

# Eco Salt®

**Salt Water Pool System.  
The Natural Solution for Pools & Spas.**

**Owners Manual**  
Model *BMSC* / Eco-Salt Series



[www.monarchpoolsystems.com](http://www.monarchpoolsystems.com)

# **Eco Salt®**

## **Salt Water Pool System.**

### **The Natural Solution for Pools & Spas.**

Congratulations! You are now the proud owner of the advanced Eco Salt® Salt Water Pool Sanitising System. Please read all information in this Manual carefully before installing or operating your ECO SALT® SALT WATER POOL SYSTEM.

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#### **PACKING LIST - Eco Salt® BMSC Systems**

Included with your BMSC system are the following items, please check the contents carefully prior to installing the system:

BMSC 13	Power Supply plus Cell incorporating housing with barrel unions
BMSC 20	Power Supply with Cell incorporating housing with barrel unions
BMSC 26	Power Supply with Cell incorporating housing with barrel unions

Please note product specifications are subject to change without notice. Please consult your Eco Salt® dealer if you have any queries regarding the above.

## INSTALLATION INSTRUCTIONS FOR ECO SALT BMSC

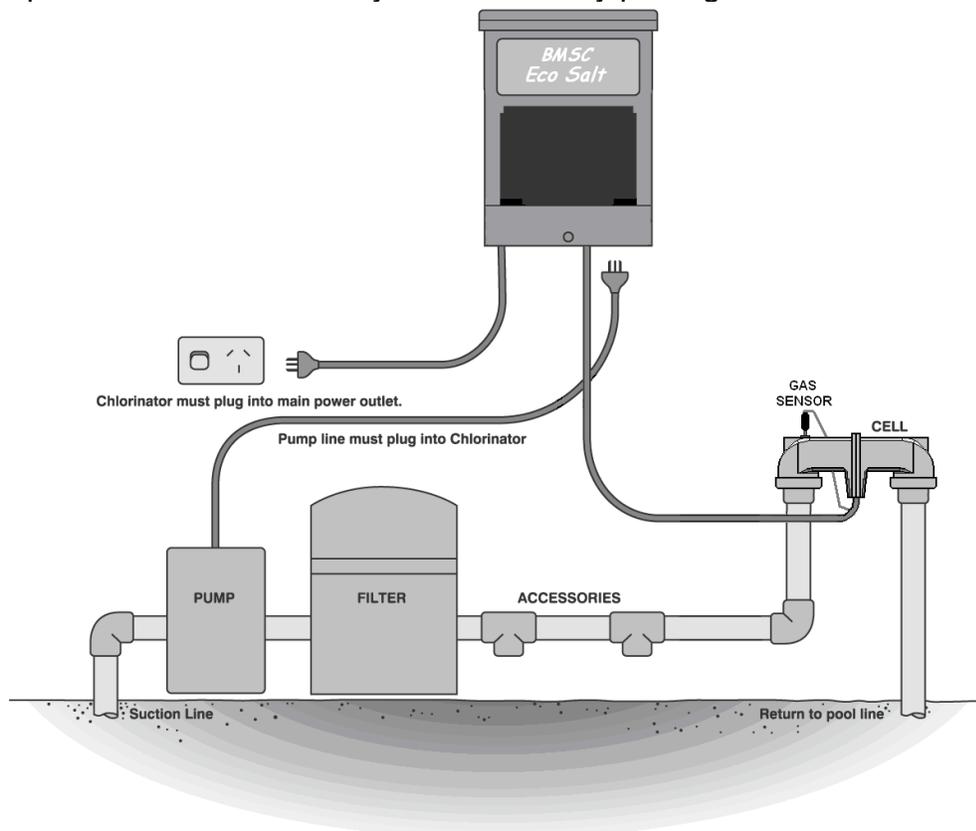
### INSTALLING THE POWER SUPPLY:

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. There is one hole in the top of the unit and one in the bottom to facilitate installation. 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).

### CONNECTING THE ELECTROLYTIC CELL TO THE POWER SUPPLY:

The BMSC Power Supply is fitted with a flexible lead terminated with connectors. These must be correctly fitted to the connections on the underside of the Cell. Fit black connectors to the outer titanium rods. Fit the white connector the middle titanium rod. The Blue Flow Sensor should be pushed onto the thread of the small threaded bolt on the top of the cell.

The power outlet on the bottom of the Power Supply (not on all models) 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 has no flow direction however the water must touch the Gas Sensor for correct operation. This can usually be achieved by placing the cell as shown.



## PRE - START UP PROCEDURE:

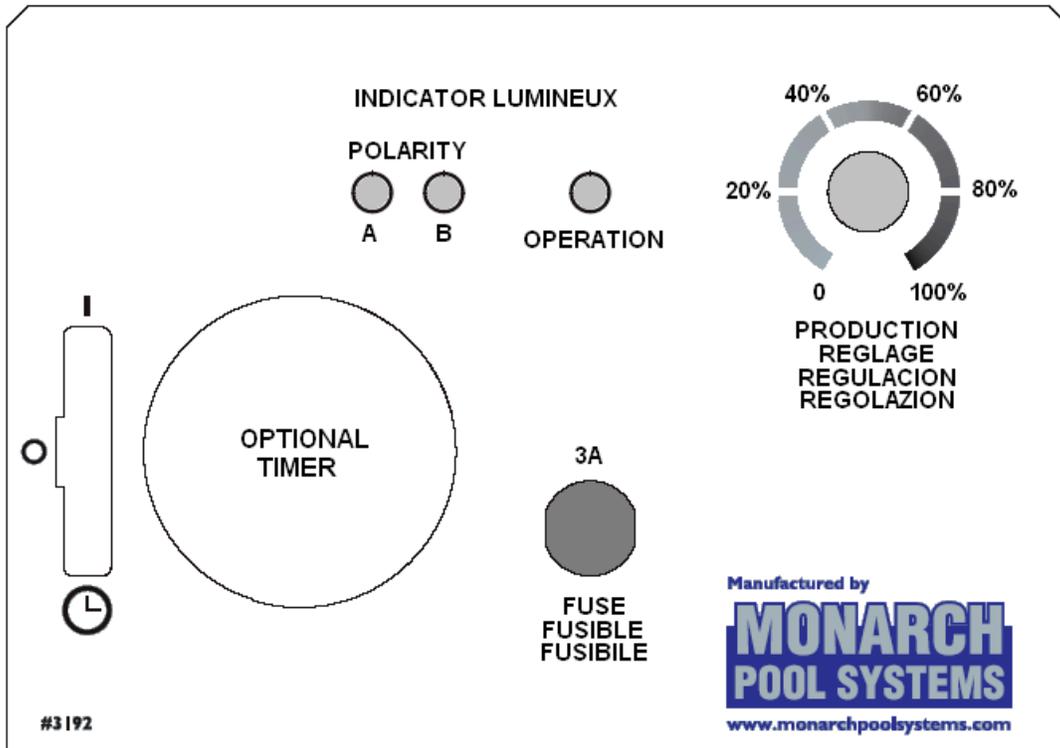
Before operating your Eco Salt® ensure the following items have been added to your pool:

- **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.

## OPERATION OF ECO SALT® BMSC SYSTEMS:

**Cell Output** is expressed as a percentage. Set the system control to the percentage output required and the unit will automatically adjust the cell output to the set level. The Unit is fitted with an electronic control and warning system. This regulates the output of the Unit to the preset maximum and changes cell polarity as indicated by POLARITY LEDs A & B. These LEDs will alternate over a number of hours or days depending on how the unit is set to operate. The warning system consists of one **Operation LED** which will glow Green to indicate normal operation or Red to indicate possible faults with the Unit or damaging operating conditions.

Control Panel Layout:



Once the salt level in the pool is correct the Unit may be switched On. (**Note: Once the unit starts there is a short time delay until the cell operates to ensure filtration system is primed with water**) At this point the **Operation LED** should be Green; if red refer below. Note: Polarity LED may be either A or B (whichever is on or brightest).

The **RED Operation LED** will indicate a number of different possible problem situations:

1. Salt Level below minimum. Add Salt.
2. Cell is calcified. Clean Cell.
3. Water temperature very cold. Salt can be added to compensate for cold water.
4. There is a problem with water flow.
5. Gas detected. Check pump/pipes for damage.
6. Gas sensor not connected to cell

## **ECO SALT® MODEL BMSC 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 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. At 100% the Cell will be ON for the entire 5 hour cycle.

When the **System Control** is set to 0, the Cell will be OFF for the duration of the filtration cycle. When the **System Control** is set to 100%, the Cell will be ON for the duration of the filtration cycle.

To turn the Cell OFF, simply turn the **System Control** to 0. This will be convenient for backwashing.

### **POLARITY A & B:**

These LEDs are used to check that the Cell current polarity is reversing. Whichever is on (or brightest) indicates the polarity of operation. The Cell will operate in one polarity for a number of hours so any change in these LEDs will happen slowly and depend on how the unit is operated.

### **LOW SALINITY INDICATION**

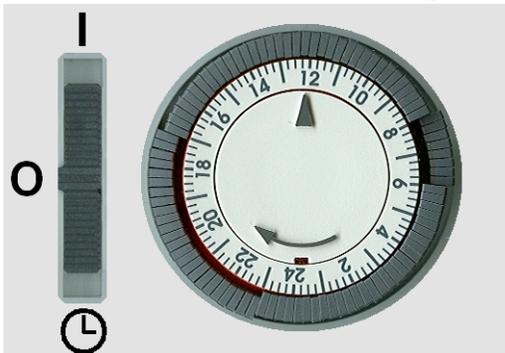
Your Eco Salt® is fitted with a number of protective systems including the **operation LED** whose primary function includes **Low Salinity Indicator**. As the salt level in the pool decreases, the wear on the Cell increases. Although salt is not consumed in the Eco Salt process, it is lost through splashing, 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 **Operation 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 Eco Salt 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. Refer Maintenance of Electrolytic cell below.
3. **Cold Water** - cold pool water reduces the ability of a Cell to carry electrical current. Addition of salt can help compensate for cold water.
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.

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

## Automatic Time Clock Operation (optional)



- O** OFF - Overrides timeclock to turn system off
- I** ON - Overrides timeclock to turn system on
- L** AUTO - system will turn on/off according to timeclock settings

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 set the desired operating time(s). The unit comes pre-set for 8 hours operation per day. The ON-OFF-AUTO switch functions as shown in the diagram. Time of day is set by rotating the clock face in the direction of the arrow shown until the correct time is seen at the vertical pointer. Use quality surface spray around unit regularly to avoid insect infestation.

## 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** can be sourced from your local Eco Salt Dealer. However it is essential that the wall or post to which the Unit is installed be sprayed (not the Unit itself) with a good surface type insect repellent periodically since penetration by insects may cause damage which is not covered by your warranty.

The back of the Unit has been designed as a heat sink. It is normal for this area to become very hot.

## **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 mesh 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 mesh 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 mesh. 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 Eco Salt® electrolytic cells 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 Eco Salt® replacement cell to match your system. The correct Eco Salt® Replacement cells to use are BMSC13, BMSC20 and BMSC26 to match the Model Chlorinator you have.

**BMSC 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 BMSC Cell** it should be disconnected from the Power Supply Unit and removed from the pool return line by undoing the unions. Take care not to lose the o-rings and always make sure that the Power Supply is turned off – failure to do so may result in the pool pump turning on while the Cell is not in place.

### **METHOD 1**

Add 1 part HYDROCHLORIC ACID to 5 parts WATER in a suitable container. The Cell should be placed on a surface that allows it to form a U shape and some of the solution can be poured into the up-turned cell. Take care when doing this as the solution can foam and create a spill which must be cleaned up by dilution. As an alternative the Cell can be immersed completely in a container. When clean the Cell should be rinsed thoroughly and the connection should be dried carefully to avoid connector corrosion. It should not take longer than a few minutes to clean, if it does the Cell should be cleaned more frequently. Return the Cell to its position and re-connect it.

## 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.

Eco Salt® 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 dramatically. 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 Eco Salt 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 salt 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**. Operating the Unit with too little salt in the pool will cause damage to your Cell. For BMSC units salinity must not exceed 7000ppm. Eco Salt® chlorinators can be manufactured to operate in Sea Water, consult your local Eco Salt® Dealer for more information.

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 Eco Salt®, and insufficient salt will damage your Cell.

#### **Low salt levels will destroy the coating on the Anode materials and will void all Warranty.**

The Eco Salt® 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 reduced dramatically. It is important that the correct model Eco Salt® has been installed on your pool. Many models are available to cope with small courtyard pools up to commercial applications. (Consult your local Eco Salt Dealer for more information).

### **CHLORINE PRODUCTION:**

The Eco Salt® must be run daily to generate sufficient chlorine to sanitise the pool. During Summer this is usually minimum 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 Eco Salt®.

## 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 Eco Salt® 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.

Eco Salt Model BMSC	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%)
13	13.0	20.0	104	160	1.3
20	20.0	30.8	160	246	1.3
26	26.0	40.0	208	320	1.7

## 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. 1 ppm- 1 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. 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.** All legitimate warranty claims on your Power Supply (parts and labour where returned to the distributor) are free for the first 12 months from the date of installation.

**IMPORTANT: ALWAYS INSIST ON GENUINE MONARCH POOL SYSTEMS REPLACEMENT PARTS. If it is necessary to replace the Electrolytic Cell, beware of “look alike”. Only the Genuine Monarch Pool Systems Cell is designed and warranted to operate with the Monarch Pool Systems Power Supply.**

**SERIOUS DAMAGE MAY RESULT TO THE ELECTRONICS INSIDE THE UNIT IF COPY ELECTRODES ARE USED AND WILL VOID WARRANTY.**

**Consult your local Eco Salt Dealer for further information.**

## **TROUBLE SHOOTING:**

### **No Chlorine Production - Check for**

1. Main power outlet switched off or Chlorinator not plugged into main outlet.
2. Pump not plugged into Chlorinator
3. Time Clock set to Off position/Power switch turned Off
4. Chlorinator 3 amp fuse blown
5. Dirty Cell
6. Filter needs backwashing
7. Gas Sensor not connected
8. Running times incorrect
9. Main house fuse blown
10. 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. Pool stabiliser too low or Salt level to low
5. pH too high
6. Eco Salt running time inadequate