HeatWave & AeroTemp

POO
HEAT UMI

- Heating Only Models -

with Heat Pump Owner

AQ Tech-12/15/03

Owner Notes

Table of Contents

WELCOME TO THE AQUACAL FAMILY

on a a ons on yo se dec s on o a e an A a a ea a yo o e. S nce 8 , A a a as a n a ned e o d de ead n e an ac e s n oo & s a ea s.

o me ea s no on y a ea n es en , b a so e os cos ec e od a a ab e o ea n oo s and s as. o exa e, as a eans o ea oo o s a a e , yo ea s o 400% o e c en an as, and, en co a ed o e ec c es s ance ea , yo ea s nea y 400% o e ec e. o can es ass ed a yo me ea s a y and c ency, and s des ned and b o o de yea s o be e o e a on. Mo eo e , s o d yo dec de yo o d e A a a o o de e a ns ec on and a n enance o yo ea *which we do recommend* yo nd a A a a as e a es and os a e d ac o y a ned se ces a n e oo & s a ea nd s y.

IMPORTANT FEATURES OF YOUR NEW HEAT PUMP

R A M S LL A A R S:

- *ThermoLink™* ea exc an e:

  e ea yo ea s e a en ed *ThermoLink™* ea exc an e. e a y ca e a ea de se s e a e ea exc an e. d na y ea exc an e s a e ade o a c on c e a oy. s c on c e a e a s s ce b e o a ac o e san ze s sed n oo s and s as, and o o e e a ed a e c e s y cond ons. nce ea exc an e a s, e ea s ned. e *ThermoLink™* ea exc an e be s ade o an , and s a y e o s o a e c e s y da a e.

- Sc o o esso :

  Sc o co esso s con a n 50% e o n a s an co on s on y e co esso s. Less o n a s e a es o o ed e ab y. Add ona y, sc o co esso s a e e n o e a on an s on y e co esso s, and o e a e a a cons de ab y e c ency e e .

- M c o ocesso on o :

  ea e, d a based c o ocesso , con o s a e e a e o n ° a e se on. e con o e a so e s e o ed e d e en oo and s a a e e a es, and o e en a e n by oc n o con o s n a ass code.

- o os on oo , o ec ed ab ne

- e a on… o e e a sc o co esso and o a y s zed an b ade.

L AS S A M S A R R B M AM L A R *ALL* A R S, SA RA A A R R A M …

GENERAL SAFETY INFORMATION

sed and a n a med o re y, yo re a o de yea on yea of safe and econo ca se ce. o re re , as any ec an ca o rec ca de ce, o re os f o yo re a *while insuring personal safety for you and others* ce a n o re a ona and a nenance ac o s s be obse ed.

L se, exce n a e no o me ca abe a nenance s *(explained later in this manual),* e a and se ce of yo re a s be e fo ed on y by ex e enced se ce e sonne . S o d yo re o me , s s ec yo re a s no e fo n o re y, by e n o e sec on n s an a en ed: " o b s oo n ", yo be abe o de e me f a ca fo se ce s e ed. o ns a e can be ome so ce of se ce, o A a a s o e S o e sonne s and ead y o ass s yo a : (800) 8 5. o es ons conce n n ns a a on, od f ca ons, o e a on, se ce and 7 e , ease con ac yo ns a e o A a a s o e S o. a an s ay be o ded f e e a e as bee n sed, a n a med, o e a ed o re y.

n add on o oss b e o d n o a an s: na o ed ns a a on e ods, non s anda d od f ca ons, oo o nco ec a nenance, se ce by n a f ed e sonne , o o e se o e e a e ay s n e sona n y and/o o e y da a e. o e sona sa e y and o a o d da a e o en , s o an a sa e y ns c ons d s ayed on e ea , and n s an a , be ead, nde s ood, and fo o ed.

o o s an a e fo o n o sa e y s na s a e aced e e a c a ca e s e ed. ease no e: **"WARNING"** e a es o e sona sa e y, e **"CAUTION"** s na s o o e a o d n da a e o en :

A R N NG	a e o ed e fo o n ay es n e amen n yo dea .
s " a n n " sy bo a ea s n s an a e e s ec a a en on s e ed fo e sona sa e y. *Specific instructions will appear in this box.*	

A L N	a e o ed e fo o n can es n da a e o en.
s " a on" sy bo a ea s n s an a e e s ec a ca e s e ed o a o d e en da a e. *Specific instructions will appear in this box.*	

WATER CHEMISTRY & TEMPERATURE FACTORS

Water Temperature Safety Factors

ARNING	a e o ed e o o n ay es n e amen n yo dea .

o on ed e s on n a e a e ano a body e e a e ay ca se a cond on no n as RM A. e sy o s o y e e a nc de: na a eness o end n aza d, a e o e ce e ea , a e o eco n ze e need o ex s a, and nconsc o sness. e se o a co o , d s, o ed ca on can ea y nc ease e s o a a y e e a. n add on, e sons a n an ad e se ed ca s o y, o e nan o en, s o d cons a ys c an be o e s n a o o s a. d en and e ex e e e de y s o d be s e sed by a es ons b e ad .

Water Chemistry Safety Factors

ARNING	a e o ed e o o n ay es n e amen n yo dea .

o e a e e s y can esen a se o s ea aza d. o a o d oss b aza ds, a n a n oo S a a e e s anda ds be o .

A N	a e o ed e o o n can es n da a e o e en .

e yo ea 's an based ea exc an e o des ea y e o s o ec on a a ns oo a e e s y, o e a e e s y ay ca se ex ens e da a e o s, e s, oo s e , e c. o a o d e en da a e, a n a n oo S a a e e s anda ds be o .

RECOMMENDED CHEMISTRY WATER STANDARDS

o ne……………….:	.0 3.0 n oo s, .5 3.0 n s as	
B o ne……………….:	2.0 4.0 n oo s, 3.0 5.0 n s as	
……………………..:	.4 . n oo s, .2 .8 n s as	
o a A a n y………:	80 40 n oo s, 80 20 n s as	
a c a dness……:	200 400 n oo s and s as	
o a sso ed So ds..:	,000 2,000 n oo s,	
	,500 abo e yo s a S n s as	

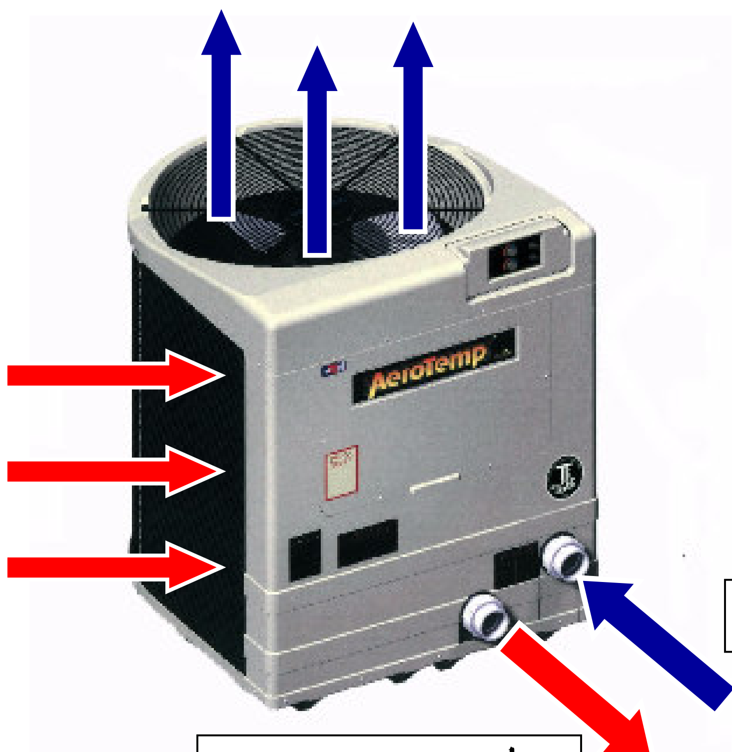
HOW A HEAT PUMP WORKS

[illegible]

A heat pump does Not Make heat…

Heat pumps are so extraordinarily efficient because they do not need to *produce* heat in order to warm your pool or spa water. Rather, heat pumps simply *transfer* heat from the outside air into the pool or spa water. If one considers that absolute "0" *the point where all heat is absent* occurs at 459° Fahrenheit below zero, it becomes evident that outside air *even at the relative cool temperature of 55° Fahrenheit* still contains a great amount of heat energy. It is that abundant heat energy that the heat pump captures and places into your pool or spa.

HEAT REMOVED FROM [illegible] AIR… COLD AIR OUT



HEAT LADEN AIR ENTERS

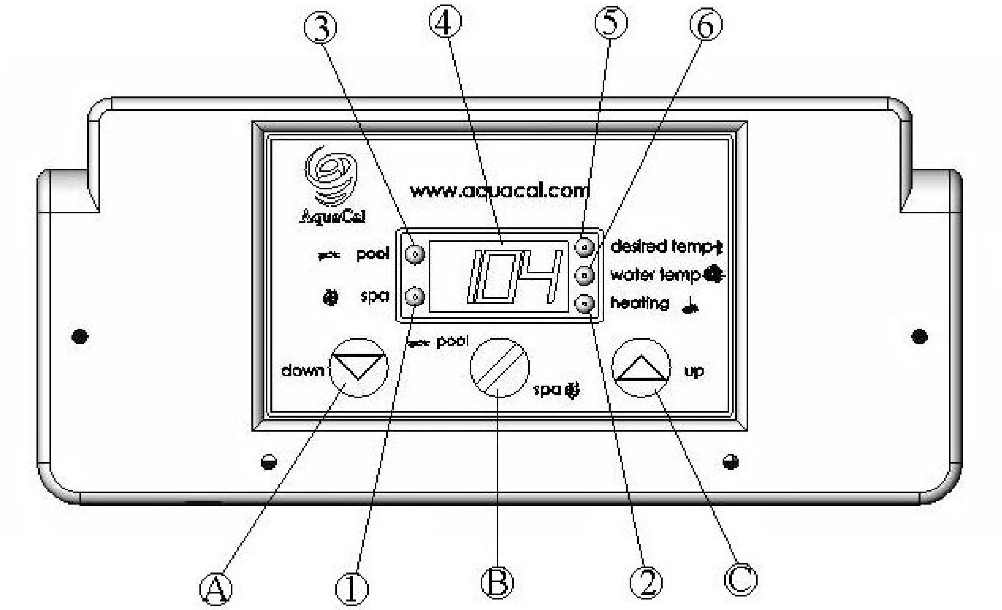
COLD WATER IN

WARMED WATER OUT

NOTE: Water returning to pool or spa will be warmed approximately 2° to 4° F, each pass through.

GETTING FAMILIAR WITH CONTROLS

DIGITAL CONTROLLER – PANEL LAYOUT



Control Buttons *(AS INDICATED BY CIRCLED LETTERS)*

A. Down Arrow Press n s ey dec eases e e e a e se n . Se n e e e a e be o 60° ns e ea off.

B. Pool / Spa Selector Press n s ey se ec s e e oo o s a ode. A so sed o acce o a n se ec ons.

C. Up Arrow Press n s ey nc eases e e e a e se n . e ax e e a e se n s 04° .

Indicator Lights & Displays *(AS INDICATED BY CIRCLED NUMBERS)*

1) **Spa Indicator Light** , nd ca es s a e os a s con o n e ea e .
2) **Heating Indicator Light** , nd ca es ea s ea n .
3) **Pool Indicator Light** , nd ca es oo e os a s con o n e ea e .
4) **LED Display** s ays a e e e a e en / ARR S a e no be n essed, o des ed e e a e en ARR o ARR s essed. a e s ay xa e … 04° d s ayed.
5) **Desired Temp Light –** nd ca es e e a e se n s d s ayed, and e e a e se n s an n d e o e ARR o ARR be n essed.

DIGITAL CONTROLLER- OPERATIONAL DISPLAYS

LL ... S ... LL B ... SPLA ... AS PAR

RMAL ... RA ... A ... R:

OPERATIONAL CODES

- **FLO** ... a ... o ... de ec ed. ode essa ... a a any ... c c a n ... s o , o ... en ... ea ... s no ec ... n co ec ... a ... o .
- **OFF** Sys ... s o . Sys ... s o ... n ... a ... se ... o n ... s a sed abo ... 0°
- **CFI** ... s s / ... a ... Se ec ... on.
- **ULC** ... se Loc ... ode. ... en ac ... a ed, s ... s o ... ex ... en ... : L .
- **ELC** ... n ... Loc ... ode. A ... o ... s end ... o se ec ... a sec ... code so on y a ... o zed ... sons can ... an ... ea ... se ... n s.
- **CFO** ... a ... ex ... ons. ... en ac ... a ed, s ... s o ... ex ... en ... : S.
- **CFS** ... a o ... ex se ec ... on. A ... o ... s ... o ... oose be ... en ca ... o ... ex o ... ons.
- **FS** ... ea ... n d ... os ... ode. ... a ... nc ... on n ... o ... a ... a ... es. an con ... n ... es ... o ... n and co ... esso ... s o . ... o ... esso ... es a ... en a ... co ... a ... ses ... o a ... ox ... a ... y 38°

IMPORTANT !

R A M ... A L ... X LA ... AL ... LL R

RA ... A ... ASS ... A ... SPLA ... S, S ... R'S

SR ... S R ... AL ... A ... M ... R LL R

L ... A ... A ... X ... S MA ... AL.

GETTING YOUR HEAT PUMP STARTED & STOPPED

ATTENTION:

THIS IS A QUICK-START GUIDE… o o co n o a on conce n n d a con o a es and o a n , see: *Owner's Instructions for HP7 Digital Heat Pump Controller,* oca ed n a nd x s an a .

INITIAL START UP

. S a a c c a o .

NOTE: L M M S B A R M B A A M L M S R M LL ALS B

2. ns a n as o conne ed; d s ay s o d be na ed.
3. d s ay s b an , be ce a n b a and a d sconne a s ed o

HOW TO OPERATE THE CONTROLS

. nce n as o conne ed, d s ay s o d ead " " o ac a oo o s a a a . o an " " o ac a a a a d s ayed, se " o S oo n " sec on.
2. d s ay eads " ", ess a o ey n d s ay eads 0 o .

L S LA A S R L / S A A M A R S M A R S S 0° AB S M A R S S B L 0° S LA A S " ".

3. nce n s d s ay n c en a a , sys s eady o o a . Loca L / S A se ec o ey on con o a ; by ess n s ey, yo can se ec be een oo and s a ode.
4. s n L / S A se ec o ey, se ec oo ode. en oo ode as been se ec ed, oo nd ca o , oca ed on s de o d s ay, be na ed.
5. con o n oo ode, se / o eys o se des ed oo a a .
6. ea s a so be n sed o ea a s a, ea o s o s s o o a des ed s a a a .
7. ea no a n a n des ed a a o ode se ec ed: L, o S A.

GETTING YOUR HEAT PUMP STARTED & STOPPED

(ontin ed)

8. In o e a ion, the tem e atu e t e ac ua (d s ayed) wate tem e atu e fa s be ow the des ed se o n , the heat pump w t sta t a te an n tia t me de ay of 3 4 m n tes.

N [illegible] . S [illegible] , [illegible] 4 M [illegible] S.

CONTINUOUS USAGE AND WATER AROUND UNIT

- If yo have fo owed the d ec ons n th s o n , yo sho d be on yo way to en oy n a wa m oo o s a.
- Afte the heat ump has been unn n fo so e t me, yo may see wate esent a o nd the heat pump . Th s wate s condensa on od ced as a by od ct of t ansfe n heat f o the a to yo oo o s a. If the a r s h m d y s th s, wate can te s of 18 a ons pe ho , a e no nco on. Conve se y, a ow h m d ty cond ons may es t n no condensa on be n od ced.

REQUIRED HOURS OF POOL PUMP OPERATION

S [illegible] L S S [illegible] A BAS S. [illegible]

- It w be necessa y to a ow yo oo c c at o o n con n o s y nt the oo has eached the des ed te pe at e.
- If a t e con o s yo t mer, t w be necessa y to o e de the t me to e t o a y a ow fo 24 h . t o e a on.
- Once the des ed te pe at e has been ob a ned *(this may take up to four days),* yo sho d ese yo t me c oc fo no a o e a n ho s.

REMEMBER … THE HEAT PUMP CAN ONLY OPERATE WHEN THE CIRCULATOR PUMP IS RUNNING. [illegible] L SS [illegible] L [illegible] B [illegible] M P'S A L [illegible] RS [illegible]

TO SHUT THE UNIT OFF

- The un t can be sto ed by sw tch n off the e ec ca s y o by se n the des ed te pe at e owe than the act a wate te pe at e.
- The n t w d s ay " ", f the des ed wate te pe at e s set be ow 40° F.

MAINTENANCE

PLANNED MAINTENANCE PROGRAM

A a a ofe s a e y easonab y ced, ofess ona y e fo ed, anned Ma ntenance o a ….See A X fo de a s.

GENERAL MAINTENANCE

- o o a e yo ea ns ec ed and a n a ned on an ann a bas s by a a f ed oo ea s ec a s . Add ona y, f yo ea s oca ed on e beac , o a a sea a e e sa s ay and sand can affec e n , o e f e en se ce ay be necessa y. o Se ce an nfo a on, ease see A X a e ea of s an a , and en con ac A a a s o e S o a : 800 8 5 .
- o de ood a f o o ea . e sdes and o of ea f ee of obs c ons.
- on o a on: n e ons e e e s a e sed fo a on, a e a y s so e es ess an oo , and a e s ay can da a e ea e co onen s. e a d ess of a e a y, s eco ended a s n e s be d ec ed a ay f o ea .
- e en a n a e n off, f o oofs, f o o n d ec y n o ea e . e ea e s des n ed o s and no a an fa , b so d s ea s of a e f o oo d nes ay e en a y da a ea co onen s. f ea es des bene a a oo ed e, o o o ea on e y, a a n eade (e) o a n s e d be necessa y.
- a na e: o ea ay od ce ab ndan condensa on nde ce a n cond ons, s s cons de ed no a o e a on. Acco d n y, e e d a n o es a e base of ea f ee of ass, eeds, d , o o e obs c ons, a o n fo f ee and co e e d a na e a o nd ea e . *(Also see, on previous page: CONTINUOUS USAGE AND WATER AROUND UNIT.)*
- f yo n s oca ed nde ees e e ea es f a and acc a e n e bo o of ea , a a f ed ec n c an s o d e od ca y e o e acc a ed ea es.

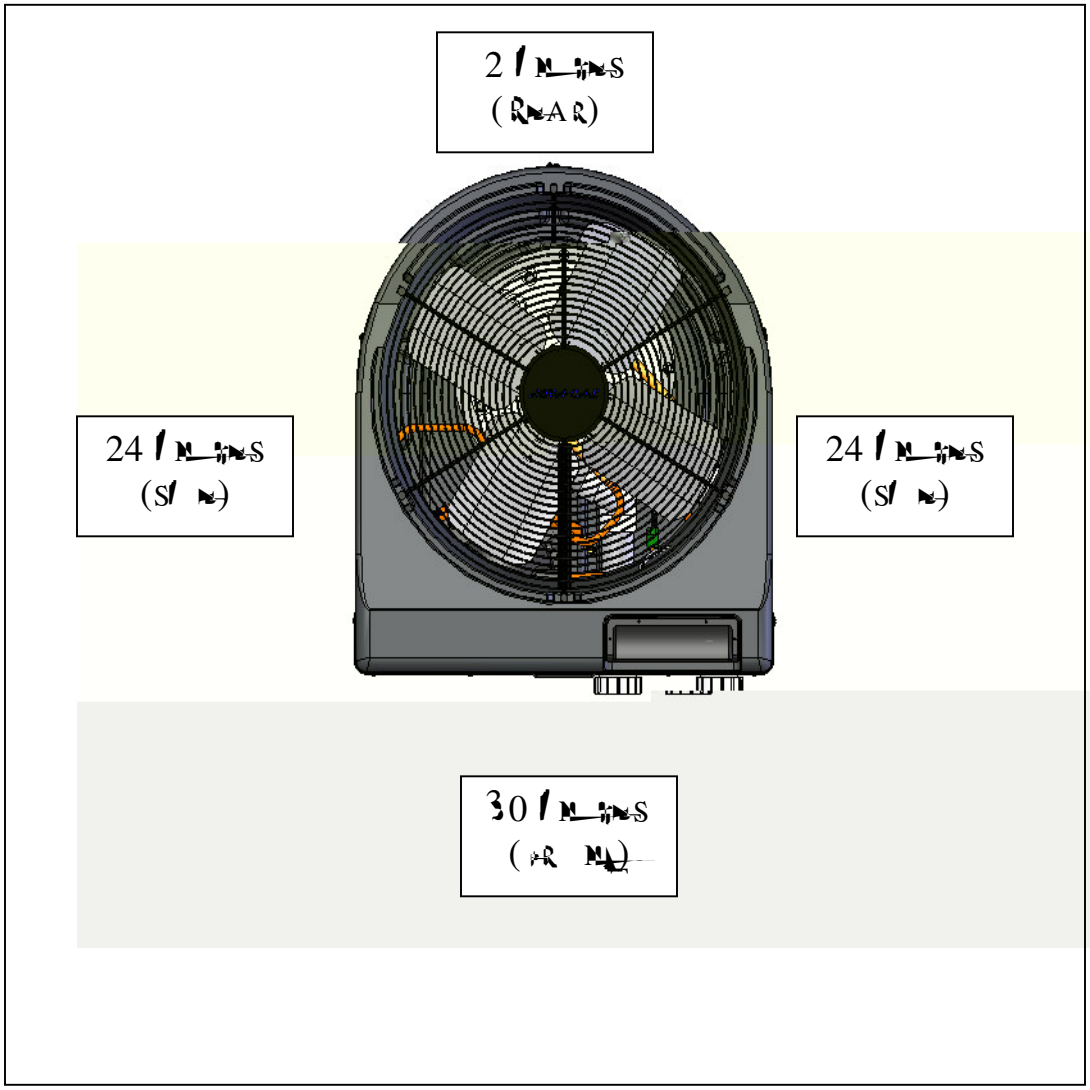
MAINTAINING PROPER WATER FLOW

- s o an o o e a e and a n a n yo e acco d n o e an ac e 's s ec ca ons. As a e e s d y, e a e o o ea s ed ced. ess e on e e a e, e o e e o a e.
- S a o a d y e, a e a o n s o deb s n e bas e can ed ce a e o ... e bas e e o deb s.
- ec o o e a e se n s. A a a y c osed a e a e e e, o a o en by ass a o nd e ea e, ca se ns c en a e o o e ea e.
- e cond ons s ed abo e e a n n eso ed, e a e o o e ea e ay be ed ced o a o n e e n e na sa e y de ces s e ea e o . o exa e, s o d an " " o " o" code be obse ed on e d s ay e e e en e ea e o o e a n ns c en a e o co d be e ca se. Be o e ca n o se ce, a ays c ec e e, e bas e, and a e a e os ons. e obe e s s s, ca A a a s o e S o a : 800 8 5 .
- **NOTE:** n oo e n s n o ac d as n , e a e o o e oo ea e s be s o n e ocess s co e ed, and e oo c e s y s once a a n n ba ance.

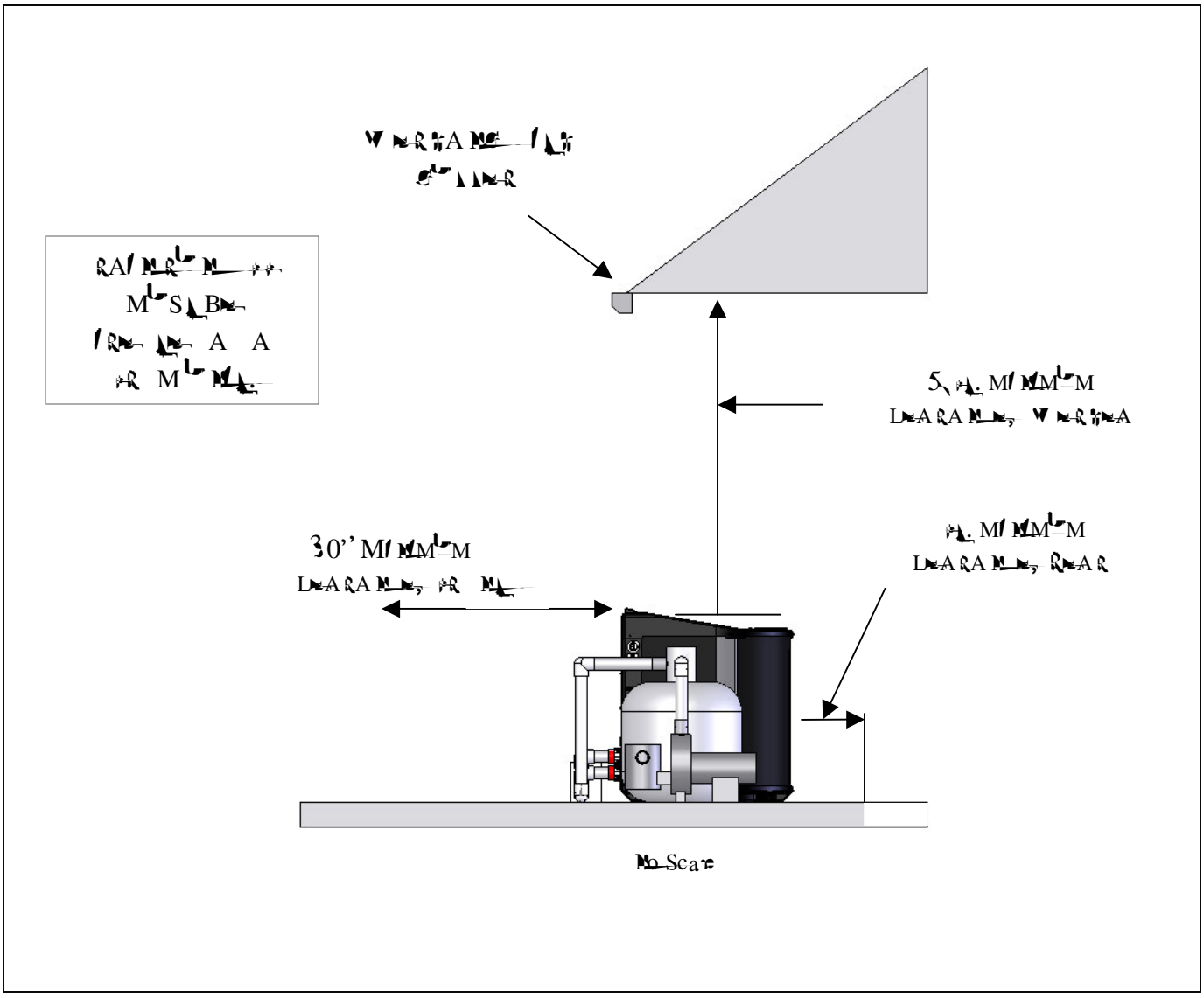
MAINTAINING PROPER CLEARANCES AROUND HEATER

- o ax e c ency, o e a o c ea ances a o nd ea e s be a n a ed.
- s o an o e e a ea a o nd yo ea c ea o e s s as s bs and b s es, a n n e, c e ca s con a e s, e c. ese e s can e en a o c c a n o e y o e ea e, and es n e c en o e a on o da a e o co onen s ns de e ea . o no ace ob ec s on o o e ea ; do n so b oc e a o ex n e ea e, and es n da a e o e co esso and an o o .
- o e c ea ances a e a so necessa y n o de o access e o n a s o yo ea e . A ea e a s easy o " e o," be a ea e a s easy o a n a n, se ce and a n enance e son e an yo o ee n e a ea a o nd yo ea e nobs c ed.
- ease see e ex o a es o eco ended c ea ances.

Recommended Clearances… Sides, Front, and Rear



Recommended Clearances… Overhead, Front, & Rear:



SEASONAL USE & SHUT DOWN

DURING THE SWIM SEASON

- n s season, n oo o s a s no n se, a o a o o o .
- s na s need o os on a s n yo *do* s a yo oo o s a.

FREEZE PROTECTION / EXTENDED SHUT DOWNS

- n a as z n cond ons a a a occ nce, a a on sys o n con n a y o d. y ca y, d n cond ons, c c a n a no .
- n a as z n cond ons a a n , ase o n z n ns c ons o o n s sec on.

WINTERIZING

A R N	a o d o o n ay s n a n n yo d a .
o a o d n y o o a n n *(fan blade)*, d sconn c ca o a b o oc d n n z n ocess.	

A N	a o d o o n can s n da a o n and/o o y.
a o o y n z n ay s n da a a . da a s no co d nd n a an y.	

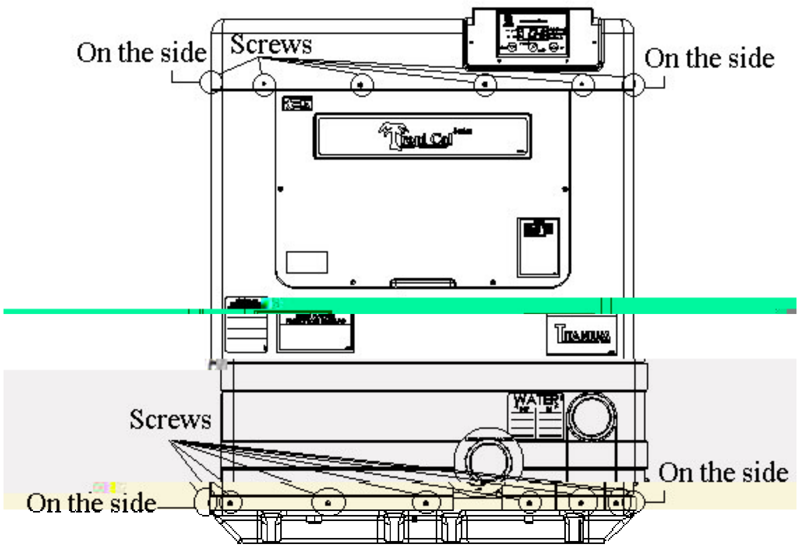
To Winterize a Heat Pump Equipped with an Internal Drain

(Per Figures 1 & 2)

1. sconn c a c ca o a ; n c c a n .
2. A o (2) conn c on n ons, d sconn c b n o a (o a s co n c oc se).
3. o on as c an by o n sc s s o n n .
4. Loca d a n a base o an cond ns and o (o a s co n c oc se). S 2.

Winterizing *(Continued)*

5. ... condenser and then, ... [illegible]
6. ... [illegible] ... and secure ... screws ... [illegible]
7. ... [illegible] ... reconnect ... (2) ... connection ... condensation ... [illegible]
8. Next Season: ... ready ... [illegible] ... connection ... [illegible]



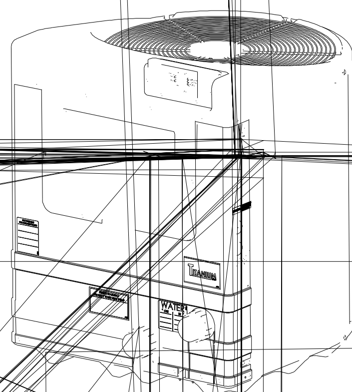
CAUTION	[illegible] ... damage ... and/or ... [illegible]
... connections are ... [illegible] ... condition *(not fully tightened)* ... [illegible]	

Winterizing *(Continued)*

To Winterize a Heat Pump Equipped with an External Drain

(Per Figure-3)

1. Disconnect all electrical power to the heater; [illegible].
2. At the two (2) connection unions, disconnect the [illegible] from the heater (turn to disconnect counter clockwise).
3. Locate the drain plug at the bottom, right hand, front corner of the heater. See Figure 3.
4. Using a 5/8", box end wrench, remove the drain plug (turn to disconnect counter clockwise).
5. Remove any of the water that is standing in the bottom of the condenser, and then replace the plug: thread the plug in clockwise until snug, then apply an additional 1/8 turn.
6. To prevent insects and other animals from entering the [illegible] during the winterized period, [illegible] reconnect the two (2) [illegible] union connections: cover each [illegible] with [illegible], [illegible] condensation to drain, but [illegible] prevent [illegible] insects and animals from entering the [illegible].
7. Next Season: To ready the heater for use, simply retighten the union connections. Hand tightening is normally sufficient.



TROUBLESHOOTING

HEAT PUMP NOT RUNNING

- Is the display on? If not, ensure the main breaker *(located at the power supply panel)* and the disconnect switch *(located near the heat pump)* are both turned ON.
- Does the display read "Flo"? If so, check to be sure that the circulation pump is operating and the filter is clean. There may also be a water hose connected incorrectly allowing water to bypass the heat pump; be sure water is flowing into the heater.
- Does the display read "WAIT"? If so the desired water temperature is set below [illegible]0°F. Raise the desired water temperature above the actual water temperature and the unit should start after a 3 to 4 minute delay.

  If the display shows any other fault codes, or is blank, contact AquaCal at 800-8[illegible]-[illegible]5[illegible]. Service may be required.

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 800-8[illegible]-[illegible]5[illegible].
- Be sure that air coil surfaces are free of obstructions; low roof overhangs, landscaping, walls, fences, etc. The heat pump needs good airflow to operate at rated efficiency.
- How long are you running your circulation pump each day? Cooler weather conditions, or heating to a higher water temperature, may necessitate running the heat pump for a longer period of time. A pool blanket can be used in [illegible] cost savings.
- [illegible] may be in the defrost mode if air temperatures are below 50°F. The digital display will read "DFS" if the unit is defrosting or air temperatures are too cold.

WATER LEAKING OUT OF THE HEAT PUMP

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

- S of yo he a , ea n he oo nn n . In a co e o s he e s o d be a a ed ed c on n he a o n o a e a o nd he bo o o he he a .
- , as an a e na e e od o ec o a a e ea , yo can es he a e d a n n o he base o he esence o he san ze yo a e s n n yo oo o s a . se yo a e es , o a es s , o ec a sa e o he a e o o me o b o me. I he sa e es s os e o san ze , ca A a a o se ce a : 800 8 5 . I he es s me a e, he a e s obab y a ess condensa e.

  N E:
  [illegible]
  [illegible]

<u>WHAT WE NEED TO KNOW WHEN YOU CALL US</u>

- If yo s o d need o ca A a a o se ce, ease a e he o o n n o a on eady hen yo ca .

  Mode :

  Se a N be :

  Ins a a on a e:

- **Having the above information ready will speed up the service process and allow us to respond more quickly.** A b e desc on o a he n s o s no do n a s o he s a on. o ay con ac s a 800 8 5 . o ce o s a e 8 a . . o 5 . . S , Monday o day. I ca n a e ho s, o o ce a se ce and e yo ca . Be s e o ea e yo na e, co e e add ess, and ho e n be . I yo e e , yo ay AX he n o a on o: 2 82 4 .

APPENDIX

I. AQUACAL'S PLANNED MAINTENANCE PROGRAM

II. CALCULATING INITIAL HEATING TIME

III. OWNER'S INSTRUCTIONS FOR HP7 DIGITAL HEAT PUMP CONTROLLER

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.

APPENDIX I

CALCULATING REQUIRED 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, we need to know the temperature at which you plan to keep your pool or spa heated.

Sounds complicated, but it's not! You can use the worksheet below 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.

Surface Area 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 _____(BTU's Required to raise your pool 1° f)
(How many degrees do you want to raise the
X # of Degrees _____temperature of the pool?)

= BTU's to heat pool

/ BTU Output of Heater_____

= Hours of operation _____ (Time it takes at 80° water, 80° air, 80% Relative hum.)

X 60° Temperature factor _____1.25__

= 60° Air running time (Running time adjusted for cooler weather)

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: A **Call Flex** time clock manager 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.

Pool/Spa Blankets

WARNING !	Failure to heed the following may result in permanent injury or death.
Improperly used, Pool-Spa solar blankets can poise a drowning risk to people and pets. Solar blankets are <u>not</u> safety covers. They are not designed to support the weight of a person. Never enter a pool until the solar cover is completely removed *(Under no circumstance should anyone swim under the blanket).* Follow all safety recommendations of the blanket manufacturer.	

A solar blanket will significantly reduce you 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 in an un-blanketed pool. Reductions of 40 – 60% on heating bills can be achieved by using solar blankets.

Owner's Instructions
for
HP7 Digital Heat Pump Controller

The Information Contained Within This Booklet Has Been
Prepared Especially for Use by Home Owners and Property Managers

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AQ Tech-12-16-03

APPENDIX III

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GENERAL DESCRIPTION of HP7 CONTROLLER

The HP7 is a low cost microprocessor control designed for use in swimming pool & spa heat pumps. The control features 3 digit temperature and setpoint displays, with touch pad changes easily performed by simple 3 key operation.

The HP7 offers precise water temperature control, accurate defrost management, anti-short cycle protection, circulation management, compressor contactor control … all with solid state reliability. The HP7 monitors water and refrigerant temperatures with precise thermistor sensors. The control also features diagnostic messages, simplifying both installation and service.

Additionally, the HP7 offers maximum corrosion and vibration protection: All tinned circuit board connections are soldered, and the main Power Board and Display Board are specially coated for added protection against humidity, air pollutants, [illegible], and vibration.

The HP7 is an excellent alternative to electro-mechanical controls.

HP7 CONTROLLER SPECIFICATIONS

Inputs:

- Swimming Pool Water Temperature Sensor *(Thermistor)*
- Refrigerant Defrost Temperature Sensor *(Thermistor)*
- Low Refrigerant Pressure Switch
- High Refrigerant Pressure Switch
- Water Pressure/Flow Switch
- Remote Flow Switch *(Automatic thermostat switching from Pool to Spa)*
- 3 Position Terminal Block Interface *(for connecting (2) and (3) wire controllers produced by Jandy and Compool)*
- 24V AC Power Supply *(Only)*

Outputs:

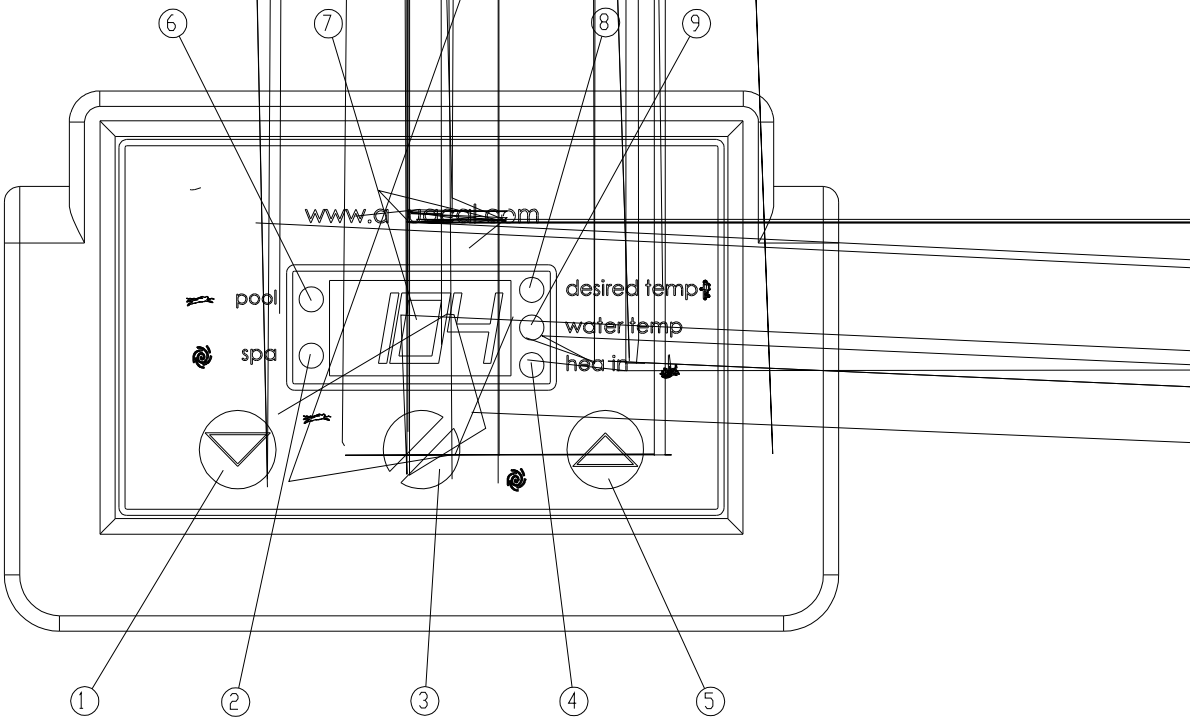
- Compressor Contactor: Relay 10 amps @ 240V AC.
- Fan Motor Contactor: Relay 10 amps @ 240V AC.
- Pump Start: Relay 10 amps @ 240V AC.

Control Features:

- Microprocessor Operation
- Water Flow Verification *(Call Flex)*
- Precise Evaporator Temperature Monitor *(Defrost Control)*
- Anti-Short Cycle Timer *(4-minute)*
- Accurate Water Temperature Monitor
- Corrosion Protection *(Conformal Coating)*

CONTROL PANEL LAYOUT

(Appearance will vary between model lines)



START UP & SETTING OPERATING CONTROLS

1. Applying Power to The Controller:

A. When power is first applied, the controller first tests all displays and the display will read [888]. Additionally, all status LED's will illuminate for 4 seconds and then go off for 1 second.

B. The controller will then display the actual water temperature as soon as the pool circulation pump is on.

C. If the pool circulation pump is off, the controller will display the **[FLO]** *(No Water Flow)* code message indicating water has not been circulated through the heat pump.

2. Turning The Heat Pump ON:

A. Once electrical power is supplied to the heat pump, the pool circulation pump is activated, and the controller has successfully completed the self tests, the unit is ready to operate.

B. The controller is shipped with the SPA selection in the **[OFF]** mode and with the POOL selection selected. The heat pump is automatically shipped off, as a selection below 40°F has been selected. In the **[OFF]** mode, the controller will display the water temperature as long as the pool water circulation pump is operational. If there is no water circulating through the heat pump, the controller will display the **[FLO]** *(No Water Flow)* code message.

C. Using the UP ⇑ arrow key, increase the desired temperature until it exceeds the value of the actual water temperature displayed. *(Note: See #8, below, if "000" is displayed upon pressing up or down arrows.)* Once the desired temperature has been entered, the display will read the actual water temperature and the heat pump will start to operate. Both the compressor and fan will be operating and the "Heat" LED will illuminate.

3. Turning The Heat Pump OFF:

A. Using the DOWN ⇓ arrow key, decrease the desired temperature until the display reads **[OFF]**. The heater will turn off, and will remain off until the temperature setting is raised above 40°F.

B. **NOTE:** Each time the heat pump is turned off, either manually, or by the thermostat being satisfied, there will be a 4 minute delay prior to restarting.

4. Selecting Pool / Spa Thermostat Settings:

A. Depress the Pool / Spa key to toggle between the pool and spa temperature settings.

B. The pool / spa indicator light is located to the left of the temperature display confirming the selected temperature setting.

5. Changing The Pool Temperature Set Point:

A. [illegible]

B. [illegible]

6. Changing The Spa Temperature Set Point:

A. [illegible]

B. [illegible]

7. Selecting Between °F And °C:

A. [illegible]

B. [illegible]

8. User Lock Code Option [ULC] :

<u>This Option Explained</u>:

[illegible]

A. <u>[illegible]</u>:

1) [illegible]

2) [illegible]

3) [illegible]

Se ec n L on *(Continued):*

4) [L] d s ayed, ess n e e o o n a o ey d s ay e ( ) o (0). Se ec n (0) a o e con o ey ad o e a n oc ed. Se ec n ( ) enab e e se Loc ode o on. en, o en e a oc code n be , ess e oo /S a ey once. [L] (n e Loc ode) d s ay;

5) **[ELC]** d s ayed, se e o o n a o eys o se ec a oc code n be . e ac o y se oc code s **"17".** de ess n any b ons o 5 seconds a o e con o o sa e e se ec on and e n o e no a o e a n ode. ess n e oo / S a ey a so sa e e se ec on and s e o e ex en a a e **[CFO]** (a ex ons);

6) nce e L o on as been enab ed, de ess n any ey d s ay **[000]** *(prompting the entry of the correct lock code number).* o a n access o e con o e :

   a) s n e a o , sc o o e co ec oc code n be , en:
   b) ess e oo /S a se ec o b on… en a e e e a e be d s ayed… on o se n s can no be e ed and an ed as des ed.
   c) A e a e od o a ox a e y o (4) n es, d n e no b ons a e been essed, e con o e a o a ca y e n o e oc ed ode. o ded e L se ec on s " ", e con o e a ays a sa e n e oc ed ode.
   d) o no ed e o e co ec oc code n be , L enab ed, con o ad s en s no be oss b e. **Be certain to record your security code in a safe place.** e oc code n be ay be an ed any n be o es by o o n e ns c ons de a ed abo e n s sec on.

B. se Loc ode s Ac a ed, b ass be s no n *("Back Door Entry"):*
NOTE: S o d e L o on be enab ed, and a oc code n be o e an e ac o y de a ( ) be ns a ed b s no n, e o o n oced e ay be o o ed o e a n con o e o a n access:

) n o e o e ea e a e b ea e ;
2) S a eo y ess and o d do n e & o n a o s;
3) on n e o d n a o b ons do n e n n e o e bac on;
4) e o d n a o s do n o a ox a e y 5 seconds;
5) **[CF1]** a ea ;
6) o o **[ELC]** by n e oo /S a b on. *(Display will change each time P/S button is pushed.);*
7) o o e a o , once. *(The number that appears is the present, valid lock code number);*
8) s eco ended e access code be e ned o e ac o y de a : " " be o e ex n e o a . By o n bac o **[ELC]** yo can se e o n a o s o ese e oc code n be bac o do n o " "

Se ec n a / ex ons [ ] …

(This feature will apply only if the heater installation includes a Call/Flex module.):

A. ess bo ⇑ and o n ⇓ a o eys s am o s y n **[CF1]** d s ay a a s. ess oo /s a y ce, d s ay a a .

B. **[CFO]** (a ex ons) code d s ayed, se o o n a o eys o sec , **(0)** o d sab a ex ons, **(1)** o enab a on, o **(2)** o enab ex on. ess n oo / S a y sa d s ayed a a and s o en a a **[LOC]** (Se ce Loc ode).

9. Fan Speed Control… *(This option is not applicable to any current models. If option present, factory default setting of "80" <u>MUST</u> remain.*

<u>OPERATIONAL DISPLAY CODES</u>

Menu Codes	Description	Function
[FLO]	**No water flow detected**	***Displayed Code Message:*** **Appears whenever the circulating pump is off, or when the heater is not receiving correct water flow.**
[OFF]	**System is off**	***Displayed Code Message:*** **Appears whenever system is off, and until temperature set point is raised above 60° F.**
[CFI]	**Celsius Fahrenheit Selection**	***Programming Entry Point:*** **Allows temperature read-out to display either Celsius or Fahrenheit.**
[ULC]	**User Lock Code**	***Programming Entry Point:*** **When activated steps to the next menu level [ELC] (enter lock code).**
[ELC]	**Enter Lock Code**	***Programming Entry Point:*** **Allows end user to select a secret code so only authorized persons can change heater settings.**
[CFO]	**Call Flex Options**	***Programming Entry Point:*** **When activated steps to the next menu level [CFS] (Call or Flex selection)**
[Fan]	**Two speed fan control**	***Programming Entry Point:*** **This option is not applicable to any current model; leave at factory default of "80".**
[LOC]	**Entrance to Service Menu**	***Service Entry Point:*** **The [LOC] code allows service personal the ability to enter a factory code and access service adjustable parameters in the software that may require calibration or adjustments. This menu is available only to authorized Service Personnel.**

OWNER TROUBLESHOOTING

WARNING !	Failure to heed the following can result in permanent injury or death.
Heater contains no user serviceable parts. Do NOT exceed the troubleshooting actions explained below. If the explained user troubleshooting fails to correct the problem, do NOT attempt to service the heater… Contact your installer or dealer or AquaCal Customer Support: 800-[illegible].	

Owner Troubleshooting Procedure:

Note…
This procedure is restricted to problems which *may* be related to the control system of your heater, and/or site conditions affecting the ability of the control system to properly start and run your heater. For other issues related problems, such as *(but not limited to)*: "Heater Leaking Water", "Heating, but Not Heating Enough", etc.… Please refer to the Heater Owner's Manual.

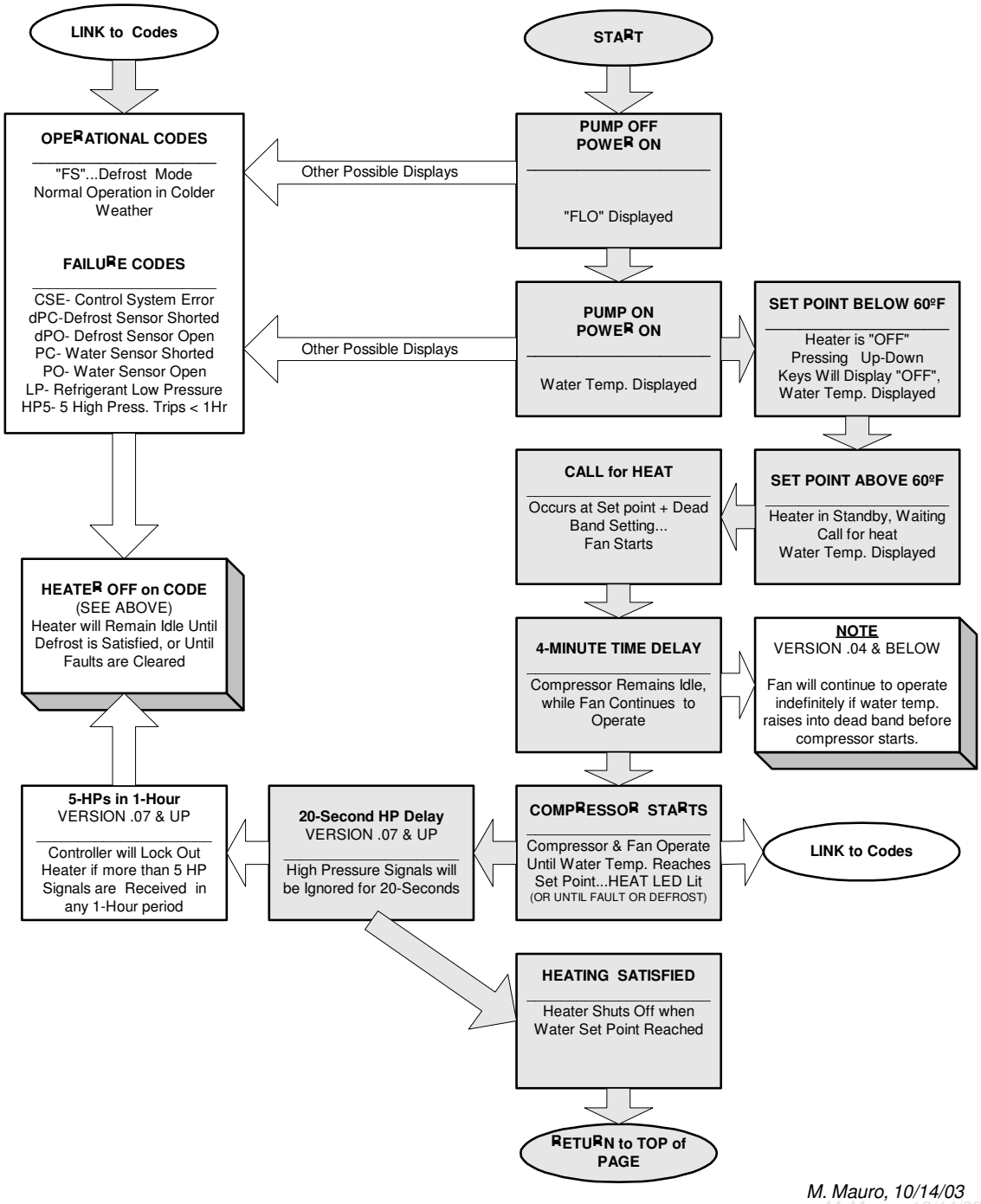
Insure correct water flow to the heater: Water flow is proper, filter clean, and pump running;

1. Check the heater power supply: All breakers and disconnect switches turned ON;
2. If nothing, no display seen on heater control panel, call AquaCal Customer Support;
3. *If display shows current water temperature, proceed with operation (Turn back to Section Entitled: START UP & SETTING OPERATING CONTROLS.).*
4. If display is ON but blank, or display is ON and displays current water temperature, but LED displays "FLO", then verify correct water flow to unit. If water flow is correct, and "FLO" still displays, contact AquaCal customer support.

Fault Display Codes & Possible Owner Actions

Code	Error Description	Owner Actions
[dPO]	Defrost Sensor Open	Contact installer/dealer or AquaCal Customer Support.
[PO]	Water Temperature Sensor Open	Contact installer/dealer or AquaCal Customer Support.
[dPC]	Defrost sensor shorted	Contact installer/dealer or AquaCal Customer Support.
[PC]	Water temperature sensor shorted	Contact installer/dealer or AquaCal Customer Support.
[LP]	Refrigerant system low pressure switch open	Contact installer/dealer or AquaCal Customer Support.
[HP]	Refrigerant system high pressure switch open	Contact installer/dealer or AquaCal Customer Support.
[FLO]	Low or no water flow detected	If correct flow has been determined per #4 above, contact installer/dealer or AquaCal Customer Support.
[FS]	Heater in defrost mode	Normal function in low air temperatures. Fan continues to run and compressor shuts off. Compressor restarts when coil temperature reaches 38° F or above. If heater remains in defrost, contact installer/dealer or AquaCal Customer Support.
[CSE]	Control system error	Control may need to be reset. Disconnect then reconnect power to heater; if error continues contact installer/dealer or AquaCal Customer Support.

HP-7 (6200P) Sequence of Operation



M. Mauro, 10/14/03

CONTACTING the FACTORY…

Should you ever experience problems with your heater, or if you simply desire further information about your heater's operation, our Customer Support staff stands ready to assist. Please call us toll-free at: 1-800-786-7751.

We Sincerely Appreciate Your Business….
Thank you for choosing AQUACAL for your swimming pool and spa heating needs.

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