

96.07.29

AQUA  
CHLOR

Electrolytic Chlorine Generator

READ THIS LABEL AND THE OPERATION MANUAL BEFORE USING

PRECAUTION:

Operating the AquaChlor Electrolytic Chlorine Generator without water flow through the cell can cause a build-up of flammable gases which can result in fire or explosion.

The AquaChlor protects itself against this condition via the FLO sensor by cutting off the power to the cell whenever flow is not detected.

The AquaChlor MUST be wired to the same circuit as the filter pump. This ensures that the AquaChlor will only generate chlorine when the filter pump is providing flow.

The AquaChlor generates .45 Kg of chlorine per day.

Electrical Ratings:

All wiring must conform to local and CEC codes. See instructions for wiring diagram and notes on installation.

PRECAUTION: CONNECT TO A CIRCUIT PROTECTED BY A CLASS A GROUND FAULT INTERRUPTER.

Power: 105-240VAC, 50/60Hz, 1.9A, 200VA max  
Use Copper Conductors only

Electrolytic Cell: Use only Goldline Electrolytic Cell 25VDC (class 2)

Fuse: 4A, type 2AG SLO-BLO. A blown fuse indicates an internal problem. Contact your local dealer for service.

REGISTRATION NO. 24584  
PEST CONTROL PRODUCTS ACT

RESIDENTIAL

Canadian Agent:  
Pool Innovations Inc.  
#B, 7003 5th St. SE  
Calgary, Alberta T2H 2G2

RAINTIGHT ENCLOSURE/ENCLOSURE 3  
SUITABLE FOR INDOOR OR OUTDOOR MOUNTING

LISTED 6D22  
SWIMMING POOL AND SPA CHLORINATOR

INDEPENDENT ENERGY INC.  
PO BOX 1305  
EAST GREENWICH RI 02818 USA

C. UL7

[ [MANUAL] ]

Model RAC-1

Automatic Electronic Chlorine Generation  
for Pools and Spas

The Aqua Collection From Goldline

AQUA CHLOR

Aqua Chlor  
Operation and Installation  
Manual

**IMPORTANT-SAFETY INSTRUCTIONS**

When using this electrical equipment, basic safety precautions should always be followed, including the following:

- READ AND FOLLOW ALL INSTRUCTIONS
- Disconnect all AC power during installation
- Warning - To reduce the risk of injury, do not permit children

to use this product unless they are closely supervised at all times.

- A green colored terminal marked "Earth Ground" is located inside the wiring compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying the equipment.
- One bonding lug for US models (two for Canadian models) is provided on the external surface. To reduce the risk of electric shock, connect the local common bonding grid in the area of the swimming pool, spa, or hot tub to these terminals with an insulated or bare copper conductor not smaller than 8 AWG US / 6 AWG Canada.
- All field installed metal components such as rails, ladders, drains, or other similar hardware within 3 meters of the pool, spa or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than 8 AWG US / 6 AWG Canada.
- SAVE THESE INSTRUCTIONS

INDEPENDENT ENERGY INC.

P.O. Box 1305  
(401) 884-6990

42 Ladd Street  
(800) 343-0826

East Greenwich, RI 02818  
(401)885-1500 fax

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### **OPERATION MANUAL**

#### **Congratulations!**

You have invested in the latest electronic pool water purification technology; the AquaChlor. The AquaChlor is designed to give you years of enjoyment with worry free operation and the best in water quality for your swimming pool and/or spa.

Please take the time to thoroughly read this manual and familiarize yourself with the AquaChlor. This manual will explain the installation, the required preparation, the operation, the maintenance and the troubleshooting of your new automatic electrolytic chlorine generator. Also, please take the time to fill out and return the enclosed warranty registration card as soon as possible.

If any questions should arise, contact your local dealer, or if needed, call the factory direct at (401) 884-6990. Thank you for the confidence you have placed in the AquaChlor and Goldline Controls.

#### **The AquaChlor System**

The AquaChlor is a automatic chlorine generation system for pool or spa sanitation. This operation requires that a relatively small amount of salt (sodium chloride) be added to the pool water. The salt level is low enough that it can not be tasted and will not

cause eye irritation. The AquaChlor automatically sanitizes your pool by converting this salt into free chlorine which kills the bacteria and algae in the pool. This process is called electrolysis. The AquaChlor generates chlorine evenly and continuously during the filtering period to ensure a more steady pool/spa chlorine level. The amount of chlorine generated can be easily adjusted by a simple dial on the AquaChlor electronic unit. When the chlorine attacks the algae and bacteria, some of the chlorine reverts back to salt (chloride ions) and can then be recycled through the AquaChlor back into free chlorine. Typically, you will only need to add salt to your pool once or twice a season.

The AquaChlor system consists of three basic parts: the electronic control, the electrolytic cell and the flow detection switch. Both the cell and flow switch are plumbed into the pool/spa return piping. The flow switch informs the control that water is flowing and the generation process can start. The cell contains a series of specially coated electrode plates and is where the chlorine generation actually takes place. The AquaChlor control unit applies a small voltage to these plates (voltages are very low and the power is completely isolated to ensure safety). The current then flows through the water and separates the sodium chloride (salt). Free chlorine is generated and purification takes place. The amount of chlorine generated by the AquaChlor is a function of the filter time, pool salt level, and the setting on Output Level adjustment.

The AquaChlor is designed to handle the purification needs of the average residential swimming pool of up to 30,000 gallons (115,000 liters) or the needs of commercial pools up to 25,000 gallons (95,000 liters). Check local codes for other restrictions. The actual amount of chlorination required to properly sanitize a pool varies depending upon bather load, rainfall, temperature, and the pool's cleanliness.

### **Water Preparation**

Giving your pool and spa's chemical makeup the proper amount of attention will protect the AquaChlor, the pool equipment, the pool finish and ensure the water's safety and attractive inviting appearance.

Previous to turning the AquaChlor ON, it is important to adjust the pool water chemistry to the optimum levels. The table below shows the ideal chemical levels for your pool. Be sure these recommended levels have been reached before the AquaChlor is turned ON.

CHEMICAL	IDEAL LEVELS
Salt	2000 to 2500 ppm

Chlorine	1.0 to 3.0 ppm
pH	7.4 to 7.6
Cyanuric Acid	60 to 80 ppm
Total Alkalinity	80 to 120 ppm (plaster pools) 125 to 150 ppm (painted, vinyl or fiberglass pools)
Calcium Hardness	200 to 275 ppm (plaster pools) 175 to 225 ppm (painted, vinyl or fiberglass pools)
Metals	0 ppm

#### Salt Level:

The AquaChlor generates chlorine from the salt that is available in the pool water. It is very important that the salt level be monitored and maintained. The ideal salt level is between 2500-3000 ppm (parts per million). A low salt level will reduce the efficiency of the AquaChlor and result in low chlorine production. A high salt level will cause the AquaChlor to shutdown and may begin to give a salty taste to your pool (generally, the salt will begin to be tasted at a level of about 3500-4000 ppm). The AquaChlor will operate properly with salt levels up to 3000 ppm. If the salt concentration is above 3000 ppm, it should be reduced by adding water to the pool (partial draining may be necessary). Included with the AquaChlor is a small container of salt test strips. Refills can be purchased from your local AquaChlor dealer. These strips are to be used for the periodic testing of salt content in your water. Simply follow the directions on the container label and note the test results on the "Pool Water Test Chart". The test only takes a few minutes and should be done with the other recommended tests. The test strip reading should show a reading between 2500-3000 ppm. The salt in your pool/spa is constantly recycled so the loss of salt throughout the swimming season is very small. This loss is due primarily to the addition of water because of splashing and backwashing. Also, rain will dilute the salt mixture and lower the salt level. It will probably become necessary during the swimming season to add additional salt to the water. A chart is provided in this manual to determine how much salt to add to your pool/spa in order to reach the desired level (larger pools should be on the high side of the acceptable range). It's important to first determine how much water is in your pool/spa. If this information is not available, use the following equations (measurements are in

feet/gallons and meters/liters):

**Rectangular:**

Length x Width x Average Depth x  
 Depth x  
 7.5 = number of gallons in pool/spa  
 pool/spa

**Round:**

Diameter x Diameter x Average  
 Average  
 Depth x 5.9=number of gallons in  
 in pool/spa

**Oval:**

Wide Diameter x narrow Diameter  
 Diameter  
 x Average Depth x 5.0 = number of  
 number of  
 gallons in pool/spa

**Rectangular:**

Length x Width x Average  
 Depth x  
 1000 = number of liters in  
 pool/spa

**Round:**

Diameter x Diameter x  
 Diameter x  
 Depth x 785=number of liters  
 in pool/spa

**Oval:**

Wide Diameter x narrow  
 Diameter  
 x Average Depth x 666 =  
 liters in pool/spa

Now that you know the number of liters in your pool/spa and the test strip reading, you can refer to the chart on the following page to determine how much salt will need to be added.

**SALT ADDITION CHART**

Pounds and (Kg) of Salt Needed to Raise Level to 3000 ppm

Current salt level	Gallons and (Litres) of Pool/Spa Water				
	12,000 (45,000)	14,000 (52,500)	16,000 (60,000)	18,000 (67,500)	20,000 (75,000)
0	270 (135)	320 (158)	360 (180)	410 (203)	450 (225)
250	250 (124)	290 (144)	330 (165)	370 (186)	410 (206)
500	230 (113)	260 (131)	300 (150)	340 (169)	380 (188)
750	200	240	270	300	340

	(101)	(118)	(150)	(152)	(169)
1000	180 (90)	210 (105)	240 (120)	270 (135)	300 (150)
1250	160 (79)	180 (92)	210 (105)	240 (118)	260 (131)
1500	140 (68)	160 (79)	180 (90)	200 (101)	230 (113)
1750	110 (56)	130 (66)	150 (75)	170 (84)	190 (94)
2000	90 (45)	110 (53)	120 (60)	140 (68)	150 (75)
2250	70 (34)	80 (39)	90 (45)	100 (51)	110 (56)
2500	50 (23)	50 (26)	60 (30)	70 (34)	80 (38)
2750	OK	OK	OK	OK	OK
3000	Ideal	Ideal	Ideal	Ideal	Ideal
above 3000	Dilute	Dilute	Dilute	Dilute	Dilute

Current salt level	Gallons and (Litres) of Pool/Spa Water				
	22,000 (82,500)	24,000 (90,000)	26,000 (97,500)	28,000 (105,000)	30,000 (112,500)
ppm					
0	500 (248)	540 (270)	590 (293)	630 (315)	680 (338)
250	450 (227)	500 (248)	540 (268)	580 (289)	620 (309)
500	410 (206)	450 (225)	490 (244)	530 (263)	560 (281)
750	370 (186)	410 (203)	440 (219)	470 (236)	510 (253)
1000	330 (165)	360 (180)	390 (195)	420 (210)	450 (225)



1250	290 (144)	320 (158)	340 (171)	370 (184)	390 (197)
1500	250 (124)	270 (135)	290 (146)	320 (158)	340 (169)
1750	210 (103)	230 (113)	240 (122)	260 (131)	280 (141)
2000	170 (83)	180 (90)	200 (98)	210 (105)	230 (113)
2250	120 (62)	140 (68)	150 (73)	160 (79)	170 (84)
2500	80 (41)	90 (45)	100 (49)	110 (53)	110 (56)
2750	OK	OK	OK	OK	OK
3000	Ideal	Ideal	Ideal	Ideal	Ideal
above 3000	Dilute	Dilute	Dilute	Dilute	Dilute

Also, a quick rule of thumb for salt addition when the level is close to the recommended range is:

**Add 2 pounds of salt per 1000 gallons of water to raise the salt content 250 ppm (parts per million).**

or

**Add 2.5 Kg of salt per 10000 liters of water to raise the salt content 250 ppm (parts per million).**

Salt: The Type to Use

It is important to use only sodium chloride (NaCl). This is granulated common food quality salt. Because this same salt is used as a water softener, it can be purchased in large quantities at building supply stores. It is also acceptable to use water conditioning salt pellets, however, it will take longer for them to dissolve. Do not use rock salt due to the products impurities.

Salt: How to Add

Whether opening the pool for the season or maintaining the existing levels, the AquaChlor must be OFF when adding salt. Turn the circulating pump ON and broadcast the salt around the edge of the pool. Try to distribute evenly around the pool. DO NOT ADD SALT INTO SKIMMER. Be aware that salt water is denser than non "salted" water and therefore will tend to stratify to the bottom of the pool. To ensure that the salt is evenly distributed throughout the pool, wait until the salt is fully dissolved, then brush or vacuum the bottom of the pool. Now allow the water to circulate for 24 hours before turning AquaChlor ON.

NOTE: To ensure a quick, troublefree transfer to the AquaChlor system, add 1 quart or liter of metal remover and 1 quart or liter of non-copper based algaecide to the pool, per manufacturers instructions.

### **The Pool Water Test Chart**

The "Pool Water Test Chart", included in this manual, also shows ideal levels for all of the listed items: Salt, Chlorine, pH, Cyanuric Acid (chlorine stabilizer), Total Alkalinity, Calcium Hardness and Metals. This chart is to be used throughout the swimming season to log chemical levels weekly. As with normal pool/spa maintenance, the AquaChlor purified pool/spa water should be tested on a weekly basis with a good quality test kit and the water should be adjusted in accordance with the recommended levels on the "Pool Water Test Chart". These adjustments prepare your pool/spa for an enjoyable swimming, soaking, exercising, or just relaxing experience. For your continued enjoyment, it is important to keep all the variables within their recommended ranges and the supplied chart will help make the task easier. For additional charts, contact your local AquaChlor dealer.

### **AquaChlor Controls**

Now that the pool/spa water has been prepared, it is important that you familiarize yourself with the controls and operation of the AquaChlor. Start by opening the cover of the AquaChlor. The inside front panel has a three position switch (Main Switch), a rotary knob (Output Level Adjustment Knob), and four LED's (Lights).

#### **The Main Switch**

**AUTO:** For normal operation, the Main Switch should be left in the "Auto" position. In this position the AquaChlor will produce chlorine according to the output level adjustment setting for the entire filtering/pumping cycle.

**BOOST:** When you have an abnormally high bather load, a large amount of rain, a cloudy water condition, or any other condition which needs a large amount of purification to be introduced, put the Main Switch in the "Boost" position. This electronically "super chlorinates" (shocks) the water for 24 hours or until the power has been turned OFF (whichever comes first). At the end of the Boost time, be sure to put the switch back into the "Auto" position.

**OFF:** The "Off" position prevents the AquaChlor from energizing the electrolytic cell. In this position there is no chlorine generation. **NOTE:** To service any of the pool equipment or the AquaChlor, turn the power OFF at the circuit breaker.

The Output Level adjustment Knob

The Output Level Adjustment knob is located in the upper center of the AquaChlor control panel. This setting is used to control the amount of chlorine the AquaChlor generates. Raise this setting to increase chlorine level and lower it to decrease chlorine level.

The lights

There are a series of four LED's which quickly show the status of the AquaChlor's operation. They show:

**POWER ON** When illuminated, the AquaChlor has input power.

**GENERATING** On during normal operation. The "Generating" LED will blink when the AquaChlor is in boost mode (switch position in boost).

**NO FLOW** When illuminated, the flow switch has detected no flow and has turned the AquaChlor OFF.

**LOW SALT** When flashing, the salt level is low but AquaChlor is generating at low efficiency. When fully illuminated, salt level is too low and AquaChlor has shut down.

### **Operation**

By understanding how the AquaChlor operates, you'll be sure to use it more effectively for maximum convenience. Assuming that the water chemical levels are in the recommended range, there are three factors that directly contribute to the amount of chlorine the AquaChlor will generate:

1. the amount of time (cycle time) the AquaChlor is powered throughout the day

2. the amount of salt in the pool
3. the Output Level Adjustment setting

A variance in any one of these factors from day to day will affect the amount of chlorine produced by the AquaChlor. Note that the filter timer will power the AquaChlor for the same amount of time (cycle time) everyday and the salt level should remain relatively constant. Therefore, you should only need to change the Output Level Adjustment setting to increase or decrease the amount of chlorine generation. Also, it is important to be aware that a change in filtering time or salt level will require some readjustments to the Output Level Adjustment setting to achieve the same chlorine generation level.

The salt level will normally stay about the same throughout the swimming season. Small fluctuations will occur and periodically the addition of salt will be required. It is important to be aware that if you are on the high end of the recommended salt level, the AquaChlor will make more chlorine than if you are at the low end of the level.

The Output Level Adjustment setting is the amount of minutes that the electrolytic cell is energized (making chlorine) out of a total of 10 minutes. For example, when the adjustment is set at 5, the AquaChlor will make chlorine for 5 minutes out of every 10. If the adjustment is at 10, the AquaChlor will make chlorine for 10 minutes out of every 10 (constantly). The main objective when using the AquaChlor is to maintain the correct level of chlorine in your pool/spa. To find the optimum Output Level Adjustment setting, start at the #5 position as noted on the "Pool Water Test Chart". After one week has passed, test the level of chlorine in the water. If the level is in the correct range ( 1.0-3.0 ppm), leave the setting where it is. If the chlorine level is low, turn the Output Level Adjustment to the next highest setting. If the chlorine level is high, turn the Output Level Adjustment to the next lowest setting. Record this level in the "Pool Water Test Chart" and test again in one week. It will take a few weeks of adjustments to find the ideal setting for your pool/spa. Once determined, it should only take minor adjustments, if at all, to compensate for differing salt levels due to splashing, backwashing, rain, etc..

NOTE: The heatsink on the back of the AquaChlor control will become warm to the touch. The AquaChlor dissipates heat whenever the electrolytic cell is energized. The amount of heat dissipated is directly related to the amount of chlorine being generated. Be aware that at high Output Level Adjustment settings and high salt levels, the heatsink can become quite warm. This is normal operation for the AquaChlor.

## **Servicing the AquaChlor System**

The AquaChlor electronic control, electrolytic cell, and the flow detection switch are virtually maintenance free. With the exception of the electrolytic cell which has a defined life of approximately 10,000 operational hours, the AquaChlor, in normal use, will supply numerous years of trouble free operation.

**Servicing and Cleaning the AquaChlor cell:** The AquaChlor electrolytic cell has a self cleaning feature incorporated into the electronic control's logic. In most cases this self cleaning action will keep the cell working at optimum efficiency. In areas where water is hard (high mineral content) and in pools where the water chemistry has been allowed to get "out of balance" it is recommended that the cell be removed, inspected and cleaned if necessary. Also, if the efficiency of the AquaChlor system has decreased over time, the cell may need to be cleaned. Turn off power to the AquaChlor before removing the electrolytic cell. Once removed, look inside the cell and inspected for scale formation (light colored crusty or flaky deposits) on the plates and for any debris which has passed through the filter and caught on the plates. If no deposits are visible, reinstall. If deposits are seen, use a high pressure garden hose and try to flush the scale off. If this is not successful, a mild acid washing is required.

**Mild Acid Washing:** To acid wash, turn off power to AquaChlor. Remove cell from piping. In a clean plastic container, mix a 4:1 solution of water. ALWAYS ADD ACID TO WATER - NEVER ADD WATER TO ACID. Be sure to wear rubber gloves and appropriate eye protection. The cell is to be immersed on its side with the wire side up and out of the solution. The level of the solution in the container should just reach the top of the cell so that the wire harness compartment is NOT submerged. It may be helpful to coil the wiring before immersing the cell. The cell should soak for 1/2 hour minimum. Rinse cell and then inspect. If any deposits are still visible, repeat soaking and rinsing. Replace cell and inspect again in two months.

**Replacement:** The defined life expectancy of the electrolytic cell is approximately 10,000 operational hours under normal usage. The easiest way to replace an electrolytic cell is to call your local AquaChlor dealer. To replace cell yourself, turn OFF power to the AquaChlor at the circuit breaker. Open electronic control and remove cover panel then remove electrolytic cell wires at terminals. Undo cell from piping. Replace with new cell by reversing procedure. When replacing the cell, it is important to also inspect the flow detection switch to ensure it is still in proper working order. (Flow switch does not have a defined life and should supply many years of dependable operation if the water chemistry is properly

maintained.)

### **Winterizing**

The AquaChlor electrolytic cell and flow detection switch will be damaged by freezing water just as your pool plumbing would. In areas of the country which experience severe or extended periods of freezing temperatures, preventative measures must be taken to ensure the AquaChlor cell and flow switch are protected through the winter. The electronic control is capable of withstanding any winter weather and should not be removed. To protect your AquaChlor cell and flow switch for the winter:

1. Drain all the water from the pump and filter, and all of the supply and return lines, before any freezing conditions occur.
2. Remove the electrolytic cell from the return piping and clean the cell.
3. Remove the flow detection switch from the tee fitting and clean the switch.
4. Coil the wire leads and wrap the electrolytic cell and flow detection switch in plastic bags or other protective coverings. They can be stored for the winter outside in a safe, protected area near the electronic control.

### **Spring Start-up**

When opening your pool for the new swimming season, the AquaChlor cell and flow switch must be reinstalled. Install the flow switch using teflon tape on the threads to prevent possible leaks. It is very important that the arrows on the flow switch (located on hex) point in the direction of water flow after the flow switch has been tightened. If the flow switch is improperly installed the AquaChlor control will not operate. The cell can simply be hand tightened and no teflon tape is needed. Now that both units are installed, open the pool in the same manner that you normally would. DO NOT turn the AquaChlor on, until the pool water chemistry, except for chlorine, has been brought to the proper levels. This information can be found on page 2.

## **INSTALLATION MANUAL**

### **Installation Overview**

Read this entire section before starting installation. The following installation information is intended for the experienced installer

familiar with both electrical wiring and PVC plumbing. Installation must be performed in accordance with Local and NEC codes. Installing the AquaChlor System involves (in order):

1. Preparing pool/spa water
2. Mounting the AquaChlor control
3. Plumbing the flow switch and cell
4. Wiring the control

The diagram below shows an overview of a typical AquaChlor system.

(( ILLUSTRATION ))

### **Preparing Pool/Spa Water**

Before activating the AquaChlor, make sure the water chemical levels are within the specified ranges. This information can be found in the Water Preparation section of this manual on page 2.

### **Mounting the AquaChlor Control**

Refer to diagram below. Mount the AquaChlor in an accessible and visible area as adjustments at the control will be necessary from time to time. The AquaChlor is contained in a raintight enclosure that is suitable for outdoor mounting. The control must be mounted a minimum of 5 ft (1 **2** m) horizontal distance from the pool/spa. When considering a mounting location, note that the AquaChlor must be powered by either a 115 or 208/240VAC source from the filter pump timer. It is important that the AquaChlor be powered by a timer to ensure constant cycle times from day to day. Also note that the flow switch and cell have 12 ft (3 **2** m) cables which must run to the control. An additional length may be added if necessary (see Wiring).

The control is designed to mount vertically on a flat surface with the knockouts facing downward. It may be more convenient to remove the bottom knockouts before mounting the AquaChlor. Because the back of the control is a heat sink (disperses heat from control) it is important not to block the upper and lower ends of the control. Do not mount the AquaChlor in a panel or tight enclosed area.

(( ILLUSTRATION ))

The ideal mounting location for the AquaChlor would be one which is close to the timer (for easy input power wiring) and within 12 ft (3 **2** m) from both the cell and flow switch (so additional wiring is

not needed). It would also be in an open accessible area allowing maximum cooling for the heat sink.

### **Plumbing Overview**

Both the flow switch and cell are to be plumbed in the return line to the pool/spa They are to be installed after the filter and heater. If there is a solar heating system, the flow switch and electrolytic cell should be installed after the solar return piping. The electrolytic cell and flow switch tee fitting are designed to be plumbed into 2" (50mm Canadian models) PVC pipe. It is important to note that the flow switch be installed before (upstream) the cell in the system. The diagram on the page 11 shows the recommended plumbing for the typical AquaChlor system.

(( ILLUSTRATION ))

### **Flow Switch**

Refer to diagram below. To aid in installation, the flow switch comes already mounted in a diameter tee fitting to be plumbed in the return line before (upstream) the electrolytic cell. The flow switch is a sensitive device so care should be taken while handling and installing. Locate an easy to access area on the return line after the filter and heater. There must be at least an 10" (30cm) straight pipe run before (upstream) the flow switch. This will prevent turbulence inside the tee fitting that could cause the flow switch to operate erratically. Mount the tee fitting in a 1" (2.5cm) cutout in the return piping. Disassembly may be required to insert the two ends into the tee fitting. Using appropriate PVC glue, install the tee fitting with the arrow pointing in the direction of flow. Make sure that both sides of the return pipe have been inserted all the way into the tee fitting until they have reached the internal "stops". The wire cable from the flow switch can be run back to the AquaChlor control. Secure the cable to the piping or other stationary items with tie straps or electrical tape. For now, do not attempt to attach the cable to the control. If removal of the flow switch from the tee fitting ever becomes necessary, teflon tape should be used on the threads when reinstalling. Also, after tightening the flow switch, make sure that the arrows located on the top of the hex point in the direction of flow. This is very important because a misalignment of the flow switch will prevent the AquaChlor from operating.

(( ILLUSTRATION ))



## **Electrolytic Cell**

The AquaChlor electrolytic cell must be mounted in the return line to the pool/spa after (downstream) the flow switch in the system. Refer to the diagram below. The cell may be mounted in either a vertical or horizontal position. Water flow direction does not matter and the electrolytic cell may be mounted with either side facing the flow. Locate an easy to access area of the return plumbing after the flow switch and cut out a 14 **2**" (37cm) section. Install the two male threaded unions to the two cut ends using appropriate PVC glue. Now the electrolytic cell can be installed by firmly hand tightening the two female ends of the cell on to the two males. The wire cable from the flow switch can be run back to the AquaChlor control. Secure the cable to the piping or other stationary items with tie straps or electrical tape. For now, do not attempt to attach the cable to the control.

After the flow switch and electrolytic cell have been installed, the pool/spa pump should be turned on and the system checked for leaks. Any leaks should be corrected before going on to the next step.

(( ILLUSTRATION ))

## **Wiring**

Power must be shut off at the circuit breaker before performing any wiring. Be sure to follow Local and NEC electrical codes. Note that the AquaChlor uses both Class I and Class 2 wiring. A wiring divider is supplied to separate the high and low voltage wiring. For now, remove the divider. Wiring the AquaChlor involves running input power (115 or 208/240VAC) from the load side of the timeclock to the control and properly connecting the cell and flow switch cables to the designated terminals. To provide safe operation, the AquaChlor must be properly grounded and bonded.

Open the AquaChlor control and remove the cover panel either by moving it to one side or unplugging the flat ribbon cable. If the knockouts have not been removed, remove them now. Locate the two sets of screw terminals at the bottom of the circuit board. Refer to the wiring label on the AquaChlor as well as the diagram in this manual to determine correct wiring connections.

Route the cell cable through the appropriate knockout. If additional length is to be added, outdoor rated cable with 16 AWG leads must be used. Make sure any splices are weathertight. Attach the cell cable leads to the two designated screw terminals according to diagram.

Route the flow switch cable through the same knockout. If additional length is to be added, outdoor rated cable with 18 AWG leads should be used. Make sure any splices are weathertight. Attach the flow switch cable leads to the two designated screw terminals according to the diagram.

Route copper input power wires through the remaining knockout and attach to the designated screw terminals. Note that the same screw terminals are used for either 115 or 208/240VAC input. For Canadian models, the AquaChlor should be connected to a circuit protected by a class A ground fault interrupter. Be sure to connect the ground wire to the marked ground screw terminal. The wiring divider can now be put back in place.

A lug used for bonding is attached to the AquaChlor heat sink plate . All Class I loads including the AquaChlor must be bonded with 8 AWG (6 AWG Canadian) copper wire to the pool bonding system. See diagram on following page.

This completes the wiring and installation of the AquaChlor. Refer to the Operation section of the Owners Manual in this booklet for detailed instructions on how to operate the AquaChlor.

(( U.S. ILLUSTRATION ))

(( CANADIAN ILLUSTRATION ))

## **Troubleshooting**

The AquaChlor System is simple to use provided that it has been installed correctly and the pool/spa water is properly prepared. If you do have a problem refer to the troubleshooting section below or call your local AquaChlor dealer. If the problem is still not solved, you may call for technical assistance at (401) 884-6990. Technicians at the factory are available from 8:00 AM to 5:00 PM Eastern Time, Monday through Friday.

### **1. Power LED not on**

Check to make sure either 115VAC or 208/230VAC input power is connected to the proper screw terminals at the AquaChlor control. Verify input voltage with a voltmeter. If there is input power, the fuse may be blown. The AquaChlor circuit is protected by a fuse that is located on the circuit board. Disconnect power and remove cover

panel. Check fuse with an ohmmeter. If the fuse is bad, there is an internal problem with the AquaChlor control and it should be returned for repair. Contact a technician at the factory.

## **2. "Low Salt" LED illuminated or blinking**

Check salt level in pool/spa. If salt level is low, add salt according to chart on page 4. If salt level is in the recommended range and the low salt LED is blinking or on, the electrolytic cell probably needs to be cleaned. Remove, inspect and clean according to instructions on page 9. If the problem still exists, the cell may be at the end of its life expectancy. Call your AquaChlor dealer for replacement. NOTE: If the pool water temperature is below 60°F (16°C), the "Low Salt" indicator may be on even if the salt level is correct. This is normal operation. Cold water is less conductive but requires less chlorine.

## **3. "No Flow" LED illuminated**

The AquaChlor has sensed a no flow condition and has stopped generating chlorine. Correcting the condition that has caused the flow to stop will allow the AquaChlor to operate normally again. If there is adequate flow and the LED is still on, check that the arrows on the flow switch (on top of hex) are pointing in the direction of flow. If so, there may be a bad Connection at the screw terminals in the AquaChlor or a possible break in the wire run from the control. Disconnect wires at control. The flow switch is a normally open switch that closes when it detects flow. While the pump is running check for continuity between the two wires. If no continuity, the problem is in the flow switch or wire run. If there is continuity, the problem may be in the control. Call factory for technical assistance.

## **4. Little or no chlorine generated**

Possible causes may be:

- Salt level too low (below 2500 ppm)
- Salt level too high (above 3000 ppm)
- Filter pump time too short (at least 6-8 hours for average size pools)
- AquaChlor switch in OFF position
- Output level adjustment setting is too low
- Excessive scaling on cell

Verify that the switch is in the AUTO position and the salt level is in the recommended range. Check that the filter cycle time is adequate for proper chlorine generation. If the AquaChlor is not responding to the Output Level Adjustment. Check for excessive scale



12								
Week 13								
Week 14								
Week 15								
Week 16								
Week 17								
Week 18								
Week 19								
Week 20								

- (1) Setting should be increased as chlorine level falls, and decreased as chlorine level rises.
- (2) Total Alkalinity: 80-120 PPM Plaster Pools: 125-150 PPM Vinyl, Painted, Fiberglass.
- (3) Calcium Hardness: 200-275 PPM Plaster Pools; 175-25 PPM Vinyl, Painted, Fiberglass.

Continue weekly chlorine Ph testing for balance of swim season. For additional ASalt Test Strips@ call GoldLine at 401-884-6990 or your local authorized AquaChlor Dealer.

INDEPENDENT ENERGY

AquaChlor Electronic Control and Electrolytic Cell Limited Warranty

INDEPENDENT ENERGY (hereinafter called "AIE") warrants the AquaChlor Electronic Control and Electrolytic Cell to be free from defects in materials or workmanship under normal and proper use by the first purchaser who has purchased the AquaChlor Electronic Control and Electrolytic Cell for its own use (hereinafter called the "AOriginal Purchaser") subject to the terms and conditions set out herein. Proof of purchase of the AquaChlor Electronic Control and/or Electrolytic Cell must be presented to IE or its authorized

representative at the time of any warranty claim is presented. This warranty extends only to the original purchaser, and is not enforceable by any other party.

The AquaChlor Electronic Control and Electrolytic Cell are warranted for a full two (2) years from the date of purchase. After expiration of two (2) years from the original date of purchase, the AquaChlor control and cell are warranted on a prorated basis as indicated under "Extended Pro-Rated Warranty."

#### MANUFACTURER'S OBLIGATIONS

IE's obligation under this warranty is strictly limited to repairing or replacing, at IE's sole discretion, the AquaChlor Electronic Control and/or Electrolytic Cell which must be returned to IE or its authorized representative, freight prepaid, within the warranty period. If the defect is found to be the responsibility of IE within the limitations of the warranty, IE will repair or replace the AquaChlor Electronic Control or the Electrolytic Cell in accordance with IE's conditions and return such item to the original purchaser, freight prepaid. The defective parts returned to IE become the property of IE.

#### EXTENDED PRO-RATED WARRANTY

After the expiration of two (2) years from the date of purchase by the original purchaser, IE warrants its AquaChlor Electronic Control and Electrolytic Cell for one (1) additional year on a prorated basis. A faulty Electronic Control or Electrolytic Cell will be repaired or replaced at 50% of the current list price of said failed part, contingent upon original purchaser following the aforementioned claim procedures.

#### WARRANTY EXCLUSIONS

1. Material supplied or workmanship performed by others in the process of installing the AquaChlor Control or Cell.
2. Damage resulting from improper installation of the AquaChlor Control or Cell.
3. Problems resulting from failure to operate the AquaChlor Control or Cell in accordance with recommended instructions contained in product's owners guide.
4. Problems resulting from failure to maintain pool water chemistry in accordance with recommended levels.
5. Problems resulting from installing less than one AquaChlor unit

per 30,000 gallons of pool water.

6. Problems resulting from tampering, accident, abuse, negligence, unauthorized repairs or alterations, fire, flood, lightning, freezing, external water, war, or acts of God.

#### TOTAL OBLIGATIONS

The foregoing constitutes the entire liability of IE to the original purchaser of a AquaChlor Control and Cell. IE makes no other warranty of any kind whatsoever, expressed or implied, and all implied warranties of merchantability and fitness for a particular purpose are hereby disclaimed by IE and excluded from this limited warranty. In no event will IE be liable to the owner for direct, indirect, incidental or consequential loss, damage or economic injury to any person or property arising out of or relating to the use of a AquaChlor Electronic Control and Electrolytic Cell except as expressly set forth herein.

No employee, agent, dealer, or other person is authorized to make any warranties, guarantees, or representations to or to allow any exceptions to this warranty, or to assume any other liability or obligation on behalf of IE in connection with the AquaChlor Control or Cell.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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