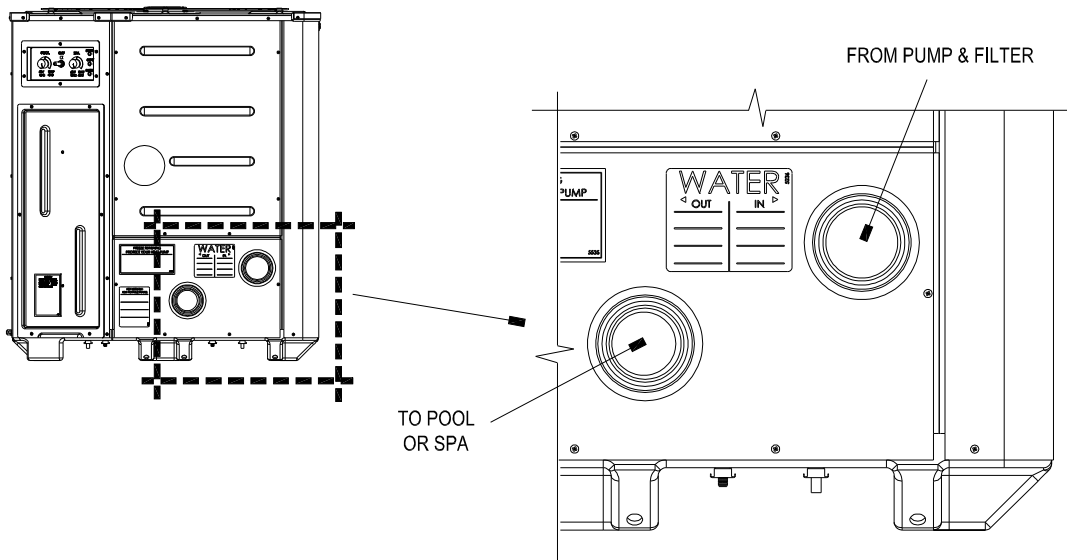
Heat Pump w/ Gas Heater backup

LEGEND

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

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.



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 electrical service industry safety standards and methods. Electrical installation to be performed by qualified individuals only.

General Information:




- ◆ 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.
- ◆ Multiple heaters installed at same site generally require special sequencing controls (AquaCal part #ASC-(number of heaters)); if yours is a multi-heater installation, contact AquaCal Technical Support for assistance (800-786-7751).
- ◆ 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.

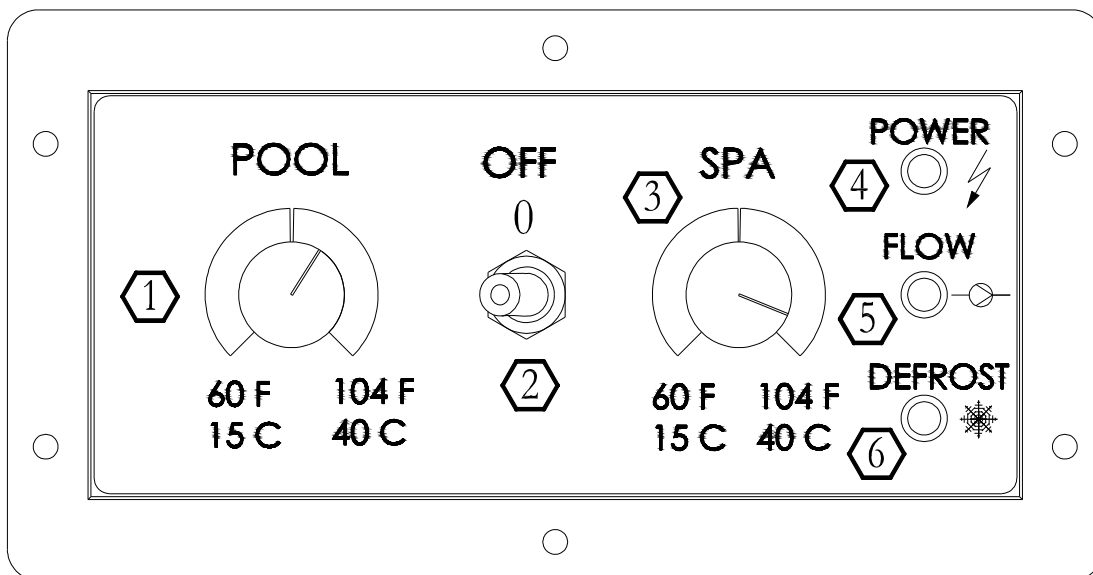
Reference Equipment Data Plate:

- ◆ All TropiCal heat pumps have their data plates located on the left, exterior, side panel. Refer to 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 represented below will contain the necessary information required in sizing electrical service and over current protection devices.

MINIMUM CIRCUIT AMPACITY	<input type="text" value="#1"/>	HZ	<input type="text" value="#2"/>	MADE IN THE USA
ELEC. SERVICE:	Vac.~	<input type="text" value="#3"/>	PHASE	<input type="text" value="#4"/>
MAXIMUM TIME DELAY FUSE OR HVAC BREAKER			<input type="text" value="#5"/>	
COMPRESSOR Vac	<input type="text"/>	R.L.A	<input type="text" value="#6"/>	L.R.A. <input type="text" value="#7"/>
FAN MOTOR Vac	<input type="text"/>	H.P.	<input type="text"/>	F.L.A. <input type="text" value="#8"/>
REFRIGERANT: Factory charged R-22 Only		oz/Kg	<input type="text"/>	
Tested to 500 psig High side/150 psig Low side			INDOOR/OUTDOOR USE	
AQUA GAL, INC A TEAM HORNER COMPANY 2737 24 TH STREET NORTH ST. PETERSBURG, FL 33713 FACTORY SERVICE 1-800-786-7751		MANUFACTURING CODE	<input type="text"/>	
				
		SERIAL NO.	<input type="text"/>	
 1234567-A03			ETL LISTED CONFORMS TO UL STD 1995 CERTIFIED TO CAN/CSA C22.2 NO. 236	

START-UP & OPERATION

Getting Familiar with Controls



T135/115/65 Control Panel Layout

- 1. POOL TEMPERATURE CONTROL** - Set this knob for desired pool water temperature
- 2. POOL/OFF/SPA** -Toggles between pool temperature/off/spa temperature
- 3. SPA TEMPERATURE CONTROL** - Set this knob for desired spa water temperature
- 4. POWER LIGHT** - Indicates electrical power is supplied to the heater
- 5. FLOW LIGHT** - Indicates water pressure (Flow) is present at the heater
- 6. DEFROST LIGHT** - Indicates heater is in the defrost mode

Overview of Controls

(Please refer to control panel diagram on previous page.)

POOL/OFF/SPA Toggle Switch:

With the toggle switch in the OFF (O) position, the heater will be prevented from operating (however, there may be power to the unit; see "Power Light On", below). With the toggle switch positioned toward the SPA or POOL thermostat knob, and with the following conditions met: 1) water pump in operation, 2) water flowing through the heater, and, 3) electrical power to the heater, the heater will run anytime the water temperature drops below the thermostat setting.

Note-Heater Can Start with Thermostats Set to Minimum:

With proper water flow and electrical power supplied to the heater, and either the POOL or SPA thermostat selected and set to minimum, the heater will run any time the water temperature falls below 60° F. To prevent the heater from operating at water temperatures below 60° F, position the POOL/OFF/SPA toggle switch to the middle, OFF position.

Power Light On:

Indicates electrical power is supplied to the heater. The heat pump will start if the selected (POOL or SPA) thermostat calls for heat, and there is proper water flow through the heater.

Power Light Off:

Indicates proper electrical power is not getting to the heater. If attempting to operate the heater, ensure any disconnect switches, or circuit breakers, are switched to the ON position.

Flow Light On:

Indicates sufficient water flow to permit the heat pump to operate. The heat pump will start upon a call for heat from the selected POOL or SPA thermostat.

Initial Start-Up and Basic Operation

(Please refer to "Overview of Controls", above, before continuing.)

1. Lower Thermostat Settings-Set P/O/S Toggle Switch to OFF:

- ◆ Turn both thermostat knobs counterclockwise to lowest settings.
- ◆ Position the POOL/OFF/SPA toggle switch to "OFF".

2. Establish Water Flow and Electrical Power to the Heat Pump:

- ◆ Position the water valves to heat either the pool or the spa.
- ◆ Ensure any heat pump-related disconnect switches, or circuit breakers, are switched to the ON position.
- ◆ Start the pool or spa pump (depending of which body of water is to be heated), permitting the pump to operate for a few minutes before going on to next step. This wait is necessary to clear any air that may exist in the water piping.
- ◆ The heat pump will not start without water flowing through it. At this point, the power and flow lights should be illuminated.

3. Select POOL or SPA-Raise Associated Thermostat:

- ◆ Position the POOL/OFF/SPA toggle towards the POOL or SPA thermostat knob (depending on which body of water you are preparing to heat).
- ◆ Turn the selected pool or spa thermostat dial clockwise to its highest setting. As soon as the thermostat setting is above the temperature of the water, the heat pump will begin to operate.

Note-Five (5) Minute Time Delay Function:

The heater controls contain a solid-state time delay module. This time delay feature prevents damage to the compressor should electrical power be repeatedly interrupted, or if the heat pump were to come under any other circumstances leading to an on-off-on-off cycling condition. If the heater has water flow and electrical power supplied, but the heater does not immediately start upon turning the thermostat to its highest setting, wait five (5) minutes; the time delay module may be preventing the heater from operating. Likewise, once the heater is running, if the thermostat is turned back below the present water temperature, the heat pump will shut off. Subsequently, the heater cannot restart for approximately five (5) minutes, no matter how far the thermostat is turned back up.

4. Ensure Uninterrupted Pump Operation During Initial Warm-Up:

- ◆ Permit your pool or spa circulation pump to run continuously until the desired water temperature is reached. (with a pool, this may take several days.)
- ◆ Continuous pump operation will likely require temporarily resetting (or removing completely) the trippers on the time clock, thus allowing nonstop operation. When an external electronic controller operates pumps and valves, follow the controller manufacturer's instructions to ensure temporary, uninterrupted pump operation.
- ◆ Throughout the warm-up period, keep the selected pool or spa thermostat dial set clockwise to its highest setting.

5. Desired Water Temp. Reached-Set Thermostat to Maintain:

- ◆ Once the desired water temperature has been achieved, rotate the thermostat knob very slowly counterclockwise until the unit (just) shuts off.
- ◆ The heater will automatically maintain your pool or spa at the selected temperature.

6. Return Pump Timer Controls to Normal Settings:

- ◆ Reset pump timer controls for normal daily hours of operation.
- ◆ During cooler or cold weather conditions, it may become necessary to extend the daily hours of pump operation; doing so will help the heater to keep up with increased heat losses.
- ◆ Also see next topic: "Heating Tips"

Heating Tips

Pool/Spa Blankets

A solar blanket will significantly reduce your heating bills. You should check with the installing dealer to see if your heat pump was sized to be used in conjunction with a solar blanket or without one. Blanketed pools will typically lose only 3 - 4° of heat per night versus 8 - 10° overnight with an un-blanketed pool. Reductions of 40 - 60% on heating bills can be achieved by using solar blankets.

WARNING !

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

Improperly used, Pool-Spa solar blankets can become a drowning risk to people and pets. Solar blankets are not safety covers. They are not designed to support the weight of a person or pet. Never enter a pool until the solar cover is completely removed (under no circumstances should anyone swim under the blanket). Follow all safety recommendations of the blanket manufacturer.

Pool and Spa Combination Heating

Everything stated for heating a pool applies for heating a spa; only the volume of water being heated is different. TropiCal model heat pumps come equipped with two thermostats. One thermostat is for the pool and the other is for the spa. Simply position the pool and spa isolation valves as directed by your installer; select the appropriate thermostat (pool or spa), whichever you are heating, and with electrical power and water flow supplied to the heater, the water will be maintained at set point.

Your system can be automated with the addition of an optional **AquaCal Universal Heater Control** (AquaCal part #0097TS). This will save you from having to change the thermostat switch each time you change from pool to spa and back again. For details, contact your installing dealer.

Spa Heating

Air blowing into your spa while it is being heated will very often neutralize or partially counteract the heat being put into the spa by the heater; this added heat loss equates to increased time to bring your spa to desired temperature. When heating a spa, be sure to turn off the air blower. Air induced through the spa jets should also be eliminated, during warm-up, whenever possible.

If your heater is being used to only heat a spa, the POOL thermostat can be used as a set-back control: simply set the pool control at a point 10-15° F below desired spa heat temperature, and select the pool thermostat. This method allows the spa—when not in use—to be held at a heated temperature, but somewhat lower than normal spa-use temperature. One would want to blanket the spa if using this set-back method. This method will result in reduced warm up periods over full-cold start ups.

Heating in Cooler Weather (Defrost Cycle)

When air temperatures drop below 50° F, your heat pump may go into a defrost cycle. The defrost cycle is initiated by a sensor on the evaporator (air coil). When the evaporator temperatures fall to a point where ice begins to form on the fins, the heat pump will shut down. The heat pump will remain in the defrost mode until the evaporator coil temperature rises. In the event the air temperatures are below 40° F, the heat pump will remain in the defrost mode until temperatures rise above the 40° mark. The length of time the heat pump is in the defrost mode is dependent upon the air temperature: the warmer the air temperature, the shorter the defrost cycle; the colder the air temperature, the longer the defrost cycle.

The need to defrost, is a very good reason why you should operate your heat pump only during the warmest part of the day. Late night and early morning is usually the coolest time of the day, and least efficient for heat pump operation.

Calculating Initial Heating Time

The initial time it takes to get your pool warm depends on several factors. First you will need to determine how many gallons of water are in your pool. If you know this, you can compute the pounds of water in the pool and the BTU's necessary to heat the pool to the desired temperature. Secondly, you need to know the approximate BTU output of your heat pump at the ambient air temperature. Finally, you will need to determine the temperature at which you plan to maintain your pool or spa.

Sounds complicated, but it's not! You can use the following worksheet to calculate approximately how long it will take your heater to bring your pool up to temperature. Keep in mind that the time will vary somewhat due to weather conditions during the period that the heater is in use.

Volume of Pool (Length X Width X Average Depth) = _____ Pool Cubic Feet

X Gallons per cubic ft.(7.5) = _____ Pool Gallonage

X Pounds per Gallon (8.3) = _____ Pounds of Water

How many degrees do you want to raise the temperature of the pool?

of Degrees _____ X Pounds of Water (per above) = _____ BTU's Required

BTU's Required (per above) _____ ÷ BTU Output of Heater = _____ Hrs. of Operation

Optional Cold Weather Adjustment Factor:

Hrs. of Operation (per above) _____ X 1.25 (60° F outside air (O.A.) Temperature Factor) = _____
Hrs. of Operation at 60° F O.A.

When you start up your new AquaCal Heat Pump for the first time to heat your pool, you must allow the unit to run continuously until the desired temperature is reached. This may take from several hours to several days depending upon the time of the year and the outside conditions. If you utilize a time clock or similar device to control the operating time of your pool system, you should temporarily override the device and allow it to run the pool or spa pump until the water reaches the desired temperature.

Your heat pump is a maintainer of heat and is sized to overcome the heat loss during the coldest period in which you are trying to heat. Once your pool is up to temperature, the time clock can be reset. The time your system has to run may need to be extended during the colder months when heat loss is at its greatest.

Since air is generally at its warmest during the day time, it is best to operate your heat pump during the daytime when there is more heat to transfer. So keep this in mind when you are trying to heat your pool.

NOTE: An optional Call Flex time clock manager (AquaCal part #0030S) can free you from having to change the settings on your time clock as the heat loss increases or decreases. Contact your installing dealer for details.

MAINTENANCE

The information in this section is written for the Home Owner, but also may apply to a servicing dealer. The section contains information on planned maintenance, proper water flow, maintaining proper clearances as well as other vital information. Please read this section now, and before calling AquaCal Customer Service at (800) 786-7751.

Planned Maintenance Program

Just as you would have yearly service performed on your air conditioning system, regular inspection & maintenance of your AquaCal heat pump will insure highest operating efficiencies while also protecting your investment, potentially extending the useful life of your heat pump far beyond the warranty period. Our expertly trained factory service technicians offer comprehensive maintenance procedures that will insure your heat pump operates efficiently and reliably when you need it to.

The 20-Point Planned Maintenance Service Includes the Following :

- > Check Water Flow
- > Clean Evaporator Coil
- > Check Relay Contacts
- > Check Capacitor Values
- > Check Refrigerant Levels
- > Clean Heat Pump Cabinet
- > Check Fan Blade Clearances
- > Check Flow/Pressure Switch
- > Check Electrical Connections
- > Check Proper Voltage To Unit
- > Oil Fan Motor (As Applicable)
- > Check Fan Motor Amperage Draw
- > Check Pool & Spa Water Chemistry
- > Check and Clean Condensate Drains
- > Check Compressor Amperage Draw
- > Check Water Pump Amperage Draw
- > Acid Wash Source Coil (As Applicable)
- > Check Operating Controls and Temperature Sensors
- > Check Air Temperature Change Through Evaporator
- > Check Water Temperature Change Through Condenser

We recommend that all AquaCal heat pump owners take advantage of this annual service starting one year after the installation of the unit. You will be surprised at the minimal cost of this service. The service is very reasonably priced for what is included. Please contact AquaCal Customer Support, at 1-800-786-7751, for further information or to schedule Planned Maintenance service.

General Maintenance

- ◆ You should have your heat pump inspected and maintained on an annual basis by a qualified pool heat pump specialist. Additionally, if your heat pump is located on the beach, or at a sea wall where salt spray and sand can affect the unit, more frequent service may be necessary. For Service Plan information, please see: Planned Maintenance Program, above, and then contact AquaCal Customer Support at: 800-786-7751.
- ◆ While annual maintenance is recommended to maintain your warranty, if you choose not to participate in the Planned Maintenance Program, rinsing the air coil 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 HAZARD . . . 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 sprag water directly into electrical components. Do NOT restore electrical power until such time as all water has dried completely.

CAUTION!

Failure to heed the following may 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 rain water 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:** Your 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 heat pump 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. Before calling for service, always check the filter, the pump basket, and water valve positions. If the problem persists, call AquaCal Customer Support at: (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 air flow clearances around heater must be maintained.
- ◆ It is important to keep the area around your 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 place objects 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 your heater. A heater that is easy to "get to", will be a heater that is easy to maintain; service and maintenance personnel will thank you for keeping the area around your heater unobstructed.
- ◆ Please see: Installation, Service, and Operational Clearances, for specific spacing requirements.

SEASONAL USE & SHUT DOWN

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 you do wish to heat your pool or spa.

Freeze protection / Extended shut downs

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

Winterizing (Hard Freeze Conditions)

CAUTION !

Failure to heed the following may 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.

CAUTION !

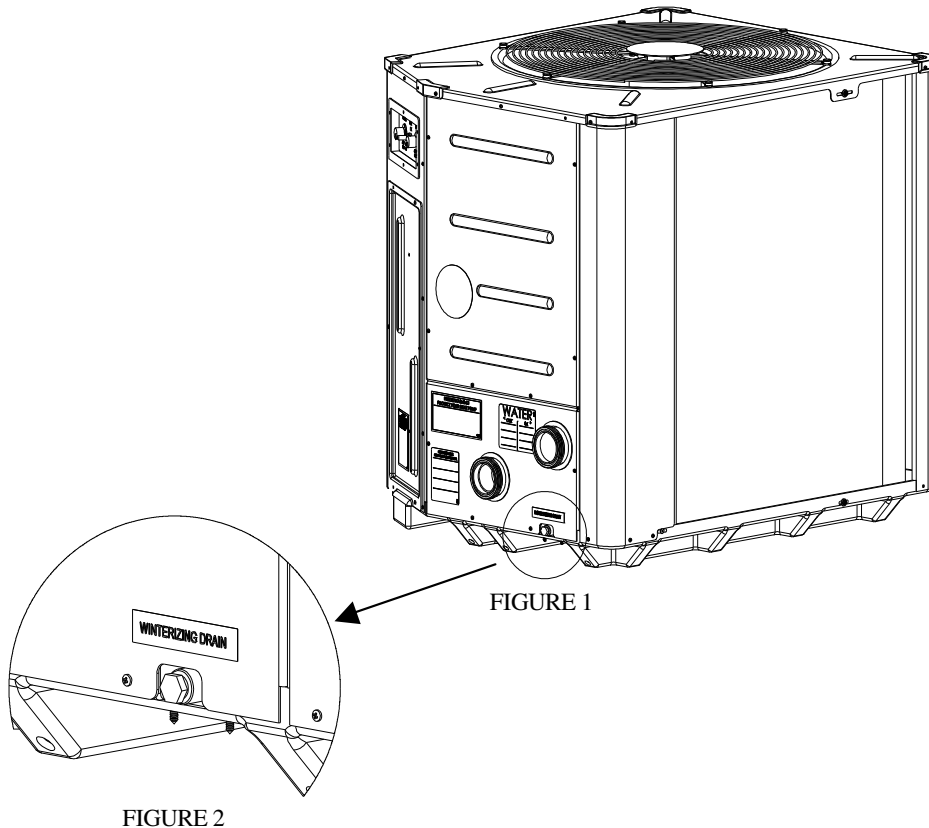
Failure to heed the following can result in damage to equipment and/or property.

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.

Winterizing Procedure:

1. Disconnect all electrical power to the heater; turn OFF circulating pump.
2. At the two (2) water connection unions, disconnect the plumbing to the heater (removal is counterclockwise).
3. Locate the drain plug at lower, right-hand, front corner of heater. (See Figures 1 & 2, below.)
4. Using a 5/8", box-end wrench, remove the drain plug (removal is counterclockwise).
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 retighten plumbing connection unions. Hand-tight is generally sufficient.

Location of Winterizing Drain



TROUBLESHOOTING

Common Troubleshooting Issues

Heat Pump Not Running

Is the power light 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.

Is the flow light lit?

If not, 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 bypass the heat pump. Be sure water is flowing through the heater.

Is the Pool or Spa thermostat selected, and have you tried turning the selected thermostat to a higher temperature setting?

If not, the actual water temperature may be above that of the selected thermostat. Raise the desired water temperature above the actual water temperature; the unit should start after an approximate 5-minute delay. If the heat pump still fails to start, and the unit is not in defrost (defrost light lit), contact AquaCal Customer 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, 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., can restrict air flow. The heat pump needs good airflow to operate at peak efficiency.

How long are you running your circulating pump each day?

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, in turn leading to substantial energy cost savings.

What is the air temperature?

Your heat pump may be in the defrost mode if air temperatures are below 50°F. The defrost light will be lit if the unit is defrosting. If air temperatures are not cold, but the defrost light is still illuminated, contact AquaCal Customer Support at 800-786-7751.

Water Coming from the Heat Pump

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

Shut off your 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. If the water appears to be drying up, the water is probably harmless condensate.

Or, as an alternate method to check for a water leak, you can test the water draining out the base for the presence of the sanitizer you are using in your pool or spa. Use your 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, call AquaCal for service at: 800-786-7751. If the test is negative, the water is probably harmless condensate.

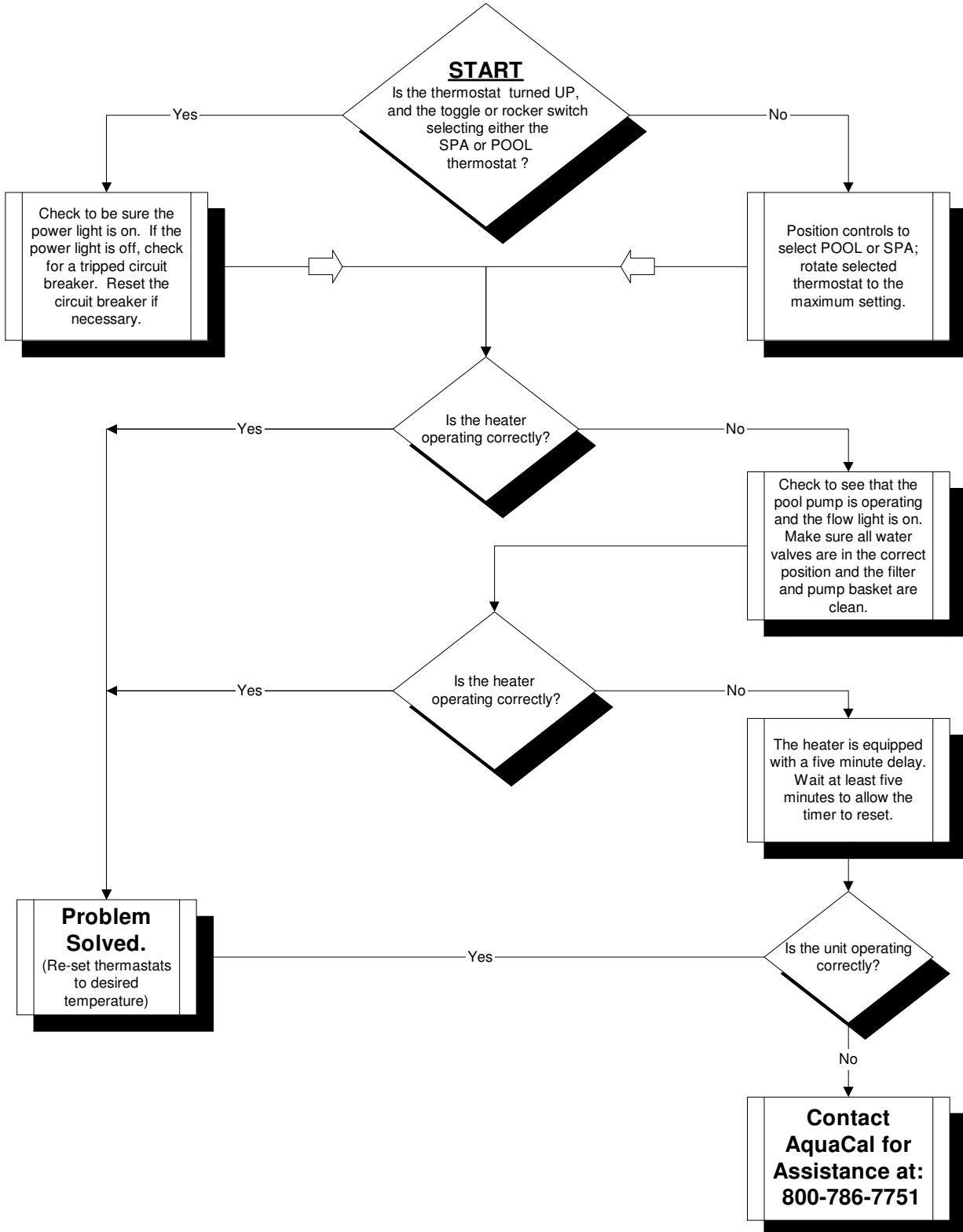
NOTE: If you are using an ionizer or ozone generator to produce sanitizer, this test method will not be effective.

Please see Troubleshooting Flowcharts, following, for more detailed information.

Troubleshooting Flow Charts

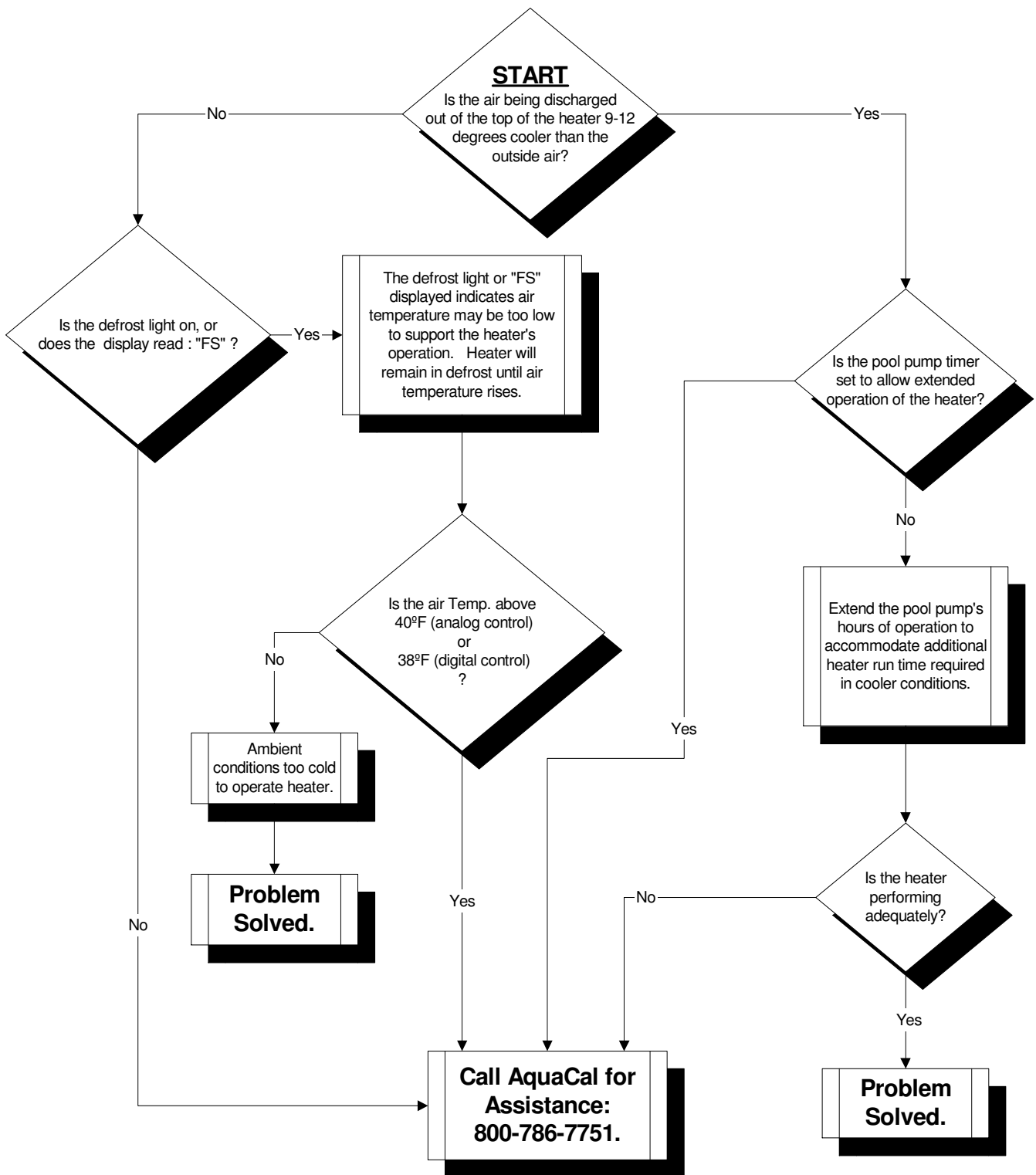
Heater Fails to Operate

Analog Controls - 12/22/03



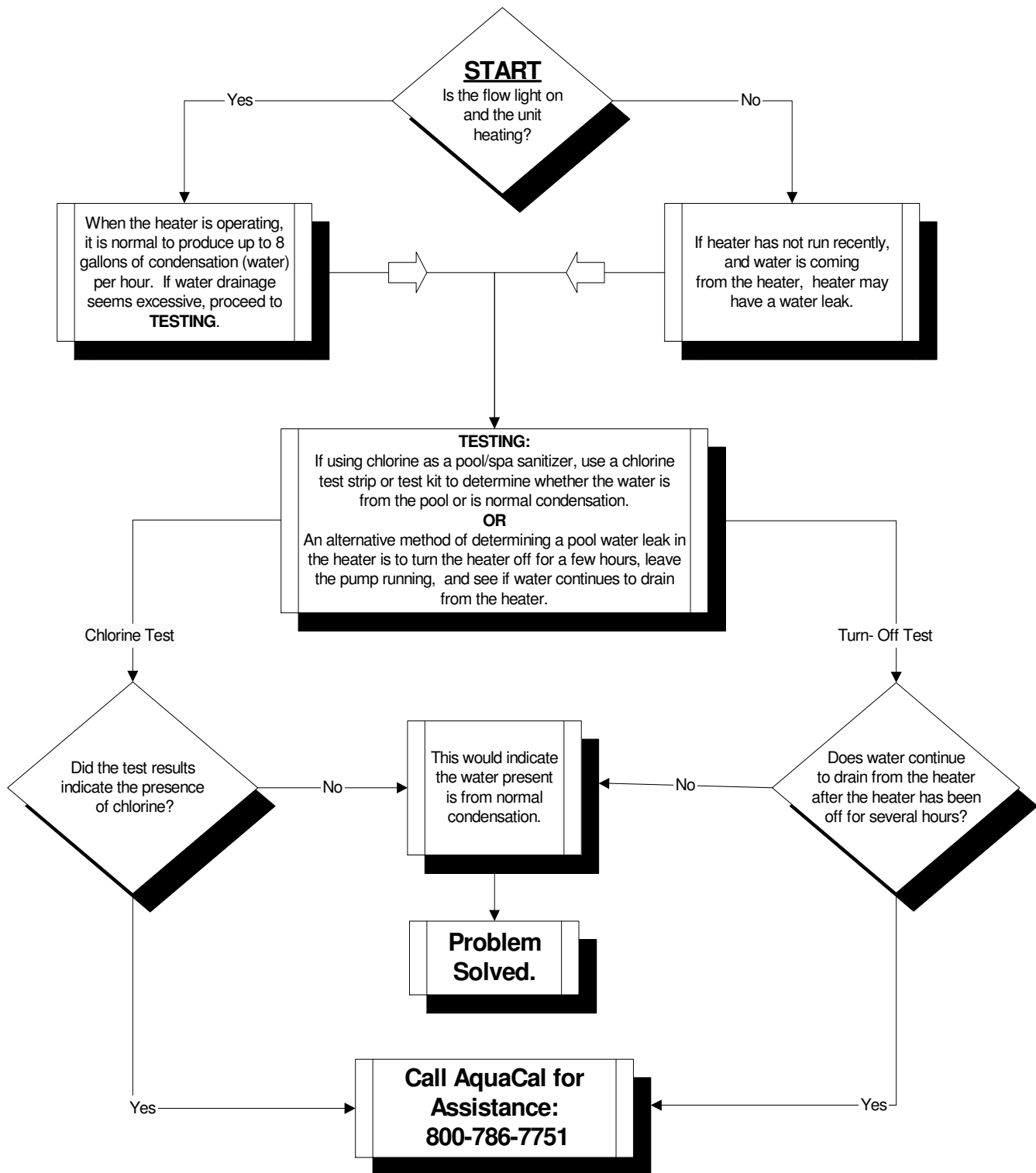
Heater Running but Not Heating

Analog or Digital Controls - 12/22/03



Determining Water Leaks vs. Condensation

All Analog/Digital Air Source Heat Pumps - 12/22/03

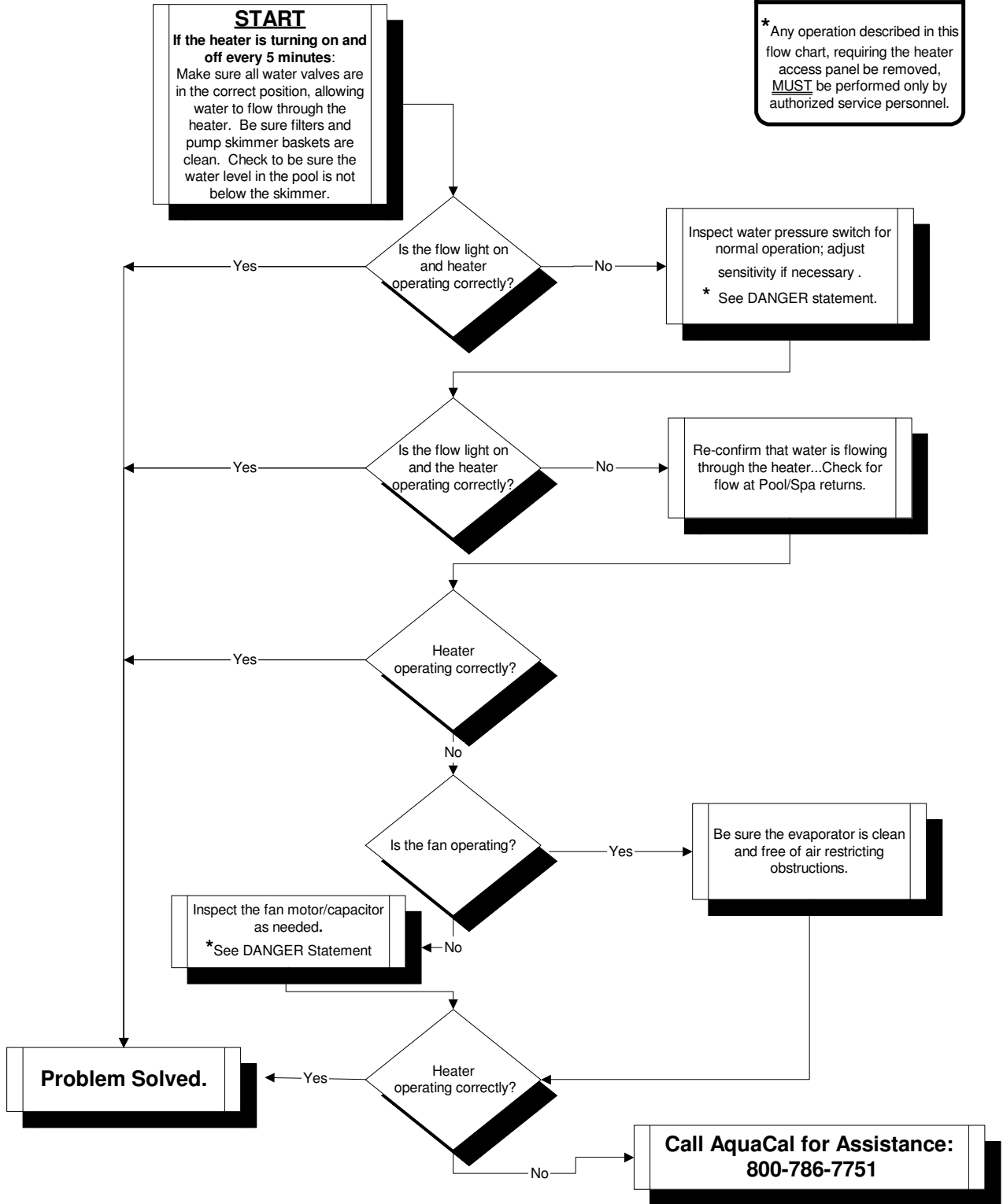


Heater Short Cycling

Analog Controls - 12/22/03

DANGER

* Any operation described in this flow chart, requiring the heater access panel be removed, MUST be performed only by authorized service personnel.



REPLACEMENT PARTS

	VOLTAGE : 1/60/208-230			VOLTAGE : 3/60/208-230		
CONTROL BOX COMPONENTS	T65"X"-A	T115"X"-A	T135"X"-A	T65"X"-B	115"X"-B	135"X"-B
PART DESCRIPTION	PART NUMBER			PART NUMBER		
THERMOSTAT,HONEYWELL POTTED	6270	6270	6270	6270	6270	6270
THERMOSTAT, AMBIENT AIR (RANCO)	7048	7048	7048	7048	7048	7048
TIME DELAY, 5 MINUTE ON BREAK	6102A	6102A	6102A	6102A	6102A	6102A
TERMINAL BLOCK, 10 LUG WECO	6318	6318	6318	6318	6318	6318
TRANSFORMER, 208/240 - 24 50 VA.	6209	6209	6209	6209	6209	6209
CONTACTOR	6061	6061	61001	6147	6147	6147
CAPACITOR FAN	6051	6051	6051	6051	6051	6051
SWITCH, WATER PRESSURE SPDT	6248	6248	6248	6248	6248	6248
GROMMET, 7/8" BLACK PLASTIC	6022	6022	6022	6022	6022	6022
GROUND LUG, ADR-2	6020	6020	6020	6020	6020	6020
CONNECTOR,SOCK. HOUSING 20 PIN	6276	6276	6276	6276	6276	6276
CAPACITOR, RUN	6056	6057	60500	N/A	N/A	N/A
CONN. 1/2 ST. THRU LIQ. TIGH. HEYCO#3200	6701	6701	6701	6701	6701	6701
LOCKNUT, 1/2 BLK NYLON #NLN12B	9164	9164	9164	9164	9164	9164
TERMINAL BLOCK, 9 POLE WECO	6316	6316	6316	6316	6316	6316
PHASE ROTATION MONITOR	N/A	N/A	N/A	6035	6035	6035
MAJOR COMPONETS	VOLTAGE : 1/60/208-230			VOLTAGE : 3/60/208-230		
	T65"X"-A	T115"X"-A	T135"X"-A	T65"X"-B	115"X"-B	135"X"-B
	PART NUMBER			PART NUMBER		
FAN GRILLE	7109	7109	7109	7109	7109	7109
FAN MOTOR	3114	3114	3114	3114	3114	3114
FAN BLADE	3104	3104	3104	3104	3104	3104
EVAPORATOR COIL	ACP0001	ACP0001	ACP0006	ACP0001	ACP0001	ACP0006
CONTOL BOX PANEL ASSEMBLY	HPA0015	HPA0015	HPA0015	HPA0015	HPA0015	HPA0015
TITANIUM COIL / HEADER FIELD KIT	CDK0008	CDK0009	CDK0010	CDK0008	CDK0009	CDK0010
COMPRESSOR	4323	4623	4729	CR33KQ-TF5-240	4623-TF5	ZR81KC-TF5-235
TSTAT SENSOR / WELL	6105D	6105D	6105D	6105D	6105D	6105D
TXV	REP0007	REP0004	REP0005	REP0007	REP0004	REP0005
BASE-PLASTIC	PCP0018	PCP0018	PCP0019	PCP0018	PCP0018	PCP0019
CONTROL PANEL	HPA0007	HPA0007	HPA0007	HPA0007	HPA0007	HPA0007
FILTER DRIER	2036	2036	2036	2036	2036	2036
PLASTIC, 120 DEGREE COVER, BLACK	PCP0005	PCP0005	N/A	PCP0005	PCP0005	N/A
PLASTIC, 150 DEGREE COVER, BLACK	PCP0004	PCP0004	N/A	PCP0004	PCP0004	N/A
PLASTIC, 90 DEGREE COVER, BLACK	70100	70100	70100	70100	70100	70100

Effective 09/01/2003

To order replacement parts, contact AquaCal Customer Support: (800) 786-7751

CONTACTING THE FACTORY

What We Need to Know When You Call Us

If you should need to call AquaCal for service, please have the following information ready:

Model: _____

Serial Number: _____

Installation Date: _____

Having the above information ready will speed up the service process and allow us to respond more quickly. A brief description of what the unit is, or is not doing, will also help us to help you.

Please contact us at (800) 786-7751. We are here to serve you from 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.

Thank You !





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