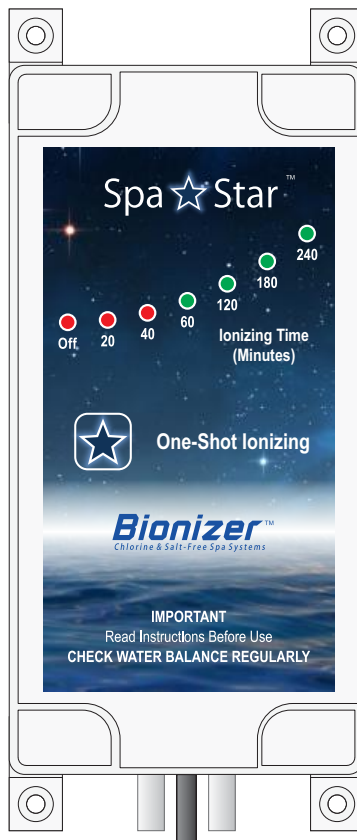


INSTRUCTION BOOK

Bionizer™
Chlorine & Salt-Free Pool Systems

Spa☆Star™



www.bionizer.com.au



www.bionizer.com

Please read before you call us for advice.

Version 3.0c, 20-Nov-2017

Ionizing & Oxidizing System

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INTRODUCTION

PLEASE TAKE THE TIME TO READ THESE INSTRUCTIONS CAREFULLY AND NOTE HOW THEY APPLY TO YOUR PARTICULAR SPA POOL AND EQUIPMENT.

Thank you for taking a positive step towards a chemical free future for your family.

The Bionizer Spa☆Star will keep your Spa Pool clean, safe and sparkling clear using the latest digital technology and electrode systems.

The Oxidizing function goes to work whenever your pool pump and filter are running... it utilizes a safe, low DC current that passes between two specially coated, long life titanium electrodes. This process oxidizes (eradicates) contaminants from your pool. As the unit consumes very little power it is a far better option than continuing to use harsh chemicals to regularly oxidize or shock your Spa Pool.

Chloramines and other nasty compounds that are created when chlorine combines with organic matter such as skin or hair, are destroyed on contact.

The One Shot Ionizing function of the Spa☆Star is used whenever you refill the Spa Pool, or when the copper level is getting low. Simply select the One Shot Ionizing time, and the Spa☆Star does the rest.

Simple, effective and chemical free.

As with all Bionizer products, ensure that the pool water is correctly balanced at all times, to ensure that the Spa☆Star is working at optimum efficiency, for best results.

Take note of the few “do’s and don’ts” in this manual and you will have a simple and trouble free start up.

Bionizer is committed to creating a more healthy environment... the Spa☆Star is one integral component of our ongoing journey in this direction.

Our other products were also created to advance us all along the path back to a toxic free world. They include the fully digital Bionizer all natural pool and spa purifier, the amazing pH BOSS automatic pH controller, and the versatile Eco-Oxidizer which continuously oxidizes your pool when the pump is running, to keep it sparkling clear.

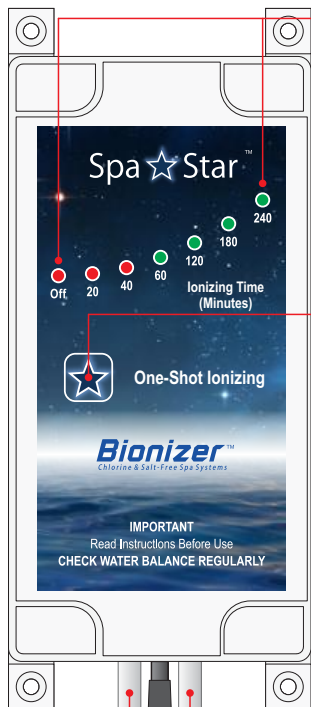
Bionizer designs and manufactures our own products...that is your safeguard right there.

The Pool owner who uses the Spa☆Star or any other Bionizer system does so because they have made a superior choice...for all the reasons above...and for the health and enjoyment of their families.

Try a Bionizer System or product on your swimming pool today,

...the risk is ours, not yours.

SPA☆STAR ILLUSTRATION



ONE-SHOT IONIZING LEDs

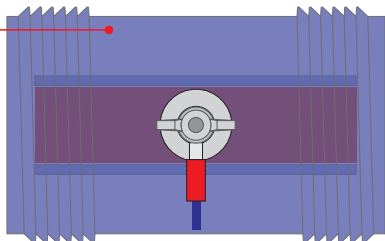
- 7 LEDs to show One-Shot Ionizing time setting selection.
- Also shows Ionizing time remaining, in minutes.
- All LEDs are lit when the unit is Oxidizing.
See page xxx for a description of LED indication when the unit is Oxidizing.

ONE-SHOT IONIZING BUTTON

- Press to select One-Shot Ionizing time, from 20 to 240 minutes.
- Select "Off" to switch Ionizing off and resume Oxidizing.

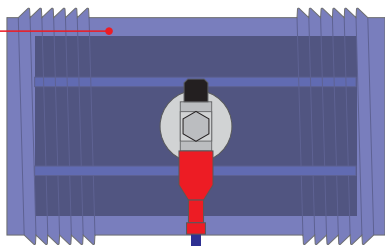
IONIZING POD

Copper / Silver Anode bars, with wing nuts and ring terminals.



OXIDIZING POD

Titanium Anode plates, with black coating and spade terminals.



IONIZING OUTPUT CABLE

Connects the Spa☆Star control box to the Ionizing Pod.

FLOW SWITCH CONNECTION

Connects the Spa☆Star control box to the Flow Switch.

OXIDIZING OUTPUT CABLE

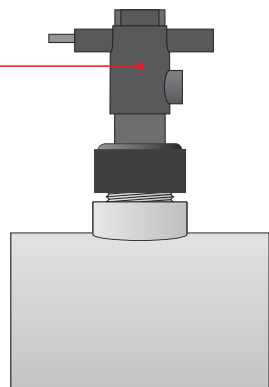
Connects the Spa☆Star control box to the Oxidizing Pod.

DC POWER SOCKET

Use only genuine power adaptor supplied by Bionizer to avoid damage to your Spa☆Star.

FLOW SWITCH

Ensures that Spa☆Star will only Oxidize and Ionize when the circulation pump is running.



SAFETY INSTRUCTIONS - READ

IMPORTANT :

It is important to follow basic safety precautions when installing and using this electrical equipment, including the following :

1. Ensure you read and follow all instructions.
2. **WARNING** - Do not allow children to use this product unless they are closely supervised at all times. This is to prevent accidental injury.
3. Keep all cables visible and do not bury them. Also, position them so that they do not get damaged by lawn mowers, hedge trimmers and other equipment.
4. **WARNING** - To prevent electrical shock, replace damaged cords immediately.
5. Read these instructions and keep the instruction manual in a safe place.

CAUTION :

Your warranty could become invalid should you fail to observe the following :

1. The Spa☆Star must be installed and operated as specified.
2. The life of the unit will be extended (as with most other pool equipment) if it is placed indoors or in an enclosed structure.
3. Always power the Spa☆Star from a genuine Bionizer power adaptor. An incorrect adaptor could damage the Spa☆Star and will void your warranty.

SPA☆STAR INSTALLATION

The Spa☆Star can be installed onto a new or existing spa or pool with minimal pool preparation. Ensure that the water is clean and correctly balanced.

See Initial Operation section on page 11.

1. Installing your Spa☆Star takes around 30 minutes.
2. Alternatively engage a competent person to do the job.

3. If installing it yourself you will need :
 - PVC pressure glue and primer.
 - A fine tooth saw.
 - Philips Screwdriver
 - For masonry walls : hammer drill with 6mm or 1/4" masonry bit.
 - Sandpaper or small file.

CONTROL BOX INSTALLATION

The control box MUST be mounted vertically, with the cables at the bottom, in order to be weather resistant. Any water ingress due to the unit being incorrectly mounted is not covered by warranty.

1. Choose a position that will allow you to see the Spa☆Star LED readout easily. Fix the control box in position using screws at each corner of the box. Ensure that the Spa☆Star is positioned near enough to a power outlet and to the Ionizing and Oxidizing Pods and Flow Switch so the cables reach without straining.
2. Make sure that the unit is undercover to avoid UV damage from long term exposure to sunlight.

3. Plug the power adaptor into a suitable power outlet. Since the Spa☆Star has a flow switch, it can be powered on continuously. It will only Oxidize and Ionize when the pump is actually running.
4. Connect the low voltage plug to the Spa☆Star DC Power Socket (see Page 4). Use only a genuine Bionizer power adaptor. An incorrect adaptor could damage your Spa☆Star and void your warranty.

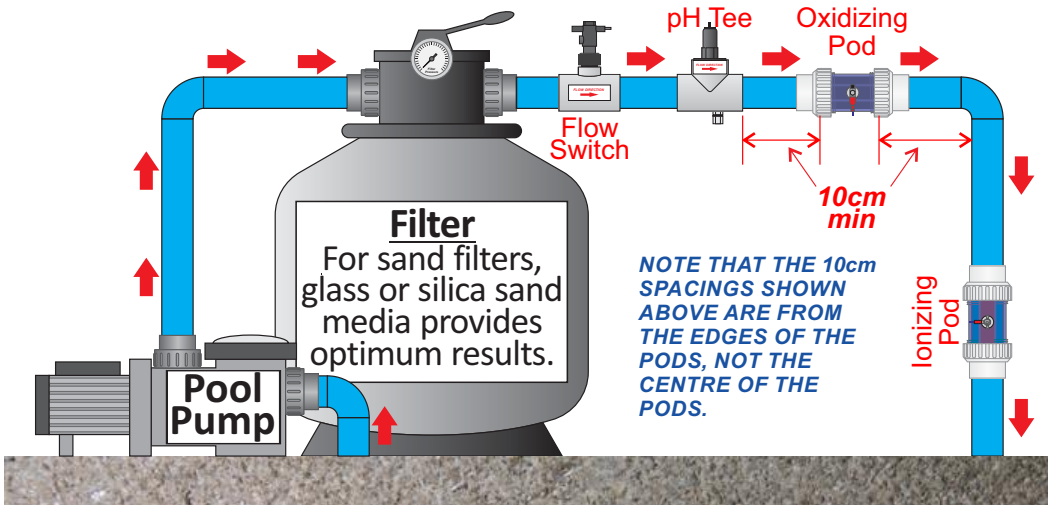
DO NOT SWITCH THE POWER ON UNTIL THE INSTALLATION HAS BEEN COMPLETE

INSTALLING THE IONIZING AND OXIDIZING PODS AND FLOW SWITCH

- Locate a section of pipe where the two Pods can easily fit. The Pods must be fitted on the pipe that sends water back to the pool after it has been filtered (the "Return Line").
- The Flow Switch tee must be installed into the same return line, and can be upstream or downstream, whichever is more convenient.
- Ensure that there is a minimum of 10cm of straight pipe AFTER the Ionizing Pod.
- Both Pods can be fitted horizontally or vertically, so they can be mounted anywhere installation is convenient and easy.
- If you are installing a pH BOSS the fittings MUST be installed in this order:
 1. pH BOSS Probe and Injection Tee
 2. Oxidizing Pod
 3. Ionizing Pod

The Oxidizing and Ionizing Pods can be fitted horizontally or vertically, as long as they are in the order above.

- **HINT :** Even if you are not installing a pH BOSS now, you may want to leave a space for the pH BOSS Tee-Piece Fitting. This requires 20cm of HORIZONTAL pipe BEFORE the Ionizing Pod.



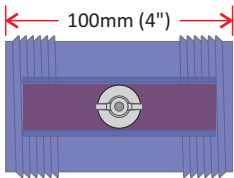
INSTALLING THE IONIZING AND OXIDIZING PODS

Installation of the Spa☆Star Pods is very flexible, and can be tailored to suit the limited space and pipe lengths often associated with Spas.

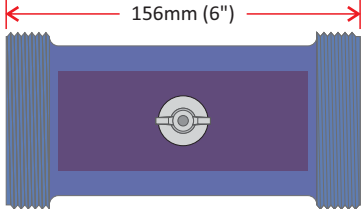
There are several main considerations to take into account before starting the installation :

- **Do you have 40mm (1½") or 50mm (2") pipe ?** For your reference, the diameter of 40mm (1½") pipe is 48mm and the diameter of 50mm (2") pipe is 60mm.
- **If you do have 50mm (2") pipe, did you purchase the Spa☆Star with small Pods to suit 40mm (1½") pipe, or with large pods to suit 50mm (2") pipe ?** Check these drawings to determine which Pods you have :

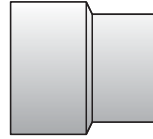
Small Pod



Large Pod



- **If you are installing Small Pods onto 50mm (2") pipe, then you must use 50x40 (2"x1½") adaptors.** These are not supplied with the Bionizer kit, but can be ordered by request. They can also be found at most hardware and plumbing outlets.



- **Will both Pods be fitted end-to-end on one straight section of pipe, or will they be installed onto two separate sections of pipe ?**

If the two Pods can be fitted end-to-end, then make up a joiner as per the instructions below. Making this in advance will make installation quicker and easier.

To install Small Pods end-to-end onto 40mm (1½") pipe, requires 360mm (14") of straight pipe.

To install Small Pods end-to-end onto 50mm (2") pipe (with adaptors), requires 530mm (21") of straight pipe.

To install Large Pods end-to-end onto 50mm (2") pipe requires 480mm (19") of straight pipe.

Illustration of end-to-end joiner :



MAKING THE JOINER WHEN INSTALLING PODS END-TO-END

ALWAYS USE PVC PRIMER ON BOTH SURFACES BEFORE GLUEING ANY PVC PARTS.

Using a short length piece of pipe and two of the barrel unions supplied with the Spa☆Star kit, make up a joiner for connecting the two Pods end-to-end.

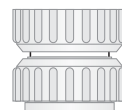
For small Pods, the joiner pipe should be 50mm long.

For large Pods, the joiner pipe should be 60mm long.

- Glue one flange to the pipe.
- Fit two barrel union nuts over the pipe, so that the threads are both facing OUTSIDE.
- Glue the second flange to the pipe.



(a)



(b)



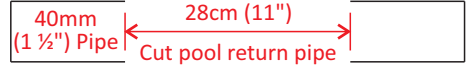
(c)

INSTALLING THE IONIZING AND OXIDIZING PODS END-TO-END

ALWAYS USE PVC PRIMER ON BOTH SURFACES BEFORE GLUEING ANY PVC PARTS.

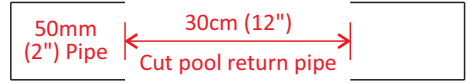
1. Small Pods with 40mm (1 1/2") Pipe :

Cut out a 28cm (11") section of pipe.



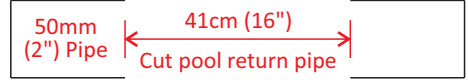
Small Pods with 50mm (2") Pipe (with adaptors):

Cut out a 30cm (12") section of pipe.



Large Pods with 50mm (2") Pipe :

Cut out a 41cm (16") section of pipe.

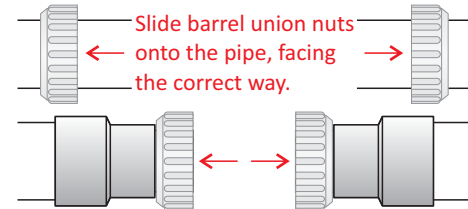


2. (This step only applies for fitting Small Pods to 50mm (2") pipe with adaptors)

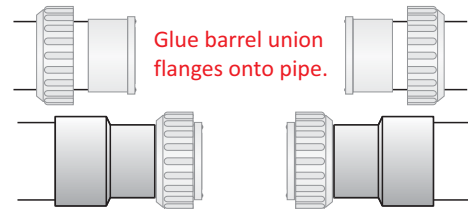
Glue the 50 x 40mm (2 x 1 1/2") adaptor bushes onto the pipe. Glue a 50mm (2") length of 40mm (1 1/2") pipe into the adaptors.



3. Slide the barrel union nuts onto the pipe. Ensure that the threads are facing the correct way, so that the nuts can be screwed onto the Pods at the last stage of installation.



4. Glue the barrel union flanges onto the pipe.



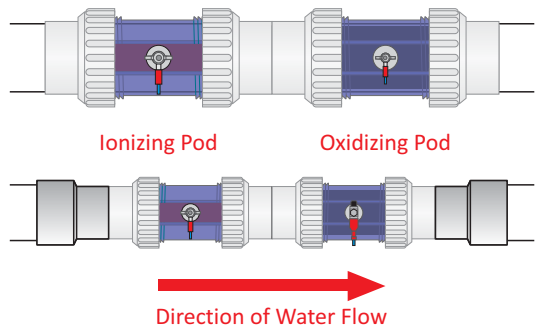
5. Fit the two Pods into place and secure the four barrel union nuts. Hand tighten only - do not use a tool.

Ensure that the Ionizing Pod is fitted before the Oxidizing Pod in the direction of water flow.

Fit the M6 ring terminals to the bolts on each side of the Ionizing Pod. Fasten wing nuts securely.

The Large Oxidizing Pod has M4 bolts. Fit the ring terminals to these and fasten wing nuts securely.

Push the cable connectors onto the spade connections on each side of the Oxidizing Pod.

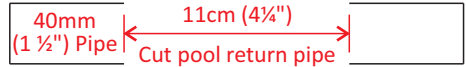


INSTALLING THE IONIZING AND OXIDIZING PODS ON SEPARATE SECTIONS OF PIPE

ALWAYS USE PVC PRIMER ON BOTH SURFACES BEFORE GLUEING ANY PVC PARTS.

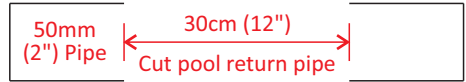
1. Small Pods with 40mm (1 ½") Pipe :

Cut out a 11cm (4 ¼") section of pipe for each pod.



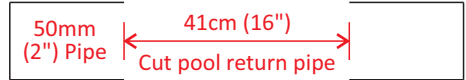
Small Pods with 50mm (2") Pipe (with adaptors):

Cut out a 13 cm (5") section of pipe for each pod.



Large Pods with 50mm (2") Pipe :

Cut out a 41cm (16") section of pipe for each pod.

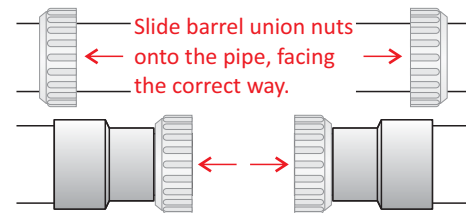


2. (This step only applies for fitting Small Pods to 50mm (2") pipe with adaptors)

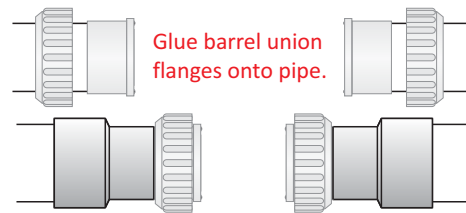
Glue the 50 x 40mm (2 x 1 ½") adaptor bushes onto the pipe. If these were supplied by Bionizer, then they will already have a short length of 40mm pipe pre-glued into them.



3. Slide the barrel union nuts onto the pipe. Ensure that the threads are facing the correct way, so that the nuts can be screwed onto the Pods at the last stage of installation.



4. Glue the barrel union flanges onto the pipe.



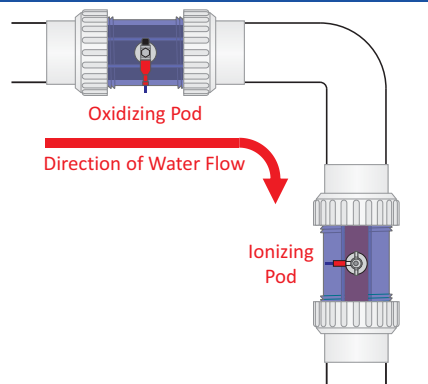
5. Fit the two Pods into place and secure the four barrel union nuts. Hand tighten only - do not use a tool.

Ensure that the Oxidizing Pod is fitted before the Ionizing Pod in the direction of water flow.

Fit the M6 ring terminals to the bolts on each side of the Ionizing Pod. Fasten wing nuts securely.

The Large Oxidizing Pod has M4 bolts. Fit the ring terminals to these and fasten wing nuts securely.

Push the cable connectors onto the spade connections on each side of the Oxidizing Pod.



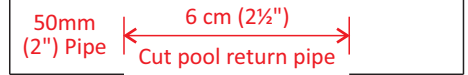
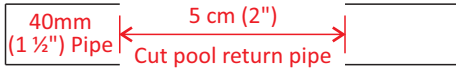
INSTALLING THE FLOW SWITCH

ALWAYS USE PVC PRIMER ON BOTH SURFACES BEFORE GLUEING ANY PVC PARTS.

1. For the standard 40mm (1½") Flow Switch Tee, cut out a 5 cm (2") section of 40mm (1½") pipe.

When installing the standard 40mm (1½") Tee into 50mm (2") pipe, you will need to fit the tee somewhere within in the smaller 40mm (1½") section of pipe between the locations of the two 50 x 40 (2 x 1½") adaptor bushes that were discussed in the previous installation sections.

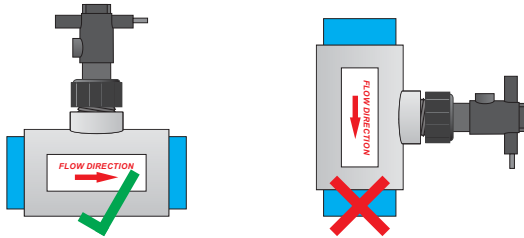
If a 50mm (2") Flow Switch Tee has been supplied for 50mm (2") pipe, cut out a 6 cm (2½") section of the 50mm (2") pipe.



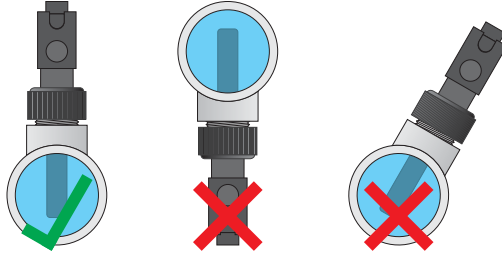
2. Glue the Flow Switch Tee onto the pipe, taking note of the Flow Switch Orientation information below.

CORRECT ORIENTATION OF THE FLOW SWITCH

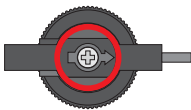
The Flow Switch tee must be installed onto a horizontal section of pipe. Do not install on a vertical or angled section of pipe. There is no restriction on position of the flow switch. It can be installed before, between, or after the pods.



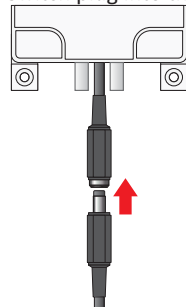
The Flow Switch must be mounted vertically upwards. Do not install downwards or at an angle.



Ensure that the Flow Switch flow direction arrow is pointing in the direction of the water flow. The cable exits on the downstream side.



Connect the Flow Switch plug into the inline socket as shown :



PROGRAMMING YOUR SPA☆STAR

The Spa☆Star features two technologies for purifying your Spa Pool water : Oxidizing and Ionising.

Oxidizing Function

See Page 12 for information regarding the Oxidizing function.

One Shot Ionizing Function

One Shot Ionizing is used whenever the copper level in your Spa Pool is getting too low, or the water was changed.

To start a One Shot Ionizing cycle :

- Test the copper level in the Spa Pool before starting a One Shot Ionizing cycle. For a complete refill, it is safe to assume there is Zero copper in the water, so testing is not required.
- Press the **One Shot Ionizing** button repeatedly until the desired Ionizing time is shown with the LEDs.

- After 3 seconds, the Spa☆Star will beep, save the new setting, and start the One Shot Ionizing Cycle.
- The Spa☆Star will count down the One Shot Ionizing time with the LEDs until the cycle is finished. When the Ionizing cycle is finished, the unit will return to Oxidizing automatically.

Suggested One Shot Ionizing time settings :

The settings below should be taken as a guide to get you started with your Spa☆Star's One Shot Ionizing function. As you become accustomed to your usual routine, you will be able to fine tune this procedure until it is second nature for you.

Off.....End One Shot Ionizing immediately and return to Oxidizing function.

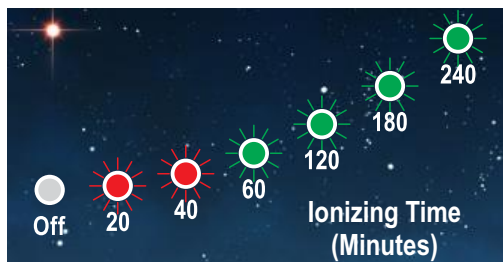
		POOL SIZE									
		1,000L 250Ga	2,000L 500Ga	3,000L 750Ga	4,000L 1,000Ga	5,000L 1,250Ga	6,000L 1,500Ga	8,000L 2,000Ga	10,000L 2,500Ga	12,000L 3,200Ga	14,000L 3,700Ga
COPPER READING (ppM)	0.0	30	60	90	120	150	180	220	280	340	390
	0.2	15	30	45	60	80	100	140	170	200	240
	0.4	5	10	15	20	30	40	45	60	70	80
	0.6	Copper level is good. No further Ionizing is needed.									
ONE SHOT IONIZING TIME (MINUTES)											

SPA☆STAR OXIDIZING FUNCTION

The Spa☆Star's Oxidizing function runs continuously whenever the filtration pump is running, except when a One Shot Ionizing cycle is running.

There is no user setting for the Oxidizing function.

When the Oxidizing function is switched On and the pool pump is running, the Eco-Oxidizer will oxidize your pool at the highest level that it can, depending on your pool balance. The LEDs will indicate to what level the unit is oxidizing :



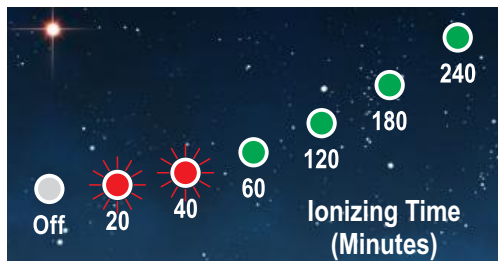
In most situations, the Eco-Oxidizer will be able to oxidize at its maximum level. If the LEDs indicate an oxidizing level anywhere in the green zone, then the unit is operating normally and no user action is required.

NOTE

Outputs anywhere in the green zone are normal for salt-free and super low salt operation. If your unit is displaying only 1 to 3 of the 4 green LEDs and you would like to obtain maximum output, then you may add 1 kg (2 lbs) of pool salt per 1,000L (250Ga) to the pool.

If you wish to run salt-free, then do not add this extra salt. Your unit will still be oxidizing normally anywhere in the green zone.

Action in case only the Red LEDs are lit :



If only 1 or 2 LEDs in the red zone are lit, then the following actions are required :

1. Inspect the Oxidizing Pod. The metal plates should be a dull black colour. If there is visible coating (for example white or grey calcification), then the plates need to be cleaned. See page xxx for cleaning instructions.
2. Check the TDS of the pool water. You may need to take a sample of your pool water to a professional pool shop to obtain this measurement. The Spa☆Star only requires 500 ppM of TDS to operate correctly. If the TDS measurement is lower than this, add 1kg (2 lbs) of pool salt per 1,000L (250Ga) to the pool.
3. If neither of the above restore the LEDs to the Normal Output range, then contact your Bionizer distributor or Bionizer directly for further instructions.

INITIAL START-UP OPERATION

PLEASE READ THIS IMPORTANT INFORMATION BEFORE OPERATING YOUR SPA☆STAR.

BEFORE OPERATING THE SPA☆STAR :

1. Balance the Pool according to the information on the Snap Pool Balance table on the rear cover of this manual, and also supplied as a chart with the Spa☆Star. Feel free to take that chart to your pool shop if you prefer them to test your water.
2. It is not advised to use skimmer basket type clarifying cubes that treat Total Dissolved Solids (TDS) and Phosphates when operating the Eco-Oxidizer.
3. Backwash your filter if it is a sand filter, or wash your filter if it is a cartridge type filter. Refer to your filter's handbook.

NORMAL OPERATION

1. Switch the Spa☆Star off 2 to 3 hours before adding any phosphate removers, flocculants, clarifiers or waterline scum detergents or the like.
2. Do not start the Spa☆Star back up again for 24 hours after adding any of the products listed above.
3. If the pool water becomes cloudy at any time we suggest testing the various pool balance levels and re-balancing the pool water according to the Snap Pool Balance table on the rear cover of this manual, and also supplied as a chart with the Spa☆Star. Feel free to take that chart to your pool shop if you prefer them to test your water.
4. Check the pressure gauge attached to your filter regularly. If the pressure is more than 50kPa above the clean running pressure, then the filter must be cleaned. Sand filters must be backwashed, and cartridge filters must be disassembled, washed with water, and reassembled. Refer to your filter's handbook.
5. To depend on the Spa☆Star to remove the cloudiness and restore clarity before testing the water balance levels is asking the unit to fix a problem that only has one solution. Correct water balance and efficient filtering with a clean filter will restore clarity...if this does not clarify the pool water then it is most likely requiring more oxidation.

To put it more simply... if the filter is operating normally, with no heavy bather load upsetting the water clarity, then any cloudy or hazy appearance in the water is most likely due to the pool water becoming being unbalanced.

MAINTENANCE

A LITTLE MAINTENANCE WILL HELP YOU GET THE MOST FROM YOUR SPA☆STAR

OXIDIZING ANODES

The Spa☆Star's Oxidizing function features a self-cleaning system for the electrodes. However, periodic cleaning in acid may still be required, especially in small Spas with high bather loads.

Cleaning is recommended every 12 months, or earlier if excessive build-up can be seen on the electrode surfaces.

If the LEDs on the Spa☆Star's keypad are only in the red zone while Oxidizing (i.e. no green LEDs lit), this could indicate that cleaning is required.

For installations where a pH BOSS is installed in the same pipeline (as per INSTALLATION section), the acid will often eliminate the need for cleaning entirely.

Cleaning Procedure

- *Always wear gloves, eye protection and protective clothing when handling acid.*
- *Never rub the anode surface or use any abrasive paper or cleaning product. The anode surfaces are electroplated with a special coating that has a dull black appearance. If this is rubbed off, the system will not function correctly and the anode pod will need to be replaced.*

- Prepare a bucket of salt chlorinator cell cleaning solution, without diluting. We recommend to use a standard 10 Litre bucket.
- Alternatively, prepare a bucket of diluted pool acid. We recommend to use a standard 10 Litre bucket. Fill with around 4 Litres of water FIRST, then add around 0.5 Litres of pool acid. **ALWAYS ADD ACID TO A LARGER VOLUME OF WATER. NEVER ADD WATER TO ACID.**
- Unscrew the two barrel union nuts. Hold the Oxidizing Pod in place to ensure that it does not drop down when removing the barrel union nuts.
- Place the Oxidizing Pod into the solution for approximately 5 minutes, or until the deposits have been visibly dissolved off.
- Remove the Oxidizing Pod from the cleaning solution and RINSE ALL OUTSIDE SURFACES WELL WITH FRESH WATER. The diluted acid will not affect the electrical connections as long as the Oxidizing Pod is rinsed well.
- To dispose of the used cleaning solution, tip the bucket into a sink or drain with copious amounts of fresh water. Rinse the bucket well with fresh water.
- Re-install the Oxidizing Pod as per the INSTALLATION section.

TROUBLESHOOTING

PLEASE CONSULT THIS TROUBLESHOOTING SECTION BEFORE CONTACTING BIONIZER.

Symptom	Possible Causes and Remedies
LEDs on the front panel are only in the red zone when the unit is Oxidizing.	<p>Pool water Conductivity is too low, which prevents adequate electrical current to flow.</p> <ul style="list-style-type: none"> • Add 1 kg (2 Lb) of table salt or pool salt per 1,000 Litres (250 Gallons) pool size. <p>Electrodes have accumulated a coating, which prevents adequate electrical current to flow.</p> <ul style="list-style-type: none"> • Clean the electrodes, as per the MAINTENANCE section. <p>Faulty electrical connection to electrodes.</p> <ul style="list-style-type: none"> • Check the cables from the Spa☆Star control box to the Ionizing and Oxidizing Pods. Ensure that the connections at both Pods are clean, tight and without corrosion. • Faulty connections can be repaired by persons with technical experience, or can be returned to Bionizer for repair.
Unit does not power up	<p>Faulty AC/DC power adaptor</p> <ul style="list-style-type: none"> • Replace power adaptor. Please contact your distributor or Bionizer. • Faulty Spa☆Star main unit. Return to Bionizer for repair.

SPA☆STAR AND CHLORINE

The benefit of the Spa☆Star Oxidizing function when used in a Spa which also employs Chlorine sanitiser.

When Chlorine or Bromine react with molecules that contain Ammonia and other nitrogen compounds (found in urine and other pollutants), it can form compounds such as Chloramine and Bromamine. These undesirable compounds are the cause of red eyes, itchy skin, and Chloramine is responsible for the "Chlorine smell" when people often (incorrectly) assume there is too much Chlorine in the pool.

The formation of Chloramines happens even more readily at low concentrations, because the level of "good" Chlorine (hypochlorous acid) is too low to oxidize them away.

These compounds can be oxidized back to Hypochlorous acid (the desirable form of Chlorine) and gaseous Ammonia by break point chlorination. This is simply the addition of enough Chlorine to achieve around 10ppM Chlorine.

Whilst this method is effective, it has its own problems. Firstly, it can take some days for the Chlorine to return to a concentration that is safe for swimming. It also adds to the hazards of large volumes of dangerous chemicals being transported and used in and around the spa pool. Thirdly, the high Chlorine concentration can damage pool equipment such as pool cleaners, and stainless steel ladders and other fittings.

The Oxidizing function of the Spa☆Star will oxidize Chloramines and other undesirable compounds using electrical current instead of high Chlorine concentration. The Oxidizing output is active continuously when there is water flow through the return-to-pool pipeline, after the filter. In this way, the undesirable compounds will be oxidized as they are formed in the pool, so they are not able to increase to a concentration that is noticeable or harmful to humans.

When used in this way, the Spa☆Star can be used not just as a Chlorine replacement device, but also as a complimentary product to allow the pool operator to maintain very low chlorine levels (0.2 to 0.5ppM), without causing undesirable Chloramine build-up.

Testing in full size swimming pools has shown safe, healthy water with no combined Chlorine during hot summer conditions, whilst maintaining under 0.5 ppM of Chlorine. The tests showed a vastly reduced Chlorine usage. Pool balance was easier to maintain, with buffer and acid usage also reduced. The most important result, is that the bathers in the test pools were not subjected to unnecessarily high levels of chemical while swimming.

SPA☆STAR AND BROMINE

The benefit of the Spa☆Star Oxidizing function when used in a Spa which also employs Bromine sanitiser.

Similar to Chlorine and Chloramines (above), Bromine forms Bromamines after reacting with molecules that contain Ammonia and other nitrogen compounds (found in urine and other pollutants)

However, in the case of Bromine, the resultant Bromamine is still quite an effective sanitiser, and also does not off-gas the way Chloramines do. So there is none of the typical itchy eyes and smell that associated with Chloramines.

However, the Spa☆Star still oxidizes Bromamines away as they are formed. So the Spa☆Star user will still obtain the best results and economy from using the complementary Bromine sanitiser.

Snapp Pool Balance

<u>Water Balance Tests</u>	<u>Required Range</u>	<u>Treatment Product</u>	<u>Period</u>
1. pH	7.0 to 7.4 pH	Hydrochloric Acid (5mL / 1,000L / pH 0.1) (0.2 FL OZ (5mL) / 250 Ga / \downarrow pH 0.1)	Weekly
2. Copper Ions (Cu²⁺)	0.5 to 0.6 ppm	One-Shot Ionizing Settings (See table on page 10)	Weekly
3. Total Alkalinity (TA)	80 to 120 ppm	Buffer / Soda Bi-Carb (20gm / 1,000L / 10ppm) (0.7 OZ (20gm) / 250 Ga / \uparrow 10ppm)	Monthly
4. Phosphates	< 0.5 ppm	Starver / Phosphate Remover (10mL / 1,000L / treatment) (0.4 FL OZ (10mL) / 250 Ga / treatment)	Monthly
5. Calcium Hardness	200 to 250 ppm	Hardner / Calcium Chloride (10gm / 1,000L / 10ppm) (0.4 OZ (10gm) / 250 Ga / \uparrow 10ppm)	Monthly
6. Total Dissolved Solids (TDS)	< 1000 ppm	Clarity with Polysheen Plus (or another Cationic based clarifier)	Quarterly

Note: Strengths of chemicals may vary from packet to packet.

Please check instructions on the label of each product and add the units required to match the volume of your pool.