Aquachlor™

Salt Water Chlorinator

Owners Manual
Model *Standard* and
Self Clean C Series II

Manufactured in Australia By

Monarch Pool Systems
www.monarchpoolsystems.com

Aquachlor™

Salt Chlorinator

Thankyou for purchasing a Quality Aquachlor Pool and Spa Product. Please read all information in this Manual carefully before installing or operating your AQUACHLOR™ SALT CHLORINATOR.

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PACKING LIST - Aquachlor™ C and SC Systems

Included with your C and SC systems are the following items, please check the contents of the box carefully prior to attempting to install the system:

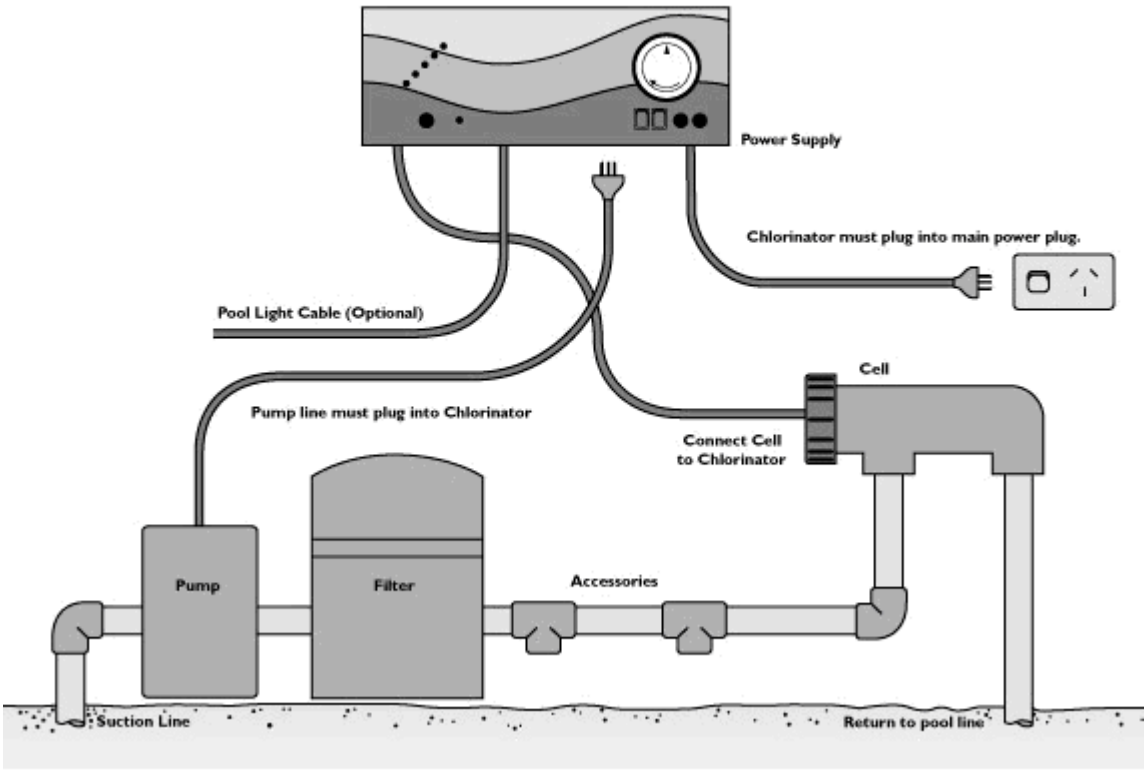
1. **Power Supply**
2. **Electrolytic Cell Housing**
3. **Electrolytic Cell – C or SC Series**
4. **Cell Adaptors (2)**

INSTALLATION INSTRUCTIONS FOR AQUACHLOR C and SC

INSTALLING THE POWER SUPPLY:
Select a convenient well-ventilated location within one metre of filter equipment and mount the Power Supply vertically onto a post or wall 1.5 metres above ground level. Australian Standards requires that the Power Supply shall not be located within 3 meters of the pool water. Plug Power supply into a suitable **weatherproof** outlet and plug pump into power outlet of the Power Supply Unit. The Unit must be kept away from acid and other chemical storage areas. Acid and chemical vapours will corrode the electronics inside the Unit. It must also be kept away from heat sources. Good ventilation is necessary for correct operation (See diagram at bottom of page). Mount unit via keyholes on back of Unit.

CONNECTING THE ELECTROLYTIC CELL TO THE POWER SUPPLY:
The Power Supply is fitted with a flexible lead terminated with connector's. These must be correctly fitted to the connections on the inside of the Cell Head. To prevent incorrect connection the fittings have been colour coded. The Blue Flow Sensor should be pushed onto the thread of the small bolt. The power outlet on the bottom of the Power Supply is dedicated to the POOL PUMP ONLY. Do not use a double adaptor to connect more than one pump - it can cause overload to the system and could void your warranty. **Important:** The Cell must be installed so that the water flows through the Cell Housing via the Cell head end in accordance with the arrow on the cell housing. This is to ensure correct operation of the flow sensor. Refer page 9 for connection of pool light on optional light transformer models.

Installation Diagram



PRE - START UP PROCEDURE:
Before operating your Aquachlor™ Chlorinator please ensure the following items have been added to your pool:

- **SALT -** Load salt into the pool at a minimum rate of 40kg per 10,000 litres (0.4%).

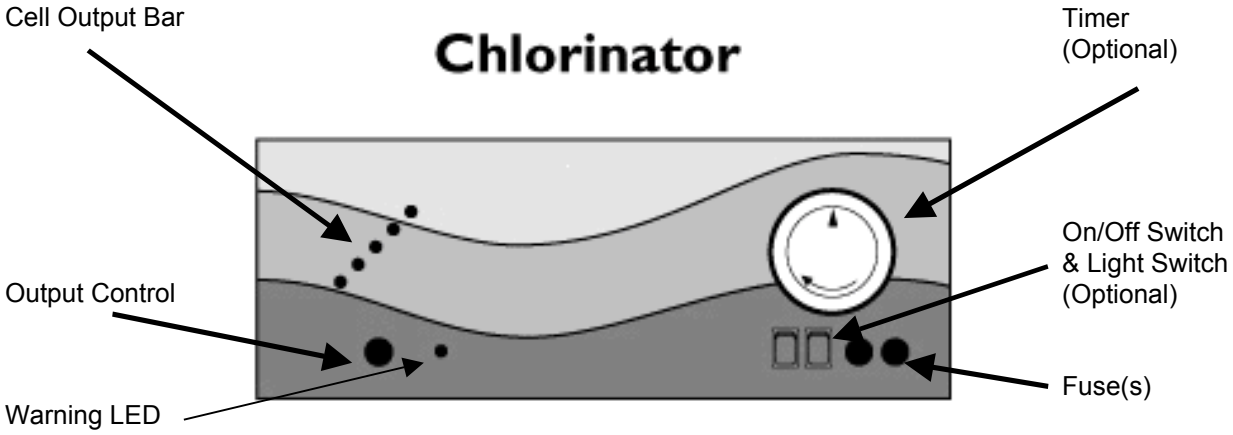
Connect vacuum system and slowly vacuum until salt dispersal is complete. Place vacuum head into deepest end of pool and allow vacuum to continue for a further 2 or 3 hours. Salt should now be completely mixed.

- **CHLORINE** - For a new pool installation that has not been chlorinated, add sufficient Chlorine (liquid or granular) to achieve a reading of 3 ppm (with a suitable test kit), or run the chlorinator system continuously for at least 24 hours or until a reading of 3 ppm is reached.

- **STABILISER -** It is essential that pool stabiliser be added and maintained at the rate of 30- 50 mg/l (30 - 50 ppm) at all times. Do not exceed 100 ppm.

(Refer **Day to Day Operation** pages 8-10 for further information).

OPERATION OF AQUACHLOR™ C (Standard) SYSTEM:
Cell Output is shown on a meter made up of a bar of five **LEDs** on the left-hand side of the unit. Normal Cell operation is indicated by at least four LEDs being on. The Unit is fitted with an electronic control and warning system. This regulates the output of the Unit to the preset maximum. The warning system consists of an **LED** which will glow Green or Red to indicate possible faults with the Unit or damaging operating conditions.



Once the salt level in the pool is correct the Unit may be switched On. The **WARNING LED** will be Green and no **Cell Output** will be seen for approx. 30 seconds, this allows the pump and filter to prime and the Cell Housing to fill with water. After this start - up delay the bar meter should light up showing at least four LEDs. At this point the **WARNING LED** should be Green; if not there is a problem. (Refer table).

BAR METER	WARNING LED	REASON/ACTION
Off	Green	1. Start – up delay functioning. 2. **System Control** set below max. Cell is turned off. (Refer **System Control** page 7).
Off	Red	1. Gas detected. Check pump/pipes for damage. 2. Gas sensor not connected to cell
4 or 5 LEDs on	Green	System operating normally
1 to 5 LEDs on	Red	1. Salt level too low. Add salt at a rate of 25kg per 25000L. 2. Cell is calcified. Clean cell. 3. Water temperature low.

OPERATION OF AQUACHLOR™ SC SYSTEM:

The Aquachlor™ SC system operates similarly to the C System described above. The SC system uses a patented **Electronic Self Cleaning** system to clean your Cell and therefore you should not have to clean your SC cell unless you have extreme water conditions. **Note: a Aquachlor SC cell must be used with an SC Unit.**

AQUACHLOR™ MODEL C and SC SERIES SPECIAL FEATURES

SYSTEM CONTROL:
The System Control varies the amount of time the Cell operates during the filtration cycle.
The **System Control** will **not** vary the electrical current supplied to the Cell. (As shown on the Display).

As an example, if one filtration cycle is set at 5 hours, and the **System Control** is set to 80%, then the total amount of time the Cell will operate during the 5-hour cycle will be 4 hours. If the **System Control** is set to 60%, the Cell will operate for 3 hours total over the 5-hour filtration cycle.

When the **System Control** is set to MIN, the Cell will be OFF for the duration of the filtration cycle. When the **System Control** is set to MAX, the Cell will be ON for the duration of the filtration cycle.

During the filtration cycle, the Cell will be turned ON and OFF a number of times each hour, unless the **System Control** is set at MIN or MAX. Using the previous example (of 60%), the Cell will operate for about 36 minutes each hour. This 36-minute operating time will be made up of a number of smaller operating periods. As an example, the Cell may turn ON 12 times (for a period of 3 minutes each time) over the hour to make up the 36 minutes. This enables the electronic circuitry to re - adjust to any changes in the pool water condition. For example, dilution from winter rains, the addition of salt etc.

If the Cell is OFF and you wish to check its operation, simply turn the **System Control** to MAX and the Cell will turn ON. Once checked, adjust the **System Control** back to the desired position and after a few minutes the Cell will turn OFF again.

To turn the Cell OFF, simply turn the **System Control** to MIN. This will be convenient for backwashing.

WARNING LED

Your Aquachlor™ Chlorinator is fitted with a number of protective systems including the **WARNING LED.** As the salt level in the pool decreases, the wear on the Cell increases. Although salt is not consumed in the Aquachlor™ process, it is lost through splashing, back - washing and on bathers as they leave the pool. The salt level is also reduced by rain, which causes dilution. Salt is not lost to evaporation. As the salt level in the pool falls toward the minimum the **WARNING LED** will turn RED. At this point the salt level should be increased by adding 25kg of salt per 25,000 litres of pool water. The addition of salt should not affect the Aquachlor™ as it is protected against overloads. If no action is taken and the salt level continues to fall damage to the system may result.

There are other factors that can cause the Unit not to work correctly:

1. **Heavy Rain** - can cause very dilute pool water to pass over the Cell due to surface skimming.

2. **Scaled Cell** - a scaled Cell will not draw as much electrical current as a clean Cell when first started.

3. **Cold Water** - cold pool water reduces the ability of a Cell to carry electrical current.

4. **Failing Cell -** as the Cell ages there will come a time when the electrical current draw will drop. This can be compensated for with the addition of extra salt. A Cell is considered failed when it draws less than 80 % of maximum current. To keep a failing Cell in operation extra salt can be added. There will come a time when the Cell will not respond to extra salt. It will then need to be replaced.

   Please note that the **WARNING LED** is not like T.D.S. meters, which are temperature compensated Scientific Instruments. The accuracy will be within 500ppm salinity and it is water temperature dependent, just as the Cell is.

Automatic Time Clock Operation (optional)

If your Power Supply is fitted with an automatic time clock (optional) the operating time(s) can be easily set by pushing the small pins forward or backwards to the desired operating time(s). The unit comes pre-set for 8 hours operation per day.

MODELS WITH POOL LIGHT TRANSFORMER (optional):
Take off Cover Panel by removing the screws in the cover bottom. Insert the two wires from your pool light into the Terminal Block provided. It does not matter which side of the

Terminal Block the coloured wires from your pool light are connected. The Light Transformer is for use with 12volt pool lights, maximum power is 150Watt.

Please Note: Only one light can be connected to each light transformer. If more than one light is required please refer to your Aquachlor™ dealer.

SAFETY NOTICE

IMPORTANT Certain local electrical regulations state "If the supply cord is damaged, it must be replaced by a special cord available from the manufacturer or its service agent".

MAINTENANCE OF POWER SUPPLY:
Little or no maintenance is normally required with the exception of replacing blown **Fuses.** These **3 Amp Fuses (5amp for C520)** can be sourced from your local Aquachlor™ Dealer. However it is essential that the wall or post to which the Unit is installed be sprayed (not the Unit itself) periodically with a good surface type insect repellent, since penetration by insects may cause damage which is not covered by your warranty.

The Unit will become warm to hot when in operation, this is normal.

MAINTENANCE OF ELECTROLYTIC CELL:
The cell is composed of extremely expensive materials, and although proper maintenance can prolong its life to the maximum, eventually the process of electrolysis will wear away its delicate coating, at which time it gradually ceases to produce chlorine.

Mineral salts and calcium (scale) are deposited on the outer and the inner plates as electrolysis takes place. This build up will interfere with the flow of electrical current in the Cell and thus lowers sanitiser production. It is essential to inspect the Cell regularly and clean when necessary. The rate at which deposits will form on the plates differs with each pool and can be influenced by the following:

- Calcium hardness of the water
- Water Temperature
- pH control
- Water which has been chlorinated with calcium hypochlorite for an extended period
- Calcium in the plaster surfaces of a concrete pool

Because these conditions vary so much, check the Cell at least weekly to begin with to see when either scale or a blue/green soapy substance appears on the plates. You will then be able to determine the cleaning cycle necessary for your pool (obviously more in summer). The intervals between cleaning could get longer to the point where cleaning is only necessary a few times each year. One exception is the use of bore water or ground water, in which case cleaning may always need to be as frequent as once a week.

Life of Aquachlor™ electrolytic cells will vary substantially from one installation to another due to variations in operating time, water quality and composition, system and cell maintenance. Please ensure that when cell replacement is necessary you use the correct genuine Aquachlor™ replacement cell to match your system.

Aquachlor ™ C Standard		Aquachlor™ SC Self Clean	
C Standard Systems Model	**C** Replacement Cell Model to order	**SC** Self Clean Systems Model	**SC** Replacement Cell Model to order
260	260	250	250
390	390	330	330
520	520		

SC SYSTEMS Please Note that unless you have extreme water conditions the Cell should not become scaled and you should not have to clean the Cell. In areas of extremely hard water it may be necessary to clean your cell periodically. Refer below.

To clean the cell, remove all leads connected to the Head Assembly. Unscrew the Cell by turning the Head Assembly clockwise – as per instructions, and withdraw from the Cell Housing.

METHOD 1
Add 1 part HYDROCHLORIC ACID to 5 parts WATER in a suitable container and immerse the Cell in this solution. It should not take longer than a few minutes to clean, if it does the Cell should be cleaned more frequently. If the build – up is not excessive it may be possible to clean the plate with a jet of running water. Return the Cell to its Housing and connect leads to the Head Assembly.

METHOD 2
As an alternative, an approved commercial Cell cleaning solution can be used a number of times effectively.

SAFETY DEVICE:
Hydrogen Gas is a by – product of the chlorine producing process. A Gas Sensor has been incorporated into the Unit and Cell, which will switch off chlorination if gas is detected in the Cell Housing or there is no water flow.

Aquachlor™ Units are also fitted with a Thermal Cut – Out to prevent overheating. If the temperature rises too high, power is automatically disconnected. The Unit will resume operation when it cools down.

DAY TO DAY OPERATION:

Four Prime rules must be observed if your unit is to give the best possible service:

1. STABILISER

The importance of pool stabiliser cannot be over – emphasised. It is essential in helping retain chlorine in your pool. Chlorine is rapidly dissipated by sunlight and the use of stabiliser will reduce this dissipation substantially. Without stabiliser, it may be necessary to run the Unit for up to three times as long!

Stabiliser should be added at the rate of 500 grams for every 10,000 litres of water. To add, place the required amount in a stocking and tie a brick to it. Place the stocking in front of the return jet. It will dissolve in 2 – 3 days.

Stabiliser should be maintained at a level of 30 – 50 ppm. Before adding more stabiliser, have your pool water analysed at your pool shop to ensure that you do not add too much.

Consult your local Aquachlor Dealer for more information.

2. pH AND TOTAL ALKALINITY:
A correct pH level must be maintained to prevent problems such as black spot, staining, cloudy water, etc. An incorrect pH level can damage the pool. Correct pH levels are as follows; Fibreglass – 7.0 to 7.4 Other pools – 7.2 to 7.6 If you allow the pH level to rise to 8.0 or above, the chlorine required could be as much as three times the normal amount. To lower the pH add HYDROCHLORIC ACID. To raise the pH level add SODIUM BICARBONATE OR SODA ASH.
Total Alkalinity should not be confused with pH, although the two are closely related. Total Alkalinity determines the speed and ease of pH change. It is measured in ppm – the ideal range is 80 – 150 ppm, or refer to your pool professional.

You should use a test kit which includes a test for Total Alkalinity. Low Total Alkalinity can cause unstable pH levels – i.e. An inability to keep the pH constant may cause staining, etching and corrosion of metals. High Total Alkalinity will cause constantly high pH levels.

To lower, add HYDROCHLORIC ACID (a little at a time). To raise, add SODIUM BICARBONATE.

3. SALT LEVELS:
The salt level MUST NEVER BE LESS THAN **4000 ppm for Aquachlor™ Systems**. Operating the Unit with too little salt in the pool will cause damage to your Cell. For C Systems there is no need to exceed 7000 ppm, however, no problems will result if this occurs. Aquachlor™ chlorinators can be operated in Seawater, refer to the manufacturer for details.

Salt is the essential element by which your Unit operates. Not enough salt means not enough chlorine - this simple rule governs the total operation of your Aquachlor™, and insufficient salt will damage your Cell.

Salt is NOT used up in the process of producing chlorine or by evaporation. Salt is only lost through back - washing, splash - out, overflow or by leakage from the pool or plumbing. Winter rains can dilute the salt solution in your pool; therefore salt levels should be checked during this season. Colder water during Winter will reduce the unit output and turn the WARNING LED red. If this occurs extra salt can be added or simply check the salt level regularly and ignore the WARNING LED until water temperatures rise.

Low salt levels will destroy the coating on the Anode plates and will void all Warranty.

The Aquachlor™ unit has a built in warning system to minimise damage resulting from insufficient salt levels, however, the ultimate responsibility is on the owner to ensure adequate salt levels are maintained all year round.

4. RUNNING TIMES:
If you run your chlorinator for 24 hours a day, or for long periods, the Cell life will be greatly reduced. It is important that the correct model Aquachlor™ has been installed on your pool. Many models are available to cope with small courtyard pools up to commercial applications. (Consult your local Aquachlor™ Dealer for more information).

CHLORINE PRODUCTION:
The Aquachlor™ unit must be run daily to generate sufficient chlorine to sanitise the pool. During Summer this is approximately eight hours per day, preferably in two periods - between 6.00 and 8.00am and between 5.00 and 11.00pm. Night time is preferable because chlorine dissipates rapidly in direct sunlight. If these running times are observed, and the Cell is functioning correctly, your pool will have sufficient chlorine when tested in the morning. If the level is too low either longer running times are required or the **System Control** needs to be adjusted to maximum. Harsh local conditions such as traffic pollution or windborne dust require different running times, in which case, seek advice from your pool shop. During Winter approximately 4 to 6 hours a day should provide enough chlorine. Without sufficient filtration/chlorination, your pool will never function correctly. **ALWAYS RUN THE FILTER WHEN SWIMMING IN THE POOL.** In extremely hot weather or during periods of heavy bathing loads, the running time may need to be extended to 10 - 14 hours per day.

In some cases you may find your chlorine level to be too high. To determine if this is the case, run your filter/chlorinator for the suggested times/chlorine production level and test your pool water on the morning after operation. If your chlorine test shows a high level of chlorine, either the running times can be reduced slightly, or the **System Control** can be turned anti - clockwise. Test your chlorine level again the following morning at around the same time. If your chlorine level is still high, repeat the above process until the correct level is attained.

SUPER - CHLORINATION:
Periodically, especially during extremely hot conditions, it may be necessary to boost the amount of chlorine in your pool in order to maintain absolute sanitation of the water. This can be achieved by adding either liquid or granulated chlorine. If granulated chlorine is added, the Cell must be checked regularly, since the additives from this product will clog the electrodes. Alternatively, extend the running time of your Aquachlor™.

CHLORINE TYPES AND COMPARISONS:
Many chlorinator manufacturers calibrate their units to compare with 65% granulated chlorine, making it necessary to adjust their readings to a lower level in order to determine true chlorine production. The Display on your Aquachlor™ expresses production as pure 100% chlorine so you will know the exact output of your Unit. Below is a comparison table of the available types of chlorine used to sanitise pools.

Aquachlor Model C (Standard)	Aquachlor Model SC (Self Clean)	Production maximum grams/hour (100%)	Production * grams/hour (65% equivalent)	Chlorine produced over 8 hours grams (100%)	Equivalent in dry granulated chlorine grams (65%)	Equivalent in liquid chlorine litres (12%)
220	250	16.0	24.6	128	197	1.07
260		20.0	30.8	160	246	1.33
	330	25.0	38.5	200	307	1.66
390		30.0	46.0	240	368	2.10
520		40.0	61.5	320	492	2.67

GENERAL INFORMATION:

Algae - Microscopic forms of plant life which enter the pool by rain, wind and dust. There are numerous varieties - some are free floating whilst others grow on walls and in cracks and come in different colours. Some are more resistant to chemical treatment than others.

Bacteria - The germs that contaminate your pool. Introduced by swimmers, dust, rain storms and other elements.

Balanced Water - The correct ratio of mineral content and pH level that prevents pool water from being-corrosive or scale forming.

Chloramines - Compounds formed when chlorine combines with nitrogen from urine, perspiration, etc. Chloramines cause eye and skin irritation, as well as unpleasant odours.

Chlorine Demand - The chlorine required to destroy germs, algae and other contaminants in the pool.

Chlorine Residual - The amount of chlorine remaining after chlorine demand has been satisfied. This is the reading obtained with your test kit.

Cyanuric Acid - Also known as stabiliser or conditioner. It reduces dissipation of chlorine by direct sunlight.

Liquid Acid - Chemical used to reduce the pH and total alkalinity in the pool water, and for cleaning chlorinator Cell.

ppm - An abbreviation for Parts Per Million the accepted measurement of chemical concentration in swimming pool water. I ppm- I mg/L.

WARRANTY INFORMATION:

During the warranty period, when an authorised technician is requested to service your Unit outside company premises**, a call - out fee will be charged to cover time travelling to and from the site and the cost of operating the vehicle.** This fee will not apply if the Unit is returned to the Distributor in your State for repairs. If an authorised technician is required to service your Unit and it is found that such services are not covered by warranty, labour charges will apply. Refer back page of this manual for list of warranty repair agents.

Monarch Industries strives to reduce or eliminate any unnecessary expense by producing this Manual. Experience has shown that by following this Manual - in particular the section on Trouble Shooting, approximately 75% of all service calls are unnecessary and the expense and frustration to clients could have been avoided. We therefore strongly suggest that the owner **read and absorb all information thoroughly.** Refer to your warranty card for warranty details. **This warranty does not apply to commercial or semi-commercial installations, i.e. where the system runs more than an average of 8 hours per day over the year. Warranty on commercial and semi-commercial installations is 12 months only on both power supply and cells.** Please fill in details on the Warranty Card provided and return within 14 days of purchase to register.

IMPORTANT: ALWAYS INSIST ON GENUINE AQUACHLOR REPLACEMENT PARTS. If it is necessary to replace the Electrolytic Cell, beware of "look alikes". Only the Genuine Aquachlor Cell is designed and warranted to operate with the Aquachlor Power Supply.
SERIOUS DAMAGE MAY RESULT TO THE ELECTRONICS INSIDE THE UNIT IF COPY ELECTRODES ARE USED AND WILL VOID WARRANTY.

PATENT INFORMATION: Aquachlor™ Self Clean Sytems are protected by Australian Standard Patent Number 684550.

Consult your local Aquachlor Dealer for further information.

TROUBLE SHOOTING:

No Chlorine Production - Check for

1. Main power outlet switched off
2. Chlorinator not plugged into main outlet
3. Pump not plugged into Chlorinator
4. Time Clock set to Off position/Power switch turned Off
5. **System Control** turned to mid setting
6, Chlorinator 3 amp fuse blown
7. Dirty Cell
8. Filter needs backwashing
9. Gas Sensor not connected
10. Running times incorrect
11. Main house fuse blown
12. Pump motor faulty

Low Chlorine Production - Check for

1. Dirty Cell - clean if required
2. Filter needs backwashing
3. Display not at correct production level/Cell failing
4. **Winter Mode** turned On
5. Pool stabiliser too low
6. pH too high
7. Salt level too low
8. Aquachlor running time inadequate

Technical Information (specifications subject to change without notice):

Model	Output 100% (grams per hour)	Fuse	Approximate Power Consumption (W)
C260	20	3A	200
C390	30	3A	300
C520	40	5A	400
SC250	16	3A	160
SC330	24	3A	240