

INTRODUCTION

The **Superior Aqua System™** electronic water disinfection system is the most safe and effective method of killing bacteria and algae, while avoiding the harmful side effects of corrosion and body reactions caused by heavy chemical dosing.

Most modern appliances function very well if used according to manufacturer's specifications. The **Superior Aqua System™** is no exception. The purpose of this manual is to instruct you as to the amount of customer cooperation needed to allow our system to perform as designed.

Please read the following carefully. The information will help you understand your pool and the **Superior Aqua System™**.

Before the installation of the **Superior Aqua System™** unit, carefully inspect the filtration and circulation systems to insure both are in good working order. If baquacil has been used in your pool in the past, it is recommended that the pool be drained, all pipes flushed, and the filter cleaned, including replacement of sand in sand filters, or consult your local **Superior Aqua System** dealer for other removal procedures.

FLOW CELL INSTALLATION

Install the "tee" fitting between the pump and filter. The "tee" fitting is to be installed so that the electrode housing is about 5 degrees above parallel to the ground (see side view on following page).

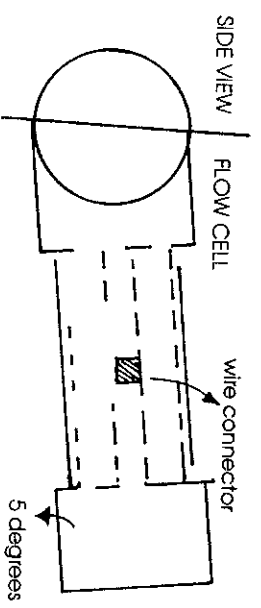
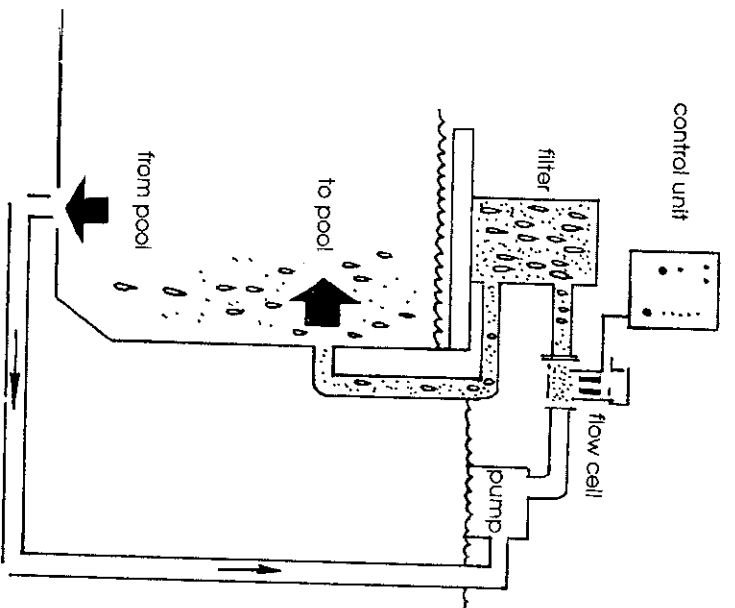
The electrode housing must be screwed into the "tee" so that the wire connectors are on each **side** of the housing and **not** on top and bottom (see side view on following page).

IMPORTANT SAFETY INSTRUCTIONS

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

1. **READ AND FOLLOW ALL INSTRUCTIONS**
2. **WARNING** — To reduce risk of an injury do not permit children to use this product unless they are closely supervised at all times.
3. **WARNING** — **Risk of electric shock.** Connect only to a grounding type receptacle protected by a ground-fault circuit interrupter (GFCI) or *dedicated circuit. Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.
4. Do not bury cord. Locate cord to minimize abuse from lawn mowers, hedge trimmers and other equipment.
5. **WARNING** — To reduce risk of electric shock, replace damaged cord immediately.
6. **WARNING** — To reduce risk of electric shock, do not use an extension cord to connect unit to electric supply; provide a properly located outlet.
7. **SAVE THESE INSTRUCTIONS.**

*IF 220 VAC HARDWIRE TO EXISTING 220 LINE



CONTROLLER INSTALLATION

1. Mount the Controller as close as possible to the switch or automatic timer for the pool pump. Hold the controller in the desired location. Mark the bottom of the enclosure. Place the top lip of the enclosure and insert #6 screws sufficiently into the hole markings to support the weight of the enclosure. Place the enclosure so that the screws pass through the holes on the bottom lip. With the enclosure thus supported, insert screws into the top lip. Two screws will securely mount the Controller. To read,

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determine if your pool pump is set for either 110 VAC or 220 VAC. **Superior Aqua System™** makes a separate unit for 110 VAC and 220 VAC.

2. If your pump is 110 VAC have a licensed electrician install a 120 VAC GFCI or dedicated circuit from the pump switch or automatic timer circuit, so that the receptacle is "LIVE" only when the pool pump is running. If your pump is 220 VAC you may hard wire to pump switch or automatic timer.
3. Connect the DC leads to the terminals on the Flow Cell.
4. Plug the Controller into the GFCI receptacle and activate the pool pump.
5. Place the Controller switch in the "ON" position and by rotating the "ION OUTPUT" knob, check to see that the LED lights in each position.
6. With a DC voltage tester, check the terminals on the Flow Cell to be certain that voltage is being supplied to the electrodes.
7. Place the controller switch in the "AUTO" position and test the unit for shutdown and reactivation (every 12 to 15 minutes).

Superior Aqua System™ OPERATION

After your water has been balanced and treated, turn on the **Superior Aqua System™** Controller with the switch in the ON position and the ION OUTPUT at maximum - MAINTAIN A CHLORINE LEVEL OF BETWEEN 1 AND 2 ppm, UNTIL YOUR COPPER TEST KIT GIVES YOU A READING OF BETWEEN .2 and .3 ppm. (After the Controller has been turned on, check your copper level every other day until your water has reached the proper level).

Having reached the proper ION level, switch to the **AUTO POSITION** (see warning sticker inside door). Adjust the ION OUTPUT to maintain such level. Assuming that the

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pump is run long enough each day to properly filter the water, very generally, the ION OUTPUT may be adjusted to gallonage as follows:

GALLONS	ION OUTPUT
10 — 20M	40%
20 — 25M	60%
25 — 30M	80%
30 — 50M	100%

Every pool has its own environment and personality. Your pool may require more or less ION generation than indicated above.

OXIDATION

The **Superior Aqua System™** will flocculate the dead organisms, the majority of which will be captured by an efficient filter. To prevent any cloudiness that may be caused by residual particles, organic matter, body oils, suntan oils, etc. that may accumulate in the water, OXIDIZE AS NECESSARY. This can be done using Hydrogen Peroxide non-chlorine oxidizer. We recommend oxidizing your water once a week, whether it needs it or not. If you use liquid chlorine, one or two quarts should handle an average 15,000 gallon pool. Simply broadcast the liquid in the pool after sunset and allow the pump to run about an hour.

MAINTENANCE

After Ionization is established, check:

- Calcium Hardness — once every season
- Total Alkalinity — weekly
- Copper — weekly
- Ph — weekly

LONG TERM POOL CARE

ELECTRODES — examine and clean twice a year.

Retain this operation guide and read it frequently until you are totally familiar with its contents. If you have any problems you can probably locate the solution in this guide.

Keep the **Superior Aqua System™** packing carton. An improperly packaged Controller returned to the factory under warranty may be damaged in shipping and possibly invalidate the Warranty.

DO NOT substitute for the pool products recommended in the Operation Guide.

QUESTIONS MOST OFTEN ASKED

What is water balance?

Balanced water refers to PH, total alkalinity and calcium hardness. This is a must for proper pool maintenance.

What is Ph?

Ph refers to the acidic or alkaline measure of the water. The scale ranges from 1 to 14. Pool water is most effective in a range 7.2 to 7.8. Muriatic acid lowers Ph, sodium carbonate raises Ph.

Scale/Cloudy	Ideal	Staining
12	10	9
8.0	7.8	7.6
7.4	7.2	7
5	3	1

POOL WATER MAINTENANCE

What is total alkalinity?

Total alkalinity is a measure of the buffering capacity or degree of resistance to Ph change. Bicarbonates, carbonates and hydrates make up most of the total alkalinity. Pool water is most effective in a range of 70 ppm to 110 ppm. Muriatic acid lowers the alkalinity, sodium bicarbonate raises the alkalinity.

Scale/ Cloudy & Staining	180	160	140	120	110	100	90	80	70	60	50	40
						Ideal						
											Ph Bounce	Corrosion

What is calcium hardness?

Calcium hardness is the amount of calcium and magnesium dissolved in the water. Pool water is most effective in a range of 150 ppm to 500 ppm. Lowering calcium hardness can be accomplished only by diluting with water that is lower in calcium hardness. Adding calcium chloride raises hardness. Ask your local dealer for assistance.

Scale/Cloudy	500	400	375	325	300	275	250	225	200	175	150
						Ideal					
											Etching/Corrosion

What is proper ion level?

Your ion level should be maintained between .2 ppm and .3 ppm. To increase ion level, increase output. To decrease ion level, decrease output.

Staining	.7	.6	.5	.4	.30	.25	.2	.1
					Ideal			
								Algae growth

What is Cyanuric Acid?

Cyanuric Acid reduces the ability of ultra violet rays to destroy chlorine. Cyanuric Acid is not required for residential pools and its use is banned in New York state.

What is Total Dissolved Solids?

T.D.S. is simply a measure of all solids dissolved in your water. (Calcium, carbonate, salt and any other by products from past chemical use). Exceeding 2000 ppm is not recommended.

	MINIMUM	IDEAL	MAXIMUM	COMMENTS
Ion Level	.2 ppm	.30 ppm	.5 ppm	
Ph	7.2 ppm	7.4 to 7.6 ppm	7.8 ppm	
Alkalinity	70 ppm	100 ppm	120 ppm	
Calcium	225 ppm	250 ppm	500 ppm	Drain Pool 1/2
Cyanuric Acid	0-	0-	100 ppm	Drain Pool 1/2
Total Dissolved Solids	750 ppm		2000 ppm	Drain Pool 1/2

FILTERS

Do I need a filtering system with my Superior Aqua System™ unit?

Yes, your filtering system is essential to remove dead bacteria and algae.

Is there more than one type of filter?

There are three types of filters for pools. They are sand filters, cartridge filters and diatomite (commonly called D.E. filters). Each uses a different filter medium.

What is the difference between them?

The filtering capabilities vary. They are measured in microns. The lower the micron rating the more the filter will remove from the water.

- Sand filters are rated from 25 to 40 microns.
- Cartridge filters are rated from 10 to 20 microns.
- D.E. filters are rated from 1 to 3 microns.

Maintain your filter as recommended by the manufacturer. A properly maintained and operating filter is essential for your ionization system to function as designed.

What can I do to increase the effectiveness of my filter?

There are several water polishers and filter aids available. Ask your local Superior Aqua System™ dealer for availability.

PUMP RUN TIME

Some people using Chlorine or Bromine in their pools run the pool pump eight, sixteen and even twenty-four hours a day, especially in the summer. Such long pump run times are unnecessary when using the **Superior Aqua System™**. Chlorine and Bromine are rapidly dissipated by the UV rays of the sun and water circulation in daylight hours is necessary to minimize chemical loss. Ions are not affected by the sun. Thus, shorter pump run time is possible with the **Superior Aqua System™**. With this system, therefore, run your pump only to filter your water.

How long should that be?

Typically, a one horsepower pump with one and a half inch pool piping will circulate about 3000 gallons an hour. Calculate your pool water volume, determine your pump size and run your pump long enough to re-cycle your water once a day in the summer. In the winter you may want to cut your pump run time by half or less.

TROUBLESHOOTING

The Superior Aqua System™ is designed to help you enjoy your pool and prevent problems. Should something unexpected happen, you should be able to solve it by using the following tips:

Cloudy Water

- Check Filter.
- Clean if necessary. You may need to add a filter aid.
- Oxidize if needed (See Oxidation).

Green Water

- Check Filter, clean if necessary.
- Check Alkalinity, adjust accordingly.
- Check Ph, adjust accordingly.

Green water may also occur upon a heavy invasion of algae, which may rapidly reduce the proper ion level. If this happens to you, check your copper reading and if below .2 ppm, move the Controller switch to the ON (shock) position and you should add a gallon or two of chlorine. (The amount of chlorine you need depends upon the size of your pool). The green will dramatically disappear. When your copper level returns to .3 ppm return the Controller switch to the AUTO position.

Usually, what has happened in the green water problem is that the ion level is sufficient to break down the algae into chlorophyll molecules (green in color) but the ion level is insufficient to flock the contaminants into particles heavy enough to be washed into the filtering system.

ABOUT POOL WATER

REFRESHED POOL WATER is required periodically for all pools, especially those that have been abused with Chlorine and other harsh chemicals in the past. **Superior Aqua System™** owners with freshened water enjoy the ultimate in Ionization experience.

EVAPORATION OF POOL WATER allows Carbonates, Calcium and other minerals to remain behind and compound with time. Problems begin when hardness exceeds 500 ppm. Hardness will increase to four times fresh water hardness in as little as two and a half to four years and can approach 900 ppm and higher in six years. Algae LOVES high total alkalinity and high hardness.

CALCIUM AND CARBONATES, when not controlled, can seriously affect operation of any Ionization system. If you have difficulty adjusting total alkalinity, it may be because of the interference caused by calcium hardness. Hardness and total alkalinity must BOTH be controlled for optimum success with Ionization.

GENERAL COMMENTS

ON A REGULAR BASIS check your **Superior Aqua System™** Controller to be sure that the unit has power. At the time you check, the Controller may be in shutdown stage, but as long as the RED power indicator LED is lit, the Controller is alive and well.

When POOL WATER HARDNESS exceeds 500 ppm the balance between total alkalinity and hardness becomes much more difficult. In such situations the hardness must be reduced. This is accomplished with a partial or complete change-out of water. The majority of public water supply systems produce water which has a hardness of 300 ppm.

If your change-out water exceeds 300 ppm. in hardness, contact your **Superior Aqua System™** Dealer for his recommendations.

AT THE END OF EACH SEASON, and at the beginning of each season, examine the electrodes for wear and clean them if necessary. To do so, simply unscrew the electrode housing from the "tee". Then examine the electrodes for wear. If the gap between the electrodes exceeds an inch and a quarter, the electrodes should be replaced. If the electrodes do not need replacing, take the opportunity to clean them. To do so, fill the housing with white vinegar and let stand for several hours. Then empty and wash with a strong spray of water. If a residue still remains on the electrodes, then brush and/or scrape until reasonably clean.

IF YOUR POOL IS HEATED, be advised that the **Superior Aqua System™** will clean your collector or heat exchanger of the contamination caused by the use of Chlorine or Bromine. This cleansing will exhibit itself as a fine gold colored dust. When visible, vacuum or push to center drain. This dust will appear until all the contamination has been removed. Usually this cleansing will take place over a period of a week to ten days depending upon the degree of contamination and the size of the heating system.

IF YOU HAVE BAQUACIL in your pool, **DO NOT** turn the **Superior Aqua System™** Controller on until there is no trace of Baquacil in the water. If there is a question, call your **Superior Aqua System™** dealer.

NEVER USE A COPPER BASE algicide with any Ionization system.

USE YOUR TEST KIT properly. Read the instructions carefully and be sure to read the results of your test by looking DOWN the test vial from top to bottom.

The **Superior Aqua System™** Controller has a three position switch, "ON", "OFF", and "AUTO". You will normally operate your unit in the "AUTO" position. The "ON" position is to be used for ion shock should you find there has been a depletion of the ion level and there is a need to restore the level in a hurry (see warning).

If you have any questions, or problems, your answers and solutions can probably be found with a phone call to your **Superior Aqua System™** dealer.

IN SUMMARY

To enjoy your pool with a minimum of attention is as simple as ONE...TWO...THREE...

ONE — Keep your water balanced.

TWO — Establish and maintain a proper ION level.

THREE — Oxidize as necessary

******It goes without saying that your pool must be properly vacuumed and brushed. An automatic pool sweep is highly recommended.

The yellow status lights, indicate the machine is changing polarity. Two lights will illuminate. Of the two, one will pulse on and off. When the system changes polarity, one light will illuminate and it will pulse on and off.

The green lights indicate the ion output level. The lowest level is one light, the highest level is five lights.

The red light indicates the machine has power.

When the system is in the auto mode, it runs for fifteen minutes and shuts off for fifteen minutes. The first cycle is off.

When changing from the on position to the auto position, put the switch into the off position for five seconds to allow the machine to reset.

EPA REGISTER #58193

Levels of copper/silver should not be imparted into pool or spa water in excess of the U.S. EPA national water regulations.

**CAUTION: IF THIS OPERATION GUIDE IS NOT FOLLOWED,
STAINING MAY OCCUR**

COMMERCIAL POOL REQUIREMENTS

WHEN INSTALLING THIS DEVICE, REVIEW THE POOL RECIRCULATING SYSTEM TO ENSURE THERE ARE NO CROSS-CONNECTIONS WITH POTABLE WATER SUPPLY LINE, AND CONSULT YOUR LOCAL HEALTH DEPARTMENT FOR APPLICABLE CODES AND REGULATIONS.

MINIMUM FREE CHLORINE RESIDUAL MUST BE 0.4 ppm, BROMINE RESIDUAL MUST BE 0.8 ppm, OR MEET LOCAL HEALTH DEPARTMENT REQUIREMENTS.

Recommended pH 7.2 to 7.8