



# ISIS



**Computer controlled automatic bromine generator for spas, hot tubs and swim spas  
Powered by GENESIS technologies from Pioneer H<sub>2</sub>O Tech.**



**Water treatment sciences since 1991**

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<b>Definitions:</b>	pH .....	Power of Hydrogen
	TA .....	Total Alkalinity
	CH .....	Calcium Hardness
	CYA .....	Cyanuric acid
	PPM .....	Parts Per Million = mg per Litre
	PPB .....	Parts Per Billion
	NaBr .....	Sodium Bromide
	TDS .....	Total Dissolved Solids
	TSS .....	Total Suspended Solids

## **DO'S and DON'Ts AT A GLANCE**

- 1.) NEVER SHOCK YOUR SPA WITH POWDERED CHLORINE !
- 2.) CYA OR CYANURIC ACID SHOULD NEVER BE PRESENT IN YOUR SPA !
- 3.) NEVER ENTER A SPA THAT'S WATER IS TURBID OR WHEN BROMINE IS NOT PRESENT !
- 4.) NEVER LEAVE CHILDREN UNATTENDED AROUND SPA
- 5.) NEVER LEAVE SPA UNCOVERED WHEN NOT IN USE

# INSTALLATION AND OPERATING MANUAL



## IMPORTANT SAFETY INSTRUCTIONS

When using this electrical equipment, basic safety precautions should always be followed, including the following:

### READ AND FOLLOW ALL INSTRUCTIONS



**WARNING** – To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

The control unit must be connected to a circuit protected by a GFCI.

A terminal marked Earth/Ground, or the  $\perp$  is located inside the supply terminal box or compartment. To reduce the risk of electric shock, this terminal must be connected to the grounding means provided in the electric supply service panel with a continuous copper wire equivalent in size to the circuit conductors supplying this equipment.

Parts containing live parts, except parts supplied with safety extra-low voltage not exceeding 12 volts, must be inaccessible to a person in the bath.

Earthed/Grounded appliances must be permanently connected to fixed wiring.

Parts incorporating electrical components, except remote control devices, must be located or fixed so that they cannot fall into the bath.

The appliance should be supplied through a Residual Current Device (RCD) having a rated residual operating current not exceeding 30 mA.

The unit shall be attached with screws. Make sure that the screws do not contact internal circuitry. Make sure that the screws do not allow the ingress of liquid.

If the supply cord is damaged, it must be replaced by the manufacturer, it's service agent, or similarly qualified persons in order to avoid a hazard.

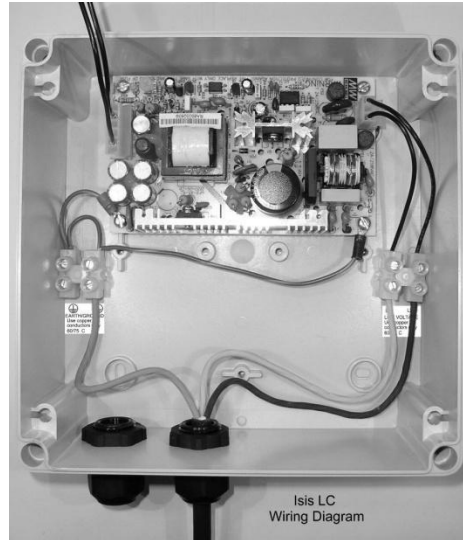
# SAVE THESE INSTRUCTIONS

CAUTION: READ THE INSTRUCTION MANUAL  
LIRE LA NOTICE TECHNIQUE

## **INSTALLATION INSTRUCTIONS**

WARNING: DISCONNECT THE ELECTRIC POWER BEFORE SERVICING  
AVERTISSEMENT: DÉCONNECTER DU CIRCUIT D'ALIMENTATION ÉLECTRIQUE AVANT L'ENTRETIEN

USE COPPER CONDUCTORS ONLY  
EMPLOYER UNIQUEMENT DES CONDUCTEURS DE CUIVRE



1. Loosen the four screws at the four corners of the case cover (top.)
2. Insert the flexible type SW, SWT, SJ, or SJT copper power wiring through the liquid tight compression connector on the case. Refer to the appropriate wiring diagram above. The opposite end of the power wiring should be connected to the spa power supply and the connection should include a GFIC. If the spa is not connected to a GFIC, one must be provided.
3. Tighten the nut on the liquid tight compression connector until a good seal is made against the outside insulation of the wire.
4. Strip the insulation back on the white, black, and Green wires 3/8 inch.
5. Insert the Green wire into one of the Earth/Ground  $\perp$  terminals. Refer to the appropriate wiring diagram above. Tighten the terminal screw.
6. Insert the White and Black wires in the Line Voltage terminals (L1, L2.) The polarity of the Line Voltage terminals is not significant. Refer to the appropriate wiring diagram above. Tighten the terminal screws
7. Replace the case cover. Make sure that the cover screws are sufficiently tight to prevent liquid infiltration.
8. Control box must be installed vertically and **MUST NEVER** be laid flat on its back. This may cause water damage not covered by your warranty! **The electrode cell MUST be installed vertically with water entering at the bottom.**

# ISIS SYSTEM COMPONENTS AND GETTING STARTED

## Unit Features:

Control Centre with adjustable bromine output (12 settings plus "BOOST")  
Digital Design, Accuracy, and Reliability Automatic polarity reversal (every 2 minutes)  
Patent pending (maintenance free) Graphitic Electrode Cell  
Acceptable voltage range of 110 to 240 volts AC (50-60 CycleS)  
Power Consumption: Isis = 20 Watts, 34 VA Maximum

5 Year Electronic Warranty  
3 Year Cell Replacement Warranty – not prorated.

Vertical electrode installation

Water Flow



## ISIS Bromine Generator - Complete System Includes:

1 -Electronic controller; NEMA 4X/IP65 enclosure, 12 different power settings plus "BOOST", duty cycle control to 97% accuracy, 110 to 240 volts AC input line voltage, automatic polarity reversal ensures maintenance free electrode cell operation.

1 - Bromine generating electrode cell.

1 - 2" -Extended "Tee" and two 1 ½ "reducer bushings

1 - bottle of NaBr – Sodium Bromide (salt test strips only and do not register Bromine, ONLY BROMIDE SALT) !

## START-UP/OPERATING INSTRUCTIONS

1. Fill your tub with water to the level recommended by the hot tub manufacturer. (use GENESIS carbon Pre-Filter)

2. Test water for its "TDS" (*Total Dissolved Solid- various inorganic matter present in your water*) content.

This can be done by your spa dealer or with purchased test strips. The ideal range for your start-up TDS is between 50 and 300 PPM - mg/L. If your starting TDS is above 500 (or water is from a well or non-municipal source) a metal remover should be used to reduce TDS. DO NOT FILL SPA WITH WATER FROM A "WATER SOFTENER".

3. Balance the spa water to the recommended levels:

- pH: 7.2 - 7.8
- Total alkalinity: 80 - 120 PPM – mg/l
- Calcium hardness: 150 - 200 PPM – mg/l
- Phosphate level less than 125 PPB (see note\*)

\*NOTE: Test that the **phosphate** level in your spa water is within acceptable parameters using a paper test strip or by taking a water sample to your spa product supplier.

**\*\*Allow water to stabilize for at least 12 hours after treatment with metal and/or phosphate removers before proceeding to step "4".**

4. Oxidize any pre-existing contaminants with 125g Tru Ox or other NONE Chlorine shock. Make sure that the hot tub's pump is set to high speed

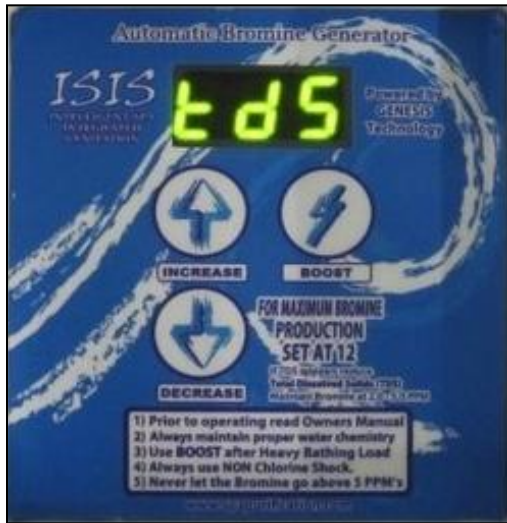
5. Ensure the spa filters are clean after the above treatments.

6. With the jets running on high speed, add **one litre Tru Blu sodium bromide per 190L (100 US gal)** or one pound of granular TRU BLU sodium bromide (not available in Canada) to each 100 gallons of spa water. Example: If your spa has a volume of **1710 litres (450 US gal)** at start-up you will require **4.5 litres of Tru Blu liquid or 4.5 pounds of granular TRU BLU**. Pour the contents of the bottles evenly over the surface of the water.

# START-UP/OPERATING INSTRUCTIONS CONTINUED

**NOTE:** If using a TDS (Total Dissolved Solids) meter, total TDS should equal start-up TDS plus approximately 1,000 PPM of sodium bromide. For example, if your start-up TDS was 300 and you added 4.5 litres of liquid sodium bromide or 2.5 bottles of TRU BLU granular sodium bromide (liquid form in Canada only) to your 450 gallon spa, your TDS count will now be 1,300 (1,000 PPM of NaBr plus 300). You can verify this with a sodium bromide test strip if desired, but it is NOT required. Ideally your Sodium bromide level should be between 1000 and 1300 PPM mg/l.

**Regardless of what water testing facilities suggest, when utilizing an ISIS system, draining your water is not required prior to water reaching a TDS count of 3,500 PPM or 3,500 mg/l.**



**NOTE:** “tDS” will appear on the ISIS controller display ( see diagram below) when the TDS are too high. If this reading appears at or near start up of your system, please consult with your spa dealer. If, however, this reading appears after an extended period of operation, a 25% water drain & refill can be performed in order to reduce TDS. If this action does not result in “tDS” disappearing from the display, please consult with your spa dealer for a comprehensive water analysis and recommended course of action.

**7. NOTE: Your spa pump must be “ON” during the following step:**

The controller should be factory preset to display “0”, OFF. Depress the “INCREASE” key until “10” appears in the display (although, your ISIS controller can be set to “12”, it is not recommended to begin production at a setting higher than “10”). If using a two-speed pump system, set the daily circulation time to a minimum of 8 hours per day. (NOTE: ISIS will only produce bromine during low speed circulation on a two-speed system. The display on the GENESIS II Controller will only appear during low speed circulation. If using a 24 hour circulation pump, the unit will produce bromine 24 hours/day).



**NOTE:** If the ISIS controller detects an inadequate connection to the electrode cell, “OE” (Open Element) will appear in the display. If this happens, please consult with your spa dealer.



**NOTE:** If the ISIS controller detects excessive current flow through the electrode cell, “SE” (Shorted Element) will appear in the display. If this happens, please consult with your spa dealer.

**8. Keep the ISIS controller at a setting at “10” unless your bromine level rises above 5 PPM. If your bromine level exceeds 5 PPM depress the “DECREASE” key *once* to reach a setting of “9”, then test the bromine level after 24 hrs. If still too high, repeat the process (turn down one setting, test after 24 hrs) until your “maintenance” setting is achieved. Lowering more than one setting at a time can result in a dramatic drop in the bromine level.**

If your bromine level is lower than desired, depress the “INCREASE” key **once**, then test the bromine level after 24 hrs. If still too low, repeat the process (turn up one setting, test after 24 hrs) until your “maintenance” setting is achieved.

**Increasing more than one setting at a time can result in a dramatic increase in the bromine level.**



**NOTE:** Your ISIS controller is equipped with a bromine “BOOST” key on the front panel. Depressing this key once will increase the bromine production to twice that of the last Bromine production setting for the next *accumulated eight hours of pump circulation time*. “BOOST” will produce a maximum output of 143% of that achieved at the power setting of 10. (If the pump is cycled “OFF” before the accumulated pump circulation time of eight hours is complete, the “BOOST” cycle will resume once the pump cycles “ON” again and will remain active until a full eight hours of pump circulation time when “BOOST” has elapsed). You will know that “BOOST” is activated if your display shows “bSt”. The “BOOST” mode may be terminated at any time by pressing the “BOOST” key until the display no longer shows “bSt”.

9. Oxidize with 125g Tru Ox daily or any None Chlorine Shock weekly, or as required based on water quality and bather load (If you find that your desired bromine residual is not being maintained, this is a good indication that more frequent shocking is required).

## **OPERATING ISIS AND FUNCTIONAL DIAGRAM**

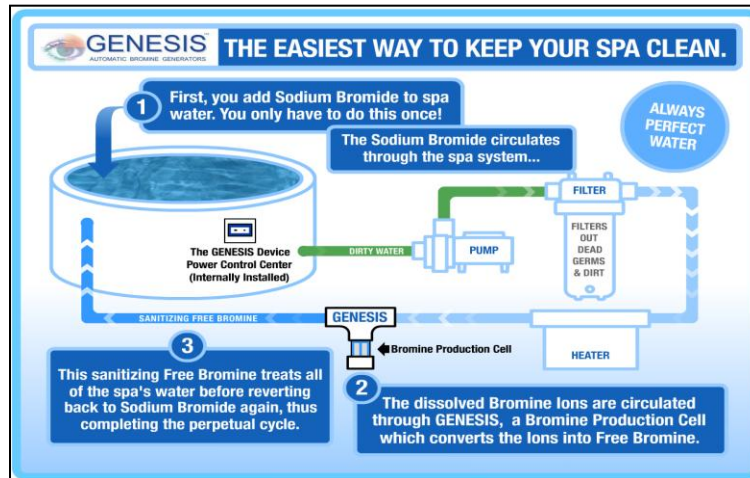
- \* It can take several days for the bromine level to stabilize
- \* With monitoring of your spa use, and adjustment of the output level of your **ISIS**, you will be able to determine your maintenance setting. You will have arrived at your maintenance setting when, after a period of normal use of your spa; you no longer have to adjust the output level on your **ISIS** to keep your bromine level between 3 and 5 PPM.
- \* The appropriate setting for your **ISIS** unit will depend on how often you use your spa. A spa with a higher-than-average bather load will require a higher setting on the **ISIS** unit. This simply means that the **ISIS** needs to produce more bromine to maintain the level between 3 and 5 PPM.”
- \* For the occasional heavy bather load press the “BOOST” key instead of adjusting the setting.
- \* *It is good spa management to test the bromine level in spa water daily and always before spa use.*

**NOTES ABOUT TDS:** TDS (Total Dissolved Solids) is a combination of metals, minerals and other organic material. ISIS requires that the TDS from the fill water be in the low range of 0-500 PPM. Municipal water sources in most cases are typically in the acceptable range. Well water is typically high in TDS (500 – 1200 PPM). **Before filling from a high-TDS source, a carbon based pre-filter is highly recommended. In fact, a spa Pre-Filter is always a great way to start any spa regardless of water source. It removes a host of chemical and organic contaminants.** A metal remover can sometimes reduce TDS sufficiently and is required when the TDS is comprised of metal salts and or heavy metals and iron.

**NOTE: DO NOT... fill spa with water from a salt water softener!**

**NON-USE of Spa:** If spa will not be in use for an extended period of time, turn down the **ISIS** power setting to ½ the normal maintenance setting to prevent elevated bromine residual.

The **ISIS** unit only creates bromine when the circulation pump is “**ON**”. See diagram below!



The **ISIS** controller's display is only visible during low speed circulation on a two-speed system, but the display will be visible continually with a single speed 24-hour circulation system.

## TAKING THE MYSTERY OUT OF SPA WATER CARE:

### SPAS ARE NOT SMALL POOLS!

- 1.) Spas are not small swimming pools. For example if we were to take a four hundred (1500 L) gallon spa and put four people into it we'd have 100 gallons of water for each individual. An equal example would be putting 100 people into a small above ground pool, but only if the water in the pool were at 104 degrees F. In simpler terms water chemistry and proper filtration time is critical to the quality of your spas water.

### THE POWER OF HYDROGEN - pH

- 2.) **pH** plays an important role in not only how effective sanitizing chemicals function, but, also on water clarity and even in insuring minerals naturally present in the water ( like calcium) do not precipitate out of solution and scale the surfaces of your spa. It is imperative that you purchase **Bromine/ pH/ Total Alkalinity** (3 in 1) test strips from your spa dealer and test your spa's water regularly to insure that your **pH**, **Alkalinity** and **Bromine** levels are in the proper range. **Never enter a spa that has cloudy water or insufficient bromine levels.** Your spa dealer has a variety of chemicals to increase or decrease your pH value and Total Alkalinity. If you are unsure how to use these chemicals after reading the products directions, consult your dealer for assistance.

### CLEANING THE SPAS FILTERS

- 3.) **FILTER MAINTENANCE:** Filters should be cleaned regularly (monthly as a minimum). Remove the spa filter(s) from your spa and immerse in a 5 gallon bucket of clean water. Then add to the water a pint of household laundry bleach. Some spa owners actually have a second filter or set of filters that they swap out during the cleaning process. After an hour or so, remove the filter and spray off thoroughly with a garden hose and replace in the spa.

### HOW MANY HOURS A DAY SHOULD MY LOW SPEED FILTERING PUMP BE ON?

- 4.) Filtration time is also an important element in clean, inviting water. Most industry professionals would assure a spa owner that there's no such thing as too much filtration. Optimally 24 hours would be great, still 8 hours is the minimum filtration time needed for **ISIS** to create the proper amount of bromine to adequately treat your spa.



## HOW WILL I KNOW WHAT POWER SETTING IS BEST?

### 5.) Finding the right power setting for ISIS on your spa may seem a little daunting at first, but, it's really quite simple.

For the first few days of operation monitor your filtration time (the period in which ISIS is producing bromine) and the amount of bromine being maintained in your spa. The perfect level for bromine in spas is between 3-5 PPM. Should your bromine elevate above 5 PPM reduce power in 10% steps once daily until the desired bromine level is achieved.

## HOW AND WHEN TO ADD TRU BLU SODIUM BROMIDE:

**In CANADA:** only a liquid version of sodium bromide is available as a 35% solution. Adding one litre of the liquid TRU BLU per 50 gallons / 190 litres will increase your sodium bromide level by approximately 100 PPM or 100 mg/l. This is important to know as it will be necessary from time to time in refreshing the sodium bromide content to proper levels, thus insuring adequate bromine production. Test the Tru Blu levels bi-monthly or when bromine production drops significantly.

For start up amounts of TRU BLU to add when filling a spa for the first time or when draining and refilling see start up instructions on page 3 of this manual.

**In the United States:** ISIS uses a 99% pure, granular version of TRU BLU. It should be added at a rate of 1-1/2 pounds per 100 gallons of spa water at start up. Be careful not to overdose the spa at start up.

## PROPER DOSAGES OF TRU BLU (SODIUM BROMIDE)

OK! Now its time to insure that the sodium bromide level in the spa is at the correct level. To do this use the sodium bromide test kit (provided). See illustration below:

This test is not instant and will take a few moments... The ideal TRU BLU level is 1400-1700 PPM / mg/l.

## Use only authentic GENESIS TRU BLU products with ISIS



**SODIUM BROMIDE (TRU BLU) IS NOT A SANITIZER IT IS SIMPLY BROMIDE SALT:**

**YOU CAN NOT TEST FOR BROMINE WITH A TRU BLU TEST KIT – TRU BLU IS NOT BROMINE:**



Your ISIS dealer's Contact information: Company: \_\_\_\_\_ Tel. ( ) \_\_\_\_\_

**CHEMISTRY at START UP:** pH: \_\_\_\_\_  
Total alkalinity: \_\_\_\_\_  
TDS: \_\_\_\_\_  
Hardness \_\_\_\_\_  
Metals \_\_\_\_\_

Where you provide bromine test strips Yes or No ?  
Where you provided TRU BLU test strips Yes or No ?  
Did you fill the spa with well or municipal water \_\_\_\_\_?  
For questions your dealer cannot answer you may  
contact Tech support at: 1 (877) 569-4377 or visit us  
online at [www.pioneerh2o.com](http://www.pioneerh2o.com)

**DATE OF SPA PURCHASE:** \_\_\_\_\_ **Name Brand of Spa** \_\_\_\_\_ **Circulation Time** \_\_\_\_\_