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**EcoSpa™**

# Salt Water Spa Sanitisation System



## Installation and Operating Instructions



**WARNING:** Failure to follow these instructions and comply with all applicable codes may cause serious bodily injury and/or property damage.

The installation of this product should be carried out by a person knowledgeable in spa pool plumbing requirements following the Installation Instructions provided in this manual.

**Please pass these instructions on to the operator of this equipment.**

Congratulations! You are now the proud owner of one of the most advanced Electrolytic Spa Sanitising System in the world. Please read all information in this instruction book carefully before installing or operating your **EcoSpa™ System**.

EcoSpa™ utilises low levels of pool salt at 2500ppm. This mild salt water in conjunction with a small amount of EcoSpa™ activator enables the water to be electrolysed using a safe and advanced electronic process to sanitise the water in your spa. EcoSpa™ Systems comprise an advanced ORP controlled power supply to operate a high quality reverse polarity (low maintenance) electrode enabling you to choose the level of sanitiser you desire and constantly monitoring and maintaining the level thereafter. EcoSpa™ is compatible with OzoMatic® Ozone Systems and is suitable for inground and portable spas.

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## Packing List

Please ensure your Eco-Spa™ includes the following components – contact your supplier if unsure:

- 1 x Control Unit
- 1 x Electrolytic Cell including barrel unions
- 1 x Manifold for ORP Sensor Probe and Flow Sensor
- 1 x ORP Sensor Probe
- 1 x Flow Sensor/pressure switch
- 2 x Mounting Screws with wall plugs
- 1 x 100 gram Eco-Spa™ Bromine Activator Salt

# IMPORTANT NOTICE

## FACTORS THAT WILL IMPROVE THE PERFORMANCE & LIFE OF YOUR SALT WATER BROMINATOR PLEASE READ THIS BEFORE OPERATING YOUR BROMINATOR

There are **THREE** main factors that will damage your Brominator and reduce the life of the product. Please monitor the following factors in accordance with your installation & operating instructions.

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### 1. MAINTAIN OPTIMUM SALT LEVELS:

#### **OPTIMUM SALT LEVEL: 2500ppm**

- Run Brominator at the Salt Levels stated within this document to ensure optimum sanitizer output and cell life.
  - Operating this device at low salt levels will damage the cell and reduce its life.
  - The control panel displays red LED indicator warnings when the salt levels are low.
  - If no action is taken to rectify the salt levels, damage to the cell may result which will not be covered under warranty.
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### 2. MONITOR & MAINTAIN YOUR BROMINATOR CELL:

- To keep your salt water Brominator in the best possible condition, regular monitoring of the electrolytic cell is recommended. The 'Cell' is the clear plastic housing located in the plumbing.
  - During the Bromination process a white powdery Calcium scale may naturally build up on the titanium plates in the cell. Monitor the cell to prevent excessive scale build up. Excessive scale build up will cause damage to your cell, and dramatically reduce its efficiency and lifespan.
  - Reverse Polarity models are low maintenance models that minimise scale build up.
  - If Calcium scale does build up please clean the cell, following the cleaning instructions provided on page 6.
  - **NEVER:** Use concentrated acid to clean your cell.
  - **NEVER:** Leave cell in cleaning solution for extended periods of time
  - **NEVER:** Use metal implements, scourers or brushes to clean your cell
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### 3. BALANCED POOL WATER CHEMISTRY:

- Salt levels **MUST** be maintained at 3000ppm for optimum performance and lifespan
- Calcium Hardness levels **MUST** be kept to ideal ranges of **200-275ppm** (for Concrete and Tiled Pools) and **100-225ppm** (for other surfaces) to prevent excessive scale build up and damage to equipment
- pH levels **MUST** be kept to ideal levels to prevent damage to equipment and pool surfaces and to obtain optimum sanitizer effectiveness (Refer to page 5).
- Total Alkalinity must also be kept in an ideal range (Refer to page 5).

# ECO-SPA™ INSTALLATION INSTRUCTIONS

(Refer to diagram next page)

1. Please ensure the EcoSpa™ Control Unit is mounted a minimum of 3 metres away from the spa water and 1.5 metres above ground level. For a portable spa, the EcoSpa™ unit can be fitted on the inside of the spa surround, please ensure easy access.
2. Select mounting point and mark 2 holes 18mm apart. (If the unit is to be mounted to a brick or concrete wall use a masonry drill bit. Some walls such as limestone or cement render can damage aluminium, if in doubt seal the wall before mounting the control unit). Drill the 2 holes and fix suitable screws to each hole. Recommended screws are 8 gauge.
3. Hang unit via slots in the top rear section of EcoSpa™ unit. NB: The additional mounting hole at the base of the EcoSpa™ can be used to help secure the unit.
4. Plug power plug from control unit into a suitable weatherproof power outlet. Ensure appropriate RCD safety device is fitted to mains power. Do not turn power on until installation is complete. When used with controller, plug into ozone position and set dip switches H & I to 1.
5. Install Manifold for ORP Sensor Probe and Pressure Switch into spa return line after the pump.
6. Plumb Electrolytic Cell into spa return line injection housing. Plug Cell connector into the appropriate receptacle in the bottom of the unit. The Cell can be installed vertically or horizontally. NOTE: ORP Sensor and pressure switch MUST be installed prior to the Cell and at least 200mm (8") from the Cell inlet, preferably further away.

**IMPORTANT NOTICE:** *For installations where manifold is not used, the pressure switch must be installed at suitable point on spa return. If return does not have enough pressure fit the pressure switch between pump return and filter. The pressure switch should be tapped into a point where the pipe enters a fitting to allow a good thread length. Tap size is 1/8" NPT. Take care not to damage threaded end and use thread tape for a good seal.*

Fit ORP Sensor Probe at least 200mm (8") before Cell. To fit ORP Sensor Probe drill hole and tap with a 1/4" BSPF tap. This must be done carefully to ensure a good threaded fit. Screw the ORP Sensor Probe into the pipework. Note that it is best to fit the ORP Sensor Probe into a fitting (elbow, coupling, etc) to ensure good thread length.

7. Connect the pressure switch to the EcoSpa™ Control Unit via the cable terminated in two insulated pade connectors. Note that the pressure switch is not waterproof and should not be exposed to the weather.
8. Connect ORP Sensor Probe to socket under EcoSpa™ Control Unit.

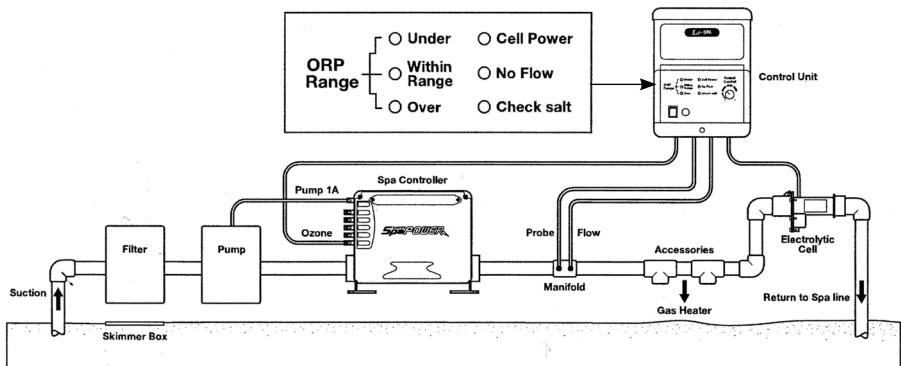
9. Add Eco-Spa™ Bromine Activator Salt at the rate of 50 grams per 1000 litres of water. Add normal pool salt at the rate of 2.5kg per 1000 litres of water. Your Eco-Spa is now ready to use and enjoy. Please note the Eco-Spa™ must be powered when filter pump is running.
10. You must change the spa water regularly and add new Eco-Spa™ Bromine Activator Salt and Pool Salt. The frequency of water changes will be affected by spa use, the more the spa is used the more frequently the water changes will be required.

#### For installations with a Davey Spa Power Controller:

- The manifold should be located after the spa controller.
- The EcoSpa must be purchased with a special AMP cordset.
- The AMP power plug is connected to the Davey spa controller via the outlet labelled "Ozone".
- The EcoSpa will then operate while a pump is circulating water through the system.

**Suggested Eco-Spa™ installation diagram follows, other cell installation configurations are possible. Refer your Eco-Spa™ dealer.**

### ECO-SPA™ INSTALLATION VIEW



## SETTING AND OPERATING THE ECO-SPA:

1. To set your EcoSpa™ first ensure the pH (7.2-7.4) and Total Alkalinity (80ppm) are balanced then add bromine whilst the spa is running to reach a level of 4ppm Bromine. Verify this with a reliable test kit or seek the advice of your pool & spa professional. Please note the above bromine levels are recommended by Australian Standard AS 3633 for water above 26°C.
2. Once the desired level of bromine is reached turn the ORP Control knob slowly clockwise or anti-clockwise as required until the ORP Redox LED indicator indicates "Within Range" (green) and the Cell Power LED turns off. As an alternative to the above procedure you can set the ORP control to vertical (this is approximately 650mV) and run the spa until the ORP within range LED is on and Cell Power is off. Check sanitiser levels and adjust ORP control to suit.
3. If a higher or lower bromine residual is required you can adjust the ORP Control up or down (this should be done in small increments)
4. Your EcoSpa™ must have water flow to operate. It is recommended that your Spa filtration system must run for a minimum of 1 to 2 hours per day to enable the EcoSpa™ to maintain the required sanitiser level. Your EcoSpa™ has a default setting via the controller of 2hrs and 40min run time per day. If the number of people or time in the Spa increases then the filtration time required may be greater.
5. If the ORP (Redox) Within Range Green Led is not achieved during your daily filtration cycle you need to either increase the filtration time or follow the trouble shooting procedures.
6. Whilst the pump is off there will be no flow and the Red "No Flow" LED will be lit. This is normal, in this state the ORP Redox LED may indicate "under" or "within range" or "over". There is some overlap of the ORP (Redox) LED's – it is possible for the "Within Range" and "Over" or "Under" LED's to be on at the same time. (Only applicable to spa operations via controllers)
7. The green "Cell Power" LED will only operate when the system is actually producing santiser.
8. If the Red "Add Salt" LED is on you need to check your spa salt level and add to achieve Salt level to at least 2,500ppm. For each 1kg of normal pool salt added you must add about 20 grams of EcoSpa™ Activator. The EcoSpa™ ORP system is reliant on the use of EcoSpa™ Bromine Activator Salt. The ADD SALT Indicator is also affected by water temperature, as is the unit output. It is designed for operation around 35°C (95°F). If the spa temperature is less then 35°C you may require more Salt and EcoSpa™ Bromine Activator to turn off the ADD SALT indicator.
9. What is "ORP"? EcoSpa™ uses an ORP Sensor probe to determine whether or not bromine needs to be produced by your EcoSpa™ to sanitise the spa. ORP levels are measured in millivolts (mV). The ORP sensor probe does not measure the actual bromine level of your pool – rather, it measures the effectiveness of bromine to oxidise and kill biological contaminants.

It is possible for two spas with identical bromine residuals to have very different ORP levels. This is due to the effectiveness of bromine in a spa being reliant on other factors such as pH, stabiliser levels, Total Dissolved Solids (TDS), combined bromine levels and temperature.

**In general ORP will be affected in the following ways:**

<b>Chemical Level</b>	<b>ORP Levels</b>
Bromine <b>UP</b>	<b>UP</b>
PH <b>UP</b>	<b>DOWN</b>
PH <b>DOWN</b>	<b>UP</b>
Combined Chlorine & Bromine <b>UP</b>	<b>DOWN</b>
Total Dissolved Solids* <b>UP</b>	<b>DOWN</b>
Temperature <b>UP</b>	<b>UP</b>

10. Please note your EcoSpa™ Cell is a reverse polarity type designed to clean itself periodically. To clean itself the EcoSpa™ will shut down for a few minutes and then reverse the polarity of its cell plates. In extreme hard water you may need to remove and clean the cell using 10 parts water to one part Hydrochloric Acid.

## **EcoSpa™ SYSTEM MAINTENANCE:**

1. Regularly check and balance pH and Total Alkalinity using a reliable test kit or the services of your local pool and spa professional. 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 spa. Correct levels are as follows; Fibreglass - 7.0 to 7.4. Other spas - 7.2 to 7.6. If you allow the pH level to rise to 8.0 or above, the bromine required could be much more than the normal amount. To lower the pH level add pool acid. To raise the pH 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 builder or pool shop for advice. 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.
2. We recommend that you completely dump, refill and re-balance your spa water on a regular basis. The frequency of this operation will depend on spa usage. Due to the use of recycling salts in the EcoSpa™ bromination process there will not be a build-up of chemical carriers or fillers. However, some organic and inorganic contaminants from bathers will build up over time, requiring dumping of the spa water. Don't forget to add the EcoSpa™ Activator Salt (50 grams per 1000 litres) and pool salt (2.5kg per 1000 litres).
3. The EcoSpa™ ORP probe does not need to be cleaned when exposed to normal spa use. It is recommended that the ORP probe be calibrated regularly and inspected as per normal spa service cycle.

4. If you operate the EcoSpa in hard water (high calcium hardness) your cell may build up excessive calcium scale. This can be easily removed by cleaning it. To clean the cell, turn off the brominator, disconnect the cell leads from control box and unscrew the barrel unions from the plumbing. Add 1 part Hydrochloric Acid to 10 parts water in a suitable container and immerse the cell in this solution. It should not take more than a few minutes to clean. While the calcium is dissolving off the cell you will notice bubbles. When the bubbling stops, the cell is clean.
5. After a few years in normal domestic use, your Eco-Spa Electrolytic cell will require replacement. Contact your local Eco-Spa dealer for assistance.

## **TROUBLE SHOOTING GUIDE:**

### **1. Red “No Flow” light is on but has water flow:**

- Pipe or Cell is partially blocked
- Adjust pressure switch (see arrows on side of pressure switch – lift lock at back)

### **2. No display:**

- Main power outlet switched off or filter pump not running
- Eco-Spa™ not plugged into main outlet or main outlet power off
- EcoSpa not plugged into ozone outlet
- Dip switches H & I not set (refer page 6, point 4)
- When pump is off (If installed with a spa controller - this is normal)

### **3. Unsatisfactory Bromine Residuals:**

- Faulty or out of date test kit
- ORP Control set too high or too low
- ORP Probe requires cleaning or removal of debris
- Running times too low or bather load too high
- Eco-Spa™ Bromine Activator Salt not added

**WARNING:** If Eco-Spa™ probe is disconnected or not properly connected to control unit then your Eco-Spa™ will continue to produce Bromine and may reach dangerous levels. Always ensure connections are intact and if cell power light is continually on or you smell high bromine levels in the Spa turn off the Eco-Spa™ and check the connections.



## Davey® Repair or Replacement Guarantee

In the unlikely event in Australia or New Zealand that this Davey product develops any malfunction within warranty periods beginning from the date of original purchase due to faulty materials or manufacture, Davey will at our option repair or replace it for you free of charge, subject to the conditions below.

### Davey Guarantee Period

Control Box - Two Years    Electrolytic Cell - Three Years    ORP Probe - Three Years

Should you experience any difficulties with your Davey product, we suggest in the first instance that you contact the Davey Dealer from which you purchased the Davey product. Alternatively you can phone our Customer Service line on 1300 367 866 in Australia, or 0800 654 333 in New Zealand, or send a written letter to Davey at the address listed below. On receipt of your claim, Davey will seek to resolve your difficulties or, if the product is faulty or defective, advise you on how to have your Davey product repaired, obtain a replacement or a refund.

Your Davey Guarantee naturally does not cover normal wear or tear, replacement of product consumables (i.e. mechanical seals, bearings or capacitors), loss or damage resulting from misuse or negligent handling, improper use for which the product was not designed or advertised, failure to properly follow the provided installation and operating instructions, failure to carry out maintenance, corrosive or abrasive water or other liquid, lightning or high voltage spikes, or unauthorized persons attempting repairs. Where applicable, your Davey product must only be connected to the voltage shown on the nameplate.

Your Davey Guarantee does not cover freight or any other costs incurred in making a claim. Please retain your receipt as proof of purchase; you **MUST** provide evidence of the date of original purchase when claiming under the Davey Guarantee.

Davey shall not be liable for any loss of profits or any consequential, indirect or special loss, damage or injury of any kind whatsoever arising directly or indirectly from Davey products. This limitation does not apply to any liability of Davey for failure to comply with a consumer guarantee applicable to your Davey product under the Australian or New Zealand legislation and does not affect any rights or remedies that may be available to you under the Australian or New Zealand Consumer Legislation.

In Australia, you are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Should your Davey product require repair or service after the guarantee period; contact your nearest Davey Dealer or phone the Davey Support Centre on the number listed below.

For a complete list of Davey Dealers visit our website ([davey.com.au](http://davey.com.au)) or call:



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\* Installation and operating instructions are included with the product when purchased new. They may also be found on our website.