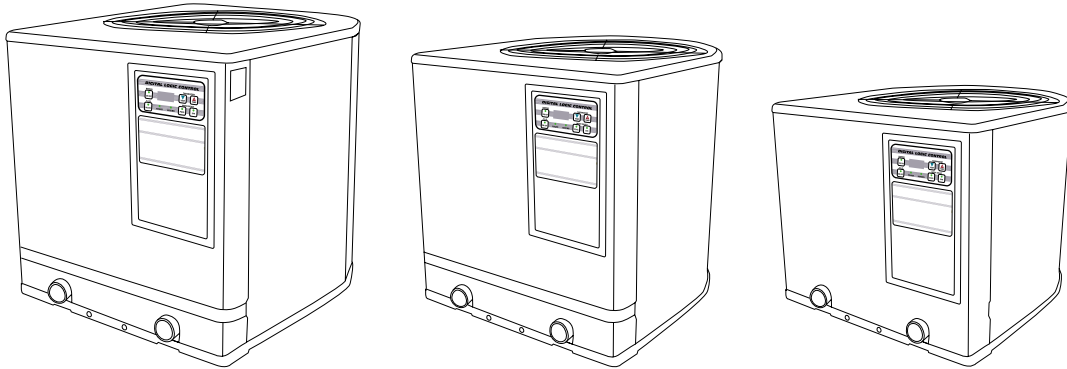
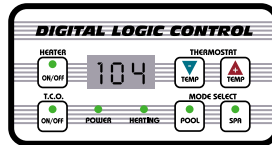


SWIMMING POOL & SPA HEAT PUMPS

INSTALLATION MANUAL

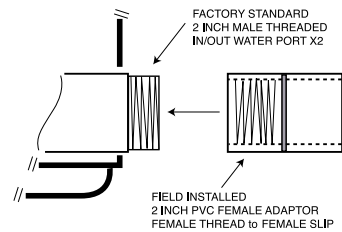


DIGITAL LOGIC™



Model AT800 AT600 & AT400 "BLACK CABINET" with DIGITAL CONTROLS ONLY

**NOTICE: UNIT REQUIRES TWO,
2 INCH FEMALE ADAPTORS
FOR PLUMBING CONNECTIONS !**



INFORMATION

PLACEMENT

PLUMBING

ELECTRICAL

WARNING: Specifications may change without notice. Intended for licensed factory authorized installers only! Users should review separate owners operational manual.



WARNING: Specifications may change without notice.

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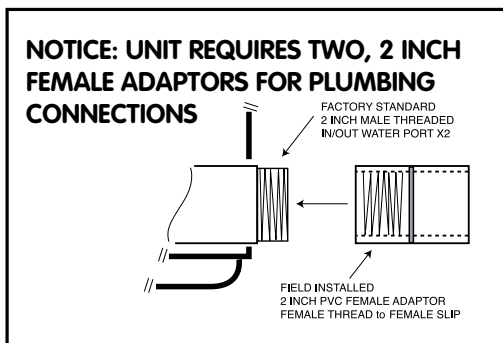
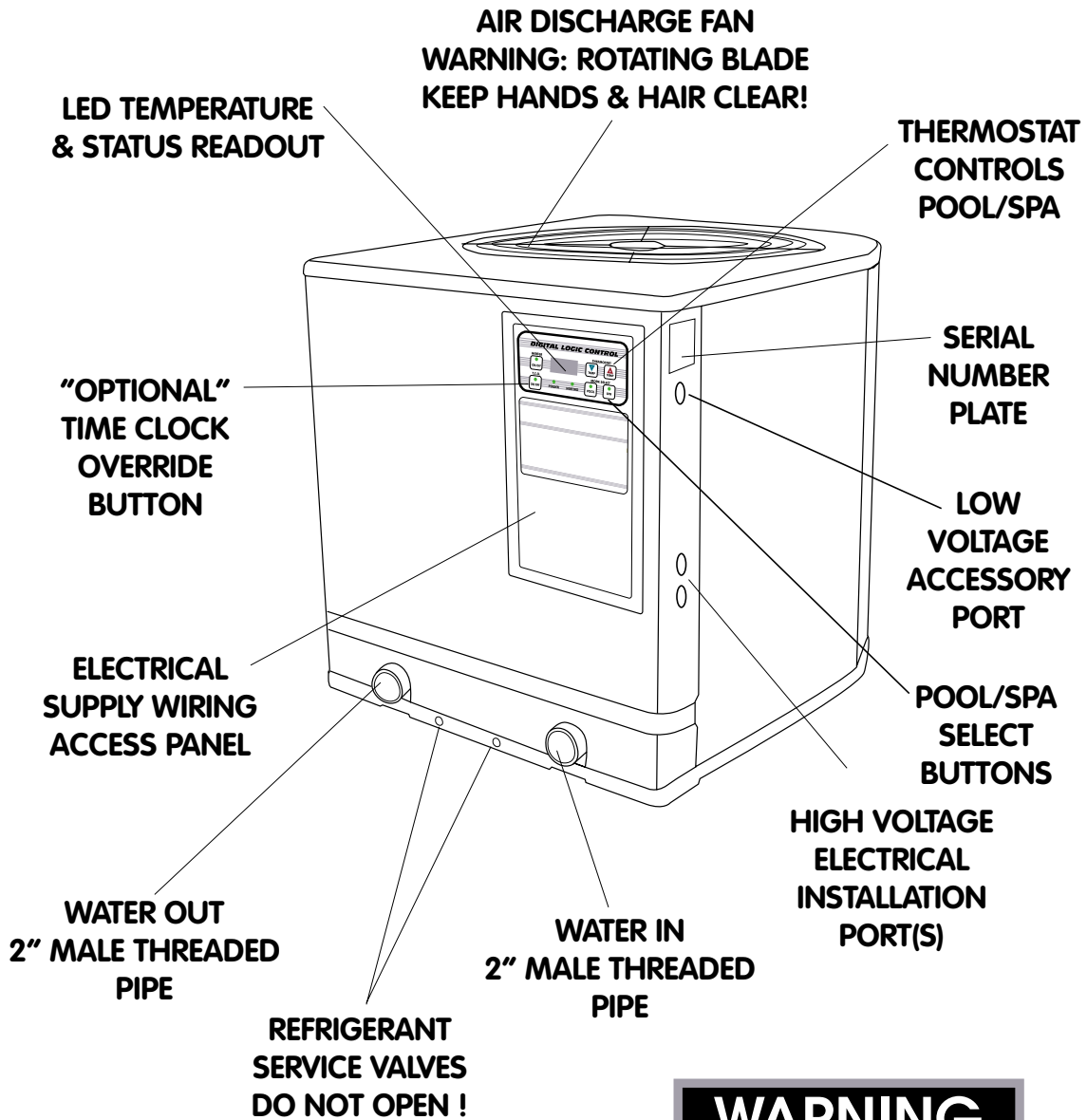


HEAT PUMPS

a Division of Calorex USA L.L.C.
2213 Andrea Lane Ft. Myers FL 33912
888-297-3826 941-482-0606
www.aquathermheatpumps.com
www.calorexusa.com

Written & Illustrated by Michael Glore

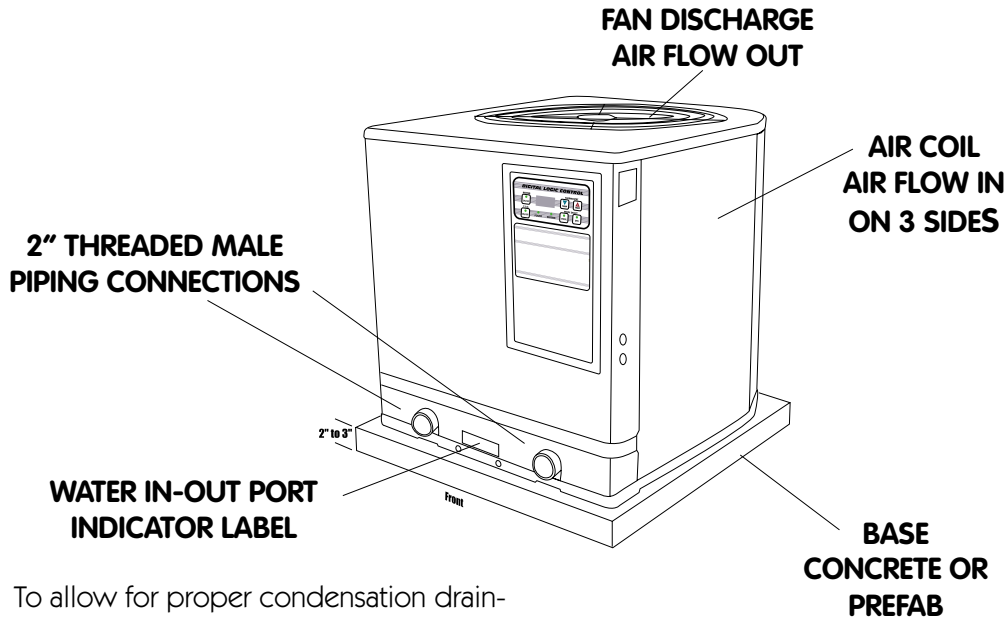
Unit Description



WARNING

DANGER FROM ELECTRICAL SHOCK & ROTATING FAN !
SHUT OFF ALL POWER BEFORE SERVICING !
CAUTION: MORE THAN ONE DISCONNECTION MAY BE REQUIRED TO ELIMINATE ALL POWER TO THIS UNIT INCLUDING POWER TO THE OPTIONAL TIME CLOCK OVERRIDE !

Heat Pump Placement & Clearances



1. To allow for proper condensation drainage, use a level slab to elevate the heat pump to at least the same height as the pool filter system slab or 2 to 3 inches "minimum" above grade.

2. Allow the minimum air flow clearances on top and the sides as shown here. Make sure the unit can "breathe" well. Do not install indoors or where the discharge air can accumulate and be drawn back through the heater. **Make sure the front is accessible for future service.**

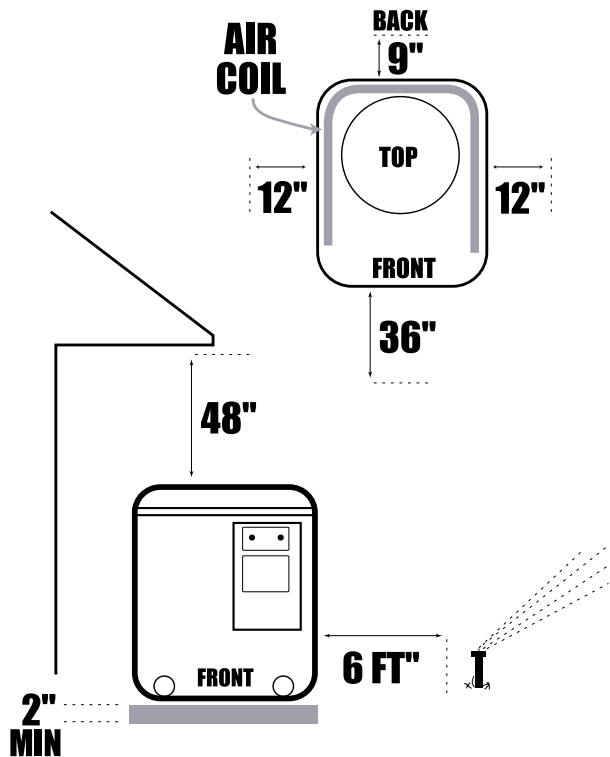
3. Keep sprinkler heads at least 6 feet away from the heat pump. Do not allow the sprinkler to spray the unit in any way to prevent damage.

4. If the unit is installed under a sharp roof pitch or under a roof valley without a gutter, a gutter or diverter should be fitted to prevent excessive water from rushing through the unit.

5. Keep all plants and shrubs trimmed away from the heater to the minimum clearances shown here to prevent air coil damage.

6. If the heater is installed above or below the pool water level by more than 3 feet you may require an external water flow switch. See the bottom of page 7 for more information.

Minimum Air Flow & Access Clearances



Plumbing & Water Connections

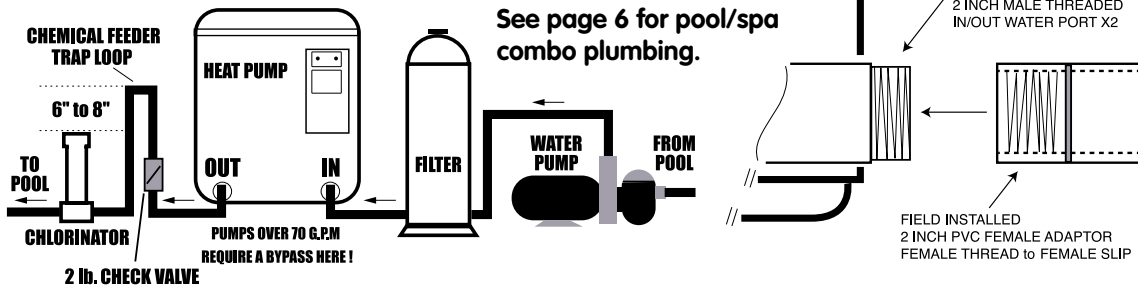
For a simple pool only or spa only, install the plumbing piping as shown:

Connections from factory are 2" threaded male pipe, requiring 2 inch female adaptors, see diagram.

Use teflon tape and pipe sealer. Tighten hand tight plus 1/4 to 1/2 snug tight with pliers.

Water **IN** on the **RIGHT**, Water **OUT** on the **LEFT**,

PLUMB AFTER the **FILTER** & **BEFORE** any **CHLORINATORS** or **CHEMICAL FEEDERS**



Be sure to install a **CHECK VALVE & CHEMICAL TRAP LOOP** as shown. The loop should be at least 6 to 8 inches above the chlorinator/feeder top to prevent chlorine backup into the heater when the water pump is off. Install a 2# check valve on the heater side of the loop as shown above to prevent chlorine from damaging it. All feeders should be installed at the **same or below the heater piping elevation** to prevent chemical back up into the heater.

DO NOT : Install the heater down stream from any chemical feeders.

DO NOT : Allow chemical feeders on the suction side of the water pump.

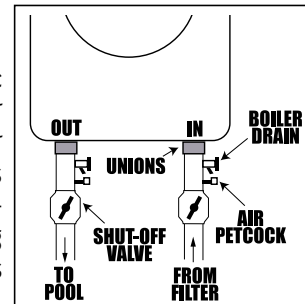
DO NOT : Allow any chemicals or chlorine to be fed through the skimmer.

DO NOT : Allow the pool water pH to go below 7.4. **DO NOT** allow the alkalinity to go below 90 p.p.m.

DO NOT : Allow the chlorine to go above 5 p.p.m. for extended periods. Chemical damage is not covered by and may void warranty.

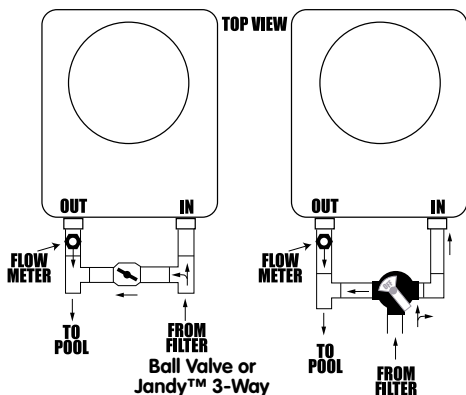
Freezing Condition Plumbing

In areas where extended freezing conditions exist, the heater must be plumbed as shown so it can be winterized. Water left inside the heater will freeze and cause damage. Plumb in a union, shut off valve, a boiler drain and a air petcock valve on the water in and water out lines as shown here. Isolate the heater with the shut off valves and use pressurized air to clear the heat exchanger of all water. In areas where freezing conditions are temporary, the water pump should be set to run 24 hours to prevent freezing. Freeze damage will void warranty.



Bypass for Flow Rates Over 70 G.P.M.

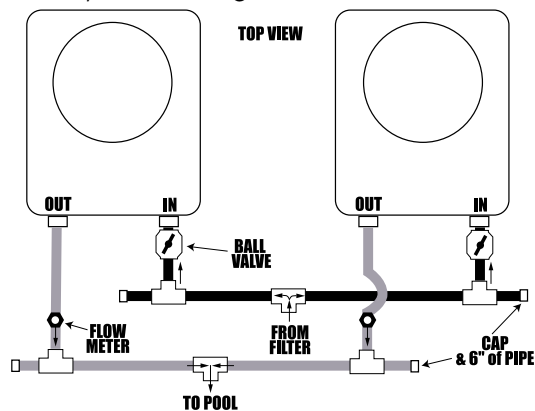
Typically the automatic internal water bypass can handle up to a 1.5 H.P. water pump or 70 G.P.M. If the water pump exceeds 1.5 H.P. then install either of the optional bypasses as shown below.



The installation of a flow meter on the **WATER OUT** line is suggested. Adjust the bypass to divert a minimum of 40 to 50 G.P. M. through the heater. Flow meters should be installed per the manufacturers instructions.

Multi Unit Water Connections

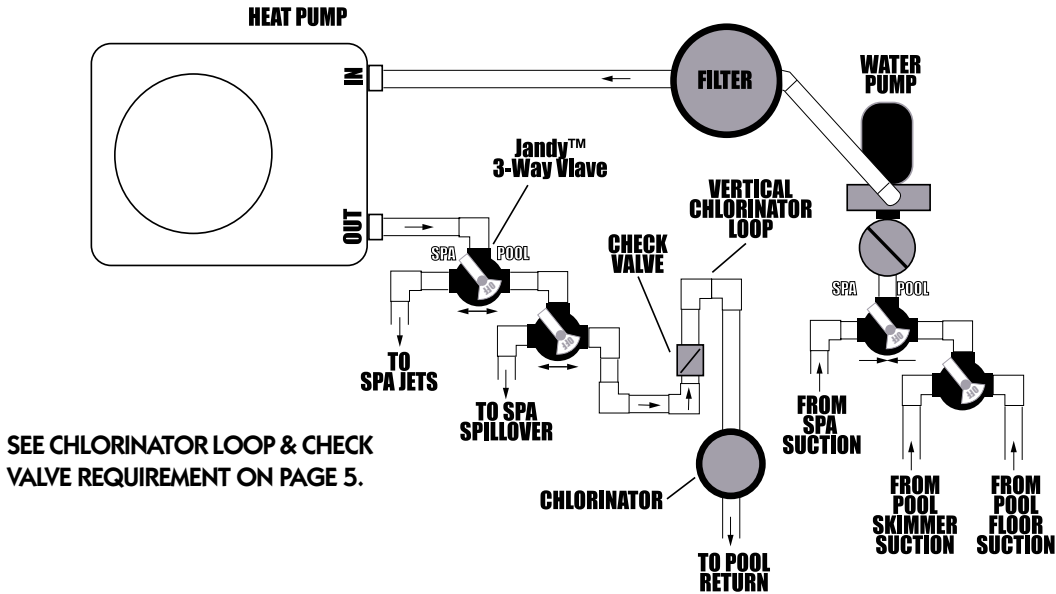
Plumb multiple units as shown below. Use flow meters on each **WATER OUT** line if two or more units are plumbed together.



Use ball valves to balance the water flow through each unit. Using T's, caps and a minimum 6 inch pipe extension on the plumbing manifold will help equalize the water flow better than 90's. Flow meters should be installed per the manufacturers instructions.

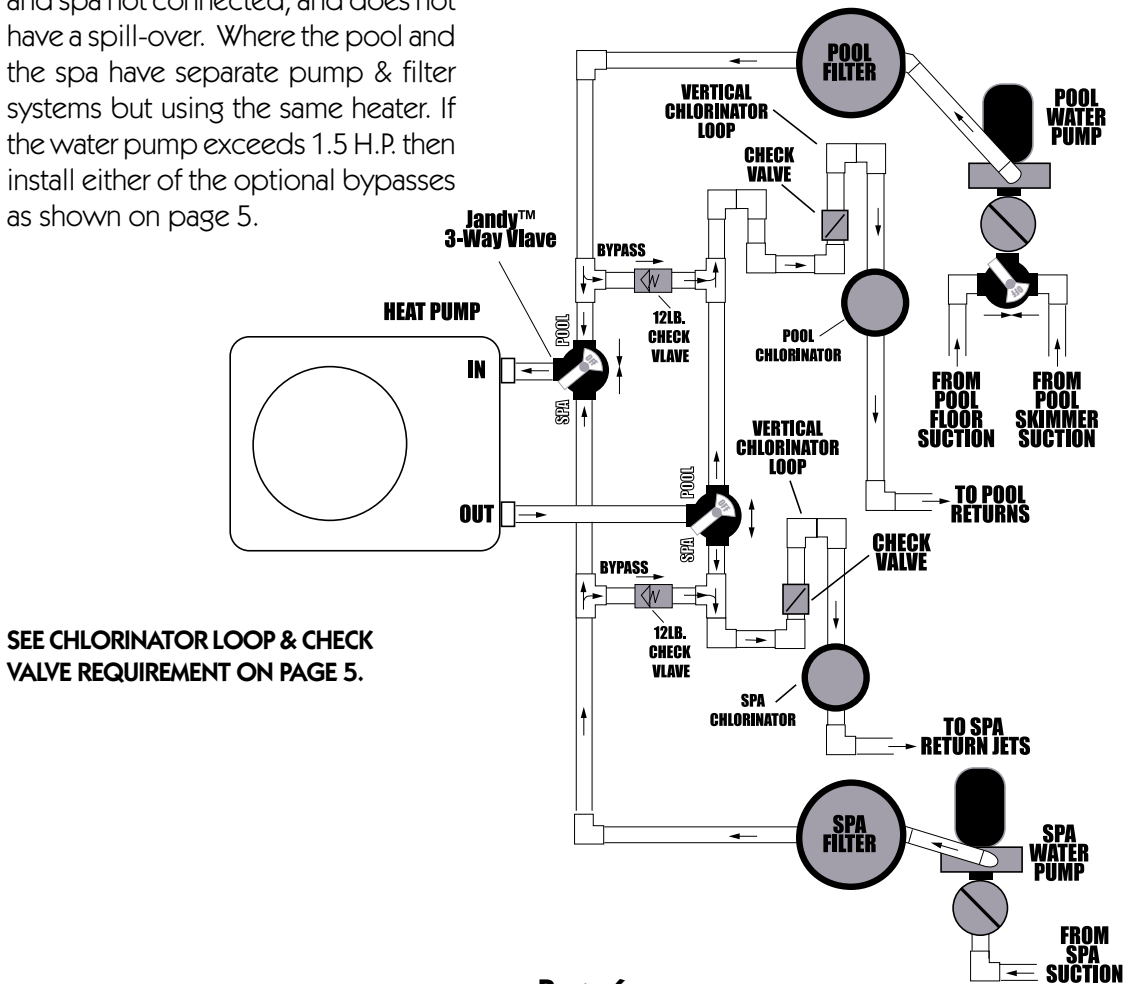
Plumbing & Water Connections for Pool/Spa Combinations

Use this diagram for a connected pool and spa, where the spa has a spill over type waterfall into the pool. Where one pump and one heater is used for either the pool or the spa. If the water pump exceeds 1.5 H.P. then install either of the optional bypasses as shown on page 5.



Plumbing & Water Connections for Separate Pool & Spa

Use this diagram for a separate pool and spa not connected, and does not have a spill-over. Where the pool and the spa have separate pump & filter systems but using the same heater. If the water pump exceeds 1.5 H.P. then install either of the optional bypasses as shown on page 5.



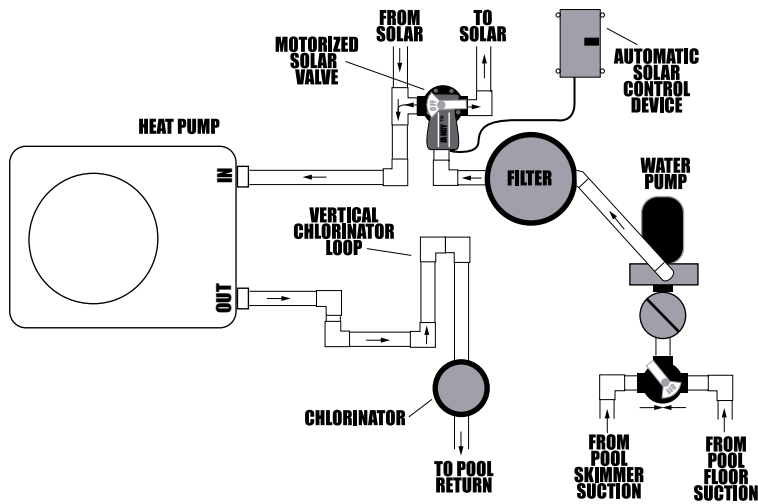
Plumbing & Water Connections with Solar

Plumbing for a system where a solar pool heater is installed. It is strongly advised that an automatic solar control device be used when used with the heat pump.

The heat pump and solar can be operated together. The heat pump will share the heating load with the solar. If there is no heat coming from the solar panels, the solar control device will turn off the solar by rotating the motor valve, otherwise it should be turned off manually. The heat pump will then maintain the pool/spa temperature.

To use the heat pump as a backup to the solar, set the heat pump thermostat 2 to 4 degrees below the solar's target temperature setting. Therefore, if the solar is not maintaining water temperature, the heat pump will come on to assist the solar. Some thermostat fine tuning may be required by the user.

If the water pump exceeds 1.5 H.P. then install either of the optional bypasses as shown on page 5.

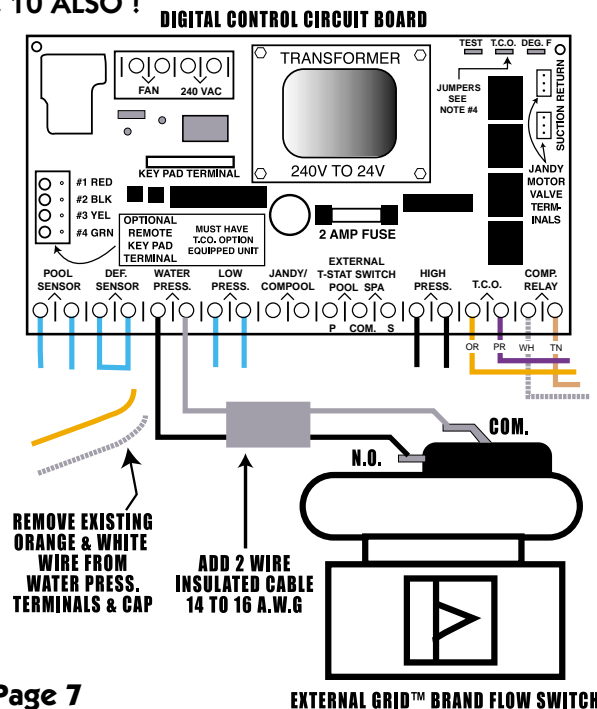
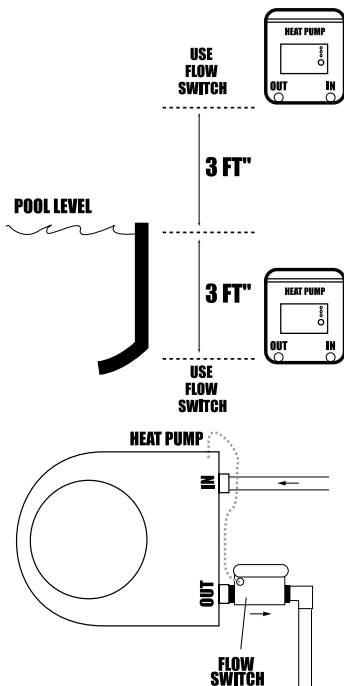


NOTE: If the solar is operated on cloudy days, while raining, at night or at low air temperatures, it may cool the pool or spa. A automatic solar control will shut the solar off when there is no solar activity, otherwise it should be shut off manually during these times.

Plumbing & Water Connections for Above or Below Water Level

If you install the heat pump above or below the pool or spa water level by more than 3 feet, the internal water pressure switch may be effected by the static pressure of the pool water. In some cases it may be necessary to install a water FLOW switch. The water flow switch is not effected by changes in water pressure but only water movement. We suggest installing a 2", Grid Brand Model 20 flow switch and disabling the internal water pressure switch. Plumb in the flow switch as shown here. Then run a TWO wire insulated cable from the flow switch into the heater and attach to the existing water pressure switch leads located behind the large service panel and wire as shown below.

REVIEW UNIT WIRING DIAGRAM ON PAGE 10 ALSO !



Electrical Connections & Wiring

The AT800, AT600 & AT400 require a MINIMUM of #8 A.W.G. copper stranded wire, (or larger if needed.)

You must increase the wire size under low voltage, high amp draw, and/or long-run conditions as required by National Electrical Code.

You must bond the heater externally to the pool/spa steel as required by local codes. A bonding lug is located on the bottom front exterior of the unit. **NOTE :** See wiring diagram on page 10. See page 20 for factory specification listings also.

WARNING

**DANGER FROM ELECTRICAL SHOCK & ROTATING FAN !
SHUT OFF ALL POWER BEFORE SERVICING !
CAUTION: MORE THAN ONE DISCONNECTION MAY BE REQUIRED TO ELIMINATE ALL POWER TO THIS UNIT INCLUDING POWER TO THE OPTIONAL TIME CLOCK OVERRIDE !**

BREAKER & WIRE SIZE RECOMMENDATION

**AT800 & AT600: 50 AMP BREAKER & #8 A.W.G. WIRE OR LARGER
AT400: 50 AMP BREAKER & #8 A.W.G. WIRE OR LARGER
ALL WIRE MUST BE COPPER STRANDED
POWER DISCONNECT SHOULD BE WITHIN 6 FEET OR CLOSER TO THE HEATER !**

TIME DELAYS

**3 minute compressor delay on break & power up.
30 second compressor delay when switching pool/spa modes.
5 minute compressor delay when T.C.O. enables in pool mode.
5 minute T.C.O. delay when: switching from spa to pool mode, when temperature is reached in pool mode, or if LF (low water flow) is displayed on LED.
When HP is displayed unit must be turned off then back on to reset.**

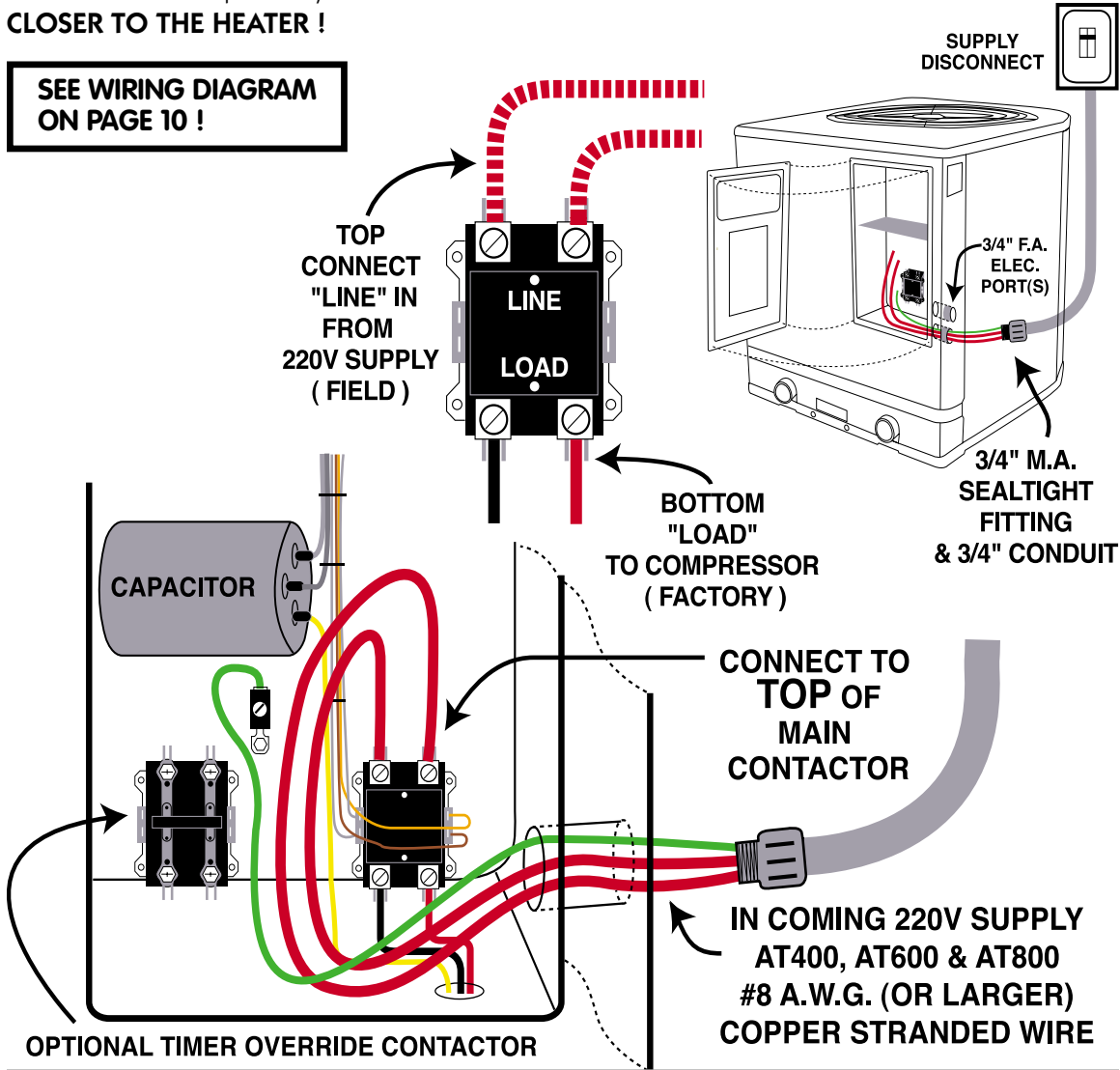
3 PHASE COMPRESSOR WARNING

3 Phase Compressor Models Are Rotation Sensitive! Use Refrigerant Gages! Do Not Go By Fan Rotation Since It Will Always Be Single Phase!

Electrical Connections & Wiring, Continued

The heater has a 3/4" threaded female access port on the left side of the heater. The access port at the top is for low voltage only! The bottom run a 3/4" conduit from the main power supply to the heater. Run the proper wire size from the main supply to the heaters main contactor. The main contactor is in the bottom of the high voltage compartment. If the unit has the optional time clock override there will be two contactors. The contactor on the right is for the main power supply. If there is a contactor on the left, it will be for the optional time clock override feature shown on page 11, 12 & 13. **POWER DISCONNECT SHOULD BE WITHIN 6 FEET OR CLOSER TO THE HEATER !**

SEE WIRING DIAGRAM ON PAGE 10 !



DANGER FROM ELECTRICAL SHOCK & ROTATING FAN ! SHUT OFF ALL POWER BEFORE REMOVING ANY PANELS ! CAUTION: MORE THAN ONE DISCONNECTION MAY BE REQUIRED TO ELIMINATE ALL POWER TO UNIT INCLUDING POWER TO THE OPTIONAL TIME CLOCK OVERRIDE !

EXTERNAL BONDING REQUIREMENTS

A #8 A.W.G. solid copper "BOND" wire coming from the pool/spa reinforcing steel must be attached to the external bond lug at the bottom of the heaters cabinet to meet electrical code. This bond wire can usually be found attached to the existing pool/spa water pump. Do not confuse this with the internal "ground" wire !

Installation for "Optional" Time Clock Override (T.C.O.)

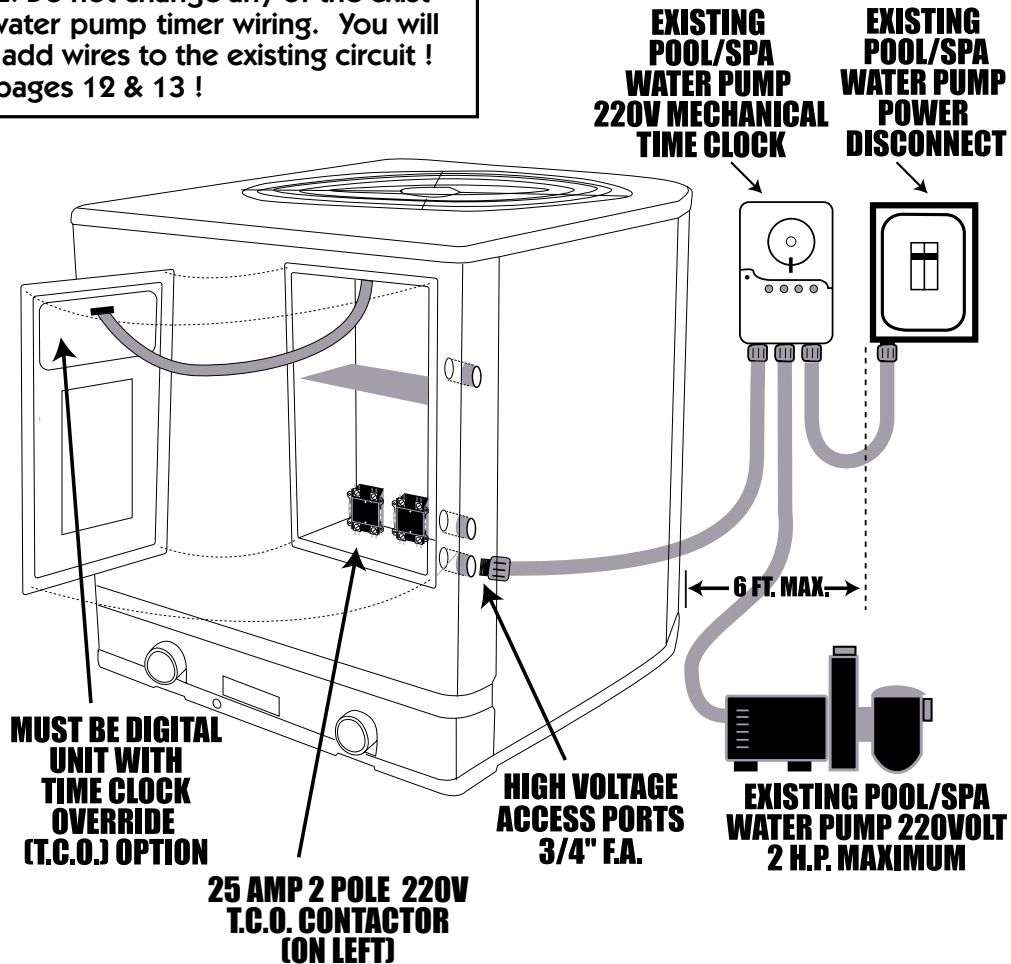
"OPTIONAL" WATER PUMP TIME CLOCK OVERRIDE OPERATION

Since the heater will only heat while the water pump is running, the Time Clock Override option is available to automatically start the water pump when the nits thermostat is calling for heat. When the T.C.O. button is set to the ON mode, the Time Clock Override feature will start the water pump whenever the pool requires heat. Once the pool is up to the set temperature the heater will stop and then 5 minuets later the water pump will stop. When this button is set to the OFF mode, the heater will operate only when the water pump is running during the timed period set on the time clock.

* WARNINGS *

- Shut off power too heater and water pump first !
- Water pump and timer must be 220 volts !
- Wire size should be a minimum or #12 A.W.G. copper stranded or larger !
- The water pump power disconnect must be within 6 feet maximum of the heater !
- Do not connect water pumps exceeding 2 horse power and/or 20 Amps maximum.
- Do not remove any existing water pump or water pump timer wires !
- Do not cross phase power legs or short will occur and breaker will trip!

NOTE: Do not change any of the existing water pump timer wiring. You will only add wires to the existing circuit ! See pages 12 & 13 !



INSTALLATION: Always shut off main power disconnect to the heater AND the water pump first. Then, install 3/4" conduit between the heater and the mechanical water pump time clock. You will be adding four wires to the existing water pump time clock. Wire size should be a minimum of 12 A.W.G. and be of different suggested colors such as: Red, Black, Yellow and Blue through the conduit. See pages 12 & 13 also,

Time Clock Override (T.C.O.) Installation (Cont.)

Attach wires as shown, see page 13 also.

RED- Time Clock LINE #1
to T.C.O. Contactor Top Left Line

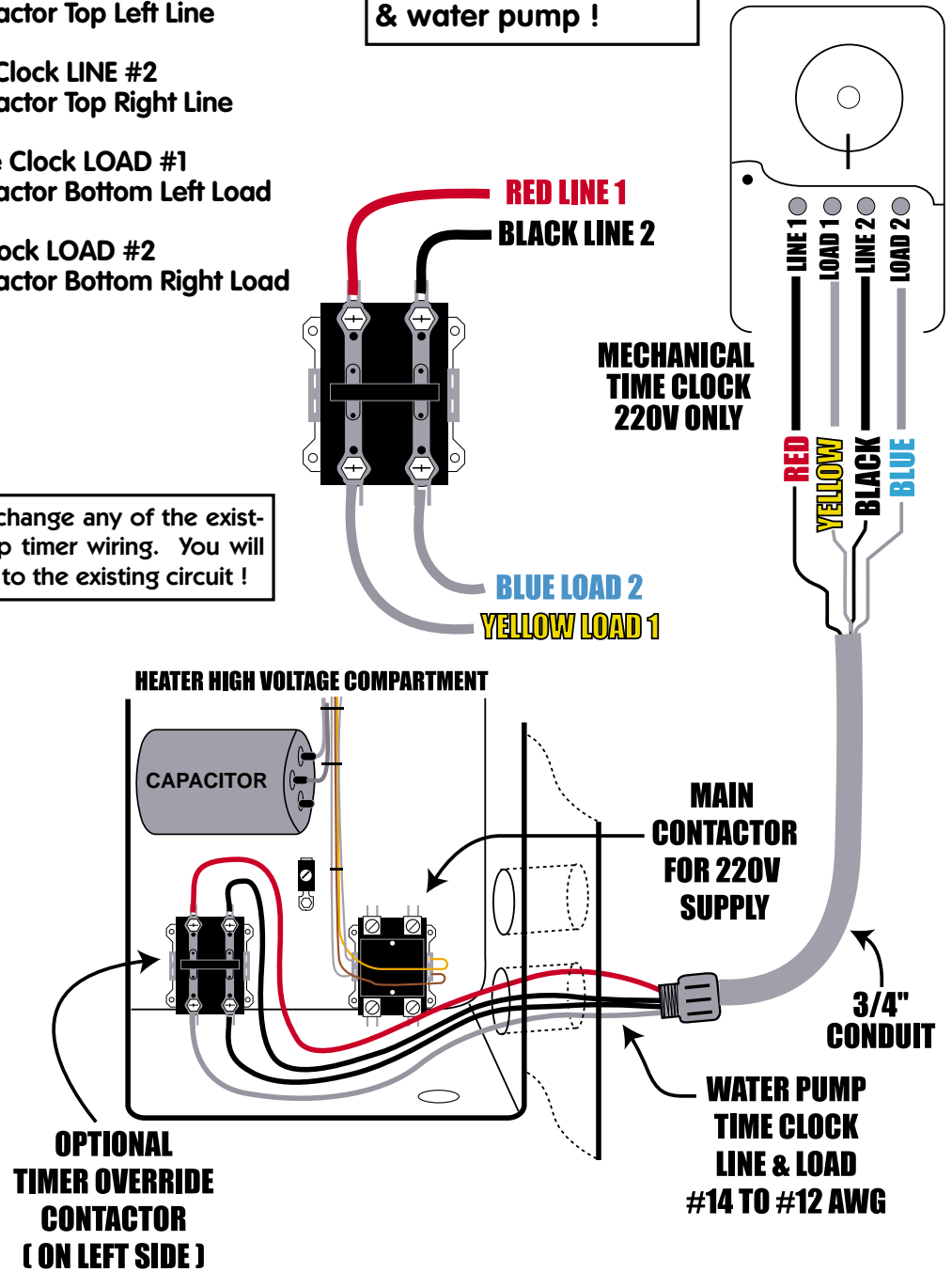
BLACK- Time Clock LINE #2
to T.C.O. Contactor Top Right Line

YELLOW- Time Clock LOAD #1
to T.C.O. Contactor Bottom Left Load

BLUE- Time Clock LOAD #2
to T.C.O. Contactor Bottom Right Load

**Shut off main power
disconnect for heater
& water pump !**

NOTE: Do not change any of the existing water pump timer wiring. You will only add wires to the existing circuit !

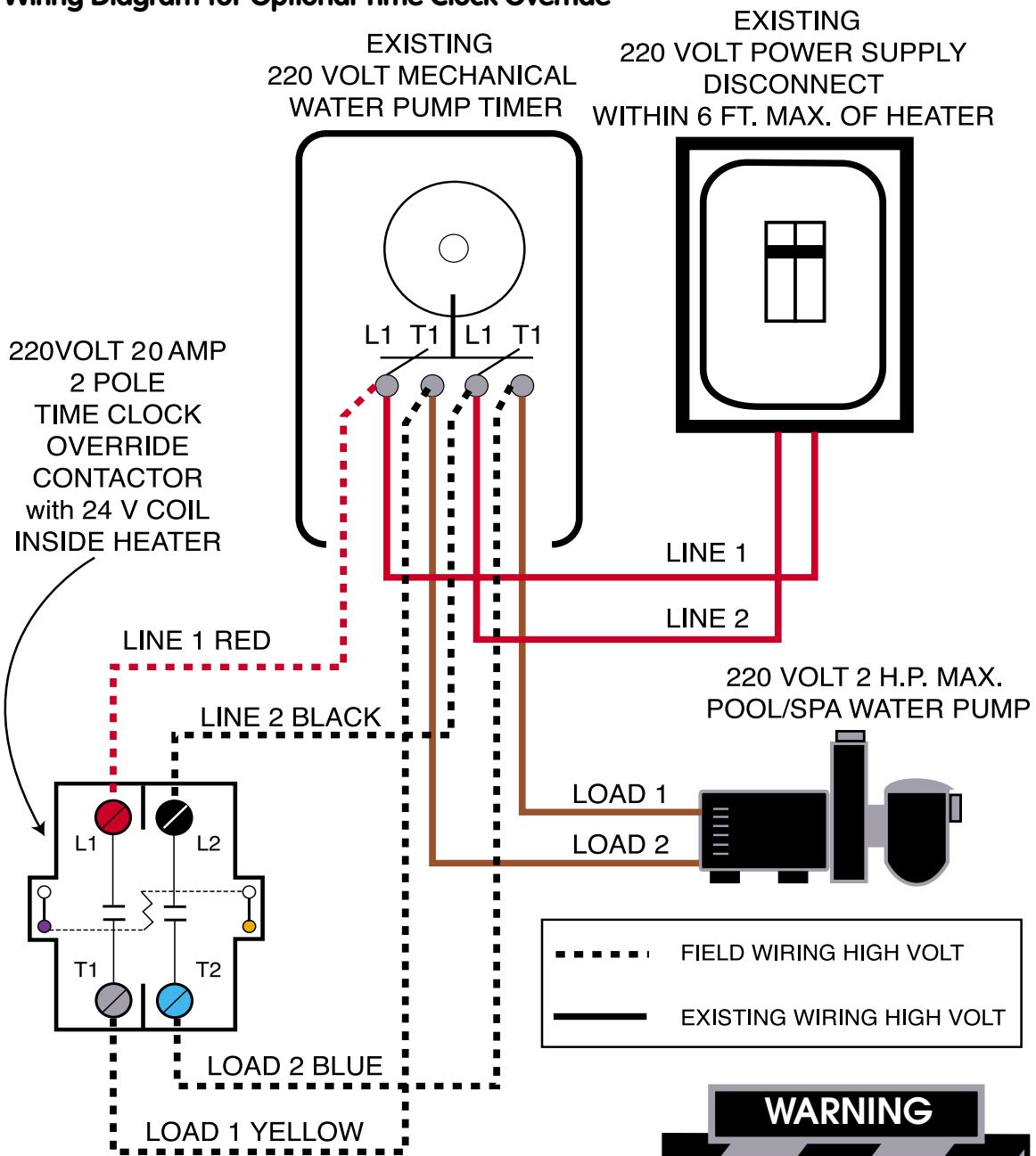


NOTE: T.C.O. works best if used during cooler weather conditions where the pool is loosing more than 8 to 10 degrees over night or when the pool is being heated from "dead cold".

NOTE: If the T.C.O. starts the water pump and the thermostat does not continue to call for heat for at least 5 minuets, the control will shut the water pump and heater off. Thereafter it will not re-attempt to start the water pump for 4 hours. This 4 hour delay can be bypassed by pressing the T.C.O. button off then back on.

NOTE: When the T.C.O. button is activated while in "spa mode" the water pump will run the entire time you are in spa mode. When you switch back to pool mode there will be a 5 minute delay before the water pump shuts off.

Wiring Diagram for Optional Time Clock Override



NOTE:
Do not change any of the existing water pump timer wiring. You will only add wires to the existing circuit !

* WARNINGS *

- Shut off power too heater and water pump first !
- Water pump and timer must be 220 volts !
- Wire size should be a minimum or #12 A.W.G. copper stranded or larger !
- The water pump power disconnect must be within 6 feet maximum of the heater !
- Do not connect water pumps exceeding 2 horse power and/or 20 Amps maximum !
- Do not remove any existing water pump or water pump timer wires !
- Do not cross phase power legs or short will occur and breaker will trip!

WARNING

DANGER FROM ELECTRICAL SHOCK & ROTATING FAN !

CAUTION: MORE THAN ONE DISCONNECTION MAY BE REQUIRED TO ELIMINATE ALL POWER TO THIS UNIT INCLUDING POWER TO THE OPTIONAL TIME CLOCK OVERRIDE !

SHUT OFF ALL SOURCES OF POWER BEFORE SERVICING !

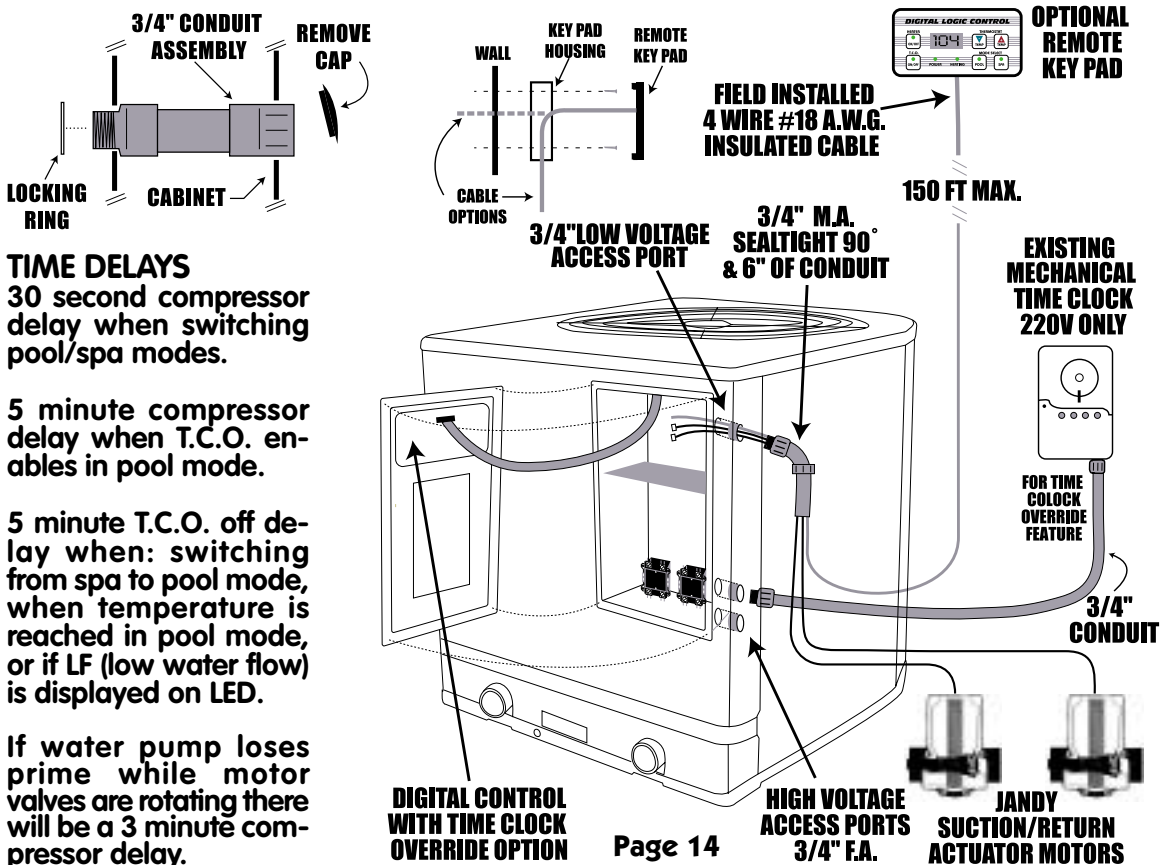
Optional Remote Key Pad Control Wiring Instructions

for "Digital Logic" Digital Control Models with Time Clock Override Option Only

The AT800, AT600, & AT400 with "Digital Logic" digital control models having the External Optional Time Clock Override feature can be retrofitted with our simple, "Remote Key Pad" control. This Remote Key Pad is identical to the key pad on the heater. **The heater must have the time clock override option to use the remote key pad !** The Remote Key Pad will perform the all the same functions as the heater's key pad: Heater on/off. Pool temperature readout. Thermostat settings for pool & spa. Activation of two field installed Jandy™ 2440 actuator motors via pool/spa select buttons. NOTE: The water pump can be activated via the time clock override button. When spa mode is selected, the water pump will start and stay running constantly while in spa mode. When in pool mode, the time clock override will only run the water pump when the thermostat calls for heat.

Installation of the Remote Key Pad is as follows: First, the time clock override feature must be wired to the heater as shown on pages 11 - 13. Next, mount the Remote Key Pad a maximum of 150 feet from the heater in a dry location at least 6 feet away from the pool/spa water. The Remote Key Pad is not water resistant and therefore must be kept dry ! Next, remove the 3/4" threaded cap on the low voltage conduit port. To prevent water penetration, attach a 3/4" M.A., 90 degree compression type fitting and a minimum 6" of flex conduit to the 3/4" female adaptor on the top right hand side of the heater. Make sure it is pointing it downward. Use epoxy sealer to seal the conduit. Next, run a 4 wire, #18 gage (minimum wire size) insulated cable from the Remote Key Pad through this conduit. Attach the Remote Key Pad wires to the heater's solid state circuit board as shown on page 15. **WARNING: Improper connection of the Remote Key Pad wires will short out the control system BE SURE THIS IS DONE CORRECTLY !!!**

Assuming the plumbing is similar to the schematics on page 6 and Jandy brand 3-way valves are in place, you can install two Jandy actuator valve motors. Install one on the suction valve and one on the return valve. Label the piping on either side of the motor valves (pool or spa) so the valve position can be identified by the user. The actuator motor wires should ran through the same conduit and should be installed (plugged into) the heater's solid state circuit board as shown on page 15. **You do not have to have the remote key pad to install Jandy actuator motors.**



TIME DELAYS

30 second compressor delay when switching pool/spa modes.

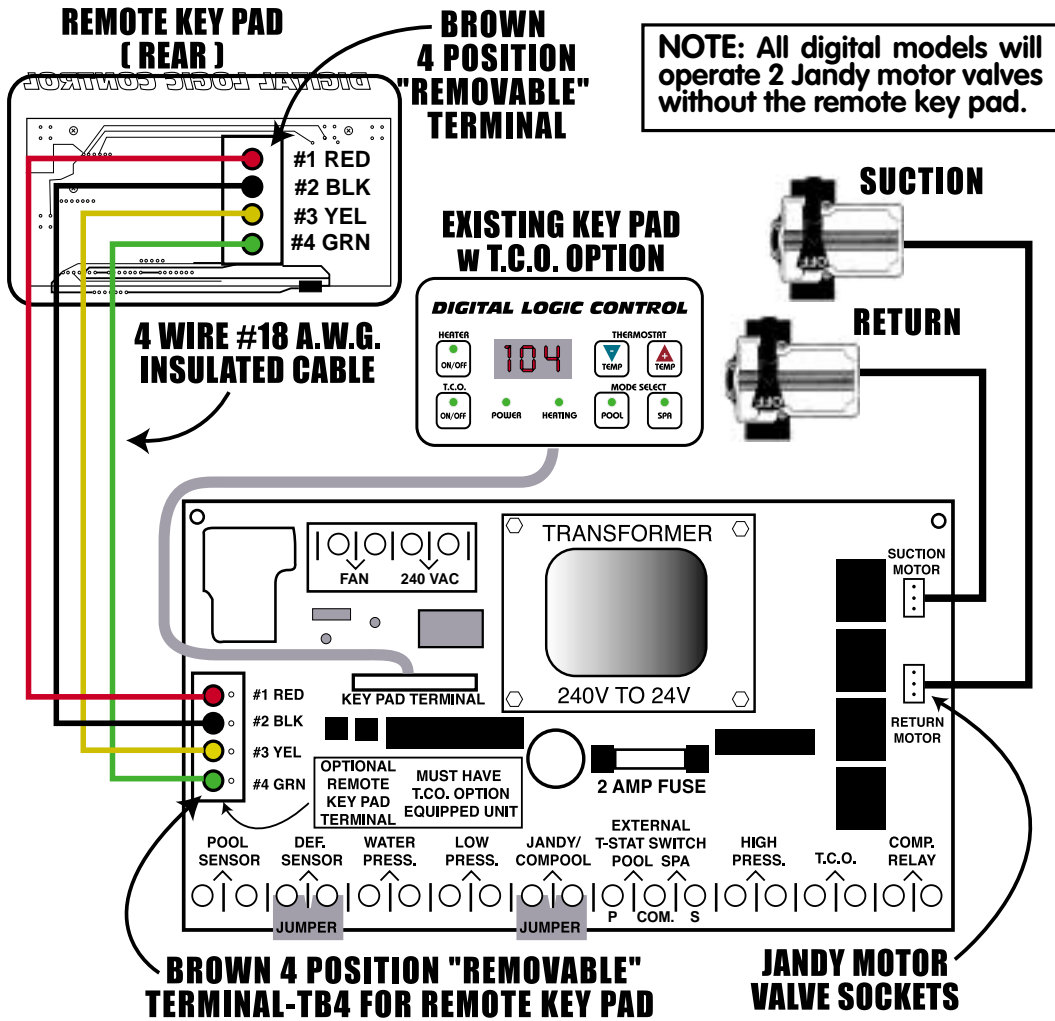
5 minute compressor delay when T.C.O. enables in pool mode.

5 minute T.C.O. off delay when: switching from spa to pool mode, when temperature is reached in pool mode, or if LF (low water flow) is displayed on LED.

If water pump loses prime while motor valves are rotating there will be a 3 minute compressor delay.

Optional Remote Key Pad Control Wiring Diagram

for "Digital Logic" Digital Control Models with Time Clock Override Option Only



WARNING: Improper connection of the Remote Key Pad wires will short out the control system, BE SURE THIS IS DONE CORRECTLY !!

Route all wires through the heater's low voltage access ports as shown on page 10. Attach the 4 wire, (#18 gage minimum wire size, 150 foot maximum length) insulated cable to the "brown" 4 position terminal located on the heater's solid state circuit board inside the low voltage compartment (top section). Attach the other end of the cable to the "brown" 4 position terminal located on the backside of Remote Key Pad in the same order:

- #1 RED
- #2 BLACK
- #3 YELLOW
- #4 GREEN

NOTE: The "brown" 4 position terminal can be unplugged from the solid state circuit board and from the rear of the remote key pad for easier wiring.

Plug-in the Jandy motor valve wire leads to the appropriate sockets (suction/return) on the heater's solid state circuit board as shown above. Route all wires through the heater's low voltage access ports as shown on page 14.

NOTE: The motor valves will turn when the pool/spa select buttons are pressed. The time clock override will activate the water pump and keep it running when spa mode is selected. **There will be a 30 second compressor time delay when the pool/spa select buttons are pressed to allow the motor valves to rotate completely. There will be a 5 minute T.C.O. off delay when: switching from pool to spa mode, when temperature is reached or if the water pump loses prime and LF is displayed on the LED panel.**

Interfacing "Digital Logic" Digital Control Models with: Jandy™ AquaLink RS & Compool

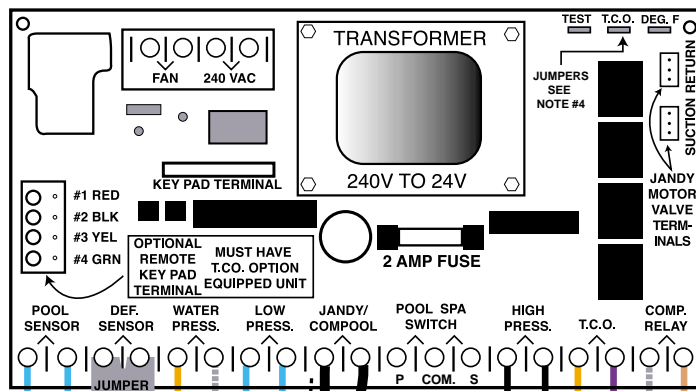
To interface the "Digital Logic" digital control heat pump models with the Jandy™ AquaLink RS series or Compool, run a 2 wire (16 A.W.G. or larger) insulated cable from the device to the heat pump.

Remove the 6 screws from the heaters front service access panel and open. Look for the heater's solid state circuit board located inside the top portion of the electrical compartment mounted on the rear wall. Locate, remove and discard the "METAL JUMPER TAB" attached to the bottom terminal bar and labeled "Jandy/Compool". Then, attach the 2 wire cable coming from the AquaLink RS or the Compool control to the 2 position terminal where the metal jumper tab was prior.

NOTE for AquaLink RS and Compool: Turn both heater thermostats all the way up and set the mode selector switch to pool and do not use the heater controls as the Jandy or Compool now has thermostat control over the heater.

for AquaLink

Attach the 2 wire cable to positions #1 and position #2 on the 10 slot, green terminal bar inside the AquaLink's power center. *See the controllers installation guide also.



for Compool

Attach the 2 wire cable to the Compool's power center board located on the terminals labeled "HTR". *See the controllers installation guide also.

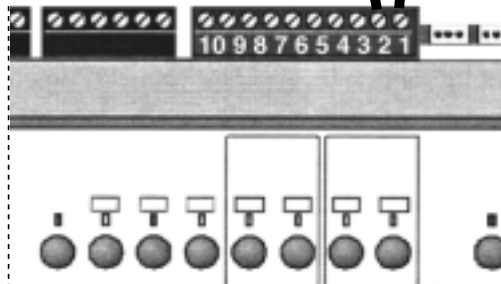
**for AQUALINK/COMPOOL
REMOVE METAL JUMPER**



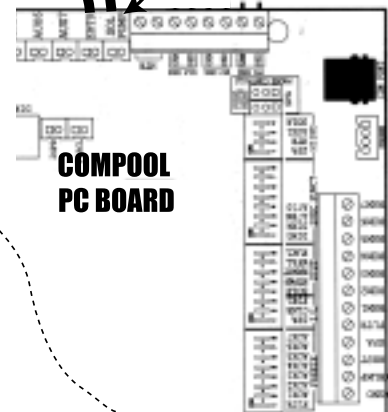
**2 WIRE CABLE
#14-16 AWG**

**TERMINAL BAR
"HTR" POSITIONS**

**GREEN TERMINAL BAR
POSITIONS 1 & 2**



JANDY AQUALINK PC BOARD

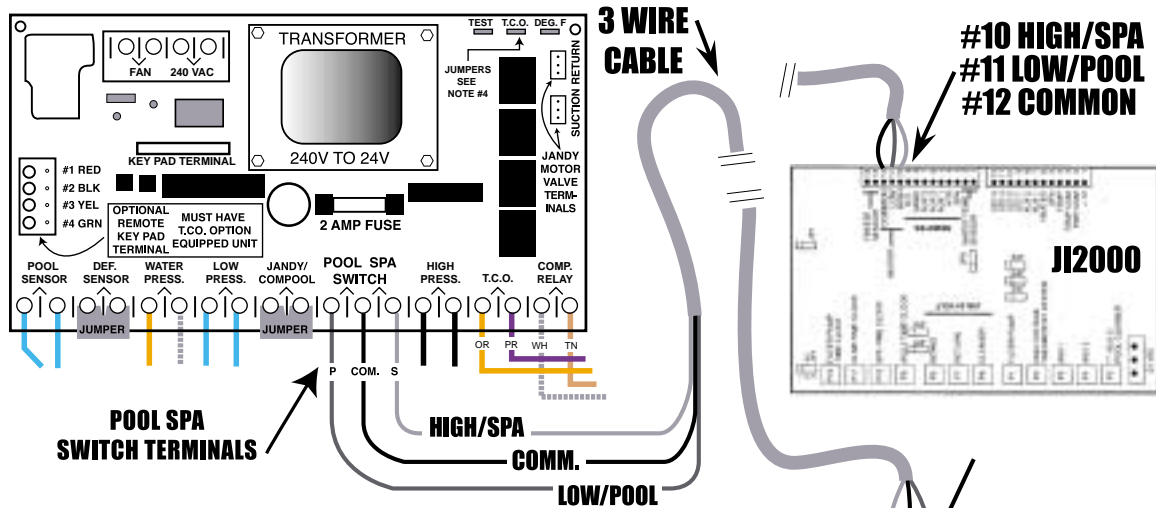


**COMPOOL
PC BOARD**

Note: The pool light on the heater's key pad will flash when an external device has control of the heater.
*See wiring diagram on page 10.
*See the controller's installation guide also.

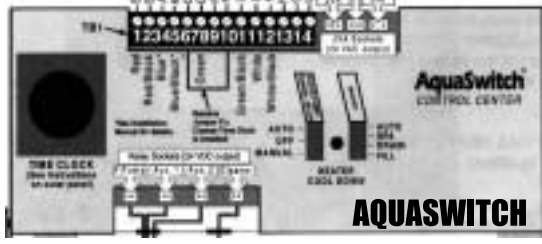
Interfacing "Digital Logic" Digital Control Models with: Aquaswitch or JI2000

If you are using a Jandy AquaSwitch or JI2000 control run a 3 wire cable from the control to the heater. Remove the 6 screws from the heater's front service access panel and open. Look for the heater's solid state circuit board located inside the top portion of the electrical compartment mounted on the rear wall. Locate the 3 terminals labeled POOL SPA SWITCH. Attach the 3 wire cable as shown below. Do not remove any jumpers.



NOTE: The control will switch between pool and spa thermostats.

Most remote control brands that do not have a thermostat control will hook up similar to the Jandy™ products.
(Pool/Comm/Spa or Low,Comm,High)



Next, attach the 3 wire cable to the **HEATER** to the three terminal positions labeled POOL SPA SWITCH
LEFT POSITION= LOW/POOL
CENTER POSITION= COMMON
RIGHT POSITION= HIGH/SPA

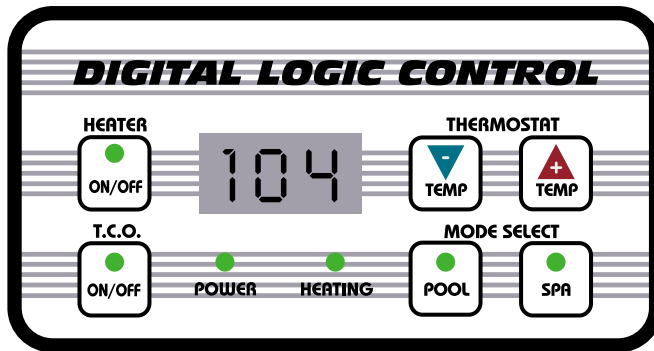
Attach the other end of the 3 wire cable to the **JI2000** as follows:
#10 For the HIGH/SPA
#11 For the LOW/POOL
#12 For the COMMON

Attach the other end of the 3 wire cable to the **AquaSwitch** as follows:
#12 For the HIGH/SPA
#13 For the COMMON
#14 For the LOW/POOL

Note: The pool light on the heater's key pad will flash when an external device has control of the heater.

- *See wiring diagram on page 10.
- *See the controller's installation guide also.

"Digital Logic" Digital Control Panel Information



LED READOUT:

When the unit has power the green power light will be on and the LED will display the current water temperature.

THERMOSTAT BUTTONS:

Pressing the + button will raise the set temperature. Pressing the - button will lower the set temperature. When either button is pressed the LED display will begin to flash. The flashing numbers indicate the thermostat setting.

MODE SELECT BUTTONS-POOL or SPA: The heater has two thermostat modes for two different desired temperature settings, one for pool mode and one for spa mode. If you do not have a spa you can use the pool mode only. If you do have a spa, you can connect two Jandy™ motorized plumbing valves as shown on page 11. Therefore when you select either mode the motorized valves will turn to isolate the heater to either the pool or spa. NOTE: There is a 30 second compressor when switching pool/spa modes.

"OPTIONAL" WATER PUMP TIME CLOCK OVERRIDE OPERATION When the T.C.O. button is set to the ON mode, the Time Clock Override feature is designed to start the water pump whenever the pool requires heat. Once the pool is up to the set temperature the heater will stop and then 5 minutes later the water pump will stop. When this button is set to the OFF mode, the heater will operate only when the water pump is running during the timed period set on the time clock. NOTE: The time clock override works best if used during cooler weather conditions where the pool is losing more than 8 to 10 degrees over night or when the pool is being heated from "dead cold". NOTE: If the time clock override starts the water pump and the thermostat does not continue to call for heat for at least 5 minutes, the control will shut the water pump and heater off. Thereafter, it will not re-attempt to start the water pump for 4 hours. This 4 hour delay can be bypassed by pressing the T.C.O. button off then back on. NOTE: When the T.C.O. button is activated while in "spa mode" the water pump will run the entire time you are in spa mode. When you switch back to pool mode there will be a 5 minute delay before the water pump shuts off. The T.C.O. option is built into the heater at the factory and can not be added later.

GREEN POWER LIGHT: This light indicates that the heater has control power. WARNING: This is not a line power indicator and caution should be used since more than one power disconnection may be required to isolate the heater electrically. WARNING: If the optional Time Clock Override is installed, you must shut off the water pumps main power disconnect as well.

GREEN HEATING LIGHT: This light indicates that the unit is heating and the compressor is running. The compressor starts after a 3 to 5 minute time delay. NOTE: The water pump must be running at the same time in order for the heater to run.

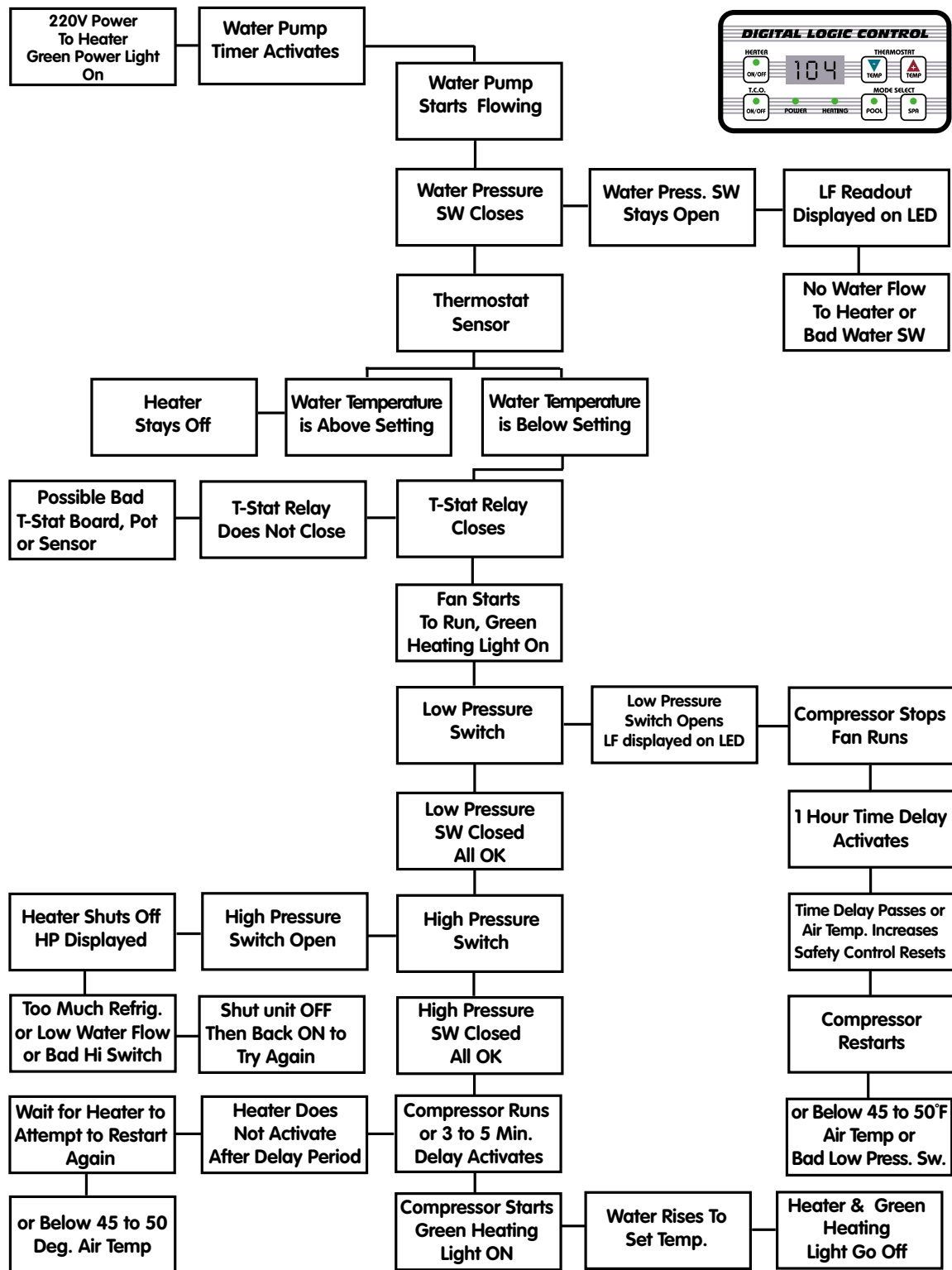
LED STATUS CODE READOUTS:

LF This light indicates there is no water flow through the heater. The heater is designed to shut off whenever the water pump is not pumping water through the heater. If **LF** is on while the water pump is running, the water pump may not be supplying enough flow for the heater to operate properly. During normal operation, the heater will only run if the water pump is running.

bF This readout indicates that the internal defrost safety control has disabled the heater. During cold weather where the air temperature drops below approximately 45 to 50 degrees (depending on humidity), the low refrigerant pressure switch (or defrost control) is designed to disable the compressor only. Once the unit is in defrost mode the compressor will shut off for 1 hour while the fan continues to help deice and warm the air coil. After 1 hour the compressor will attempt to restart. If the air temperature has increased to the operational range the compressor will continue to run, otherwise the compressor will return to the defrost mode for another 1 hour delay cycle.

HP this readout out indicates high refrigerant pressure. The high refrigerant pressure switch is designed to shut the compressor and fan off if a heat buildup occurs for whatever reason. Typically the high refrigerant pressure switch will trip if the water flow through the heater is restricted. It may also trip if the air flow is restricted through the heater. **When HP is displayed the heater will be disabled until is reset by resetting it off then back on.**

Operational Sequence & Troubleshooting Flow Chart for "Digital Logic" Digital Control Models



TIME DELAYS

30 second compressor delay when switching pool/spa modes.

5 minute compressor delay when T.C.O. enables in pool mode.

5 minute T.C.O. off delay when: switching from spa to pool mode, when temperature is reached in pool mode, or if LF (low water flow) is displayed on LED.

If water pump loses prime there will be a 3 minute compressor delay.

When HP is displayed unit must be turned off then back on to reset.

Factory Specifications

Model Number	AT600	AT400
BTU Output	108,000*/102,000**	92,000*/84,000**
Coefficient of Performance	6.0*/4.9**	6.4*/5.5**
Copeland Scroll™ Compressor	ZR67 w/ Receiver Tank	ZR54 w/ Receiver Tank
Heat Exchanger Condenser	Cupronickel Alloy-Water / Copper-Exterior	
Air Coil Evaporator	Oversized: Copper Tube w Lanced Fin	
Fan Motor	1/4 H.P. @ 1.6 Amps	
Air Flow	4000 C.F.M. w/ Cowling Venturi	
Kilowatt Input	5.8 Kw/Hour	4.4 Kw/Hour
Electrical (208/240v/60Hz)	Single Phase	Single Phase
Typical Running Amps	27.4 Amps	20.4 Amps
Minimum Circuit Ampacity	37 Amps	35 Amps
Min/Max Breaker Size	40/50 Amps	40/50 Amps
Min. Copper Stranded Wire Size	#8 A.W.G. or Larger	#8 A.W.G. or Larger
Min/Max Water Flow	20/70 GPM, Over 70 G.P.M. or 1.5 H.P. Add External Bypass	
Water Plumbing	2" Full Flow w Internal Automatic Bypass	
Refrigerant Charge	R22	R22
Cabinet Construction	Corrosion Proof Molded ABS	
Ship Weight	305 Lbs.	279 Lbs.
Dimensions	35H x 31W x 34L	29H x 31W x 34L
Model Number	AT800	
BTU Output	112,000*/104,000**	
Coefficient of Performance	6.3*/5.3**	
Compressor	Copeland Scroll™ ZR67 w/ Receiver Tank	
Heat Exchanger Condenser	Cupronickel Alloy-Water / Copper-Exterior	
Air Coil Evaporator	Oversized Mt. Holly Gold™ Polyester Clad	
Fan Motor	1/4 H.P. @ 1.6 Amps	
Air Flow	4200 C.F.M. with Built In Cowling Venturi	
Kilowatt Input	5.5 Kw/Hour	
Electrical (208/240v/60Hz)	Single & Three Phase	
Typical Running Amps	26.1 Amps / (18.5 Amps @ 3 Phase)	
Minimum Circuit Ampacity	37.8 Amps / (25.4 Amps @ 3 Phase)	
Min/Max Breaker Size	40/50 Amps / (25/35 Amps @ 3 Phase)	
Min. Copper Stranded Wire Size	#8 A.W.G. or Larger	
Min/Max Water Flow	20/70 GPM, Over 70 G.P.M. or 1.5 H.P. Add External Bypass	
Water Plumbing	2" Full Flow w Internal Automatic Bypass	
Refrigerant Charge	R22	
Cabinet Construction	Corrosion Proof Molded ABS	
Ship Weight	324 Lbs.	
Dimensions	37H x 31W x 36L	

WARNING: THREE PHASE MODELS:

3 Phase Compressor Is Rogation Sensitive! Use Refrigerant Gages!
Do Not Go By Fan Rotation Since It Will Always Be Single Phase!



HEAT PUMPS

a Division of Calorex USA L.L.C.
2213 Andrea Lane Ft. Myers FL 33912
888-297-3826 941-482-0606
www.aquathermheatpumps.com
www.calorexusa.com

* Optimum output & efficiency typical of Florida conditions. Ratings outside the scope of P.H.P.M.A. heat pump pool heater certification program. ** Rated and certified in accordance with A.S.H.R.A.E. standard 146-1998 and P.H.P.M.A. addendum test procedure.



Specifications may change without notice.
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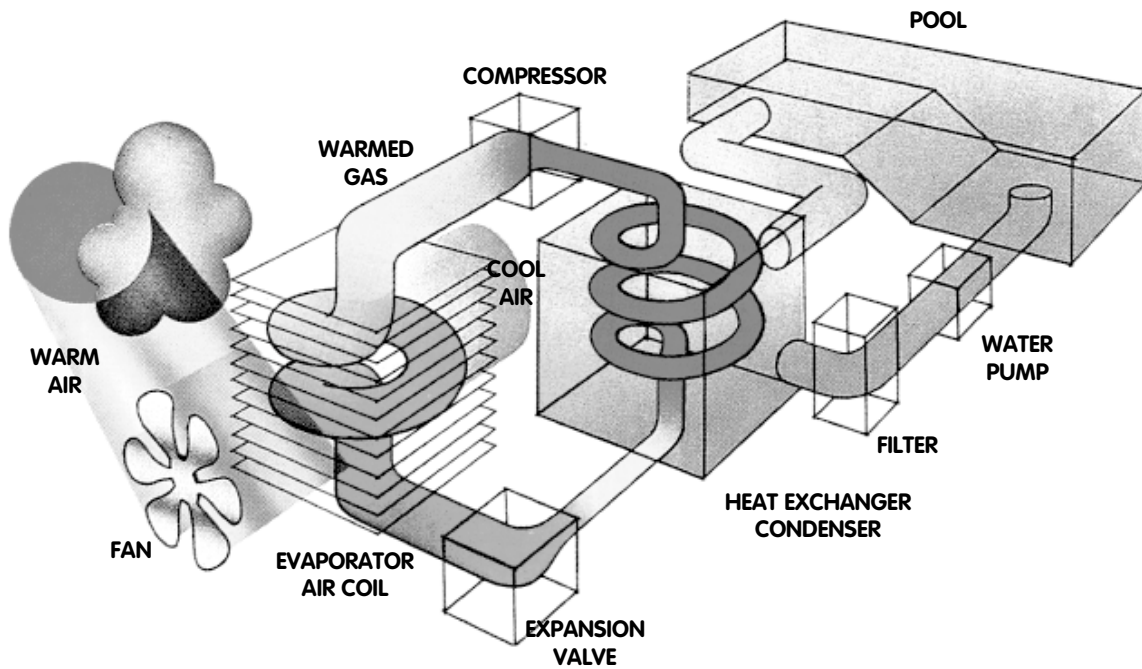
How Does A Heat Pump Warm A Pool ?

A swimming pool & spa pump utilizes proven refrigerant technology to capture the heat in the outside air and transfers it to the pool water. Refrigerant is used because of its ability to absorb and transfer heat energy.

The **fan** circulates air through the outer **evaporator air coil** that acts as a heat collector. The liquid refrigerant in the air coil absorbs the available heat in the ambient air, transforming it into a gas. The refrigerant gas is then pumped into the **compressor**. When this warmed gas is compressed, it intensifies or concentrates the heat, like a magnifying glass in the sun.

This intensely hot gas is then pumped into the **heat exchanger condenser**, where the actual heat transfer takes place. As the pool water passes through the heat exchanger, the hot gas gives up its heat to the cooler pool water.

The refrigerant returns to a liquid state and is pumped through the **expansion valve** then into the evaporator air coil to start the process all over again.



RELATIVE POOL HEATING COST COMPARISON

	1	3	5	7	9
H E A T E R T Y P E	<div style="background-color: #cccccc; padding: 5px; margin-bottom: 5px;">AT SERIES</div> <div style="background-color: #cccccc; padding: 5px; margin-bottom: 5px;">OTHER HEAT PUMPS</div> <div style="background-color: #cccccc; padding: 5px; margin-bottom: 5px;">NATURAL GAS HEATERS</div> <div style="background-color: #cccccc; padding: 5px; margin-bottom: 5px;">L.P. GAS HEATERS</div> <div style="background-color: #cccccc; padding: 5px;">ELECTRIC RESISTANCE HEATERS</div>				

How Efficient Is It ?

Operational Cost Comparison for Equal Amounts of Pool Heat

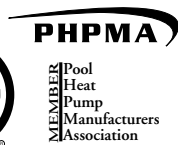
A Heat Pump is the Most Efficient Way to Heat Your Pool

Compared to L.P. gas heaters, a heat pump produces 5 times more heat for every \$1.00 you spend on operation.



HEAT PUMPS

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www.aquathermheatpumps.com
www.calorexusa.com



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