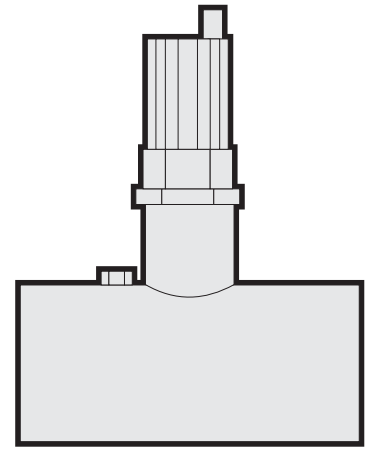
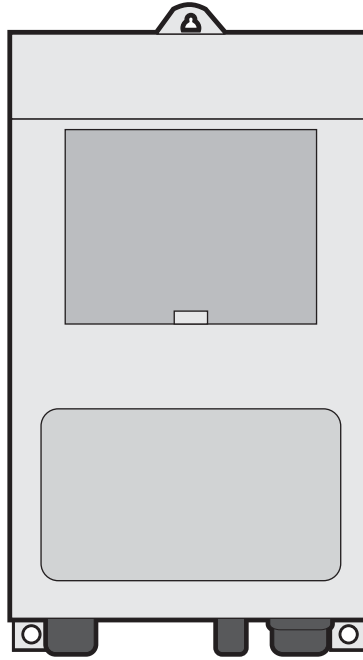
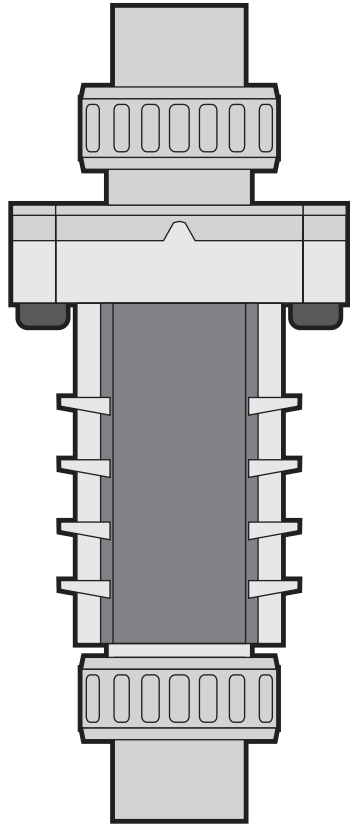


# Inline Salt System

OWNER'S MANUAL



# Inline Salt System

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*Thank you for purchasing our product. Before installation or operation, please read these instructions carefully. This manual contains easy to follow step-by-step procedures to properly install and operate your system.*

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# 1. Important Safety Instructions

## Read and Follow All Instructions

All electrical work must be performed by a licensed electrician and conform to all national, state, and local codes. Improper use or installation can badly harm the unit and its surroundings.

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

### **DO NOT OPEN THE SEALED COVER OF THE BOX – NOT A SERVICEABLE UNIT**

- Disconnect all AC power before installation.



**WARNING – To reduce the risk of injury, do not permit children to use this product.**

- The Power Supply must be mounted **vertically** on a flat surface and at a minimum horizontal distance of 5 ft (1.5m) (or more, if local codes so require) from the pool/spa.



**WARNING – Risk of electric shock. Connect only to a grounding type circuit protected by a ground-fault circuit-interrupter (GFCI) outlet. The installer should provide this GFCI requirement. The GFCI should be rated for minimum 6 Amps and tested on a regular basis by pushing the test button. If the GFCI fails to operate correctly, there is ground current flowing indicating the possibility of electric shock. Do not use this unit.**



**Disconnect unit and have a qualified professional correct the problem before using.**

**WARNING – The Input circuit (LN1 & N/LN1) must be connected only after OVERCURRENT DEVICES, such as fuse or circuit breaker to limit the amperage in the input wire to the maximum that is permitted by the National Electrical Code.**



**WARNING – The Unit must be permanently connected, with copper wire, not less than 1.5 mm (14 Awg).**



**WARNING – The wiring of the unit must be performed according to the wiring instructions of this manual.**



**WARNING – A build-up of flammable fumes can result in a hazardous condition if the cell is allowed to operate without flow. This device must be operated only with an approved inline flow sensor.**



**WARNING – The Flow Sensor must be installed between the last piece of apparatus and the Cell.**



**WARNING – Ensure that equipment and materials used in or around the pool and spa are compatible with salt-based sanitation systems. Certain materials may be susceptible to salt and chlorine damage.**

- ALWAYS ADD ACID TO WATER, NEVER WATER TO ACID.
- SAVE THESE INSTRUCTIONS.

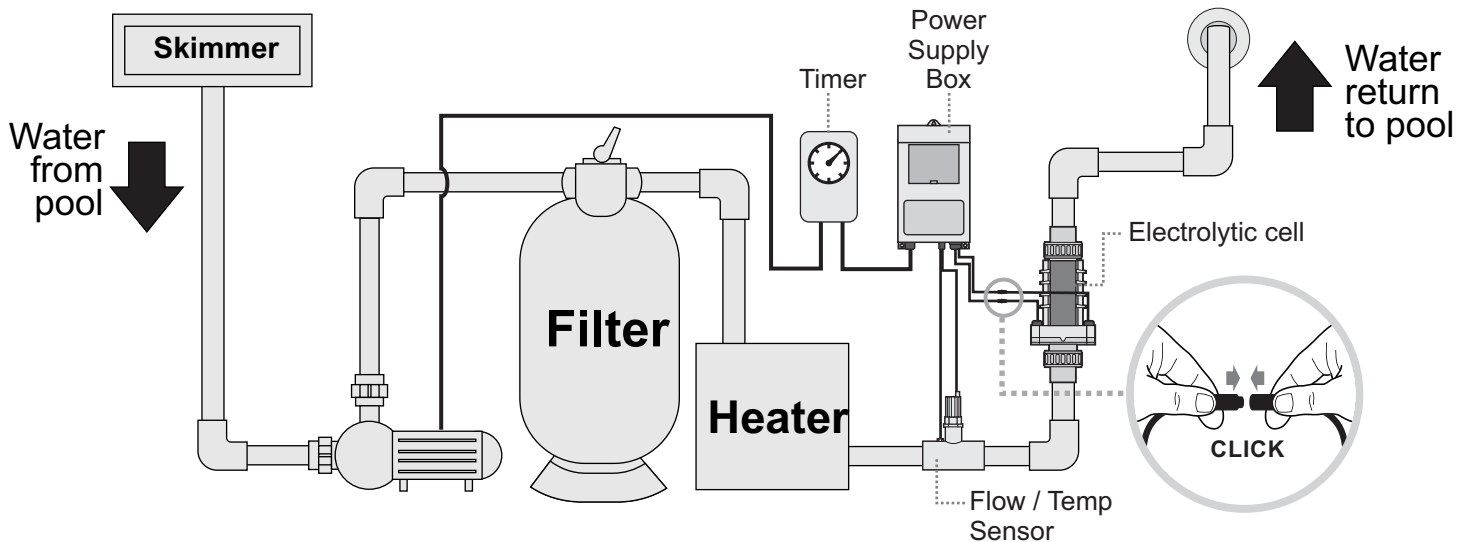
## WINTERIZING

If your pool is in a climate where the equipment is winterized, you must winterize the salt cell in the same way that your other pool equipment is winterized. This includes draining the water from all equipment and possibly adding antifreeze to the plumbing. It is not necessary to remove the cell from the plumbing. Many poolowners leave the Power Supply mounted on the wall for winter. However, removing and storing the Power Supply in a dry location for the winter will extend it's life.

## Section 2. System Overview

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### 2.1 System and Plumbing Configurations:



The system has three major parts: **the Power Supply Box, Cell and Flow Sensor.**

**Power Supply Box** - The power supply converts AC electrical current to a low voltage DC current which is required by the cell to perform the electrolysis. The power supply is connected with the pool circulation pump electrical source so that the electrolytic cell only operates when the pool pump is on. The flow Sensor is a backup device only.

**Electrolytic Cell** - The electrolytic cell contains bipolar electrodes which perform the electrolysis and produce chlorine when energized with DC current. Chlorine is generated as pool water containing salt passes through the cell. This system automatically cleans the Cell electrodes. This does not interrupt the production of Chlorine.

**Flow/Temp sensor**-The Flow/Temp sensor allows the cell to operate only if there is adequate water flow through the cell. The water temperature is constantly monitored in order to protect the cell.

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### **IMPORTANT!**

## **ADD SALT TO THE POOL BEFORE STARTING INSTALLATION**

Adding the salt to the pool water **BEFORE** starting the salt system is required. The system could show error lights on the power supply if there is no salt circulating in the pool water for several hours before starting the system.

The "Low Salt" light may remain lit for up to 24 Hours until salt is fully dissolved in the water.

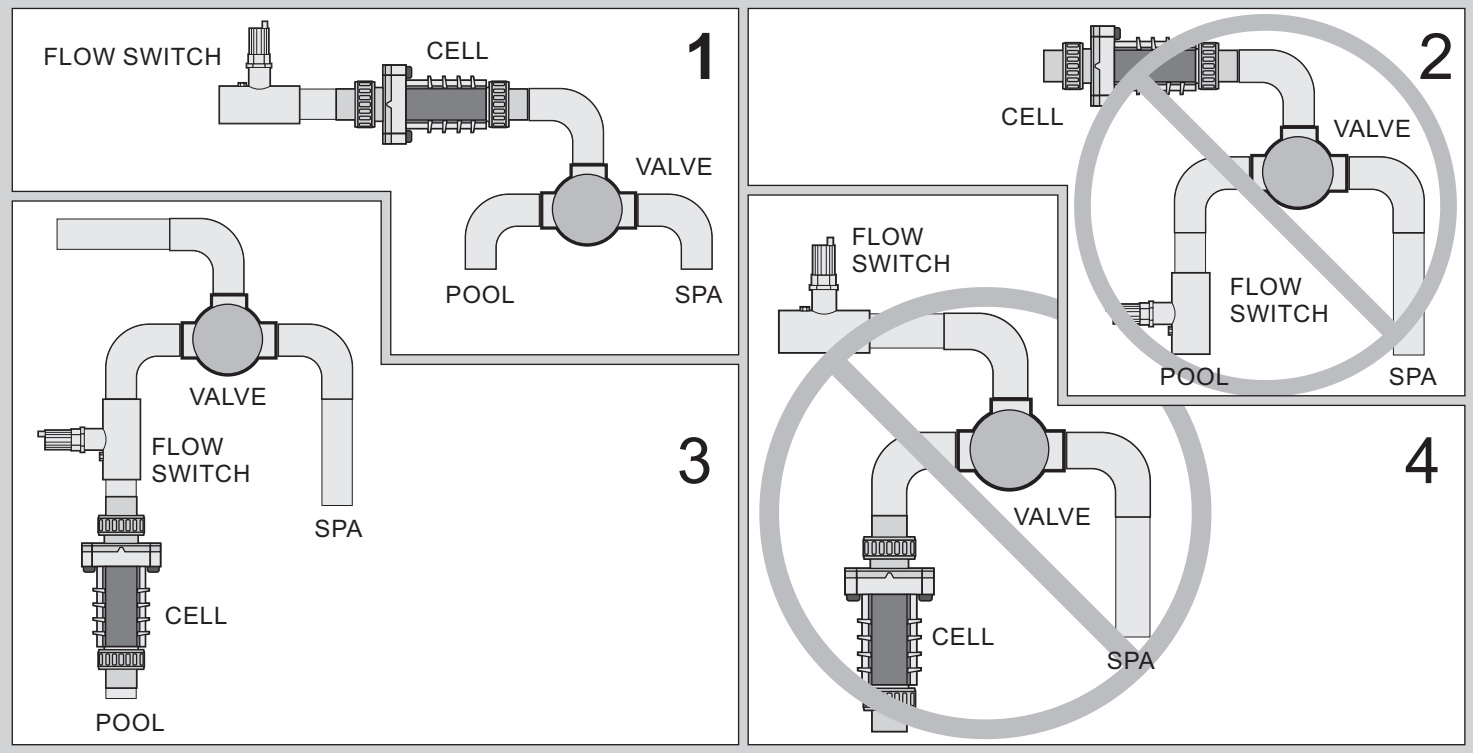
## Section 3. Installation Instructions

### 3.1 Materials and Tools

1. PVC solvent cement and priming fluid
2. Hacksaw or pipe cutters
3. Screwdrivers
4. Drill
5. Silicone Lubricant (DO NOT USE silicone glue or petroleum jelly).
6. Pipe adaptors (i.e. reducer couplings) if needed for systems with 1 ½ inch plumbing

### 3.2 Install the Cell and the flow sensor

#### Cell & Plumbing Configuration:

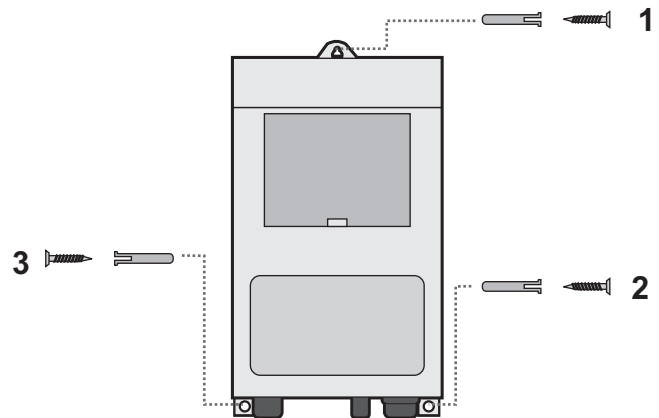


1. The Cell and Flow Sensor must be installed downstream from the filter and heating devices but before any tees in the return line. The Cell may be installed horizontally or vertically so long as the Cell is pointed in the direction of flow.
2. On the pipe where the cell will be installed, mark two lines 11¾ inches apart and then cut the pipe.
3. Unscrew and remove the barrel unions (i.e. barrel nuts and slip connections) from either end of the Cell. Thread the barrel nuts over the pipe and glue the slip connections to the cut pipe.
4. After the glue had sufficient drying time, place the Cell with the o-rings into the opening between the two ends of the pipe and tighten the unions making sure that the Cell is installed with the arrow pointing in the same direction as the flow (i.e. water should enter from the larger side of the cell).
5. Install the Flow Sensor next to the cell. Make sure there is no valve between the cell and the flow sensor.
6. Be sure the arrow on the top of the Flow Sensor is pointing in the direction of flow and that no glue or pipe cleaner touches the paddle inside the sensor as it may cause it to jam.

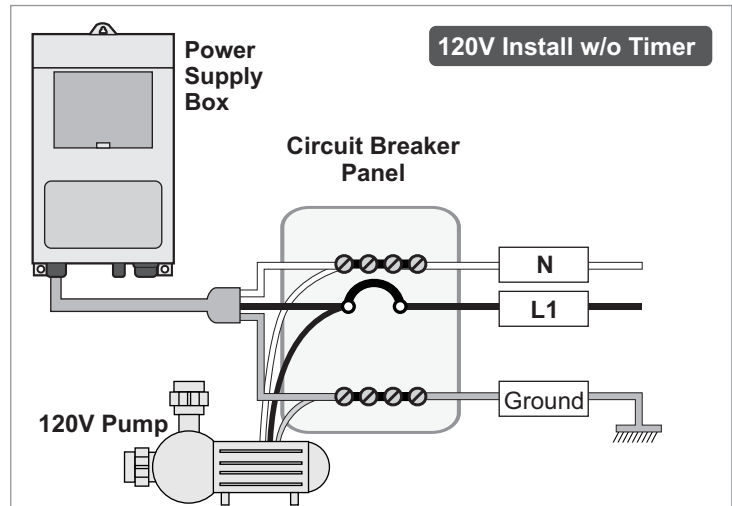
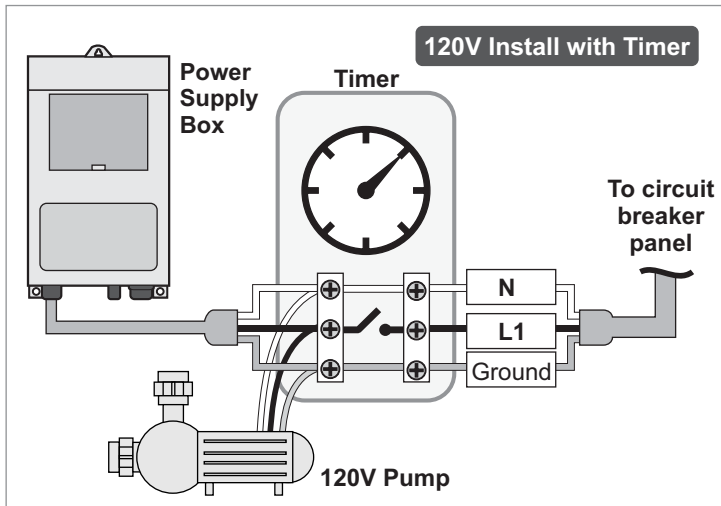
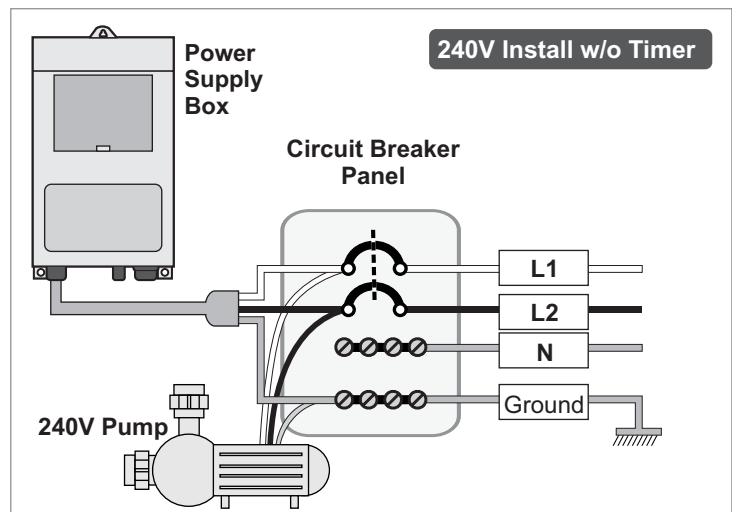
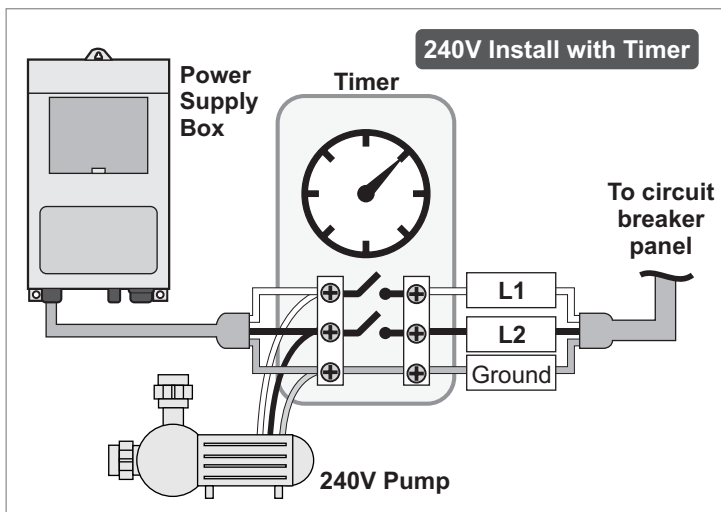
### 3.3 Install the Power Supply / Control Box

1. The Power Supply Box must be mounted vertically on a flat surface and a minimum of 5 ft (1.5m) horizontal distance (or more, if local codes require) from the pool/spa.
2. Locate a position for your Box within 8 ft of where the Cell will be installed and within 6 ft of the timer box to ensure enough cable is available.
3. Because the box acts as a heat sink dispersing heat from inside the box, do not block the four sides of the Control Box. **Do Not** mount the system above a heater or inside a panel or an enclosed area.
4. If possible, try to mount the power supply out of direct sunlight.

#### Power Supply Box Mounting Configuration:



Screws and Anchor  
Hardware Kit Included



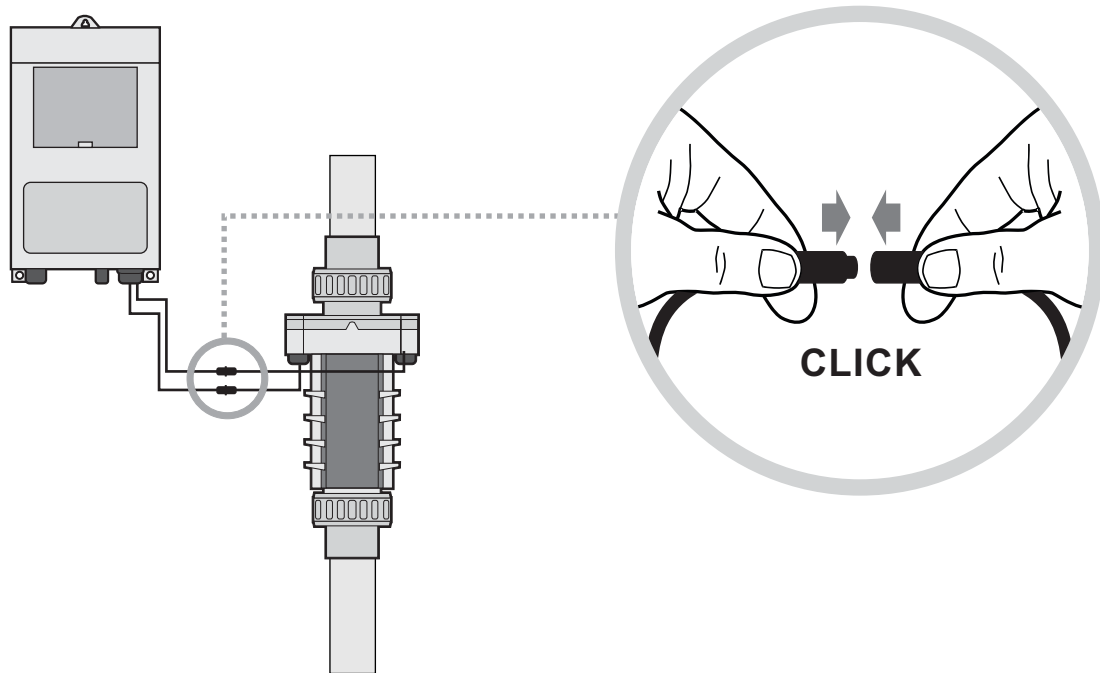
### 3.4 Wiring the Power Supply Box

1. Connect the green wire to the Ground lug of the timer.
2. Connect the black Load wire from the chlorine generator to Load 1 of the time clock.
3. If wiring a 240 Volt system, connect the white wire with black shrink to Load 2 of the time clock. If wiring a 120 Volt system, connect the white wire with black shrink to the Neutral lug on the timer and REMOVE the black shrink tube.

### 3.5 Wiring the cell.

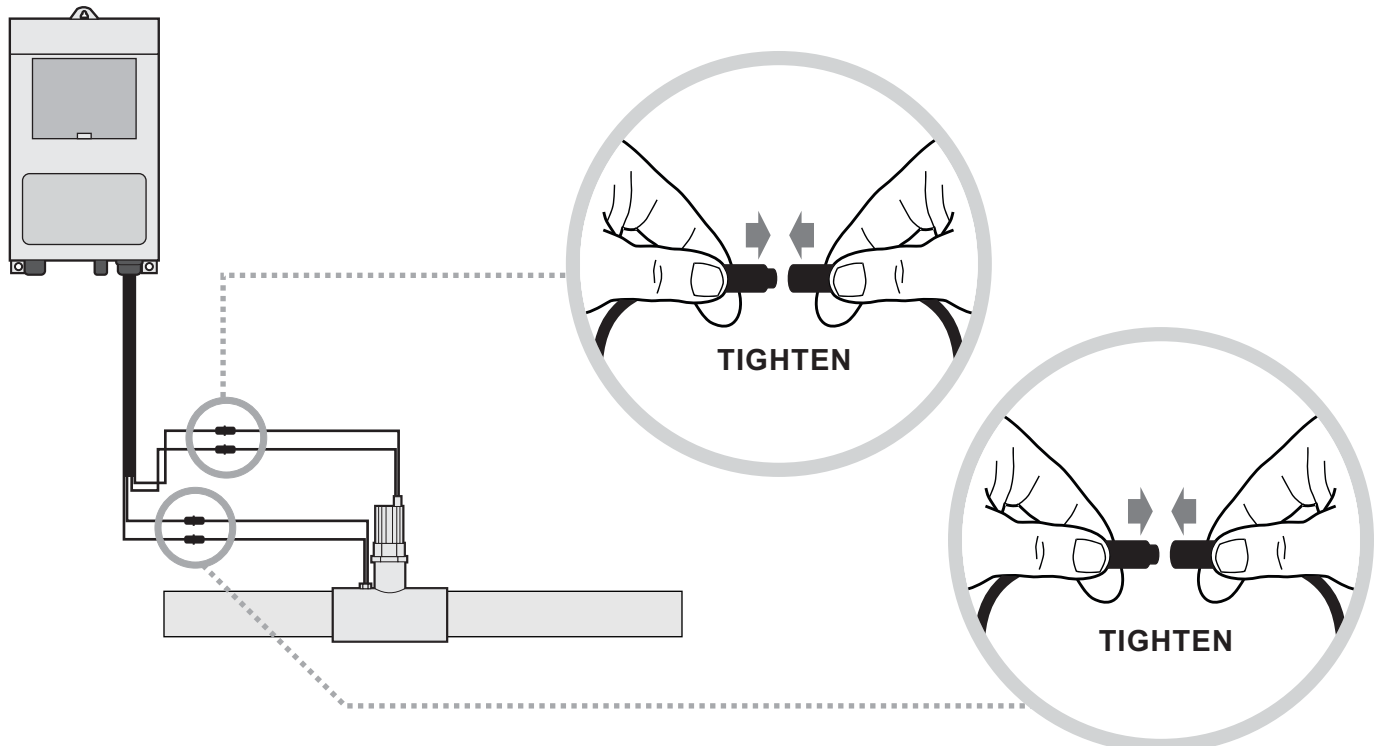
Connect the two black wires from the Power Supply Box to the two Quick-Connects on the sides of the Cell. Ensure the connections are perfectly clean of any debris.

**Note: these wires are interchangeable.**



### 3.6 Wiring the Flow Sensor

Find the sensor cable from the Power Supply with the 4 small connect terminals and push them on their respective connectors on the Flow and Temperature sensors. Polarity DOES NOT matter.





# 4. Pool Water Preparation

## 4.1 Adding the salt

Adding the salt to the pool water **BEFORE** starting the salt system is required. The system could show error lights on the power supply if there is no salt circulating in the pool water for several hours before starting the system.

The "Low Salt" light may remain lit for up to 24 Hours until salt is fully dissolved in the water.

1. Measure the pre-existing salinity of your pool. Previous use of liquid chlorine may have created a residual level of salt in your pool.
2. Determine how much salt is needed from the **pool volume calculator and salinity demand table on the following pages**. This table is based on a salt concentration of 3500 ppm.
3. Keep the circulating pump on.
4. Distribute the determined amount of salt evenly around the pool. To avoid clogging the filter or damaging the Control Box and pump, do not add salt through the skimmer. Brush the bottom of the pool to help dissolve the salt.
5. The readout on the chlorine generator may fluctuate until the salt is fully dissolved.

### GOOD Acceptable Salts

Granulated Pool Salt

### BAD – do NOT use:

Iodized Salt

Salt with more than 1% anti-caking agents

Rock Salt, Water Softener Salts

Calcium Chloride (not salt). Use Sodium Chloride Only

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## 4.2 Calculating the size of the pool

<b>Gallons (Dimensions in feet)</b>	<b>Liters (Dimensions in meters)</b>
<b>Rectangle</b> Width X Length X Average Depth X 7.5 = Gallons	<b>Rectangle</b> Length x Width x Average Depth x 1000 = Liters
<b>Round</b> Diameter x Diameter x Average Depth x 5.9 = Gallons	<b>Round</b> Diameter X Diameter X Average Depth X 785 = Liters
<b>Oval</b> Length X Width X Average Depth X 6.7 = Gallons	<b>Oval</b> Length X Width X Average Depth X 893 = Liters

Use the above chart to determine the water volume of your pool

**Example:** 15' X 30' Rectangle Pool 3' shallow end, 6' deep end.

$$15^{\text{wide}} \times 30^{\text{long}} = 450^{\text{sq ft}} \times 4.5^{\text{avg depth}} \times 7.5^{\text{gal per cubic ft}} = 15,147^{\text{gallons}}$$

# 5. Salinity Demand Table (in lbs.)

		Salt level before addition (in PPM)								
		0	500	1000	1500	2000	2500	3000	3500	4500
		How much salt to add (in pounds)								
Water volume in thousands of Gallons	4	117	100	83	67	50	33	17	0	OK
	6	175	150	125	100	75	50	25	0	OK
	8	234	200	167	133	100	67	33	0	OK
	10	292	250	209	167	125	83	42	0	OK
	12	350	300	250	200	150	100	50	0	OK
	14	409	350	292	234	175	117	58	0	OK
	16	467	400	334	267	200	133	67	0	OK
	18	525	450	375	300	225	150	75	0	OK
	20	584	500	417	334	250	167	83	0	OK
	22	642	550	459	367	275	183	92	0	OK
	24	701	600	500	400	300	200	100	0	OK
	26	759	651	542	434	325	217	108	0	OK
	28	817	701	584	467	350	234	117	0	OK
	30	876	751	626	500	375	250	125	0	OK
	32	934	801	667	534	400	267	133	0	OK
	34	992	851	709	567	425	284	142	0	OK
	36	1051	901	751	600	450	300	150	0	OK
	38	1109	951	792	634	475	317	158	0	OK
	40	1168	1001	834	667	500	334	167	0	OK
	42	1226	1051	876	701	525	350	175	0	OK
44	1284	1101	917	734	550	367	183	0	OK	
46	1343	1151	959	767	575	384	192	0	OK	
48	1401	1201	1001	801	600	400	200	0	OK	
50	1460	1251	1043	834	626	417	209	0	OK	

Locate the current salt concentration at the top of the chart (e.g. 1000 ppm). Then locate the size of your pool on the left (e.g. 12,000 gallons). Run these figures down and across until they meet. That number is the number of pounds of salt required for your pool.

## 6. Pool chemistry explained

**Salt** is the sanitizer source of the Chlorine Generator. The ideal salt level to ensure maximum benefits using our system is 3500 ppm (parts per million). A low concentration of salt may hinder the generator effectiveness. A concentration of salt above 5500 ppm may cause corrosion damage to the pool fixtures. See the Adding Salt section for more information.

**Free Chlorine vs. Combined Chlorine:** The unpleasant smells and side effects often associated with chlorine are actually caused by combined chlorine (i.e., chloramines). Combined chlorine is a chlorine molecule that attacks a noxious particle in the water but is unable to destroy the noxious particle. This chlorine particle remains attached to the noxious particle until one of the two is burned off; hence the term Combined Chlorine (a.k.a. chloramines). To burn off the noxious particle and free up the chlorine again, pool owners have to shock (with chlorine) the pool periodically, but with the Chlorine Generator, the noxious particles are burned off within the Cell and the combined chlorine is continuously converted back to free chlorine. The free chlorine level in the pool should be maintained at 2 to 4 ppm. This level of free chlorine is comfortable to swim in with no unpleasant smells, and maintains proper sanitizing power.

**pH** is a measure of the acidic or basic solution. A scale of 0 to 14 is used to measure pH. Pure water has a pH of seven (neutral), acid solutions have a pH of less than seven, and basic (alkali) solutions have a pH of more than seven. The recommended range is 7.2 to 7.6 for pools; chlorine is much more effective within this range and the water is most comfortable for bathers. pH levels above 7.8 drastically reduce the effectiveness of the chlorine. To lower the pH, add muriatic acid or dry acid. Be sure to read and follow the respective manufacturer's instructions.

**Total Alkalinity** reduces changes in pH. It is often referred to as the "big brother of pH." Keeping proper levels of total alkalinity helps reduce unwanted fluctuations in pH levels. Total alkalinity is also used to offset high or low levels of calcium hardness.

Add muriatic acid or dry acid to lower the total alkalinity and sodium bicarbonate to raise the total alkalinity. Be sure to read and follow the respective manufacturer's instructions.

**Stabilizer (Cyanuric Acid or Conditioner)** is necessary in outdoor pools to maintain appropriate levels of chlorine. Chlorine stabilizer helps provide an appropriate residual chlorine level in the water. Without stabilizer, UV radiation from the sun destroys most chlorine within 2 hours, but excessive amounts of stabilizer can decrease the effectiveness of chlorine. Chlorine stabilizer should be maintained at 60 ppm to offset the harmful effect of the sun while maintaining the effectiveness of the chlorine. Where pH/ORP automatic sensors are used, 40 ppm of stabilizer suffices. **If you have a Salt System, you must use stabilizer!**

**Phosphates and Nitrates** set very high demands on chlorine; most often nitrates and phosphates bring the chlorine level down to zero (0). You can have your water tested for nitrates and phosphates by the local pool professional. Your pool should NOT contain Nitrates or Phosphates. To reduce Phosphate levels, use a phosphate remover from your local pool professional. To reduce Nitrate levels, the pool must be partially or fully drained. (Please check with your local pool professional prior to draining the pool).

**Metals (copper, iron, etc.)** can cause loss of chlorine and can stain your pool. If a water test reveals the presence of metals, refer to your local pool professional for recommended methods of removal. Be sure to use a phosphate-free metal remover to avoid replacing a metal problem with a phosphate problem.

**Calcium Hardness**, like pH and alkalinity, affects the water tendency to be aggressive or scale forming. Lower levels of calcium hardness improve the chlorine generator's ability to stay clean and provide softer silkier water for the swimmers. Check with your pool professional for proper calcium levels for your pool surface.

**Total Dissolved Solids (TDS)** is a measure of many types of dissolved materials, including salt. High effective TDS levels (i.e., 1500 ppm and up) cause cloudy water and significantly increase chlorine demand. To obtain the effective TDS level in a pool using a salt system, subtract the salt level from the TDS reading. (e.g., 5000 TDS – 4000 Salt = 1000 effective TDS).

**Saturation Index** determines whether the pool water is balanced, aggressive, or scale forming by comprehensively taking into account all the relevant factors, including pH level, alkalinity level, calcium hardness, and temperature. These factors should be tested periodically, and then included into the worksheet on the following page to verify the proper balance of the pool and make adjustments as necessary.

# 7. Maintenance

## 7.1 Maintenance Instructions

It is important to constantly monitor the salt level in your pool for the system to work as efficiently as possible.

The cell should be monitored monthly to make sure calcium buildup is properly addressed.

Depending on the water quality and hardness, some systems will have to be cleaned more often.

## 7.2 Cell Cleaning



### CAUTION:

**Do not use metal or other hard objects to clean the cell. Do not insert anything into the cell. Both of these actions could scratch the precious metal coating on the plates and void the warranty.**



### CAUTION:

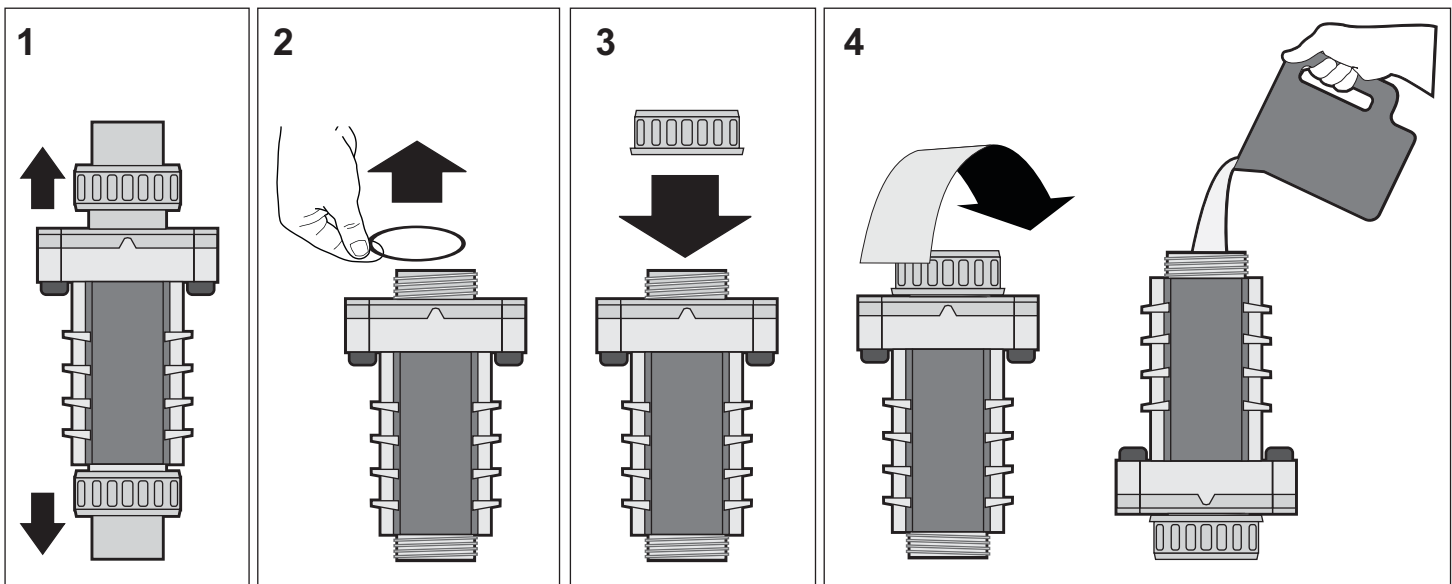
**Always add acid to water, NOT water to acid.**

Diluted muriatic acid solution = 1 part acid to 4 parts water

**Note: Follow the instructions of the acid manufacturer.**

### Cleaning with Cleaning Cap.

1. Remove the cell from the line by unthreading the barrel unions from the cell ends. There is no need to remove the electrical wire connections when using the cleaning cap.
2. Remove the black O-ring on one end of the Cell.
3. Attach the Cell Cleaning Cap to the other end of cell.
4. Pour into the Cell, either undiluted white distilled vinegar, or a solution of diluted muriatic acid (one part muriatic acid to 4 parts water). **Always add acid to water; do not add water to acid!**
5. Wait for foaming to stop (5-10 minutes when using muriatic acid; vinegar takes longer).



**6. Safely dispose of the acid solution by pouring it into your pool.**

7. Rinse the cell with water hose.

8. Put the O-ring back in place and re-install the Cell in the line.

9. If the cell cable connectors were removed make sure they are clean and free of debris and re-connect them.