



6 SPECIFICATIONS, WARRANTY AND CONTACTS

6.1 Standards

Type	Standard	
Electrical	AS/NZS 3136:2001	Electrical Equipment for Spa and Swimming Pools
	CISPR 14	Electromagnetic Compatibility
Chemical	APVMA	Australian Pesticides and Veterinary Medicines Authority Approval no. 58847

6.2 Warranty Information

The EnviroSwim system has a TWO (2) year replacement warranty on the control box.

6.3 Contact Information

Watertech Services International

P O Box 8982
G.C.M.C.
Bundall
Queensland 9726

Phone : 1300 888 457
Calls from outside Australia : +61 7 55467366

Email: info@enviros swim.com



Model ES-3

Pool Sanitizing System

Operating Manual

IMPORTANT SAFETY INSTRUCTIONS

ATTENTION OPERATOR

WARNING - READ AND FOLLOW ALL INSTRUCTIONS. IMPORTANT SAFETY INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

WARNING - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised.

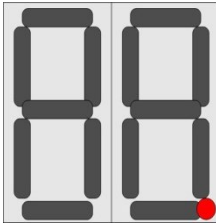
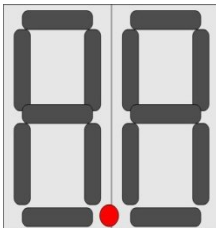
WARNING - When mixing acid with water, ALWAYS ADD ACID TO WATER, NEVER ADD WATER TO ACID.

WARNING - To reduce the risk of injury, service should only be attempted by a qualified Service Professional.

WARNING - Do not operate the electrolytic treatment cell without water circulating through the system. A build-up of gases and chemicals in the cell could result in hazardous conditions/ overdose when the circulation is restored and the contents return to the pool.

CAUTION - Use of chemicals other than those recommended may be hazardous. Follow the Chemical Manufacturer's Instructions. Do not add undiluted chemicals directly to the pool as staining may occur. Undiluted Calcium hypochlorite reacts with copper and silver and can cause staining, an alternative such as liquid chlorine is recommended if shock treatment is required.

CAUTION - This unit is for use with permanently - installed pools. Do not use with storable pools. A permanently - installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storable pool is constructed so that it is capable of being readily disassembled for storage and reassembled to its original integrity.

Problem	Possible Cause	What to do to fix it
<p>TDS Indicators (Low)</p> 	<p>Low TDS levels causing a high voltage to be applied across the plates to maintain current.</p>	<p>Flashing indicator at bottom right indicates low TDS levels. Increase TDS by adding pool salt.</p>
<p>TDS Indicators (High)</p> 	<p>The ES-3 current limiting circuits are reducing the voltage applied to the plates.</p> <p>Causes are</p> <ul style="list-style-type: none"> • Possible short circuit on plates or electrodes • Very high TDS due to concentrated chemicals flowing past plates or conversion of Salt Water pool. 	<ul style="list-style-type: none"> • Short Circuit – check plates and remove any short circuit. • Temporary effect of concentrated chemicals - turn off ES-3 processes and run pump only for 10 minutes. Enable ES-3 and see if indicator has reset. • Salt Pool conversion - either dilute to reduce TDS below 2000ppm or contact EnviroSwim about specially designed plates.

Problem	Possible Cause	What to do to fix it
Blown fuse	Undiluted chemicals added to pool or skimmer basket	Turn off power to control box. Replace fuse and allow clean water to circulate through the system before switching on.
Copper level too low	<ul style="list-style-type: none"> • Low conductivity • Excessive makeup water added due to leak in pool or equipment • Build up of scale on copper/silver electrodes • Electrodes worn away • Pool system not running long enough 	<ul style="list-style-type: none"> • Refer to operating instructions • Repair leak • Clean rods and ensure that the chemical balance of pool water is correct • Replace with new electrodes • Refer to operating instructions
Excessive build up on plates in oxidation chamber	<ol style="list-style-type: none"> 1. High calcium content (water hardness) in pool water. 2. pH to high. 	<ol style="list-style-type: none"> 1. Remove ORP cell and clean in 75/25% ratio water/hydrochloric acid. See section 1.1.2 Pool Balance - Adjusting water hardness. 2. Reduce pH. Refer section 1.1.2.
Flashing Oxidiser Production Digital Display	Pb	<p>This will be a flashing display that indicates that the system is not applying current to the oxidiser plates due to any of</p> <ul style="list-style-type: none"> • Air in the system • Insufficient water flow • Calcium build-up on plates.
	OL	<p>This will be a flashing display that indicates that current is no longer being applied to the oxidiser plates. This is done to protect the EnviroSwim unit due to excessive current draw that may be caused by</p> <ul style="list-style-type: none"> • Excessive TDS (greater than 3000ppm) • Undiluted chemicals added to skimmer • Short circuit across the plates.

If you employ a pool maintenance contractor, ensure that they read and follow these instructions as an EnviroSwim System pool differs from common chlorine/salt pools.

The best results with the EnviroSwim system are obtained by following a few simple rules:

- Do not use stabilizer
- Do not use bromine compounds
- Do not use aluminium based or any other flocculants
- Do not use Soda Ash
- Do not use Granular Chlorine. The use of Granular Chlorine may cause black staining of the pool if it is added undiluted to a pool treated by an EnviroSwim System.
- Do not throw un-dissolved chemicals into the pool.
- Clean the pool filter regularly.

Due to the many different test kits on the market, we recommend that you follow the manufacturers instructions supplied with each test kit.

SAVE ALL THESE INSTRUCTIONS

For advice phone 1300 888 457

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4 MAINTENANCE

4.1 Basic Maintenance

The EnviroSwim system is very low maintenance. Only the copper and silver electrodes are consumable and require periodic adjustment and replacement. The oxidizer plates and copper/silver electrodes are self-cleaning and the ultrasonic system is maintenance free.

4.1.1 Fuse

Fuse replacement: 240 Volt, 5 Amp, Slow Blow

WARNING

There is a risk of electrical shock, fire and damage to the unit if an incorrectly sized fuse is installed in the fuse holder.

4.1.2 Adjustment of Copper/Silver Electrodes

The positioning of the copper/silver electrodes should be adjusted periodically to provide even wear and maximum discharge of ions into the water.

After several months of operation you will notice that the surface of the electrodes that are closest to each other have eroded. This is normal and means that the EnviroSwim system is successfully losing positively charged copper and silver ions into the pool water. With the erosion the distance between the electrodes increases which affects the conductivity and number of ions being released.

The electrodes are designed so that they can be simply adjusted without disassembly. To adjust loosen the nuts (do not remove completely) that hold the electrodes and conducting wires from the Control Box. Turn each electrode (use pliers if necessary) one quarter or half turn until surfaces that are not eroded (or the least eroded) are adjacent to each other.

When the electrodes are severely eroded they should be replaced before they detach from the threaded rod.

4.1.3 Replacement of Electrodes



The copper/silver electrodes are a consumable and will require periodic replacement. The life of the electrodes will depend on many factors including pool use, maintenance, dirt and other debris that are allowed to build up in the pool. The electrodes should be changed before they become so small that they fall off the stainless steel threaded rod that holds them in place.

NOTE

Replacement electrodes can only be purchased through EnviroSwim. Using any electrodes not supplied by EnviroSwim will void any remaining warranty. EnviroSwim will not be held liable for the performance or effectiveness of the system when other manufacturers' electrodes have been installed.

3 INITIAL SYSTEM START-UP

If you employ a pool maintenance contractor, ensure that they read and follow these instructions as an EnviroSwim System pool differs from common chlorine/salt pools.

For ideal operation EnviroSwim requires a TDS level of between 800-1200 ppm to provide conductivity for its electronic processes. When converting Salt Water Pools or pools where TDS exceeds 2000ppm please contact EnviroSwim.

If TDS is low adding 5kg of pool salt per 10,000 litres of water will raise the TDS by around 500ppm.

For new pools, or those that have just been refilled, add pool salt to ensure the conductivity of the water is high enough for the ionization process to take over. If retrofitting to an existing pool the conductivity of the water should be sufficient for the EnviroSwim system process to initiate.

When the system is initially installed, it will need to be run continuously for a time to allow the various processes to take effect in the pool. The time taken to initialize the system will vary, depending upon the volume and conductivity of the pool water. Typically a 50,000 liter pool would take 48- 60 hours to build up the copper level to the required 0.25 ppm.

Perform the following steps to allow the EnviroSwim system to be running in the start-up mode:

1. Turn on the pool pump so that water is flowing through the filtration system and the EnviroSwim ionization/oxidation chamber and ultrasonic emitter pipe.
2. Make sure that the ionization/oxidation chamber is filled with water.
3. Turn both controls (Ioniser and ORP) on the EnviroSwim control box (figure 8) fully counter-clockwise.
4. Turn on the green power switch on the control box and make sure that the light in the switch is illuminated.
5. The LEDs on the control box should be illuminated as follows from left to right; the first LED will alternate from red to green approximately every six minutes, second LED will change colour every 3-5 seconds. Turn the knob on the control box under the ioniser meter slowly clockwise to its maximum position. This setting provides maximum copper/silver ion production providing that the conductivity of the water is high enough (see previous paragraph).
6. Turn the knob on the control box under the ORP meter slowly clockwise until the ORP meter reads between 13 - 15 Amps. If the maximum output is below 12 amps the conductivity of the water may be too low. (see previous paragraph).
7. Allow the unit to run for 48 hours.
8. Perform chemical tests to determine readings for pH, ORP, alkalinity, copper, and calcium hardness.
9. Once readings are at the following levels:
 - Alkalinity: 80 to 150 ppm
 - pH: 7.0 to 7.2 ppm (fiberglass pool)
 - pH: 7.2 to 7.5 ppm (cement pool)
 - Copper Content: 0.2 to 0.4 ppm
 - Calcium Hardness: 200 to 250 ppm
 - ORP: 500-750 millivolts minimum; equivalent to a reading of 0.5-1.5 ppm of chlorine using a DPD test tab

Reduce the run time on the unit to 1 hour per day for every 10,000 litres of water in the pool and turn the knob on the control box under the ioniser meter to (40% output) The system is now operating normally and the initial start-up phase is completed. The copper output could later be adjusted as necessary to find a setting that will maintain the 0.2 – 0.4 ppm recommended level.

1 OPERATING INSTRUCTIONS

Thank you for purchasing the EnviroSwim ES-3. Following these basic instructions will allow you to enjoy the benefits of low maintenance and exceptional water quality achievable with this system. **During periods of intense use or when there has been significant water dilution or contamination more frequent testing and active management may be required.**

WARNING

It is important that the ES-3 system only be allowed to operate when the pool pump is running so that water is flowing through the ionization/oxidation chamber and the ultrasonic emitter when they are in operation.

1.1 System operation

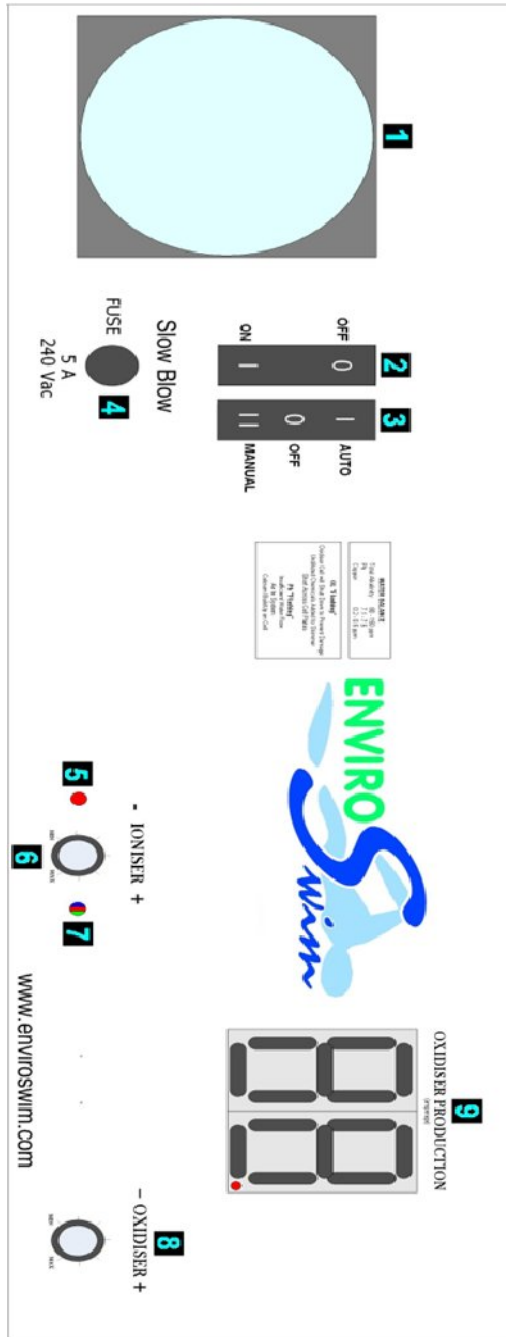
Water that is totally acceptable for drinking purposes may have a definite mineral imbalance for use in a swimming pool. In parts of the world where mineral excesses or deficiencies exist in natural water, the pool will need initial balancing. A balanced pool is necessary for proper disinfection and will assure freedom from staining and scaling problems. Mineral imbalance and improper pH control can significantly complicate maintenance and have a serious deteriorating effect on the pool itself. After initial balancing of the water, mineral balance must be maintained within the proper parameters to provide continued protection and ease of maintenance. Frequency of testing is dependent on weather and pool load.

Avoid prolonged running of the pool with a high pH and or high copper levels. This is easily avoided by regular testing. EnviroSwim recommends that you test the pool water every two weeks.

The only chemicals necessary to keep your pool balanced and healthy will be a buffer such as sodium bicarbonate and hydrochloric acid. Naturally, you'll continue to remove leaves and dust as usual, as these eat up the sanitizer and provide nutrients for algae and bacteria.

Diagram 1

1. Timer Clock
- 2,3. EnviroSwim Functions ON/OFF Switch
4. Fuse
5. Ioniser Polarity Indicator
6. Ioniser Current Control
7. Ioniser Operation Indicator
 - Alternating Blue/Red/Green Indicates Normal Operation
 - Flashing Blue Indicates Ioniser Switch is in OFF Position
 - Flashing Blue/Red Indicates Loss of Power to Ioniser
(Check connections before contacting service agent)
8. Oxidiser Current Control
9. LED Digital Display



2 BASIC THEORY

There is no such thing as a maintenance-free pool. However, the EnviroSwim system requires only a few minutes each week to keep your pool in top condition while it saves money. This section of the manual gives some basic insight into the theory of the processes at work on your pool when using the EnviroSwim system.

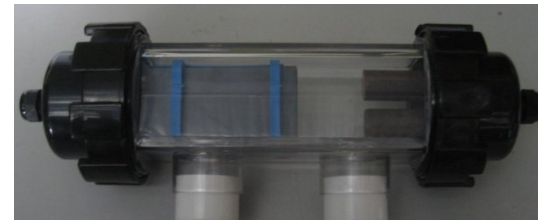
2.1 Ionization

The use of copper and silver to sanitize water is well documented and the process has been used for thousands of years. Copper is a very powerful algacide and silver is a very powerful biocide. When the two metals are combined and introduced to the water using electrolysis, they become a formidable sanitizer. The required residual level of copper and silver introduced to the swimming pool is well below acceptable drinking water standards making for a very safe residual sanitizer.

2.2 Electronic Oxidization (ORP generator)

Traditionally copper and silver ionization systems have required an oxidizer to be added to the pool water to help burn out organic compounds (oils, dust, leave stains etc.). The most common form of oxidizer used for this purpose has been chlorine. There is a growing concern regarding the adverse health effects of chlorine and its associated by-products (Chloramines)

EnviroSwim has eliminated the need to add chlorine to the pool by incorporating an electronic oxidizing unit into the system. ORP stands for Oxidation-Reduction Potential. In practical terms, it is a measurement of the ability to oxidize contaminants. ORP is the only practical method we have to electronically



monitor sanitizer effectiveness. In some parts of the world, it is also known as Redox Potential. Using electrolysis the EnviroSwim system produces the oxidizer in sufficient quantities to maintain an acceptable ORP.

2.3 Ultrasonics

Ultrasonics used in the EnviroSwim system further helps to improve the water quality by removing existing scale and preventing the formation of scale caused by silica in the water. This process improves the efficiency and reduces the operating costs of the pool filtration/circulation and heating equipment.



1.1.1 Controls

1.1.3 Adjusting Copper/Silver Levels

The desired copper range is between 0.2 to 0.4 ppm. The EnviroSwim system works best at these levels. To increase copper levels, increase the run time and/or ionizer output of the EnviroSwim system. To reduce copper levels, turn down the ionizer output of the EnviroSwim system. As a guideline, to reduce copper levels from 0.7 to 0.4 ppm, the Enviro-Swim ionizer system can be left off for 7-10 days, dependent on weather and bathing loads. Levels are easily checked by means of dry tab copper test kits available from EnviroSwim ans can also be purchased off website www.enviroswim.com. Always ensure pH is balanced before testing copper levels in order to avoid getting a false reading.

It is very important that copper levels are not allowed to exceed 0.5 ppm for extended periods, as copper staining may appear. Prolonged high copper and/or high pH levels will lead to the copper coming out of suspension, and may produce a very light blue stain on the mortar of pebble pools. This effect is not harmful to swimmers or the pool, and if desired can be removed with some effort. Pool owners that have let this happen find the blue tint actually enhances the pool water's appearance.


If the copper level rises above 0.5 ppm, turn down the EnviroSwim ionizer unit and dilute the pool with fresh water to reduce the copper level to 0.4 ppm. Unlike chlorine, copper/silver are extremely stable in water making the level very easy to maintain.

NOTE

EnviroSwim will not be held responsible for damage caused by excessive copper levels.

NOTE

If you take a water sample to a pool shop for a copper test, you may get a false reading if the pool pH has been high during the 24-hour period prior to the sample being taken from your pool. Some types of testing equipment can also give a false reading due to the silver content in the sample. We strongly advise that you use the test kit and instructions provided with the EnviroSwim system to avoid misleading results that can cause high copper levels and excessive wear of the copper/silver anodes.

No	Name	Operation																		
1	Timer Clock	 <p>If using the timer this is set by 1. Set the time by rotating the central hand to the current time. Note: This will need to be reset whenever the power is disconnected from the unit and for daylight saving time changes. 2. Push the small yellow switches out for the period of time that you wish to operate the EnviroSwim system for. This will control the amount of time the pool filter pump (when powered from the Enviroswim unit) will operate in conjunction with Enviroswim processes. These switches cover a full 24 hours per cycle. Note : proper operation requires that the appropriate switch settings below are enabled.</p>																		
2 & 3	EnviroSwim Power And Mode Switches	<p>These switches allow for manual or automatic (timer controlled) operation of the EnviroSwim system either in conjunction with the pump or the pump on its own. Note : The EnviroSwim processes should never be operated unless the pump is running and the system when properly installed should preclude this.</p> <p>The following Switch Settings are possible</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">SWITCH 2 (On/Off)</th> </tr> <tr> <th colspan="2"></th> <th>Off (0)</th> <th>On (I)</th> </tr> </thead> <tbody> <tr> <th rowspan="3">SWITCH 3 (ON/OFF/AUTO)</th> <th>Off Disabled (0).</th> <td colspan="2">Pump and Enviroswim Functions disabled regardless of timer.</td> </tr> <tr> <th>On Manual untimed settings (I)</th> <td>Pump only operational independent of timer.</td> <td>Pump and EnviroSwim functions operational independent of timer.</td> </tr> <tr> <th>Auto Timed settings (II)</th> <td>Pump only operational as per timer settings.</td> <td>Pump and EnviroSwim functions operational as per timer settings.</td> </tr> </tbody> </table>			SWITCH 2 (On/Off)				Off (0)	On (I)	SWITCH 3 (ON/OFF/AUTO)	Off Disabled (0).	Pump and Enviroswim Functions disabled regardless of timer.		On Manual untimed settings (I)	Pump only operational independent of timer.	Pump and EnviroSwim functions operational independent of timer.	Auto Timed settings (II)	Pump only operational as per timer settings.	Pump and EnviroSwim functions operational as per timer settings.
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4	Fuses	Refer to Maintenance Section 4.1.1 for details.																		
5	Ioniser Polarity Indicator	This LED changes colour from red to green approximately every six minutes to indicate that the polarity of the Ioniser electrodes has changed. Changing the polarity assists in cleaning the electrodes and ensures that they wear evenly.																		

No.	Name	Operation												
6	Ioniser Current Control	This control is used to vary the current applied to the Copper/Silver electrodes. The control has six output settings as follows: OFF, 20%, 40%, 60%, 80% & 100%. The off position is selected by turning the knob fully anti-clockwise, turning the knob clockwise will increase the output in the above increments. The ioniser system has a ten-minute cycle i.e. at 20% setting, the ioniser will run 2 minutes in a ten-minute period. Refer to manual section 1.1.3 for details of measuring and adjusting the copper ionisation to ensure that the correct levels are maintained.												
7	Ultrasonic operation indicator and Ioniser warning light	This LED cycles through several colours indicating normal operation. When the ioniser is turned <u>off</u> the LED will flash Blue. In the event of loss of power to the ion generator the LED will flash a blue & red warning. Check connections before contacting a service agent.												
8	ORP Current Control	This control is used to adjust the current being applied to the plates. The effect of adjusting this control when the EnviroSwim unit is operational will be displayed on the Oxidiser production digital display.												
9	Oxidiser production digital display	This display shows the status of the Oxidiser plates and has a range of values.												
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1.1.2 Pool Balance

Balance Parameter	Symptoms	Ideal Range	Measurement	Adjustment
Alkalinity	<ul style="list-style-type: none"> pH difficult to maintain pH bounce Bather discomfort Corrosion Cloudy Water 	80-150 ppm	Use supplied test kit or Pool Shop Free testing.	Raise by using Sodium Bicarbonate. Approx 450 grams per 10,000 litres (e.g. 2.25kg for 50,000 litres) to raise from 60ppm to 100ppm.
pH	<ul style="list-style-type: none"> Reduced sanitation effectiveness Plaster and concrete etching Corrosion Cloudy water Bather discomfort 	Cement and Plaster 7.2-7.6 Vinyl and Fibreglass 7.0-7.2	Use supplied test kit or Pool Shop Free testing. We recommend checking the pH level of the water every 2 weeks. New concrete pools require weekly checks of the pH for 2-3 months, until the concrete has fully cured.	The pH of your pool water is increased by adding sodium bi-carbonate, and reduced by adding hydrochloric acid or sodium bisulfate (dry acid). Dry acid at the rate of 50 grams per 10,000 liters. Hydrochloric acid add 50 ml per 10,000 liters. When mixing acid with water, ALWAYS ADD ACID TO WATER, NEVER ADD WATER TO ACID Test pH again; and if it is still high repeat until the correct pH level is obtained.
Water Hardness	<ul style="list-style-type: none"> Etching and Corrosion Cloudy Water 	200-250ppm	Take sample to pool shop.	In order to reduce calcium, you will need to dilute the pool water by draining part of the water and adding new water. Calcium chloride can be added to the pool in order to raise calcium hardness. In order to raise calcium hardness by 10 ppm, you can add 150 grams of calcium chloride per 10,000 liters of pool water.