

Naturally Balanced Chlorine / Bromine Generation

# AutoLEC

## RESIDENTIAL INSTALLATION / OPERATION MANUAL

MODELS AL-7 / AL-15

Factory Direct Customer Assistance...

HOTLINE: 1.800.922.6246 or 1.954.772.2255

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**IMPORTANT**

Read This Manual Before Installing & Operating

**Cyanuric Acid / Stabilizer Conditioner**

Cyanuric acid, CYA, (also known as stabilizer or conditioner) prevents rapid breakdown of chlorine by sunlight and inhibits the corrosive effects of chlorine and bromine. Regulations may exist regarding use of Cyanuric acid in public pools; please consult your pool professional. Use the chart below to determine the amount of Cyanuric acid needed. Test water with test kit that includes CYA testing, then use the chart below to determine the amount to add.

**POUNDS OF CYANURIC ACID NEEDED FOR 75 PPM RESIDUAL**

CYA Level Before Addition	Pool / Spa Volume in Gallons										
	312	625	1250	2500	3750	5000	7500	10000	15000	20000	30000
0 ppm	3 oz.	6 oz.	0.75	1.5	2.25	3	4.5	6	9	12	18
12 ppm	2.5 oz.	5 oz.	10 oz.	1.25	1 lb./14 oz.	2.5	3.75	5	7.5	10	15
25 ppm	2 oz.	4 oz.	0.5	1	1.5	2	3	4	6	8	12
37 ppm	1.5 oz.	3 oz.	6 oz.	0.75	1 lb./2 oz.	1.5	2.25	3	4.5	6	9
50 ppm	1 oz.	2 oz.	0.25	0.5	0.75	1	1.5	2	3	4	6
62 ppm	.5 oz.	1 oz.	2 oz.	0.25	6 oz.	0.5	0.75	1	1.5	2	3

**NOTE: ABOVE CHART BASED ON 1 POUND OF CYANURIC ACID ADDED TO 41,500 POUNDS OF WATER (5,000 GALLONS) WHICH EQUALS 25 PPM OF CYA.**

Normal required Cyanuric Acid levels are 60 -80 ppm. To add, pour around the perimeter of the pool. Allow CYA to dissolve and circulate for 24 hours before measuring again. Pre-dissolving any chemical prior to addition to pool water is advised.

**KILOGRAMS OF CYANURIC ACID NEEDED FOR 75 PPM RESIDUAL**

CYA Level Before Addition	Pool / Spa Volume In Cubic Meters										
	1.18	2.366	4.731	9.463	14.194	18.925	28.388	37.85	56.775	75.7	113.55
0 ppm	0.08	.17	0.34	0.68	1	1.3	2	2.7	4	5.4	8.1
12 ppm	0.07	0.14	0.28	0.56	0.85	1.1	1.7	2.2	3.4	4.5	6.8
25 ppm	0.05	0.11	0.22	0.45	0.68	0.9	1.3	1.8	2.7	3.6	5.4
37 ppm	0.04	0.08	0.17	0.34	0.51	0.68	1	1.3	2	2.7	4
50 ppm	0.02	0.05	0.11	0.22	0.34	0.45	0.68	0.9	1.3	1.8	2.7
62 ppm	0.01	0.02	0.05	0.11	0.17	0.22	0.34	0.45	0.68	0.9	1.3

**NEEDED BY INSTALLER**

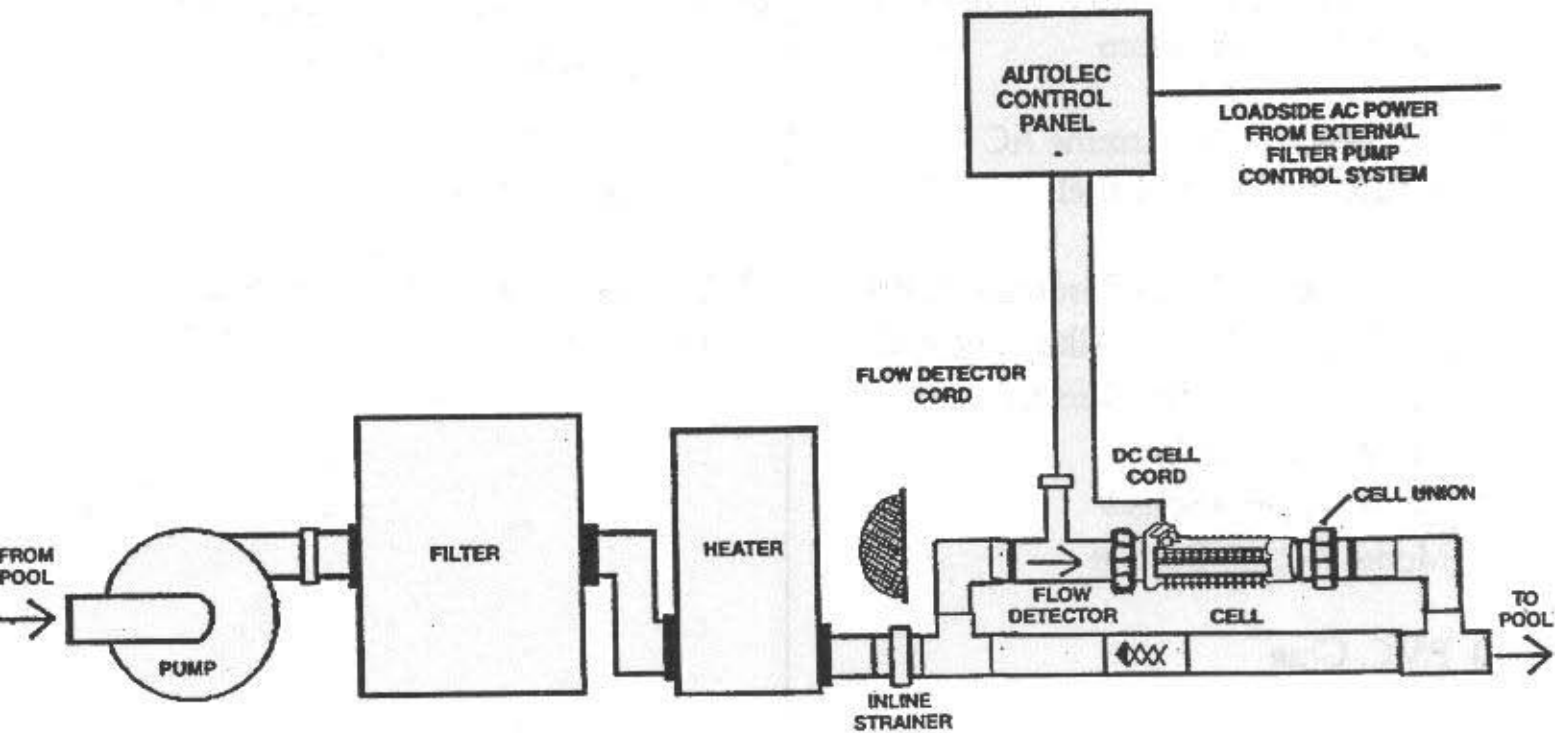
- 1) Required amount of salt
- 2) Hacksaw, Pipe Cutters or Cable Saw
- 3) Tape measure & Permanent Marker
- 4) Screwdrivers: Flat head & Phillips head
- 5) Drill with 1/4" (6mm) masonry-drill bit for block or stucco
- 6) Voltmeter - To determine AC voltage to Control Panel
- 7) Test kit for Chlorine/Bromine, Calcium Hardness, pH, Total Alkalinity, and Cyanuric Acid (stabilizer).  
We recommend the  
Taylor Technologies®  
Model K-2005 Test Kit
- 8) P.V.C. Glue
- 9) P.V.C. Cleaner / Primer
- 10) Assorted P.V.C. Fittings & Pipe
- 11) Assorted Electrical Hookup Components
- 12) Teflon tape or pipe joint compound

**SUPPLIED BY AUTOLEC**

- 1) Residential Installation / Operation Manual
- 2) Limited Warranty with Warranty Card (Must Return)
- 3) AUTOLEC Control Panel
- 4)
  - Chlorine/Bromine Production Cell
  - Flow Detector With Tee
  - Cell Unions
  - Strainer Union
- 5) Salt test strips & vial with mounting hardware.

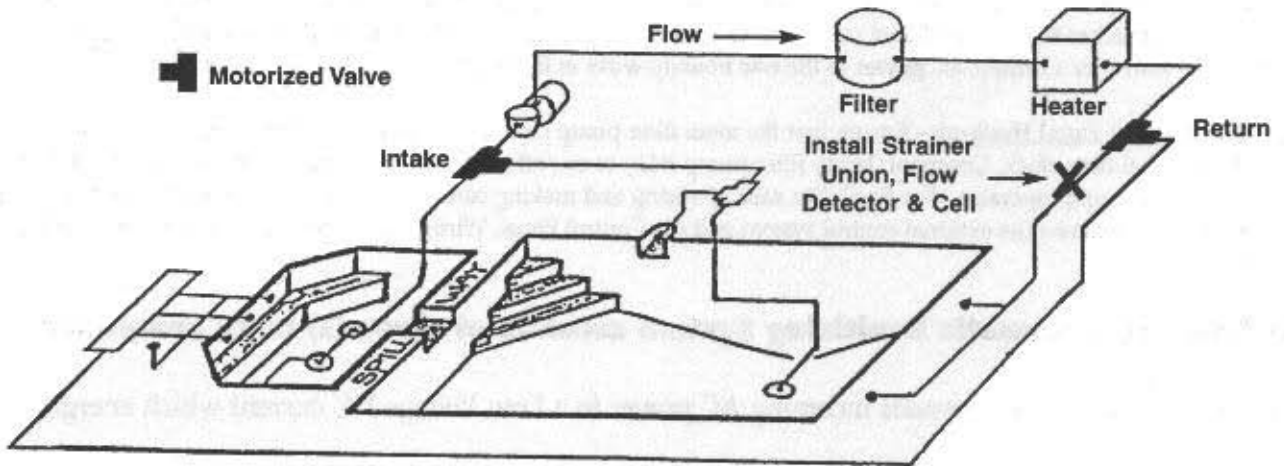
**Control Panel**

Using the supplied anchors and screws, the Control Panel should be mounted on a flat, sturdy, vertical surface away from direct exposure to sunlight. The Control Panel is equipped with a 12 foot DC cell cord and flow detector cord. For ease of installation, please ensure that both cords connect to the cell and flow detector while still providing slack in each cord for future service. Using a torpedo level and permanent marker, hold and level the Control Panel on the surface to be mounted and dot each of the (4) mounting holes with the permanent marker. Using a .25" (.62 cm) drill bit, drill to a depth of 1" (2.5 cm) and install the supplied anchors. The Control Panel is now ready to receive the (4) mounting screws to secure the installation. **DO NOT SHOOT OR PERMANENTLY ATTACH THE CONTROL PANEL TO THE WALL! This will void warranty, damage the Control Panel and make it virtually impossible to service without damaging the cover.** NOTE: Install at least 5 ft. (1.53m) from the inside wall off the pool or spa.



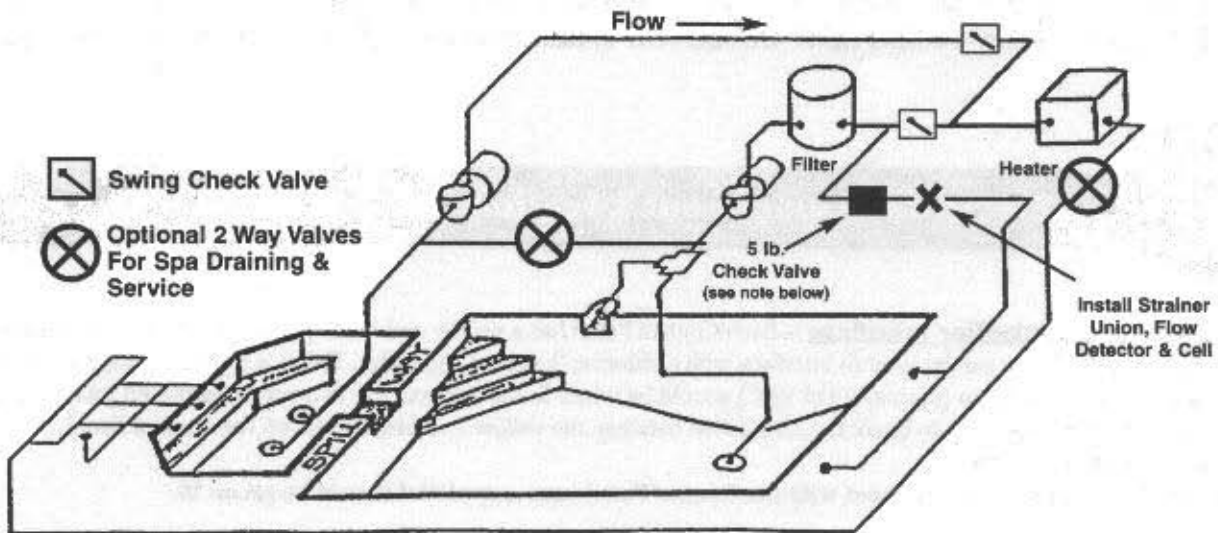
NOTE: The cell is a bi-directional flow device. When installing, do not glue or silicone the threads of the unions into the body of the cell. This will void the warranty. Teflon tape or pipe joint compound is suggested.

NOTE: See diagrams below for the proper location of the strainer union, flow detector and cell, so not to over chlorinate/brominate the spa.



**Single Pump Pool / Spa Combination**

NOTE: If this scheme is desired and the spa is raised, a Swing Check Valve must be installed after the Return Motorized Valve on the Spa Jet line to ensure spa drain down does not occur.



**Dual Pump Pool / Spa Combination**

NOTE: If this scheme is desired and the spa is raised, a 5 lb. Check Valve must be installed on the Pool Return line between the strainer union and the flow detector to ensure adequate spa spillover.



**STEP 1 - High Voltage Wiring**

All electrical equipment must be located five feet or more from closest pool or spa waterline. Use the ground wire provided inside the Control Panel for grounding. Bond all equipment, including the Control Panel, to earth ground.

**STEP 2 - Wire from the sub-panel** - Your AutoLEC Control Panel is shipped with the voltage selector switch factory set to 230 VAC. If 115 VAC is desired, remove the screw securing the access cover, using a small slotted screwdriver, slide the red voltage selector switch to the 115 VAC position. The Control Panel will operate at either 50Hz or 60Hz line power. Ensure that the filter pump AC voltage used matches the Control Panel voltage setting. Improper wiring will damage the Control Panel, which is not covered under warranty. Connect AC power to the two hookup wires at the bottom of the Control Panel.

**STEP 2 a - Control Panel Hook-up** - Ensure that the main filter pump circuit breaker is set to OFF. Connect AC from the LOAD SIDE of the external time clock, Compool/Jandy filter pump relay or on/off switch to the Control Panel so that AUTOLEC operates only when the filter pump operates. For flexibility, ease of wiring and making connections, #14 gauge stranded wire is recommended for interconnection between the external control system and the Control Panel. Wiring diagrams are located on the Control Panel's, access cover.

**Each AutoLEC Automatic Sanitizing System consists of three (3) main components:**

1. The CONTROL PANEL converts incoming AC power to a Low Voltage DC current which energizes the Cell.
2. The CELL receives that Low Voltage DC current from the Control Panel, indicated by a GREEN CELL ON indicator, which initiates the electrolytic process and allows sanitizer to be produced. This process converts ordinary table salt (Sodium Chloride) to 100% Pure Sodium Hypochlorite (Liquid Chlorine) which in turn sanitizes your pool. This processed salt then reverts back to ordinary table salt and the entire process is repeated.
3. The FLOW DETECTOR ensures adequate flow is present to produce sanitizer. Further, it protects the Cell from damage caused by insufficient flow. If the flow rate drops below 15 GPM (Gallons Per Minute), the Control Panel will display a RED FLOW DETECTOR indicator and the CELL ON indicator will display dark.

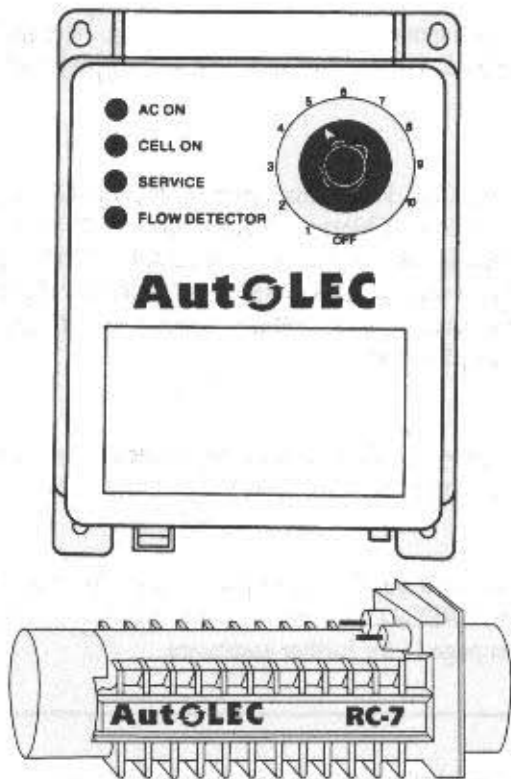
**Electronic Component Location: AL-7 & AL-15**

**a) Chlorine/Bromine Controller Interface** - Each Control Panel has a yellow and black pair of wires labeled. "Use with chlorine controller only". These can be used to interface with a chlorine/bromine controller. This is a dry-contact input. If an ORP controller is used, its output voltage (normally 115 VAC) should be wired to the coil contacts of a normally-closed relay or contactor. The relay contacts are then used only to break the connection between the yellow and black wires on the Control Panel. Remove the access cover for access to these wires.

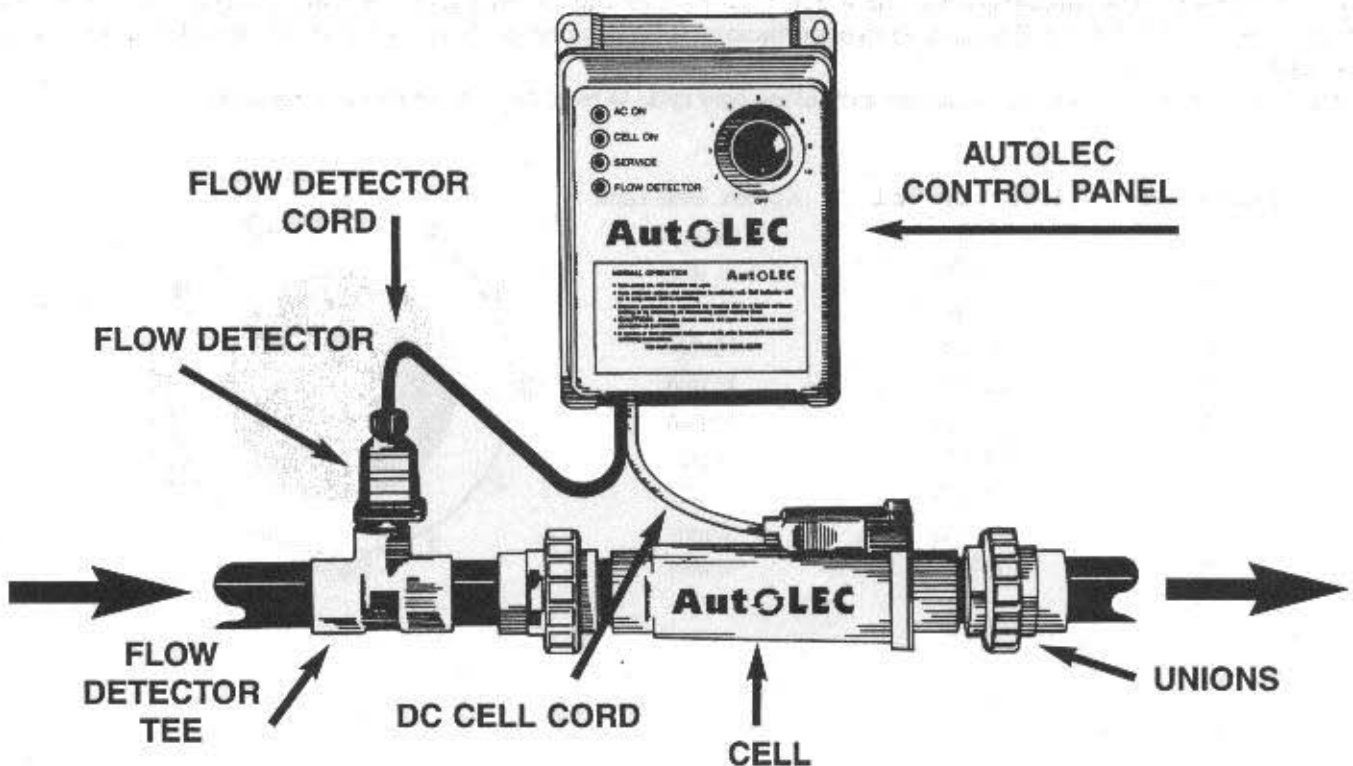
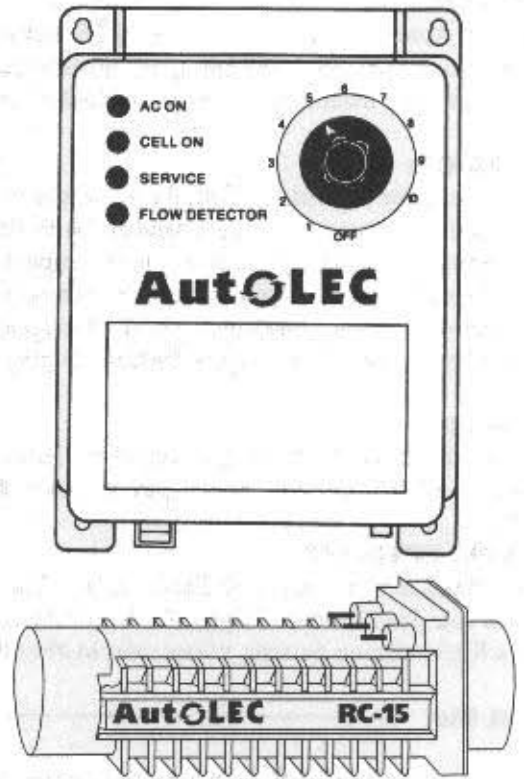
**NOTE:** When an ORP controller is interfaced with the Control Panel your output dial should be set on 10.

**b) 10A Cell Fuse** - On the back of the Control Panel a 10 amp cell fuse is installed into a black fuse holder. This fuse protects the Control Panel and cell from voltage spikes. If a red service light displays, inspection and possible replacement of this fuse may be necessary. The Control Panel must be removed from the wall to access this fuse.

**AUTOLEC MODEL AL-7**



**AUTOLEC MODEL AL-15**



**Indicator Lights**

**A. AC ON:**

If your AutoLEC is wired properly, this indicator will display GREEN whenever the main filter pump is operating. This indicator ensures that proper incoming AC power is being delivered to the Control Panel. Further, this indicator will display dark whenever the main filter pump is switched off or power is interrupted.

**B. CELL ON:**

This indicator will display GREEN whenever the Control Panel is energizing the Cell. While this indicator displays GREEN, rest assured that your pool is being sanitized with 100% Pure Sodium Hypochlorite (Liquid Chlorine). Except for the OFF position, each time the incoming AC power is interrupted and then restored to the Control Panel, this indicator will display GREEN for the first 30 minutes of continuous operation regardless of the Output Control Dial setting. This is a normal START-UP CYCLE whenever the unit is reset by a power interruption. The Output Control Dial regulates the amount of time the Control Panel switches on and off to energize the Cell. During rest mode this indicator will display dark.

**C. SERVICE:**

Normally, this indicator will display dark. This indicator will display RED whenever an abnormal activity exists within the system. If a RED indicator persists, please refer to #8 of the Trouble Shooting Guide on page 16 for further assistance.

**D. FLOW DETECTOR:**

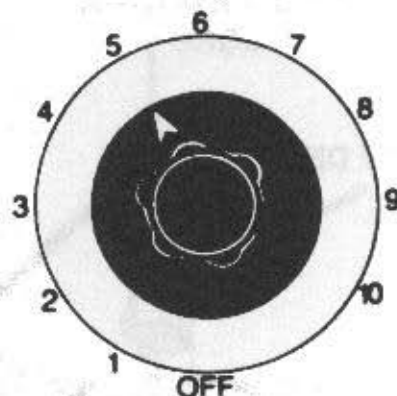
Normally, this indicator will display dark. This indicator will display RED whenever insufficient flow is present. Typically, the flow rate drops below 15 GPM. Further, if this indicator is displaying RED, the GREEN CELL ON indicator will display dark. If a RED indicator persists, please refer to #9 of the Trouble Shooting Guide on page 16 for further assistance.

**Output Dial**

This is a percentage timer that regulates the amount of time the system is to produce chlorine/bromine during the filter pump running cycle. The output is regulated according to the setting of this dial. Each setting has a memory cycle of 23 minutes. The setting of the dial will determine how long the cell will produce chlorine/bromine and how long it will be in the rest mode. While in the rest mode your cell light will be off to indicate that no chlorine/bromine is being produced. Below is a chart that indicates the on and off periods of each output setting.

**NOTE: Any interruption of power, will cause the current memory cycle to reset itself, when power is restored.**

Dial Setting	Approx. On-Time	Approx. Rest-Time
1	1 min.	22 min.
2	2 min.	21 min.
3	7 min.	16 min.
4	9 min.	14 min.
5	11 min.	12 min.
6	12 min.	11 min.
7	14 min.	9 min.
8	16 min.	7 min.
9	21 min.	2 min.
10	23 min.	0 min.





**Use Of Sodium Bromine** *Once a bromine pool - Always a bromine pool.***SODIUM BROMIDE (OPTIONAL) - 50 PPM**

Where Cyanuric acid is not available or where its use is restricted, bromine can be used as an alternative sanitizer to chlorine. The AutoLEC will convert sodium bromide to bromine in the same way that it converts sodium chloride to sodium hypochlorite.

**NOTE:** Bromine pools do not require the addition of Cyanuric acid. Typical chlorine stabilizer provides no U.V. protection for bromine. However cyanuric acid is known to reduce the corrosive effect of oxidizers.

To produce hypobromous acid (bromine sanitizer), we recommend initially adding 6 pounds (1.8Kg) of sodium bromide for every 12,000 gallons (46 cubic meters) of pool water capacity. To maintain the sodium bromide level; add 1.0 pound (0.45Kg) of sodium bromide for every 50 pounds (22.5 Kg) of sodium chloride added to the pool.

**REMEMBER:** For the AutoLEC System to operate properly, the pool water must contain the recommended level of both salts as previously specified. (When used, sodium bromide is added in addition to the normal amount of sodium chloride required.)

**NOTE:** Refer to your Taylor Pool & Spa Water Chemistry Testing & Treatment Guide (part # 2004B) from Taylor's Test Kit # K-2005. Use of an OTO test kit to measure residual bromine levels is required.

**Equipment Start Up Sequence**

Before operating the AutoLEC System, perform the following steps to ensure proper installation and operation:

- A. Turn ON all circuit breakers to the pool equipment.
- B. Set the output control dial at position five.
- C. Switch on the main filter pump, the following indicators should display...a GREEN AC ON and a RED FLOW DETECTOR. This is normal. After sufficient flow is detected, greater than 15 GPM, the RED FLOW DETECTOR indicator should display dark and approximately 5-10 seconds later, a GREEN CELL ON indicator should display. If this sequence does not occur or any RED indicators display, please refer to the Trouble Shooting Guide starting on page 15 for further assistance.

**NOTE:** Be sure to monitor the chlorine/bromine level for the next few days and properly adjust the chlorine/bromine output according to AutoLEC's required levels. **DO NOT EXCEED SANITIZER LEVELS REQUIRED!**

If an adjustment is required, make the adjustment and allow the pool to react to this change a minimum of 5 days. After the 5 days expires, retest the pool water and make any further adjustments if necessary. Typically, when an adjustment is made, the amount of time the main filter pump operates does not change. A simple rule to follow....

**As the water temperature decreases, the sanitizer demand also decreases.**

Lower the Output Control Dial to satisfy this change in sanitizer demand. (When the water temperature drops below 60°F (14°C), lower the Output Control Dial, in some cases, set it to the "OFF" position. Because the water temperature is cooler, the sanitizer demand is lower, it is unnecessary to produce as much sanitizer as normally produced in warmer water. Further, this action protects the Cell from damage caused by operating below 60°F (14°C). Alternative sanitizers such as a non-chlorine shock can be added to the pool until the water temperature increases above 60°F (14°C).

**As the water temperature increases, the sanitizer demand also increases.**

Raise the Output Control Dial and/or increase the main filter pump runtime to satisfy this change in sanitizer demand.

<b>PROBLEM</b>	<b>CAUSE</b>	<b>SOLUTION</b>
1. Insufficient sanitizer production.	<p>A. The test kit reagents or test strips are old or expired.</p> <p>B. The unit is set too low in relation to an increased sanitizer demand.</p> <p>C. The bather load has increased.</p> <p>D. Sanitizer lose due to intense sunlight exposure.</p> <p>E. The body of water being sanitized leaks.</p> <p>F. Low salt</p>	<p>A. Retest with new reagents or test strips.</p> <p>B. Turn up the output dial and/or increase the filter pump run time.</p> <p>C. Set the output control dial to #10 and allow the filter pump to operate 24 hours (where applicable remove the "OFF" tripper from the external time clock) to super-chlorinate / brominate the water.</p> <p>D. Check the stabilizer level and add cyanuric acid if needed. (Refer to the Cyanuric Acid Needed for 75 PPM section, page 7.) If on bromine, replenish bromine residual.</p> <p>E. Repair the leak and rebalance the water being sanitized. (Refer to the Pool Water Preparation section, page 5.)</p> <p>F. Check the residual salt level and add if necessary. (Refer to the Salt Requirements Needed for 3000 ppm section, page 6)</p>
2. Scale build-up within the cell.	<p>A. The water being sanitized contains high pH, alkalinity and calcium hardness.</p> <p>B. The unit is not reversing polarity.</p> <p>C. Possible cell failure</p>	<p>A. Calculate Langelier's Index to assure balanced water. (See page 5) Adjust the water chemistry and mix 1 part muriatic acid to 4 parts water. Pour this solution into the cell and allow it to clean the cell for no longer than 15 minutes. Repeat if necessary. Drain and rinse with fresh water and re-install. Dilute pool water with fresh water if necessary.</p> <p>B. Send the control panel back to the factory for service.</p> <p>C. Check with either a 504 or 947 cell tester. Replace the cell if needed. Refer to #4 of this section.</p>
3. DC plug and cell terminals burned.	<p>A. The cell cord plug is not securely pushed onto the cell terminals allowing moisture to seep into the plug.</p> <p>B. The cell terminals leak.</p> <p>C. Completely failed cell</p>	<p>A. Ensure that the cell cord plug is pressed completely onto the cell terminals. Check the cell terminals and clean with a dry cloth to remove all dirt and corrosion.</p> <p>B. Shut off the main filter pump and patch the cell terminal(s) with epoxy putty and leave the filter pump off for 24 hours.</p> <p>C. Replace the cell.</p>
4. Premature cell failure. (Requires replacement cell. Normal cell life, if sized and operated correctly, is 3 - 5 years.)	<p>A. The service indicator has been ignored allowing the unit to operate (unprotected) at low salt levels.</p> <p>B. Abnormally high cell usage due to an insufficient cyanuric acid level.</p> <p>C. Debris in Cell</p>	<p>A. Check and add salt if needed. (Refer to the Salt Requirements Needed For 3000 PPM section, page 6.)</p> <p>B. Check the stabilizer level and add cyanuric acid if needed. (Refer to the Cyanuric Acid Needed for 75 PPM section, page 7.)</p> <p>C. Ensure that the strainer union screen is being used. Inspect the cell monthly and clean debris if required.</p>
5. White flakes in the water.	<p>This occurs when excessive calcium hardness is present in the water being sanitized. This should cease after a few days.</p>	<p>Monitor the pH and adjust if necessary. (Refer to the Pool Water Preparation section, page 5.)</p>
6. No AC ON light.	<p>A. Incoming AC power for the main filter pump is not present.</p> <p>B. The control panel is damaged.</p> <p>C. The unit is not wired properly.</p>	<p>A. Ensure that the main filter pump circuit breaker is set to "ON".</p> <p>B. Send the Control Panel back to the factory for service.</p> <p>C. Rewire the unit. (Refer to section 3a, page 11.)</p>

PROBLEM	CAUSE	SOLUTION
7. No CELL ON light.	<ul style="list-style-type: none"> <li>A. The unit is in rest mode.</li> <li>B. Red flow detector light</li> <li>C. Check the voltage selector switch.</li> <li>D. The Control Panel has failed.</li> </ul>	<ul style="list-style-type: none"> <li>A. This is normal. (Refer to the Output Dial section, page 13.)</li> <li>B. See # 9.</li> <li>C. Ensure that your not powering a 230 VAC Control Panel with 115 VAC.</li> <li>D. Send the Control Panel to the factory for service.</li> </ul>
8. Red SERVICE light.	<ul style="list-style-type: none"> <li>A. The cell is scaled.</li> <li>B. The cell cord is disconnected from the cell.</li> <li>C. The 10A cell fuse may be blown.</li> <li>D. Low salt</li> <li>E. The unit is not reversing polarity.</li> <li>F. Possible cell failure.</li> <li>G. Very cold pool water.</li> </ul>	<ul style="list-style-type: none"> <li>A. See # 2.</li> <li>B. Ensure that the cell cord is firmly pressed onto the cell.</li> <li>C. Check the 10A cell fuse on the back of the Control Panel and replace if necessary.</li> <li>D. Check the residual salt level and add if necessary. (Refer to the salt requirements needed for 3,000 ppm section, page 6).</li> <li>E. Send the Control Panel back to the factory for service.</li> <li>F. Check with either a 504 or 957 cell tester. Replace the cell if needed. Refer to #4 of this section.</li> <li>G. Lower the output control dial setting, even to the "OFF" position, and add a non-chlorine shock to the pool until the water temperature increases above 60° F.</li> </ul>
9. Red FLOW DETECTOR light.	<ul style="list-style-type: none"> <li>A. Water exiting the filter is being diverted away from the inlet of the flow detector.</li> <li>B. Check the condition of the filter.</li> <li>C. Check the condition of the strainer union at the inlet side of the flow detector.</li> <li>D. Ensure that the flow detector is not installed opposite in relation to the actual water flow.</li> <li>E. The Control Panel is not wired properly.</li> <li>F. The flow detector may have failed.</li> </ul>	<ul style="list-style-type: none"> <li>A. Increase the flow rate above 15 gallons per minute to activate the flow detector.</li> <li>B. If the filter is dirty, clean the filter to increase the overall flow rate.</li> <li>C. If it is clogged; remove, clean and reinstall.</li> <li>D. Extract the flow detector and re-install if necessary.</li> <li>E. Rewire the Control Panel. (Refer to section 3a, page 11).</li> <li>F. Replace the flow detector.</li> </ul>

# AutoLEC

Record The Following Information

Installer \_\_\_\_\_

Date Installed \_\_\_\_\_ Model Number \_\_\_\_\_

Control Panel Serial Number \_\_\_\_\_

Cell Serial Number \_\_\_\_\_ Pool Gallons \_\_\_\_\_

**Factory Direct Customer Assistance...**

HOTLINE: 1.800.922.6246 or 1.954.772.2255

FAX: 1.954.772.4070

E-MAIL: [autopilot@swimstuff.com](mailto:autopilot@swimstuff.com)

**Visit Us On The Internet @**

<http://www.swimstuff.com>

**Manufactured by**

AutoPilot Systems, Inc.

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**Heat Your Pool For A Dollar A Day!**

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# AutoLEC

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## Notes

- 1. Tell your friends about the soft, silky water and great convenience of having your pool on an AutoLEC!*
- 2. Call 1-800-922-6246 to make sure your factory warranty has been registered, and if you have any questions unresolved by your Authorized AutoLEC Dealer.  
(Office Hours 9 am 5 pm Eastern Standard Time)*
- 3. Give us the names of a fellow pool owner who buys an AutoLEC and receive a free gift!*
- 4. Relax, Exercise and Have Fun In Your Pool !*
- 5.*

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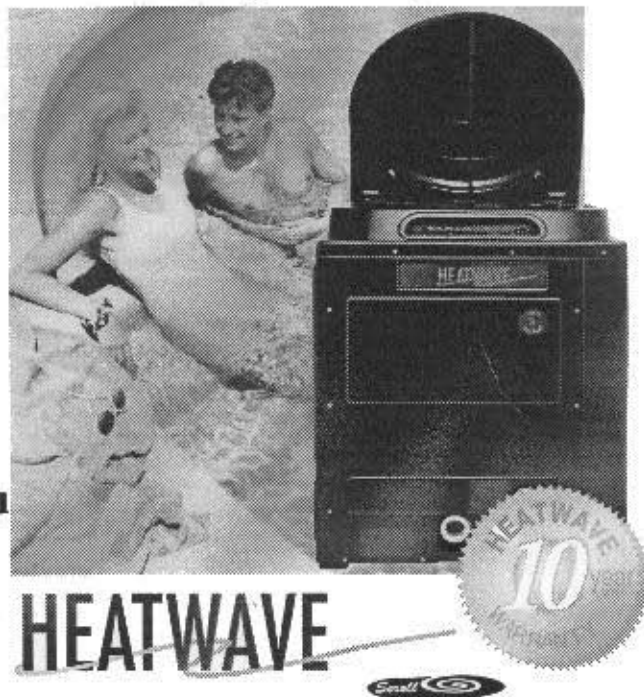
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# AutoLEC

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# IMPORTANT SAFETY INSTRUCTIONS

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

1. **READ AND FOLLOW ALL INSTRUCTIONS.**
2. **WARNING** - to reduce the risk of injury, do not permit children to install or operate this product.
3. Follow all aspects of the local and National Electric Code(s) when installing this product.
4. During installation, mount the AUTOLEC Control Panel to ensure the least amount of direct exposure to rain, direct sunlight or any corrosive environment.
5. Install at least 5 feet from the inside wall of the pool or spa.
6. A green ground wire is fastened to the inside of the Control Panel. To reduce the risk of electrical shock, connect this ground wire to the grounding terminal of your electrical service or supply panel with a continuous green or green & yellow striped insulated copper wire, equivalent in size to the circuit conductor supplying this equipment, but no smaller than No. 12 AWG (3.3mm<sup>2</sup>).
7. A security screw is provided on the access cover to restrict access to the Control Panel after installation. Remove screw from access cover prior to installation, insert and tighten screw when installation is complete.
8. **SAVE THESE INSTRUCTIONS.**

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## CAUTION

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Failure to follow these instructions can result in fire, explosion, electric shock or electrocution. Read through and follow these instructions carefully before beginning the installation or start up of the AutoLEC system.

# Specifications

**ALL MODELS INPUT:** 115 VAC, 50/60 Hz, 2.5 Amps  
220 VAC, 50/60 Hz, 1.3 Amps

## Outputs

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**RC-7 Cell** .75 lbs. (.34 kg) @ 3.5 Amps  
per 24 hours @ Maximum setting (10)

**RC-15 Cell** 1.10 lbs. (.49 kg) @ 5 Amps  
per 24 hours @ Maximum setting (10)

## Flow Rate

Minimum: 15 gpm / 3.4 cubic meters per hour  
Maximum: 50 gpm / 11.3 M<sup>3</sup>/hr (Use external bypass if flow rate exceeds 50 gpm (11.3 M<sup>3</sup>/hr))

## Automatic Self Cleaning Feature

### **Reverse Polarity Function (Standard in all models)**

The Reverse Polarity Function is designed to automatically clean the cell blades, maximizing the cell's ability to manufacture chlorine or bromine.

This feature is only enabled when the GREEN CELL ON indicator is displayed. This feature is part of a start up cycle. Thirty minutes after the Control Panel is energized, a polarity reversal occurs, which cleans the cell. There after, as long as the Control Panel is allowed to operate continuously without a power interruption, an expected polarity reversal will take place approximately every 3 hours of main filter pump operation. This setting is not selectable. Since the OUTPUT CONTROL DIAL effects the amount of time the GREEN CELL ON indicator is displayed, it also has the same effect with regards to the Reverse Polarity Function.

**NOTE:** Before adding any make-up water to your pool, it is suggested that pretesting the make-up water for high pH, total alkalinity and calcium hardness will aid in the adjustment of these levels before they become excessive. If manual cleaning of the cell is required, please refer to page 5 for further details and instructions.

# AutoLEC

## System Sizing

Use these three formulas to figure your correct gallonage:

**Rectangular Pool:** Length x Width x Average Depth x 7.5 = Total Gallons

**Oval / Round Pool:** Diameter x Diameter x Average Depth x 5.9 = Total Gallons

**Free Form Pool:** Average Length x Average Width x Average Depth x 7.5 = Total Gallons

## AutoLEC's System Production Capacity

## 1. Sanitizer Demand / Pool Requirements

The rate at which sanitizer is consumed in any swimming pool depends on the relationship of eight major variables. Since these variables can vary widely from pool to pool and season to season, precise prediction of the sanitizer demand for any one pool is difficult. At the end of this section, rules of thumb are provided for AutoLEC System Sizing. Given all the variables, should you find the unit unable to keep up with the sanitizer demand in your pool (assuming it is being operated correctly), we suggest increasing the output through a larger or multiple units.

THE VARIABLES ARE:

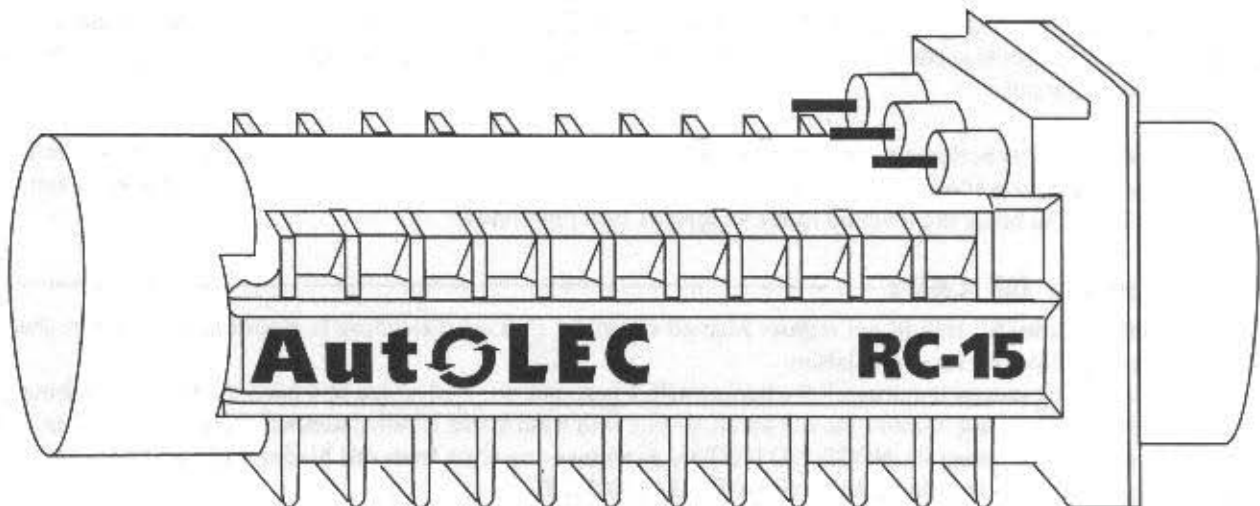
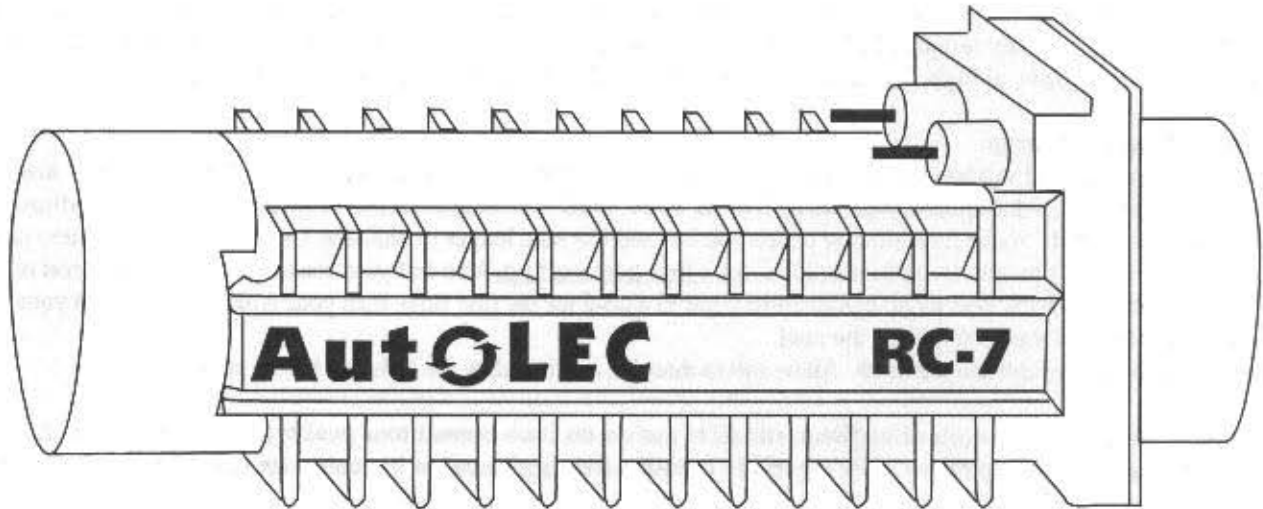
1. Volume and surface area of the pool / spa being sanitized.
2. Average water temperature maintained: As the temperature of the water increases, the sanitizer demand will also increase. As the temperature of the water decreases, the sanitizer demand will also decrease. When this happens, the output dial *should* be decreased to compensate for this lower demand (which will also protect your equipment from excessive levels of sanitizers).
3. Cyanuric acid level maintained: This chemical, when added to pool water, significantly inhibits sanitizer depletion from exposure to sunlight. Cyanuric acid also inhibits corrosion if your pool is equipped with any metal components. Minimum levels or better must be maintained to ensure that the sanitizer being produced is protected from UV breakdown.
4. Bather load: As the bather load increases, the sanitizer demand will also increase.
5. Amount of direct sunlight / UV exposure: Pools exposed to larger amounts of direct sunlight are more vulnerable to increased sanitizer loss and algae growth. Indoor or screened pools have less sanitizer demand.
6. Exposure to vegetation and airborne debris: Dense landscaping near the pool, along with increased nitrate levels (urine, bird droppings, fertilizer, well water, etc.) greatly contribute to increased sanitizer demand.
7. Chemical dilution: Virtually *all* pool chemicals experience dilution through rainfall, adding of fresh make-up water due to evaporation, splash-out, filter backwashing, leaks, etc. When freshwater is added, sanitizer demand increases for a brief period.
8. Main filter pump runtime and your pool's circulation patterns: Sanitizer can only be produced while the main filter pump is operating. Waterfalls/Fountains and other water features operated by the filter pump can directly effect sanitizer demand. The main filter pump runtime and/or output dial may need to be increased to satisfy this higher demand.

### 2. Sanitizer Production / System Sizing

While sanitizer *demand* varies beyond precise prediction, and you may desire a higher or lower sanitizer residual in your pool, the following "rules of thumb" will assist you in properly selecting the correct AutoLEC model. When unsure, we recommend selecting the larger model versus the smaller model if you desire 100% of your sanitizing requirements be satisfied with your AutoLEC System.

1. A Control Panel with a **RC-7 cell**, operated at maximum output (3.5 amps), at 2500 ppm salt residual will produce .75 lbs. (.34 kg) of **100% pure** Sodium Hypochlorite (at a natural pH of 7.7) in 24 hours of continuous operation. This amount of chlorine could satisfy up to **25,000** gallons of pool water, depending on the 8 *demand* variables for sanitizer. Ninety percent (90%) of the time, this model should produce adequate sanitizer for a 20,000 gallon pool.
2. A Control Panel with a **RC-15 cell**, operated at maximum output (5.0 amps), at 2500 ppm salt residual will produce 1.10 lbs. (.49 kg) of **100% pure** Sodium Hypochlorite (at a natural pH of 7.7) in 24 hours of continuous operation. This amount of chlorine could satisfy up to **40,000** gallons of pool water, depending on the 8 *demand* variables for sanitizer. Ninety percent (90%) of the time, this model should produce adequate sanitizer for a 30,000 gallon pool.

**NOTE:** Residual salt levels must be maintained above 2000 ppm and below 3000 ppm. Do not exceed 3000 ppm salt residual or you will begin to taste the salt in the water!





**STEP 1 - Proper Water Balance Requirements**

Proper AutoLEC System operation is dependent on proper pool water conditions. Manually balance the pool water chemistry to meet all suggested ranges of water balance factors below before start-up of AutoLEC. From that point forward your AutoLEC System will assist you in keeping your water chemistry factors in balance *naturally*.

**BEFORE START UP MAKE SURE THE POOL WATER MEETS THE FOLLOWING REQUIREMENTS:**

**ALL WATER BALANCE FACTORS SHOULD BALANCE WITH LANGEIERS SATURATION INDEX. WE RECOMMEND THE TAYLOR K-2005 TEST KIT, OR A VISIT TO YOUR LOCAL POOL PROFESSIONAL.**

**AutoLEC System Required Ranges** (And periods for testing water for these water balance factors.)

**STEP 2 - Bi-Weekly Checks**

- 1) Free Chlorine 1.0-3.0 ppm or Bromine 2.0-4.0 ppm
- 2) pH 7.2-7.8 ppm

**STEP 3 - Monthly Checks**

- 3) Calcium Hardness 150-300 ppm
- 4) Total Alkalinity 80-150 ppm
- 5) Cyanuric Acid (stabilizer) 60-80 ppm (Outdoor Pools)  
10-20 ppm (Bromine/Indoor Pools)
- 6) Salt Residual 2000-3000 ppm
- 7) Langeliers Index (water balance) + or - 0.3 pH of saturation

**CAUTION:** Excessive Bromine or Chlorine residuals (greater than 4.0 ppm) will cause erosion and/or corrosion of any metal components in contact with pool water. Staining and premature failure of heaters, filters, and other metal components will be the result. Do not exceed recommended sanitizer ranges. **NOTE: Standard pool water test kits do not read chlorine levels above approximately 8.0 ppm residual. Test reagents, at high levels, return to a clear liquid. AVOID HIGH SANITIZER LEVELS!**

**STEP 4 - Salt Requirements**

It is important that a suggested salt level of 2500 ppm be maintained at all times. Allowing less than 2000 ppm salt will activate a service light. The amount of salt required depends on the size of the pool. Use of granulated, evaporated, 98% pure sodium chloride (NaCl) salt is recommended. Water conditioning pellets can be used but take longer to dissolve. Use the chart on the next page to determine the amount of salt to add, in pounds or kilos, for a new pool start up. Also test your make up water for its level of salt and compare it with the charts on the next page. Before adding salt to a pool for the first time, turn your AutoLEC off, open your main drain, then pour salt around the perimeter of the pool.

**NEVER** add salt directly through the skimmer. Allow salt to dissolve and circulate for 24 hours before starting up unit.

**NOTE: DO NOT** allow large amounts of undissolved salt to remain on fresh cementitious pool/spa interior surfaces. Brush vigorously to accelerate salt dissolving especially in cold water conditions, or in pools with inoperative or no main drains.

**Stains From Salt**

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Most salt purchased has an anti-caking additive in it that contains a small amount of Iron. When large quantities of salt are left on the pool floor to slowly dissolve, this iron content will leave a brown or orange colored stain. We suggest brushing the salt periodically to assist in the dissolving of the salt.

**NOTE: Homeowners with water softening equipment, which utilize salt, may already have substantial levels of salt in their drinking water. So before adding this water to your pool, test the level of salt, then determine the amount of salt still needed to be added to bring the level up to the suggested 2500 ppm level.**

**Manual Cleaning Of Cells**

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In normal conditions the AutoLEC should not require Manual Cleaning. If manual cleaning is required, check water chemistry for possible imbalances or call factory for consultation.

Remove the cell by loosening unions to release. Fill a bucket with 1 part muriatic acid added to 4 parts of water and submerge the cell. After 10 - 15 minutes of foaming, remove the cell and rinse out with fresh water. If cell blades still have scale on them, repeat the process, not to exceed 15 minute intervals. **NOTE: DO NOT try to remove any scale from cell blades with any tools. This may scratch or damage the coating on the blades and will VOID WARRANTY.**

**CAUTION: Always add acid to WATER, not water to acid.**

### POUNDS OF SALT NEEDED FOR 3000 PPM RESIDUAL

Salt Level Before Addition	Pool / Spa Volume in Gallons													
	234	469	937	1875	3750	7500	9375	11250	13125	15000	18750	22500	26250	30000
0 ppm	5.5	11	23	46	93	187	233	280	327	375	468	562	656	750
320 ppm	5	10	20	41	83	167	208	250	292	335	418	502	586	670
640 ppm	4.5	9	18	36	73	147	183	220	257	295	368	442	516	590
960 ppm	3.5	7	15	31	63	127	158	190	222	255	318	382	446	510
1280 ppm	3	6	13	26	53	107	133	160	187	215	268	322	376	430
1600 ppm	2.5	5	10	21	43	87	108	130	152	175	218	262	306	350
1920 ppm	2	4	8	16	33	67	83	100	117	135	168	202	236	270
2240 ppm	1	2	5	11	23	47	58	70	82	95	118	142	166	190
2560 ppm	12 oz.	1.5	3	6	13	27	33	40	47	55	68	82	96	110
2880 ppm	3 oz.	6 oz.	12 oz.	1.5	3	7	8	10	12	15	18	22	26	30
3000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: ABOVE CHART BASED ON 1 POUND OF SALT ADDED TO 1 MILLION POUNDS OF WATER (APPROXIMATELY 120,000 GALLONS) WHICH EQUALS 1 PPM OF SALT.

### KILOS OF SALT NEEDED FOR 3000 PPM RESIDUAL

Salt Level Before Addition	Pool / Spa Volume in Cubic Meters													
	0.89	1.775	3.547	7.097	14.194	28.388	35.484	42.581	49.678	56.775	70.969	85.163	99.356	113.55
0 ppm	2.5	5	10	21	42	85	106	127	148	170	212	255	297	340
320 ppm	2.2	4.5	9	18	38	76	94	113	132	152	190	228	266	304
640 ppm	2	4	8	16	33	67	83	100	116	134	167	200	234	268
960 ppm	1.5	3	7	14	28	58	72	86	101	116	144	173	202	231
1280 ppm	1.3	2.7	6	12	24	48	60	72	85	97	121	146	170	195
1600 ppm	1.1	2.2	4.5	9	19	39	49	59	69	79	99	119	139	159
1920 ppm	0.9	1.8	3.6	7	15	30	38	45	53	61	76	92	107	122
2240 ppm	0.4	0.9	2.2	5	10	21	26	32	37	43	53	64	75	86
2560 ppm	0.3	0.6	1.3	2.7	6	12	15	18	21	25	31	37	43	50
2880 ppm	0.08	0.1	0.3	0.6	1	3	4	4.5	5	7	8	10	12	14
3000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0