94.09.21

UNICLOR MODEL 600

Device for water treatment system
Hypochlorous acid generating device
for control of Bacteria and Algae
In Swimming Pool Waters

This device is approved for general
use only with diluter option
Manual caustic removal must be
accomplished by trained personnel

REGISTRATION NO. 22074
PEST CONTROL PRODUCTS ACT

READ THE LABEL AND OWNER
MANUAL BEFORE USING

CAREFREE POOL CARE

OWNER'S MANUAL

IMPORTANT!

PLEASE READ THIS MANUAL THOROUGHLY BEFORE YOU
ATTEMPT TO OPERATE YOUR CHLORINATING SYSTEM!

Sophisticated Systems, Inc.
3785 Alt. 19 N.
Palm Harbor, FL
34683

LIMITED WARRANTY

SOPHISTICATED SYSTEMS, INC. warrants the CHLORINATING SYSTEM to be free from defects in materials and workmanship for a period of one year from date of purchase when used in residential service only. Anodes and membranes are consumable items. Their life expectancies depend only upon service conditions. Product failure caused by abuse, misuse, neglect, or damage of any kind

is specifically excluded from this warranty.

THERE ARE NO OTHER WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING THOSE OF SUITABILITY FOR ANY PARTICULAR PURPOSE OR APPLICATION. LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING FROM USE OR MISUSE OF THIS EQUIPMENT IS EXCLUDED TO THE FULL EXTENT PERMITTED BY APPLICABLE LAW.

Manufacturer's obligation is limited to repair or replacement, at manufacturer's option, of parts shown to be defective at time of purchase. Before returning any material for adjustment under this warranty, please call for a Return Authorization Number. All transportation charges must be prepaid. Products returned for warranty service must be accompanied by a sales receipt, or the Warranty Registration Card must be on file with manufacturer.

Maximum liability of SOPHISTICATED SYSTEMS, INC., is in no case to exceed the value of the CHLORINATING SYSTEM involved.

The manufacturer reserves the right to make such changes in design or construction, which in its opinion constitute improvement, without notice.

IMPORTANT!

Your Chlorinating System incorporates standard chlorine production technology with an innovative design to allow easy operation and to provide you with the ultimate in pool water quality.

Like all devices producing or requiring the use of pool sanitizers, certain precautions are necessary. By taking a few minutes to read and understand the information contained in this Owner's Manual, the Installation Instructions and the Operations Summary Sheet, you can assure your satisfaction with this product for many years to come.

WARNING!

1) Verify proper installation! An improper installation will cause your Chlorinating System to malfunction and may damage the generator and pool support system.

    a) Unit must be wired so it operates only when filter pump is on.

    b) Venturi must be installed and adjusted to provide continuous vacuum when system is operating. There must be no controls, valves or equipment between venturi and pool.

    c) Venturi installation must not allow system drain down when the pump is off.

2) Exercise care when servicing the Chlorinating System. As with all pool chemicals, SAFE HANDLING IS ESSENTIAL.

   a) Caustic liquid from cathode side of cell can:
      * Burn skin.
      * Burn eyes and cause blindness.
      * Cause fatal burns if taken internally.

   Handle with extreme care, avoid splashes, wear rubber gloves and eye protection when handling. Dispose of the caustic where it is inaccessible to children and animals.

   b) Chlorine gas is extremely corrosive; DO NOT INHALE FUMES.

3) Venturi adjustment providing adequate purge air flow through the cell (characterized by a good stream of bubbles in the pool) is required for proper cell and safety vent tube operation.

4) Salt caking is caused by improper installation, servicing, or internal leaks. Corrective measures must be taken immediately.

I. INTRODUCTION

Thank you for your purchase of our product and the confidence you have shown in our company.

This manual describes your new Chlorinating System, it's installation and operation. A convenient Operations Summary chart is also provided as a separate sheet. For more detailed instructions, however, you should refer to the "Operating Instructions" portion of this manual.

Proper operation of your Chlorinating System depends heavily on correct installation and set up. BEFORE you attempt to install 0or operate your system, please read all of the instructions quickly to familiarize yourself with them. Then, as you undertake the various phases of putting your system into operation, refer to the appropriate section for guidance.

IF YOUR CHLORINATING SYSTEM DOES NOT APPEAR TO FUNCTION PROPERLY:

More than 99.9% of all problem calls are the result of improper installation and/or operation. Before contacting your dealer or the manufacturer, please review this manual and the installation instructions carefully to assure ALL installation and operating requirements have been met.

With proper installation and operation, your Chlorinating System will provide you with years of reliable service.

WE REALLY DO CARE!

If you suspect that you have an installation problem, or if you are not satisfied for any reason with your Chlorinating System we want to know! Please call us at (813)938-9475 and let us help you!

II. HOW IT WORKS

The Chlorinating System includes three basic components that work in concert with your pool system.

A. Cell

The chlorine generating cell is divided into 2 chambers (See Figure 1). Water and a 18kg bag of salt are poured into the large (salt) chamber. Water is added to the small (caustic) chamber.

When the pool pump is on, the power supply sends a low voltage DIRECT CURRENT to the cell at levels selected by the control on the power supply.

Figure 1

Chlorine and sodium are electrolytically separated from the salt brine. Chlorine then bubbles up through the salt brine and is drawn from the cell by the vacuum created by the venturi injector. Sodium is drawn through the membrane into the small chamber where it combines with the water and becomes sodium hydroxide. This action causes the liquid volume in the small chamber to increase and spill over into the same tube carrying the chlorine to the venturi. This process helps manage pool water balance.

Caustic Diluter

The Caustic Diluter is an option which allows operation of the cell without having to drain the caustic.

The diluter uses a small stream of pool water directed over the hydrometer to the suction side of the venturi. When the caustic concentration exceeds approximately 5%, the hydrometer rises and interferes with the stream of water, redirecting it to the caustic chamber. This causes the chamber to overflow more of the caustic solution back to the pool. When the caustic density falls below 5% the hydrometer sinks back down and the stream once again jumps across the gap.

B. Venturi

The venturi uses pool system water flow to create a vacuum so that the chlorine and sodium hydroxide can be drawn from the cell

and mixed with the pool water.

C. Power Supply

The power supply converts 120 or 240 volt power to low voltage Direct Current. A safety shut-off probe inserted in the salt chamber vent tube senses the presence of adequate brine in the salt chamber. If liquid level is too low the power supply is turned off to prevent cell damage.

III. OPERATING INSTRUCTIONS

- NOTE -

Before placing the Chlorinating System into service, the pool MUST be chemically balanced and stabilized.

The UNICLOR system generates chlorine (an acid when mixed with water) and Sodium Hydroxide (a strong base).

WHEN THE DILUTER IS USED, these components are mixed with your pool water forming a slightly alkaline sanitizer. That means your pool pH will tend to rise. This condition is normal and it will prevent corrosion of your pool plaster and equipment.

Under some conditions, however, dissolved minerals may create a deposit in pool piping and equipment in the form of scale. To prevent this condition, your pool water balance must be maintained as follows:

When diluter is used, maintain the following chemistry:

		MONITOR
Ph	7.2 - 7.8	Weekly
Chlorine	1 - 3 ppm	Weekly
Alkalinity	80 - 100	Monthly
Cyanuric Acid	50 - 80 ppm	Every 3 months
Calcium	200 - 300 ppm	Every 3 months

WHEN THE DILUTER IS NOT USED, a higher level of alkalinity is recommended because the sanitizer tends to be slightly acidic and alkalinity will be consumed. Alkalinity must be checked and adjusted at least once per month or pool wall and system corrosion may result.

When the diluter is not used, maintain following water chemistry:

		MONITOR
pH	7.2 - 7.8	Weekly
Chlorine	1 - 3 ppm	Weekly

Alkalinity	100 - 150	Monthly
Cyanuric Acid	50 - 80 ppm	Every 3 months
Calcium	200 - 300 ppm	Every 3 months

If chlorine residual is difficult to maintain, have pool water tested for nitrates and/or sterilize pool and recirculation systems with a shock treatment of 20 to 50 ppm chlorine. When total dissolved solids exceeds 1000 ppm and/or calcium hardness exceeds 400 ppm excessive chlorine consumption often results.

A. Initial Start-Up:

When all of the components have been installed, the Chlorinating System is ready to be charged and placed in service. Make sure that the rotary control on front panel of Power Supply is positioned to "OFF" or fully counter clockwise.

1. Salt Chamber

a. Remove the lager of the two plugs on top of the Chlorinating System and add 18 kg of 99.5%+ pure salt without additives (Morton "System Saver" in the yellow bag) to the large chamber. Never add more than 18 kg.

b. Through this same opening, add 30 mg of pure tri-sodium phosphate. This chemical captures impurities in the salt and water to help preserve system performance.

c. Then, through this same opening, fill the large chamber with clean water until the water level just touches the bottom of the fill neck. If your tap water is very hard or has high iron levels, we recommend the use of treated (softened) or distilled water. Mineral free water will prolong membrane life. Make certain hose or container is thoroughly cleaned and flushed to remove all plasticizers before filling cell. Flush those first!

d. Replace the large plug FINGER TIGHT ONLY to facilitate later removal.

2. Caustic Chamber

a. Remove the smaller plug from the top of the cell and fill the small chamber with clean water until the water level just touches the bottom of the fill neck. (When the pool pump is turned on, the water level in the small chamber will stabilize at its operating level; approximately half way down the indicator rod attached to the fill neck).

- NOTE -

The caustic chamber must be filled to it's operating level to function properly. A low level will defeat the pH adjustment feature and prevent the recharge

indicator/hydrometer from floating at the proper concentration. This may damage the cell.

b. Replace the small plug in the top of the cell FINGER TIGHT ONLY to allow later removal.

3. Caustic Diluter Option

This option can be used by connecting the diluter assembly and venturi ports as indicated in the installation instructions.

One length of tube is connected between the pressure port of the venturi and the diluter nozzle (part #27)

The other tube is connected between the catcher fitting (part #29) and the vacuum port on the venturi. This is directly across from the gas line port.

Make sure the diluter stream is jumping the gap unless the hydrometer is deflecting it into the cell.

If diluter is not used, caustic must be drained each time the hydrometer rises to the top of the clear plastic splash guard (a 16% solution of sodium hydroxide). The pH will remain stable for some time but alkalinity will be consumed and must be replaced to avoid pool surface and equipment damage.

4. Venturi

a. Prime circulating pump if required.

b. Turn on circulating pump.

c. Verify that there is a vacuum at the venturi. This is indicated by disconnecting one of the black tubes from the two fittings at the venturi throat and listening for a vacuum. Vacuum can be increased by closing the bypass valve to force more water through the venturi. When a good vacuum is confirmed, reconnect the black tube.

- NOTE -

Water overflowing from the cell or coming from the venturi when the tube is removed indicates an improperly installed venturi, excessive pool return line back pressure, or an improperly adjusted venturi bypass valve. High return line back pressure may be caused by blocked lines or deflector nozzles at the pool water inlets. Deflector nozzles must be enlarged or removed to reduce return line back pressure.

Bubbles will appear at the pool inlets. This is normal and should not be cause for concern. These bubbles are caused by the air being drawn through the Chlorinating System cell.

5. Power Supply

a. Observe the ammeter on the front panel of the Power Supply while applying power to the Chlorinating System. Position the rotary control fully clockwise. There should be a little movement from the "0" ampere reading. Typically, a peak current reading of 12 to 20 amperes will be noted after the initial startup period of 24 to 48 hours of continuous operation of the system (expect lower output at colder temperatures). If the ammeter indicator does not move, assure that the safety shut off probe is properly installed in the cell and connected to the power supply and the circuit breaker located on the bottom of the power supply has been "Reset" (push in and release). Maximum cell voltage at the connectors should be 8 volts DC.

b. As the current reading increases, check the pool water for chlorine. You will note that the concentration will be rising. You will be able to control this by adjusting the rotary control on the front panel of the power supply and/or changing the amount of time the system operates until the desired chlorine level is reached.

AVOID DAMAGE!

Do not operate with current readings in excess of 20 amperes.

B. OPERATING ADJUSTMENTS:

1. Maintaining Chlorine Level

The power supply and pump run time should be adjusted so that the chlorine level is maintained greater than 1.5 ppm. The Chlorinating System running time and the Power Supply setting will depend on the season, pool size and on the usage. A higher power setting and/or longer running time will mean more chlorine production per day.

The following are suggested initial settings for an average size residential pool. Settings will have to be adjusted to suit each individual pool.

SUMMER:

Settings of 12 - 15 amps should be sufficient with pool pump run time of 6 to 12 hours per day. For larger pools or heavier pool usage, increase setting and/or pump run time.

WINTER:

Settings of 10 amps should be sufficient with a pool pump run

time of 2 to 6 hours per day.

SHOCK TREATMENT:

To "shock" or super chlorinate, position the control to maximum level and allow the filter system and the Chlorinating System to run 24 to 48 hours. Occasionally, to solve persistent algae or excessive chlorine consumption problems, the pool may require a strong shock using sufficient chlorine compound to raise concentration to 50 ppm or more.

AVOID ROUTINE (WEEKLY) USE OF ALGICIDES OR ANY OTHER CHEMICAL.

2. Maintaining Pool pH:

As chlorine gas is mixed with the pool water, hypochlorous and hydrochloric acids are formed, which tend to reduce pH.

The small chamber, when properly filled, will slowly overflow into the pool during normal operation. This is due to the increase in fluid volume which results from the formation of sodium hydroxide. The result is a form of "semi-automatic" pH compensation, off-setting the pH reduction caused by adding chlorine gas to the pool water.

TOTAL ALKALINITY

Is an important part of your pool's inherent "pH control system". The total alkalinity (TA) must be tested at least once a month.
IF THE DILUTER OPTION IS NOT USED, regular additions of sodium bicarbonate will be necessary to keep TA in range (between 100 and 150 ppm).
IF DILUTER IS USED, maintain TA in range (between 80 to 100 ppm). We recommend a high quality test kit or visit your local pool professional for expert water analysis.

FAILURE TO MONITOR AND CONTROL TOTAL ALKALINITY AND OVERALL WATER BALANCE WILL DAMAGE POOL SURFACE AND EQUIPMENT.

RAISING pH

When the diluter option is not used the pool pH can be increased by adding clean water to the small chamber. Eventually, the normal overflow of caustic fluid will be sufficient to manage pH until recharge is required. The diluter option will eliminate the necessity for draining and recharging the caustic chamber. However, periodic additions of muriatic acid may be required to lower pH.

LOWERING pH

High pH usually occurs near end of caustic chamber batch life or when using the diluter option.

If not using the diluter option, drain the caustic from the unit in accordance with Section IV.A., and refill with water. If pool pH remains high, it should be lowered with muriatic acid. (Consult your pool professional).

If diluter option is used, it will be necessary to reduce pH periodically with muriatic acid, added directly to the pool water. The muriatic acid may be added to the salt chamber of the cell (maximum 300 ml per day) this will help cell conductivity.

CAUTION: This process also will release chlorine gas. Quickly replace cap and avoid breathing fumes.

- Leave the pump operating.
- Turn off Power Supply ONLY.
- Open cell by removing larger of two plugs and add 300 ml of muriatic acid to the salt side.
- Replace large plug.
- Allow cell to soak at least 1 hour while pump is operating.
- Then operate cell normally.

3. Venturi Adjustments

Vacuum at the venturi is controlled by flow through the venturi which is adjusted by the bypass valve.

- Disconnect gas line from the black fitting on the cell and adjust the bypass valve for a good vacuum without too much bubble noise at the pool.

- Reconnect the gas line. Do not tighten the nut more than 1/2 turn beyond finger tight.

C. Periodic Maintenance Checks:

1. Weekly:

Turn off power to the Chlorinating System. This is an important safety precaution! Always do this first!

Check electrical terminals on cell -- no more than warm to the touch. If corrosion or overheating is suspected, service in accordance with Section IV.C.

Check caustic compartment:

- Caustic liquid level touching indicator peg inside fill neck.

- Recharge indicator (hydrometer) free to float. (When

hydrometer floats, if not using diluter option, refer to Section IV.A.)

- Proper operation of diluter option depends on:

  1. Hydrometer free to move.

  2. Water stream jumping gap at all times - no dribbles or sprays.

  3. Good venturi suction.

Check salt compartment:

- Brine level in salt chamber covers the salt and is touching the indicator peg inside the fill neck.

- Use the salt level indicator to measure salt level. If necessary, add salt use only 99.5%+ pure salt without additives (Morton's "System Saver" in the yellow bag).

- Turn on power to Chlorinating System.

- Check operation of safety shut-off probe by lifting probe clear of liquid in vent tube and verify that the ammeter reading goes to zero. Use caution: probe-end may be covered with caustic. IF TEST FAILS, CALL FOR SERVICE IMMEDIATELY!

- Check vent tube to assure it is not blocked with salt or caustic crystals. Rinse clear if necessary.

- Re-insert probe and clip to vent tube lip.

- Confirm proper ammeter reading.

Check pool chlorine and pH using a test kit.

2. MONTHLY:

Check alkalinity

- 80 to 100 ppm if using diluter
- 100 to 150 ppm if not using diluter

Adjust as necessary.

3. QUARTERLY:

Check cyanuric acid (more than 50 ppm) and calcium (200 to 400 ppm). Adjust as necessary.

D. COMPATIBILITY WITH POOL CHEMICALS

Most pool chemicals are compatible with your Chlorinating System.

1. Chlorine Products can be added directly to the pool if necessary.

2. Algicides are usually not needed. We recommend avoiding routine algicide use because some of these products actually reduce chlorine residual or inhibit it's effectiveness. If an algicide is necessary, we recommend a polyquat based product.

3. Water Balance Chemicals will be required on occasion and if used properly, have no effect on the operation of your Chlorinating System.

If any other pool chemicals are needed, it is best to seek the advice of your dealer to assure optimum results.

IV. SERVICING

A. CAUSTIC (SMALL) CHAMBER:

- If the diluter option is used...

- It will only be necessary to check the caustic liquid to assure proper operation level.

- If the diluter option is not used...

- The caustic chamber will require servicing approximately 3 times for each salt fill.

- When the indicator top floats at the top of the clear plastic splash guard it is time to drain the caustic (Sodium Hydroxide) solution down to the drain valve and replace it with water.

- NOTE -

The Chlorinating System will stop making chlorine if the caustic (Sodium Hydroxide) solution concentration is too high. Operating the unit when the recharge indicator shows a high concentration of caustic (Sodium Hydroxide) solution will damage cell.

- WARNING -

Use eye protection when draining or handling caustic!! The caustic (sodium hydroxide) solution can cause burns! It will corrode aluminum or zinc galvanize. Handle with extreme caution. Wear eye protection. Avoid spills and splashed. Antidote: Immediately flush affected areas with flowing water for 15 minutes and call a physician.

To remove the caustic (Sodium Hydroxide) solution:

1. Position the rotary control on the Power Supply Unit fully counter-clockwise to the off position to prevent cell damage. Check the electrical connections on the Chlorinating System for signs of corrosion and overheating.

2. Remove the small plug from the top of the Chlorinating System, remove the cap from the drain valve and install the drain valve handwheel. After checking the container to make sure it is sound, place it beneath the drain valve.

3. Drain the small chamber of all liquid, down to the drain valve. This will require 3 or more trips using the container provided. Partial draining will shorten service cycle and raise pool pH.

4. Dispose of the liquid in a place inaccessible to children and pets by pouring into a drain pipe, sink or toilet. This liquid is similar to, but much weaker than, many commercial drain cleaning chemicals and may be used in a similar fashion. After pouring caustic into a drain, flush with water to clear trap.

5. Refill small chamber with clean water until the water level just touches the BOTTOM of the fill neck. DO NOT OVERFILL. This will rinse out the gas tube and allow liquid to seek it's proper level (approximately half way down the indicator rod attached to the fill neck).

- NOTE -

Small chamber must be filled properly for unit to function properly. Low level will cause pool pH to drop and prevent recharge indicator from floating at proper concentration and can result in damage to cell. Liquid should always touch small indicator rod attached to inside of fill neck. Check weekly.

6. Replace the small plug on top of the Chlorinating System finger tight to facilitate later removal.

7. After each caustic recharge, check to see if cell needs salt.

- NOTE -

To prevent accidental injury, ensure valve cap is installed on drain valve. Drain valve handwheel is removed and remains attached to drain cleaner jug. They should be rinsed and stored in a sage dark place after each draining operation to prevent unauthorized use, damage, or deterioration by sunlight.

B. SALT (LARGE) CHAMBER:

The length of time that your CHLORINATING SYSTEM will operate before needing salt is determined by the chlorine demand of your pool. After one complete cycle, you will be better able to determine the required frequency for adding salt.

- NOTE -

Avoid rapid anode wear! DO NOT operate system without adequate salt and brine (water) in the large chamber. BRINE MUST ALWAYS COVER THE SALT AND TOUCH THE INDICATOR ROD. CHECK WEEKLY.

As the salt is chemically broken down, the level of the water and salt in the larger chamber of the Chlorinating System will decrease. Need for salt addition will be indicated by level indicator rod in salt fill cap. As it approaches full down, salt addition is required.

WARNING!
DO NOT INHALE CHLORINE FUMES!

1. Turn the rotary control on the front panel of the Power Supply fully counter-clockwise and remove the large salt chamber plug, but allow the pool circulation pump to continue running. Maintain this condition for up to one hour to allow most of the chlorine gas in the chamber to be drawn off.

2. If salt cake is found, remove the salt cake and correct cause -- caustic getting into salt chamber by overfilling caustic chamber, improper venturi operation or leaking between chambers.

- NOTE -

It is not necessary to change the water in the salt chamber. However, water must ALWAYS cover the salt and contact water level indicator. Brine must contact bottom of the fill neck when salt is at maximum level. DO NOT fill chamber with water above bottom of the fill neck or cathode damage will occur.

3. Add 18 kg of 99.5%+ pure salt without additives (Morton "System Saver" in the yellow bag). The purity is important to ensure that remaining chemicals do not plug the membrane. Take care to assure brine level does not go above bottom of fill neck while filling. If necessary, remove brine to permit complete fill up or use only partial salt fill until the liquid space is available.

4. Add water to bottom of fill neck.

5. Replace fill plug, finger tight only.

6. Set the timer and power supply controls as required.

C. ELECTRICAL CONNECTIONS:

Turn the machine off and inspect the terminal lugs on the Chlorinating System for signs of corrosion or overheating during operation (hot to the touch). If corrosion or overheating is suspected, loosen lug nuts, clean terminals with a rag and wire brush, then RE-TIGHTEN USING TWO WRENCHES.

D. WINTERIZING

TEMPERATURES NOT EXPECTED TO GO BELOW - 2'C - special storage not required.

TEMPERATURES BELOW -2'C - can freeze the electrolytes in the cell which could damage the cell.

- Remove the electrolytes from cell using a plastic bilge pump on the salt side and the drain valve on the caustic side. (Electrolytes are the liquid substances in the cell).

- Electrolytes (from both sides of the cell) can be stored separately for use next season or they can be mixed and disposed of in the sanitary drain system.

- It is not necessary to remove the salt but storage of the cell out of the elements (preferably above -2'C) is advised.

- It is not necessary to store the power supply or safety probe or to winterize them in any way.

- Remove the fittings from the venturi and install threaded plugs in venturi so pipes can be blown out.

V. TROUBLESHOOTING AND REPAIR

A notable feature of the Chlorine Generating Machine is that it has no moving parts to wear out or break. Beyond normal checks and servicing, your unit should require little attention. However, if you experience difficulty, the following troubleshooting table is designed to make your problem easy to define and easy to fix. First, look for a "Symptom" that matches your problem. Then just follow the "Repair Action" to correct the problem.

SYMPTOM: NO OR LOW CHLORINE PRODUCTION DURING THE FIRST FEW HOURS OF OPERATION

CAUSE	REPAIR ACTION

A. This condition is normal. It may take 48 hours of continuous operation before normal production levels are reached.	None.

SYMPTOM: NO OR LOW CHLORINE PRODUCTION AFTER FORTY EIGHT HOURS OF OPERATION

CAUSE	REPAIR ACTION
A. Incorrect installation.	Verify proper installation.
B. Power supply switch incorrectly positioned.	Set at maximum positio and verify current increases to greater than 10 amps.
C. Inadequate stabilizer in the pool.	Assure cyanuric acid concentration is greater than 50 ppm.
D. Excessive chlorine demand.	Consult your dealer.
E. Periodic cell overflowing caused by improper installation or venturi bypass valve setting or diluter constantly diluting cell.	Correct installation, bypass valve adjustments, insure hydrometer not sticking, diluter water flow jumps gap and sufficient vacuum available.

SYMPTOM: DIFFICULT TO MAINTAIN CHLORINE IN POOL AFTER AN EXTENDED PERIOD OF SATISFACTORY OPERATION

CAUSE	REPAIR ACTION
A. Inadequate stabilizer.	Assure cyanuric acid stabilizer concentration is greater than 50 ppm.
B. Excessive chlorine demand.	Consult your dealer.

SYMPTOM: CHLORINE ODOR NEAR THE CHLORINATING SYSTEM

CAUSE	REPAIR ACTION
A. Intermittent or weak vacuum (chlorine machine running with no way to expel generated chlorine gas).	Check filter & pump operation: 1. Clean pool filter. 2. Verify circulating pump is working properly; assure large return orifices; repair if

	necessary. 3. Check for scale in return line, clean if necessary.
B. Plugged gas tube between cell and venturi.	Verify suction at venturi gas port and clear gas tube.

SYMPTOM: LOW CHLORINE PRODUCTION AFTER PERIOD OF SATISFACTORY OPERATION

CAUSE	REPAIR ACTION
A. High caustic concentration cell.	Remove the caustic solution in and replace with water. Check to ensure hydrometer is free to move.
B. Low salt level.	Add salt and assure that the water level in the salt chamber is at the bottom of the fill neck with a full salt charge.
C. Low water level on salt side (sometimes results from heavy use).	Add water to cover salt and touch internal indicator rod and safety shut-off probe.
D. Worn out anode or cathode.	If amp level is low (after extended run time), check anode and cathode or call for service.
E. Plugged Membrane.	If amp level is low (after extended run time), turn off power cell, leave pump running and add 227 ml of muriatic acid to the salt side of cell. Replace cap and allow to soak for 1 hour before turning power supply back on.
F. Loss of electric power to the Chlorinating System.	Assure main circuit breaker in "ON" and pump is running. Then: Check that power supply circuit breaker is set. Confirm safety probe is properly installed and connected and touches salt brine.

	Check for loose, corroded or broken wiring connections at Chlorinating System. Confirm 7 to 8 volts DC at cell terminals; have power supply or probe repaired as required.
G. Internal leak between caustic and salt chamber (usually accompanied by salt cake in cell).	Call dealer for repair.

SYMPTOM: DIFFICULT TO MAINTAIN PROPER pH

CAUSE	REPAIR ACTION
A. Inadequate alkalinity in pool.	Readjust to 80 - 150 ppm. (See section III)
B. Improper draining of caustic. If not using diluter, alkalinity will be consumed.	Review Section IV.A.
C. Diluter option will slowly raise pH.	Add muriatic acid as required.
D. Improper pool chemistry.	Adjust per Section III.

SYMPTOM: SALT CAKE IN CELL

CAUSE	REPAIR ACTION
A. Periodic pool water flow back through gas line causing caustic to overflow into salt chamber (usually occurs during start up after recirculation system has been off and drained down or as solar water heater drains down).	Remove salt cake and: 1. Replace or add gas line check valve. 2. Replace pool recirculation line check valve. 3. Repair filter or pump leak. 4. Readjust venturi bypass for consistent vacuum. 5. Ensure proper installation of venturi.
B. Overfilling caustic chamber above bottom of fill neck.	Fill caustic chamber only to bottom of fill neck.
C. Caustic chamber leak into salt	Repair leak area with heavy

side (usually in internal piping).	body PVC cement or call your dealer for repair.
D. Continually adding salt.	Add salt in 18 kg increments only.

POWER SUPPLY
PARTS LIST

PART NO.	QUANT. REQ.	DESCRIPTION
002-LIT 81504.5	1	Circuit Breaker Amp
002-1062	1	Heat Sink Small
002-1065	1	Heat Sink Large
002-2N682	2	SCR 25 Amp
001-2070	1	Wire 12-2 DC Power Cord
002-S-1768-M	2	Crimp Solder Lug #10-12 1/4 Slip
002-S-1100-M	1	Crimp Solder Lug #12 1/4 Stud
002-S-1011-M	1	Crimp Solder Lug #12 #12 Stud
002-TM-5300	1	Transformer 120/240 19 VCT
002-SS-1090-M	2	Crimp Solder Lug #16-14 1/4 Slip
002-EM-6353-SS	1*	Amp Meter 25 Amp (Edge Wise)
002-EM-6596-SS	1*	Amp Meter 25 Amp (Square)
002-FW-386-M	1	Insulator Shoulder Washer 1/8 ID
002-1092	1	Washer 1/8 Steel
002-2916	1	Wire Nut
002-RT350-1000BK	2	Tywrap 1/8" X 4"
002-1484	1	Strain Relief (Small)
002-1517	1	Strain Relief (Large)
002-1101	8	Screw Round Head 8-32 SS Phillips
001-1071	1	Safety Probe Kit
002-2917	2	MOV 125 Vac
002-2120A3	1**	Indicator Lamp
002-6T4-14	1	Ground Lug
001-2322	1	Control & Swith Assembly
002-0004	1	Control Selector Knob

120/240 VOLT SCHEMATIC

* Model Specific ** Only on UNICLOR

CHLORINATING SYSTEM & VENTURI ASSEMBLY
PARTS LIST

ILLUS. NO.	DESCRIPTION	PART NUMBER
1.	Caustic Compartment Plug	002-0009
2.	Salt Level Indicator	001-0205
3.	Top Cap-Screw PVC	002-1032
4.	Top Nut Nylon	002-1033
5.	Gas Port Fitting	002-40-4-6-KB-0

6.	HDPE Tube	001-1052
7.	Venturi Fitting, Kynar (Gas)	002-40-4-2-KB-0
8-11.	Cathode Kit Includes: Cathode insulator washer, washer and cathode nuts 12-28	001-3222
12-16.	Anode Kit Includes, Anode, anode stud 1/4 20 titanium, washer, insulator washer and anode nuts 1/4 20.	001-3216
17.	Drain Valve Assembly	001-1038
18-19.	Membrane Clamp Ring Kit	001-4050
20.	Venturi Tapped Model 500	001-3401
21.	Top Assembly Kit	001-1049
22.	Vent Tube Assembly	001-2115KIT
23.	Venturi Fitting, Water	002-40-4-2-P-O
24.	Drain Valve Handwheel Assy.	001-2038
25.	Caustic Jug with Cap	002-2400
26.	Drain Valve Cap	002-04HC
27.	Diluter Assembly	001-0212
28.	Diluter Nozzle	001-0209
29.	Catcher Tube	001-1056
30.	Catcher Fitting	002-10-6-2-P-O
31.	Splash Guard	001-0307
32.	Safety Probe (Power Supply Part)	001-1070

UNICLOR

CAREFREE POOL CARE

INSTALLATION INSTRUCTIONS

IMPORTANT!

MORE THAN 90% OF ALL PROBLEMS AND DAMAGE
ARE CAUSED BY AN IMPROPER INSTALLATION.

DO NOT ATTEMPT INSTALLATION OF THIS EQUIPMENT
WITHOUT FIRST HAVING READ AND UNDERSTOOD
THESE INSTRUCTIONS.

INTRODUCTION

IMPORTANT REQUIREMENTS

TO PREVENT DAMAGE TO POOL EQUIPMENT OR THE CHLORINATING SYSTEM, PLEASE READ THE FOLLOWING VERY CAREFULLY.

1. The venturi must be isolated from the pool equipment to prevent equipment corrosion! See page 2 for details.

2. Improper valve alignments must not cause venturi to lose vacuum or cell to flood.

3. Cell must be level and away from pumps, heater, etc., to prevent corrosion by chlorine gas, caustic, or salt spilling from cell during recharge operation.

4. Venturi must be installed below cell lid level and must not discharge water at any time.

5. Proper cell polarity must be maintained.

   - Red (+) lead connects to salt (large) chamber.

   - Black (-) lead connects to caustic (small) chamber.

6. Electrical connections at cell must be CLEAN and TIGHT.

7. Cell divider wall must be perpendicular to stand cross-members and cell must rest on stand cross-members.

8. Drain valve must not be over-tightened.

COMPONENTS SUPPLIED

Your Chlorine Generator System consists of 3 components:

1. POWER SUPPLY:

Power supply may be connected to 120 or 240 VAC it must be turned on and off with pump timer.

2. CELL:

Cell is supplied with a salt level indicator and a diluter assembly mounted on the cell lid. Use of the caustic diluter is optional. It can be connected using tubing and white fittings supplied or the ports in the venturi may remain plugged.

3. VENTURI:

The venturi provides the pressure source for the diluter nozzle and vacuum sources for the diluter overflow, gas and caustic.

TOOLS & MATERIALS REQUIRED:

- Hacksaw
- Medium flat blade screwdriver
- Pliers
- Drill and drill bits for power supply anchors
- Necessary PVC fittings to install venturi and bypass assembly
- 99.5+% PURE water softener salt. (Use Morton 18 kg - in the yellow bag)
- Optional equipment and supplies as indicated
- Two 7/16" open-end wrenches
- Concrete pad or other solid level surface to mount cell stand.

LOCATING AND INSTALLING THE COMPONENTS

Figure 1 illustrates the preferred relationship between the Chlorine Generator and existing pool equipment components. The following sections discuss important conditions for installation of each component. In all cases, an improper valve alignment or plugged filter must not allow cell flooding or system drain down. For special conditions or considerations see Special Installations section beginning on page 6.

FIGURE 1

VENTURI INSTALLATION

The venturi is a very simple means of producing the vacuum necessary to operate the Chlorinating System. Venturi location depends on the support system configuration. HOWEVER, FOUR CONDITIONS MUST BE MET ON EACH INSTALLATION:

1. The venturi must be mounted below cell lid.
2. The venturi must be located downstream of all pool equipment and controls (ie. filters, heaters, heat pumps, pool/spa controls, pool cleaner and all valves). This is required to prevent cell flooding. (See Figure 1)
3. To avoid excessive back pressure and reduced system flow,

the venturi must be installed with a bypass. Use a plastic valve.

To avoid valve adjustments, a 3 kg spring check valve can be used to automatically adjust the by-pass flow. The venturi by-pass spring check valve must be flooded with water when the system is off to prevent spring corrosion. (See Figure 2)

FIGURE 2

4. To prevent system drain-down and pool equipment corrosion, the venturi must be isolated from the support system with a water seal. This may be accomplished by the following installation methods.

METHOD 1

Low loop seal between venturi and pool equipment to protect against backflow of chlorine gas. (See Figure 3).

FIGURE 3

METHOD 2

The following method can fail and should only be used when preferred method 1 (shown in Figure 3) is not possible. The owner should be advised of this and of how to test periodically to assure that the system is working properly.

Check valve with minimum 15 cm water seal to protect valve from chlorine gas, installed upstream of venturi. Use only leak tight check valve. (See Figure 4).

FIGURE 4

POWER SUPPLY

INSTALLATION

1. Connection of the Power Supply and the proper grounding of the entire electrical system must be in accordance with applicable local codes. It should be performed by a qualified electrician. Improper grounding could cause pump corrosion and/or shock hazard.

2. The Power Supply should be installed near the pool circulating pump timer, above the cell, and above lawn sprinkler spray patterns.

3. Mount the Power Supply in an upright position with the wires extending from the bottom. Power Supply must be mounted on and over non-combustible material.

4. Check connection points with a volt meter to verify voltage available.

5. Turn power OFF at the main circuit breaker. Connect the Power Supply to the filter pump circuit so that the Power Supply can NOT operate when the pump is off.

6. The 120/240 VAC Power Supply has 4 wires (black, red, white and green). It, like the pump, is connected to the LOAD side of the timer (See Figures 5 & 6). The Power Supply must be off when the pump is off.

7. Turn power ON at main circuit breaker and check installation to assure power supply will not operate if pump is off.

120 VOLT WIRING DIAGRAM FIGURE 5

FIGURE 5

240 VOLT WIRING DIAGRAM FIGURE 6

FIGURE 6

IMPORTANT!

Use your volt meter! Connecting 240V to 120V Power Supply wires will cause damage!!

NOTE:

a. If Power Supply is to be mounted within 1.5 m of pool, a #8AWG ground wire must be attached to the grounding lug on the case.

b. Assure that timer switch and the branch circuit ratings are adequate to carry both pump load and the 2 amp Power Supply load.

CELL INSTALLATION

REQUIREMENTS

1. Cell must be:
   - Level
   - Above Pool Water Level
   - In Well Ventilated Outside Area
   - In stand on a hard surface, so it won't settle off level

2. If Cell will be enclosed:
   - Area must be well ventilated.

   - Power Supply must be connected to a pressure switch (Part #001-5505) to prevent chlorine production when the venturi is inoperable.

3. Cell Stand Set-up

   - The long legs of the stand must be down and the "This Side Up" sticker should be facing up on the horizontal support rods.

PROCEDURE

1. Mount the cell away from the other equipment so that any spill or overflow accident, or chlorine gas released during recharge, or tube plug will not damage other equipment and heat from heater will not damage Cell.

2. Turn the Power Supply off and connect it to the Cell with the cable provided. Run the wire through the loop provided at the top of the Cell (See Figure 7).

FIGURE 7

Note that two different sized lugs have been provided. These mate with respectively sized studs on the Cell. After removing the first nut from the large stud, place the large lug over the large stud and replace the nut. TIGHTEN NUTS AS CLOSE AS POSSIBLE TO THE OUTER END OF THE STUD USING TWO WRENCHES and dress the wire upward to reduce the possibility of corrosion problems (See Figure 8).

FIGURE 8

3. Repeat the procedure with the smaller lug and stud.

4. Connect safety probe wire to Power Supply and insert probe into cell vent tube. Dress and tie all wiring for a neat appearance.

5. Connect black tube between the black gas port of the Cell and the black fitting vacuum port of the venturi. The length is not critical but the tube should slope down to the venturi and be as short as practical. (See Figure 10)

IMPORTANT!

Do NOT tighten tube fitting nuts more than 1/2 turn past finger tight of the tube will break after only a short time in service.

6. Install the drain valve.

IMPORTANT!

Avoid thread or drain valve bushing damage. Tighten drain valve to within 1.5 mm of bottom. Over-tightening will cause cracking. (See Figure 9).

FIGURE 9

CAUSTIC DILUTER OPTION

INSTALLATION:

The system is connected in accordance with Figure 10.

1. Connect a length of tube between the pressure port of the venturi and the nozzle assembly on the lid of the cell.

   a. Insert one end of the tube in the elbow fitting at the pressure port of the venturi.

   b. Insert the other end of the tube into the fitting of the nozzle assembly.

2. Connect another length of tube to the white vacuum port of the venturi and insert the other end of the tube into the large black tube connected to the diluter catcher fitting. (See Figure 10)

   a. Insert one end into the white elbow fitting at vacuum port of the venturi.

   b. Insert the other end of the tube into the large black tube connected to the catcher assembly. Take care to angle this tube down and away from the diluter assembly.

3. Turn on pump and check to assure stream goes into catcher tube and venturi vacuum is sufficient to pull entire stream, plus a lot of air.

4. Turn off pump.

5. Secure tubes for neat appearance.

FIGURE 10
TUBING CONNECTIONS

6. Install splash guard (clear plastic tube) into diluter assembly. Do not glue.

This completes the installation of your Chlorinating System. Please refer to the Owner's Manual for start up and operating

instructions.

SPECIAL INSTALLATIONS
APPENDIX

The following support system types will require special consideration. Refer to the special instructions regarding these systems:

- Pool/Spa Combinations
- Cell Below Pool Water Level
- Solar Water Heater
- Two Speed Pumps
- Metal Piping
- Automatic In-Floor Cleaning Systems
- Installations Involving High System Back Pressure

POOL/SPA COMBINATIONS

As indicated earlier, the venturi must be mounted downstream of the pool/spa selector valve and in the pool return line only.

If it can be expected that the pool will be isolated for extended periods to heat and operate the spa, a pressure switch (Part #001-5505) should also be installed. This pressure switch will turn off the chlorinating system when the venturi is isolated for spa operation.

CELL IS MOUNTED
BELOW POOL WATER LEVEL

Install a Surge Chamber Kit (Part #001-2503) vertically, above pool water level to prevent cell flooding when system is shut down (See Figure 11). DO NOT USE GAS LINE CHECK VALVE FOR THIS APPLICATION. They may leak and cause salt cakes and cell damage. The maximum operating distance below pool water is 1.5 meters for the cell. More than 1.5 meters could cause cell flooding.

FIGURE 11

Make certain all vacuum connections are leak tight.

TWO SPEED PUMPS

To provide automatic by-pass readjustment when pump speed changes, the manual by-pass valve is replaced with a spring loaded check valve. To protect the spring when the pump is off, the valve must be flooded at all times (See Figure 12).

FIGURE 12

TO PREVENT METAL PIPE CORROSION

Metal pipe must be protected from chlorine gas when the system is shut down.

To prevent drawing chlorine gas into metal pipe, water is trapped in the venturi, thus sealing off the chlorine source. A vacuum breaker in the line downstream of the venturi permits drain down to the pool water level without pulling chlorine gas (See Figure 13).

FIGURE 13

IMPORTANT!

1. Cell must be mounted above the venturi to retain water seal.

2. For vacuum breaker, use rubber flap type PVC check valve mounted open-side-down to exclude tampering and debris.

IF POOL SYSTEM INCLUDES SOLAR HEATER

Install a Gas Line Check Valve Kit (Part #001-2502) in gas and diluter suction lines to prevent cell flooding caused by momentary unsatisfactory venturi operation.

IN-FLOOR CLEANING SYSTEMS

Because of the high discharge pressure caused by an automatic in-floor cleaning system, the standard venturi installation will not work reliably. We recommend installation of the Dual 180 venturi kit (Part #001-3202) in a dedicated return line, independent of the cleaning system (See Figure 14).

The 180 venturis, available as an option, will operate with very low flow if back pressure is also low. They must be connected downstream of all equipment and valves and just before the floor cleaning system selector valve. The line must be provided with a low loop seal up stream of the venturis to isolate the support system from chlorine gas when the system is off (See Figure 14). A valve should be installed upstream of the venturis to control flow.

FIGURE 14

The outlet of the venturi line can be located in the side of the skimmer above pool water level, or it can be tolerated in the pool wall, away from the skimmer (See Figure 15). Use a low resistance fitting or bushing to finish off the discharge end.

FIGURE 15

INSTALLATIONS WHERE HIGH BACK PRESSURE IS A PROBLEM

The optional 180 venturi(s) can be used in place of the standard venturi to overcome most problem installations involving high back pressure or low system flow. The bypass valve must be provided and the usual precautions against system drain down must be taken.

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