



## 7 SPECIFICATIONS, WARRANTY AND CONTACTS

### 7.1 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

### 7.2 Warranty Information

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

### 7.3 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 5546 7366

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# Model ES-3

## Pool Sanitizing System

## Installation Guide

## IMPORTANT SAFETY INSTRUCTIONS

### ATTENTION INSTALLER

This manual contains important information about the installation of this product. For complete instructions on operation and safe use of this product refer to EnviroSwim ES-3 Operating Manual.

**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.

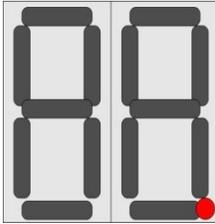
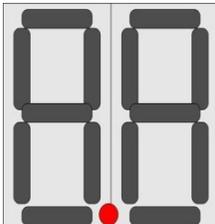
**WARNING** – To reduce the risk of injury, service should only be attempted by a qualified Service Professional.

**WARNING** – Do not operate electrolytic cell without proper flow or water circulation. A build-up of gases will result in hazardous conditions.

**CAUTION** – Use of chemicals other than those recommended may be hazardous. Follow the Chemical Manufacturer's Instructions.

**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.

### READ ALL THESE INSTRUCTIONS

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"> <li>• Possible short circuit on plates or electrodes</li> <li>• Very high TDS due to concentrated chemicals flowing past plates or conversion of Salt Water pool.</li> </ul>	<ul style="list-style-type: none"> <li>• Short Circuit – check plates and remove any short circuit.</li> <li>• 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.</li> <li>• Salt Pool conversion - either dilute to reduce TDS below 2000ppm or contact EnviroSwim about specially designed plates.</li> </ul>

## 6 TROUBLESHOOTING

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"> <li>• Low conductivity</li> <li>• Excessive makeup water added due to leak in pool or equipment</li> <li>• Build up of scale on copper/silver electrodes</li> <li>• Electrodes worn away</li> <li>• Pool system not running long enough</li> </ul>	<ul style="list-style-type: none"> <li>• Refer to operating instructions                             <ul style="list-style-type: none"> <li>• Repair leak</li> </ul> </li> <li>• Clean rods and ensure that the chemical balance of pool water is correct                             <ul style="list-style-type: none"> <li>• Replace with new electrodes</li> <li>• Refer to operating instructions</li> </ul> </li> </ul>
Excessive build up on plates in oxidation chamber	<ol style="list-style-type: none"> <li>1. High calcium content (water hardness) in pool water.</li> <li>2. pH to high.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove ORP cell and clean in 75/25% ratio water/hydrochloric acid. See section 1.1.2 Pool Balance - Adjusting water hardness.</li> <li>2. Reduce pH. Refer section 1.1.2.</li> </ol>
Flashing Oxidiser Production Digital Display	Pb	This will be a flashing display that indicates that the system is not applying current to the oxidiser plates due to any of <ul style="list-style-type: none"> <li>• Air in the system</li> <li>• Insufficient water flow</li> <li>• Calcium build-up on plates.</li> </ul>
	OL	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 <ul style="list-style-type: none"> <li>• Excessive TDS (greater than 3000ppm)</li> <li>• Undiluted chemicals added to skimmer                             <ul style="list-style-type: none"> <li>• Short circuit across the plates.</li> </ul> </li> </ul>

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## 1 OVERVIEW

This guide provides instructions for the safe installation of the EnviroSwim ES-3 Pool Sanitising system. Before commencing installation read all of these instructions. Before commissioning the EnviroSwim system please read the EnviroSwim ES-3 Operating Manual. If there is any doubt with regards to these instructions or EnviroSwim System compatibility with other Pool Treatment elements please contact EnviroSwim.

### 1.1 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.

#### 1.1.1 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.

#### 1.1.2 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.

#### 1.1.3 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. This method of treating Calcium in the water is often referred to as Magnetic Treatment.



## 5 MAINTENANCE

### 5.1 Basic Maintenance

The Enviro-Swim system is very low maintenance. The oxidizer plates and copper/silver electrodes are self-cleaning and the ultrasonic system is maintenance free.

#### 5.1.1 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.**

#### 5.1.2 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.

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 (fibreglass 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.

## 2 PRE-INSTALL

Before installing take care to ensure that you have read the instructions, have all required equipment and measured your installation to allow for the length of connecting cables.

### 2.1 The Enviroswim kit

The Enviroswim Installation Kit consists of

- 1 x Enviroswim Control Unit
- 1 x Transparent cell
- 1 x Titanium plates
- 2 x Cu/Ag electrodes
- 2 x 40/50mm pipe adapters
- Installation Guide (this guide)
- Operating Manual (A5)
- Copper test kit

### 2.2 Additional Installation Materials

The following materials will or may be required

- 40 or 50mm pressure pipe
- 40 or 50mm pipe angles as appropriate to fit
- PVC Pipe adhesive
- Cable ties
- Mounting screws for control Unit

### 2.3 Recommended tools

Only basic tools are required for implementation.

- Electric Drill and bits
- PVC Pipe Saw
- 10mm wrench
- Heat Gun

## 2.4 Converting Existing Pools

When fitting the EnviroSwim ES-3 system to existing pools consideration should be given to the treatment that has been previously been applied to the pool.

Previous Treatment(s)	Comments	Recommendations
Chlorine or Bromine		OK to install ES-3 with the existing water. The chlorine will dissipate naturally in a few days and does not react with the ES-3 processes.
Ozone	This is usually in conjunction with Chlorine.	Ozone has no residual in the water so this is the same as Chlorine based pool.
Bacquacil (Polyhexamethylene biguanide hydrochloride (PHMB))	Often used in conjunction with specialist algaecide (DDAC) and hydrogen peroxide.	<b>DO NOT</b> install ES-3 with existing pool water. It is essential that the pool is completely drained and that any filter media is replaced.
Salt Water Chlorinator	Due to the large amount of Salt in the Pool there is a very high TDS (greater than 3000ppm)	Options are <b>Completely drain and refill Pool.</b> or <b>Operate with the existing water and allow to naturally dilute over time.</b> Should the existing water be used we recommend the installation of a modified set of cell plates to reduce the load generated by the high TDS. Please contact EnviroSwim for the provision of these. <b>NOTE:</b> If the existing water is used the plates in the Cell will generate Chlorine gas – the same as a Salt Water Chlorinator.
Copper Based Algaecides	These leave a residual of copper in the water.	Take care to measure the copper levels in the water with the supplied test kit. Adjust the ioniser levels appropriately - refer to the Operating Manual.
Any other treatments		Contact EnviroSwim.

## 4 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.

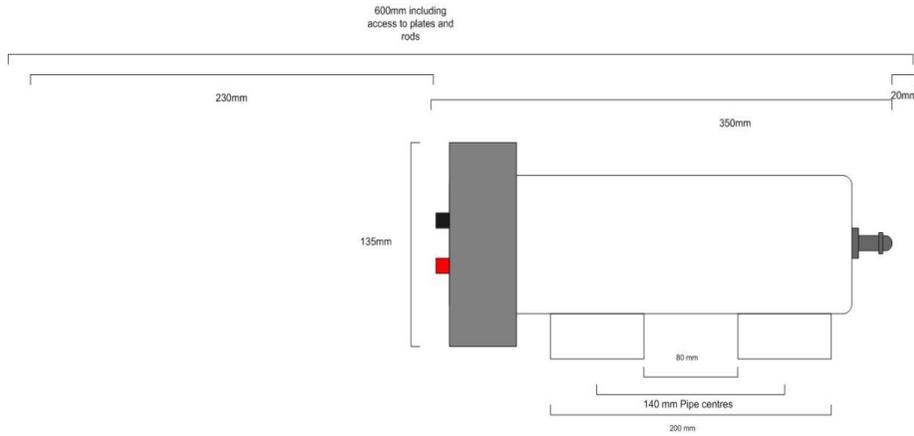
For new pools, or those that have just been refilled, add pool salt to ensure the conductivity of the water is high enough for the ionization process to take over. If retrofitting to an existing pool the conductivity of the water should be sufficient for the EnviroSwim system process to initiate.

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 litre 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).

## KEY MEASUREMENTS



If insufficient vertical clearance is available the unit could be mounted on Mac unions and be lifted horizontally for removal before servicing.

### 3.3 Installation of Ultrasonic Emitter Coils

The ultrasonic emitter may be installed anywhere between the outlet of the pump and the return to pool line and may be mounted in either a horizontal or vertical position. It is optimal to have the ultrasonic emitter installed before any heating system in order to assist in de-scaling the heating elements.

Considerations for location are

- If the pool has a heater install on the inflow side of the heater.
- Install close enough to the control box for connection without extending cables.



## 2.5 Filters

The processes used by ES-3 mean that excellent filtration can be achieved using standard cartridge or sand filters with coarse sand. Sand filters are the most convenient.

Filter considerations are as follows

Type	Media	Recommendation
Cartridge	Standard Filter	OK with ES-3
Diatomaceous Earth (DE)	Filter with DE coating	OK with ES-3. Generally high maintenance and fine filtration provides no significant benefit with ES-3 installed.
Sand Filter	Coarse Sand	Recommended as providing excellent filtration with ES-3 when regularly back flushed.
Sand Filter	Fine Sand	OK with ES-3. Fine Sand does not provide significant additional filtration benefit with ES-3 installed.
Sand Filter	Glass or silica based media	OK with ES-3.
Sand Filter	Zelbrite Zeolite	<b>DO NOT USE</b> The manufacturer's literature indicates that Zelbrite will remove metals (including copper) from the water. This will restrict the effectiveness of ES-3.

## 2.6 Chemical Feeders and Control Systems

The ES-3 is compatible with Chemical Feeder and Control systems. These systems generally adjust chlorine, pH balance or a combined system doing both tasks. pH measurement and dispensing of the appropriate chemicals will operate as expected.

Should a Chlorine Feeder be installed expect very little or no Chlorine to be dispensed. These systems determine the Chlorine dosage based on ORP measurement. When the ES-3 system is operated properly no or very little chlorine will be dispensed as the ORP levels should always be adequate.

### NOTE

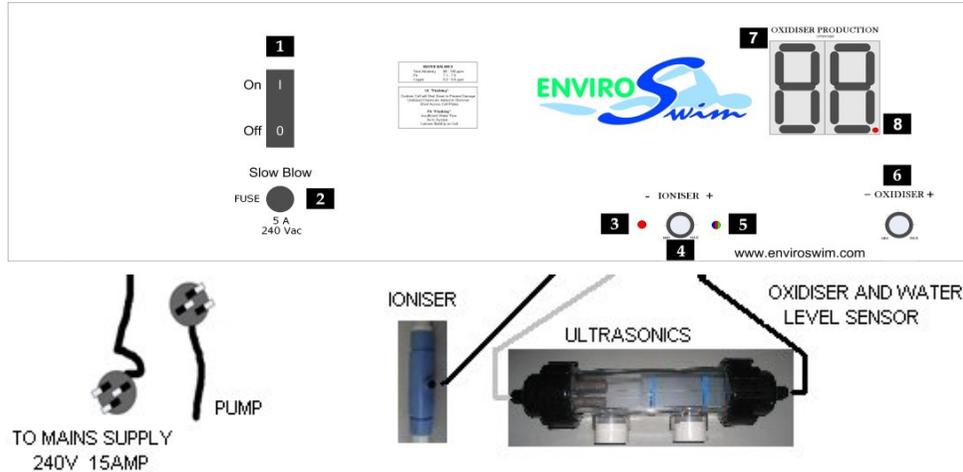
**When installing ES-3 with Chemical Feeders ensure that the ES-3 Wet Cell is installed so that the water flows through it before the Chemical Feeder. This will reduce stress on the ES-3 from undiluted chemicals drawing large electrical currents across the plates.**

### 3 INSTALLATION

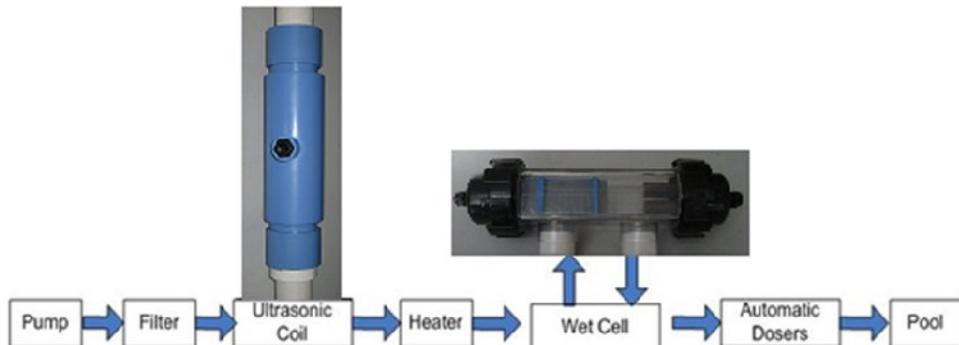
There are 3 components of the ES3 system to install and connect.

- Control Box
- Ioniser/Oxidiser Unit (Wet Cell)
- Ultrasonic Emitter Coil

Before commencing installation consider the length of the standard cables attached to the control box and their ability to easily reach the Wet Cell and Coil. All cables are approximately 1.5 metres.



The ideal sequence and flow for the water treatment components is

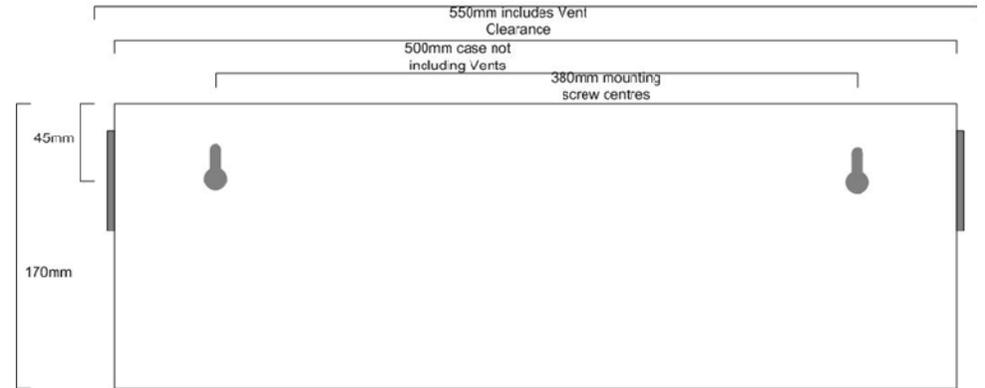


### 3.1 Control Box

The control box is IP25 rated and approved to NZS/AS standards. It is designed for outside or inside installation. Ensure adequate ventilation is provided and that it is in a position where it is unlikely to be flooded, sprayed with water or come into contact with chemicals.

Mount the control box where all cables will reach the power source or components to be connected. It is not recommended to extend cabling beyond the 1.5 metres (approximately) supplied.

#### KEY MEASUREMENTS



### 3.2 Ioniser/Oxidiser Unit (Wet Cell)

#### CAUTION

**When attaching the wet cell to pipe work do not use primer on the clear wet cell plastic. Use Pipe adhesive only.**

The cell is ideally installed on the outlet from the Filter (or heater where installed) and before any Automatic Chemical Feeders.

Install so that the inflow is over the oxidiser plates and the outflow is from the Electrode end.

Ensure that the cell is fitted to allow access to the plates and rods for maintenance.

