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Trainers Pal Salt Water Spa Chlorinator
Chlorine Generating Device
Controls Bacteria and Algae in spas
DOMESTIC
REGISTRATION No. 32277
PEST CONTROL PRODUCTS ACT

One Trainers Pal Salt Water Spa Chlorinator unit can treat a maximum of 6500 Litres of spa water.
Maximum output of hypochlorous acid equivalent to 73 grams of free available chlorine per day.
Always maintain 3-5 ppm free available chlorine in your spa water.

READ THE LABEL AND THE
INSTALLATION/OPERATION MANUAL BEFORE USING.
KEEP OUT OF REACH OF CHILDREN.

Do not use this device with bromide products

Blue Falls Manufacturing
4549 – 52 Street
Thorsby, AB, T0C2P0
Tel. 780-789-2626

Trainers Pal Salt Water Spa Chlorinator REPLACEMENT CELL
Replacement electrode for the chlorine generating device
Trainers Pal Salt Water Spa Chlorinator
REGISTRATION NUMBER 32277 PEST CONTROL PRODUCTS ACT.
This cell must only be used on this model of chlorine generating device.
Do not use this device with bromide products
Read the label and the Installation Operation Manual of the chlorine generating device
Trainers Pal Salt Water Spa Chlorinator before using.
Blue Falls Manufacturing 4549- 52 Street, Thorsby, Alberta, T0C 2P0
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Chlorine Generating Device for Spas

Trainers Pal Salt Water Spa Chlorinator

DOMESTIC Installation / Operation Manual

REGISTRATION NUMBER 32277 PEST CONTROL PRODUCTS ACT.

Maximum output of hypochlorous acid equivalent to 73 grams of free available chlorine per day. One Trainers Pal Salt Water Spa Chlorinator unit can treat a maximum of 6500 Litres of spa water. Controls Bacteria in Spa Water.

**PLEASE RETAIN OWNER'S MANUAL FOR FUTURE
REFERENCE**

Certified to CAN/CSA C22.2 No. 218.1 and UL 1563

**IMPORTANT
READ THE LABEL AND THE INSTALLATION/OPERATION MANUAL BEFORE
USING**

Do not use this device with bromide products

KEEP OUT OF REACH OF CHILDREN

Trainers Pal Salt Water Spa Chlorinator device must be installed by the spa manufacturer only.

**Blue Falls Manufacturing • 4549 – 52 Street • Thorsby, AB • T0C 2P0
Tel: 780-789-2626**

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IMPORTANT SAFETY INSTRUCTIONS

READ AND FOLLOW ALL INSTRUCTIONS EQUIPMENT RELATED, INSTALLATION AND GENERAL USE

Installation of Trainers Pal Salt Water Spa Chlorinator

When installing and using the trainers Pal Salt Water Spa Chlorinator unit, basic safety precautions must always be followed, including the following:

1. Follow all aspects of the local and National Electrical Codes when installing the Trainers Pal Salt Water Spa Chlorinator unit.
2. During installation, mount the Trainers pal Salt Water Spa Chlorinator unit to ensure the least amount of direct exposure to rain, garden sprinkler water, direct sunlight or any corrosive environment.
3. **WARNING** - Risk of electrical shock. Power the unit through a circuit protected by an approved G.F.C.I.
4. **WARNING** - Do not use spas or hot tubs unless all suction grates are installed to prevent body and hair entrapment.
5. **DANGER** - To reduce the risk of drowning from hair and body entrapment, install suction fittings with a marked flow rate that equals or exceeds the flow rate on the equipment assembly.
6. **CAUTION** - Maintain water chemistry at suggested levels
7. All field-installed metal components such as rails, ladders, drains, or other similar hardware within 3m (10 feet) of the spa or hot tub shall be bonded to the equipment grounding bus with proper conductors not smaller than No. 8 AWG in the U.S.A. and No. 6 AWG in Canada.
8. **WARNING:** heavy spa usage and higher temperatures may require higher chlorine output to maintain proper free available chlorine residuals.
9. If additional chlorine is required due to heavy bather loads, use Arctic Pure "Boost" or any other product containing sodium dichloro-s-triazinetrione to maintain an appropriate chlorine residual in the water.
10. **DO NOT** add pool or spa chemicals directly to the skimmer. This may damage the cell.
11. Check the expiry date of the test kit as test results may be inaccurate if used after that date.
12. The life expectancy of the electrolytic cell is 20,000 hours under normal use conditions.
13. When replacing the cell, only use replacement cells having a label that clearly states that it is a replacement cell for the chlorine generating device Trainers Pal Salt Water Spa Chlorinator, REGISTRATION NO. 32277, PEST CONTROL PRODUCTS ACT.
14. For proper sanitation, spas must be completely drained periodically. The number of days between **COMPLETE SPA DRAINAGE** is equal to the volume of spa water in litres, divided by 10 times the maximum number of daily spa users. Refill spa with water and repeat **DIRECTIONS FOR USE** of the device.

15. To prevent build-up of flammable gas generated in the absence of water flow through the electrolytic cell, users must never block the electrode unit.

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Important Safety Instructions

1. **WARNING - Risk of Electric Shock.** Connect only to a spa controller protected by a ground-fault-circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the controller is protected by a GFCI. The conductors on the load side of the GFCI shall not occupy conduit boxes or enclosures containing other conductors unless the additional conductors are also protected by a GFCI.
2. The GFCI must be tested before each use. With the Trainers Pal Salt Water Spa Chlorinator unit operating push the test button on the GFCI. The spa and the trainers pal Salt Water Spa Chlorinator unit should stop operating. Push the reset button. The spa and the Trainers Pal Salt Water Spa Chlorinator unit should now start to operate normally. If the GFCI fails to operate in this manner, there is a ground current flowing indicating the possibility of an electrical shock. Disconnect the power until the fault has been identified and corrected.
3. **WARNING -To reduce the risk of electric shock, replace damaged cords immediately.**
4. **WARNING -To reduce the risk of electric shock, do not use extension cords to connect unit to electric supply. The trainers pal Salt Water Spa Chlorinator unit is designed to be connected through a spa controller.**

General Use

1. **WARNING - To reduce the risk of injury do not permit children to use this product. Children should not use spas or hot tubs without permanent adult supervision.**
2. **WARNING - Risk of Accidental Drowning. Extreme caution must be exercised to prevent unauthorized access by children. To avoid accidents, ensure that children cannot use a spa or hot tub.**
3. **DANGER - To reduce the risk of injury, do not remove the suction grates. Never operate a spa or hot tub if the suction grates are broken or missing. Never replace a suction grate with one rated less than the flow rate marked on the equipment assembly.**
4. **DANGER - Risk of electrical shock. Do not permit any electrical appliance, such as a light, telephone, radio, or television, within 1.5m (5 feet) of spa or pool.**
5. **To avoid injury exercise care when entering or exiting the spa or hot tub.**

HEALTH

GENERAL

General: WARNINGS -To reduce the risk of injury:

1. People using medications and/or having an adverse medical history should consult a physician before using a spa or hot tub.
2. People with infectious diseases should not use a spa or hot tub.
3. The maximum spa water usage temperature is 40°C (104°F). Duration in spa water at 40°C (104) should not exceed 15 minutes. Lower water temperatures are recommended for young children and when spa use exceeds 10 minutes.
4. Water temperature in excess of 38°C (100°F) may be dangerous to your health.
5. Pregnant or possibly pregnant women should consult a physician before using a spa or hot tub.
6. Since excessive water temperatures have a high potential for causing fetal damage during the 1st trimester of pregnancy, pregnant or possibly pregnant women should limit the spa water temperatures to 38°C (100°F).
7. Before entering a spa or hot tub, the user should measure the water temperature with an accurate thermometer since the tolerance of water temperature regulating devices varies.
8. The use of alcohol, drugs, or medication before or during spa or hot tub use may lead to unconsciousness with the possibility of drowning.
9. Obese persons and persons with a history of heart disease, low or high blood pressure, circulatory system problems, or diabetes should consult a physician before using a spa/hot tub.
10. Persons using medication should consult a physician before using a spa or hot tub since some medication may induce drowsiness while other medication may affect heart rate, blood pressure, and circulation.
11. Do not use a spa or hot tub immediately following strenuous exercise.
12. Prolonged immersion in a spa or hot tub may be dangerous to your health.

Hyperthermia

WARNING -The use of alcohol or drugs can greatly increase the risk of fatal hyperthermia in hot tubs and spas.

Consult your spa/hot tub manufacturer's manuals for the proper adjustment of water temperature. Prolonged immersion in hot water may induce hyperthermia.

Hyperthermia occurs when the internal temperature of the body reaches several degrees above the normal body temperature of 37°C (98.6°F). Hyperthermia symptoms include drowsiness, lethargy, and an increase of internal body temperature.

The effects of hyperthermia include:

1. unawareness of impending hazard
2. failure to perceive heat
3. failure to perceive the need to exit the spa/hot tub
4. physical inability to exit spa
5. fetal damage in pregnant women
6. unconsciousness and danger of drowning

SAVE THESE INSTRUCTIONS

SPECIFICATIONS

Trainers Pal Salt Water Spa Chlorinator

OUTPUT: 12 VDC, 1A. (40°C/104°F)

INPUT: 100-220 VAC, 50/60 HZ, 0.5 Amp.

A maximum of 6500 L of water can be treated with one Trainers Pal Salt Water Spa Chlorinator unit. Maximum output of hypochlorous acid equivalent to 73 grams of free available chlorine per day.

The basis of Trainers Pal Salt Water Spa Chlorinator's chlorine production determination is the ORP (oxidation-reduction potential) of the spa water. ORP is the measurement of the water's ability to break down contaminants. ORP is a quantitatively measurable quality that can be tested by measuring the spa water's electro-conductivity.

Trainers Pal Salt Water Spa Chlorinator uses a specialized sensor which is capable of measuring the ORP of the spa water. The Trainers Pal Salt Water Spa Chlorinator controller compares the measured value to the desired (Factory preset or user determined) value and determines whether or not the salt cell shall be powered.

Spa water ORP values should be periodically monitored using a hand held meter. The Trainers Pal Salt Water Spa Chlorinator sensor output can be re-calibrated by your Arctic Spas dealer if required.

NOTE: The Trainers Pal Salt Water Spa Chlorinator unit is designed to provide a chlorine residual whenever the spa IS NOT in use. With an average residential spa, this "non-use" time represents

most of each day. Supplemental sanitizer/oxidizer should be added before and/or after EACH spa use, to always maintain 3-5 ppm of free available chlorine.

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Self cleaning electrodes

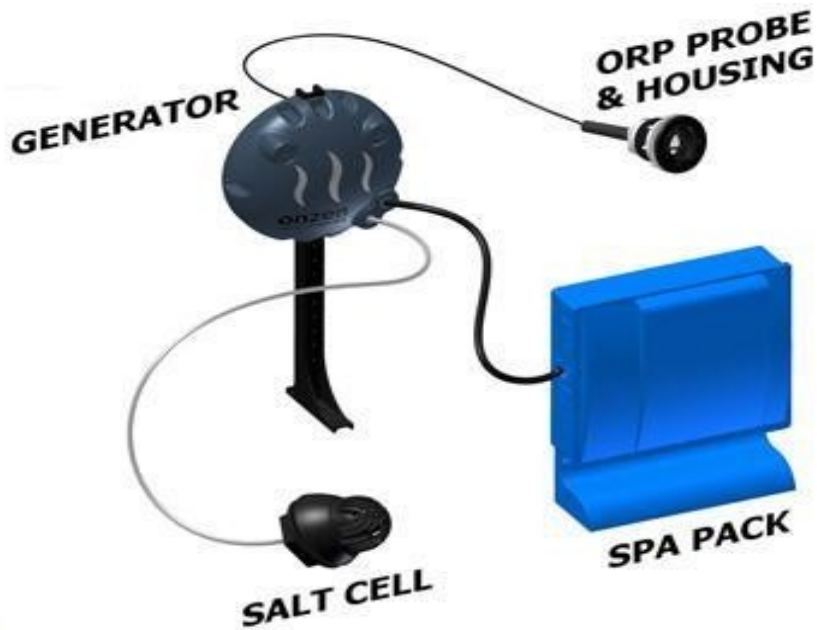
The Trainers Pal Salt Water Spa Chlorinator has a reverse polarity function that is designed to automatically clean the cell blades, maximizing the cell's ability to manufacture chlorine. The unit automatically reverses polarity of the current to the electrodes every two minutes when the unit is operating.

Note: This feature is only enabled when the AC power is on.

INSTALLATION INSTRUCTIONS

Description

The Trainers Pal Salt Water Spa Chlorinator chlorine generator is comprised of three components. These are the power supply, the ORP sensor, and the salt cell.



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The power supply for the salt cell is contained within the blue dome shaped enclosure and is comprised of the controller of the unit and the digital user interface. This unit is designed to be located under the skirting of the spa enclosure and although it has a water resistant design, is is not meant to be exposed to the elements.

WARNING

The Trainers Pal Salt Water Spa Chlorinator generator is designed for and must be powered through a low current output of a spa controller and must not be operated on an independent circuit. The spa controller must be powered through an approved GFCI.

Mounting the controller

WARNING : Before starting the installation of the Trainers Pal Salt Water Spa Chlorinator unit, Disconnect all sources of power to the spa

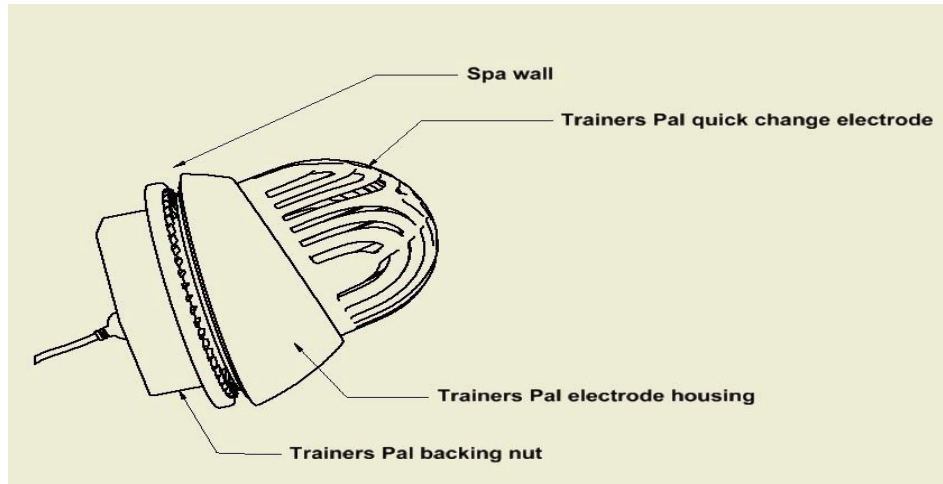
The controller should be mounted with the dome shaped housing in a vertical position using the specially designed stand. The stand should be securely attached to the floor of the spa enclosure in a location which allows access to the user interface(digital display) and is close enough to the spa controller (pack) that the cord will reach.

Mounting the salt cell

The Trainers Pal Salt Water Spa Chlorinator unit is provided with a chlorine generating cell that is to be located in the foot well of the spa. This procedure must be completed after the spa has been drained. The cell is to be mounted by cutting a appropriately sized hole through the shell of the spa and retained in place with the backing nut provided. The seal is provided by silicone caulking which is applied to the edge of the opening before the backing nut is applied and tightened.

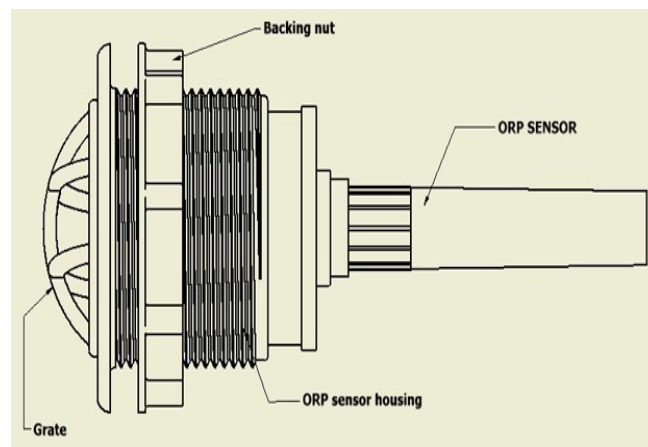
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The final orientation is such that salt cell housing should point up with the plates of the salt cell oriented such that they run vertically.



Mounting the ORP Sensor

The ORP sensor is integral to the operation of the Trainers Pal Salt Water Spa Chlorinator system and must be installed correctly. Similar to the salt cell, the sensor is mounted through the wall of the spa using the fittings supplied with the unit. Use teflon thread sealing tape to prevent the threaded connection between the fitting and probe from leaking.



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IMPORTANT CONCEPTS TO CONSIDER WHEN DETERMINING

SANITIZER REQUIREMENTS AND HOW Trainers Pal SALT WATER SPA CHLORINATOR SIMPLIFIES THE PROCESS

1 . Sanitizer Demand

The rate at which sanitizer is consumed in any spa depends on the relationship of eight major variables. Since these variables can vary widely from spa to spa and season to season, precise prediction of the sanitizer demand for any one spa is difficult. This was the main driving force behind the development of the Trainers Pal Salt Water Spa Chlorinator chlorine generator. By continuously monitoring the spa water quality we are able to react to changes before serious imbalances occur.

THE VARIABLES ARE:

1. Volume and surface area of the spa being sanitized.
2. Average water temperature maintained: As the temperature of the water increases, the sanitizer demand will also increase. As the temperature of the water decreases, the sanitizer demand will also decrease. When this happens, the output dial should be decreased to compensate for this lower demand (which will also protect your equipment from excessive levels of sanitizers).
3. Cyanuric acid level maintenance : This chemical, when added to your outdoor spa water, significantly inhibits sanitizer depletion from exposure to sunlight. Cyanuric acid also inhibits corrosion if your spa is equipped with any metal components. Minimum levels or better must be maintained to ensure that the sanitizer being produced is protected from UV breakdown.
4. Bather load: As the bather load increases, the sanitizer demand will also increase.
5. Amount of direct sunlight / UV exposure: Spas exposed larger amounts of direct sunlight are more vulnerable to increased sanitizer loss and algae growth. Indoor or screened spas have less sanitizer demand.

6. Exposure to vegetation and airborne debris: Dense landscaping near the spa, along with increased nitrate levels (urine, bird droppings, fertilizer, well water, etc.) greatly contribute to increased sanitizer demand.

7. Chemical dilution: Virtually all spa chemicals experience dilution through rainfall, adding of fresh make-up water due to evaporation, splash-out, leaks, etc. When freshwater is added, sanitizer demand increases for a brief period.

8. Main filter pump run time and your spa's circulation patterns: Waterfalls/Fountains and other water features operated by the filter pump can directly effect sanitizer demand. The main filter pump run time and/or output dial may need to be increased to satisfy this higher demand.

Trainers Pal Salt Water Spa Chlorinator Sanitizer Production optimization

Optimal Trainers Pal Salt Water Spa Chlorinator system operation is dependent on proper spa water conditions. Manually balance the SPA water chemistry to be within all suggested ranges of water balance factors **before** start-up of the Trainers Pal Salt Water Spa Chlorinator unit. This is essential to enable the Trainers Pal Salt Water Spa Chlorinator system to assist you in keeping your spa water crystal clear.

Note : A gradual increase in spa water pH levels over time is normal and to be expected. Use pH down to keep the spa water within the correct range.

Required Spa water parameters

Water parameters to be maintained as part of daily maintenance.

Free available chlorine	3.0 - 5.0 ppm
pH	7.2 - 7.8
Total alkalinity	100 - 120 ppm
Calcium hardness	150 - 200 ppm
Cyanuric acid (outdoor spa)	30 – 100 ppm
Salt	3000 ppm

Maximum sanitizer production is achieved when the salt concentration is 3000ppm and the salt cell runs continuously. A maximum of 6500 L of water can be treated with one Trainers Pal Salt Water Spa Chlorinator unit. Maximum output of hypochlorous acid equivalent to 73 grams of free available chlorine per day. The actual amount of sanitizer produced by the Trainers Pal Salt Water Spa Chlorinator system depends upon actual spa water conditions. Always maintain 3-5 ppm of free available chlorine.

Determining the correct amount of Salt

In order to achieve optimal performance from your Trainers Pal Salt Water Spa Chlorinator chlorine generator, it is important that the correct concentration of salt is used in the spa water. The amount of salt can be determined if you know the volume of water in your spa.

We can either measure the amount of water going into the spa with a water meter or calculate its approximate value. Depending on the shape of the spa we can use the following formulas:

Rectangular spas: Length(M) x Width(M) x Average Depth(M) x1000 = Total Litres

Round spas: 3.14 x Radius (M) x Radius (M) x Average Depth (M) x 1000 = Total Litres

Free Form: Average Length (M) x Average Width (M) x Average Depth (M) x 1000 = Total Litres

Maximum recommended chlorine output is achieved with a salt concentration of 3000 parts per million(ppm).

One gram of salt per litre has the equivalence of 1000 ppm

To calculate the salt requirement to achieve a 3000 ppm salt solution, multiply the number of litres by 3 and the result is the amount of salt required in grams. Divide this number by 1000 to get a result in kg.

Amount of salt required (kg) = $\frac{\text{spa water volume(l)} \times 3}{1000}$

Sanitizer Production level – simplified with Trainers Pal Salt Water Spa Chlorinator

Previously we outlined the fact that sanitizer demand varies beyond precise prediction, and you, personally, may desire a higher or lower sanitizer residual in your spa than another person might. By simply adjusting the ORP set level, we can adjust the amount sanitizer produced as the salt cell will automatically shut off when the desired levels are reached.

The Trainers Pal Salt Water Spa Chlorinator unit comes preset from the factory with a ORP set point of 600mV.

NOTE: Residual salt levels must be maintained at 3000 ppm.

NOTE: The Trainers Pal Salt Water Spa Chlorinator unit is designed to provide a chlorine residual whenever the spa IS NOT in use. With an average residential spa, this “non-use” time represents most of each day.

Use test strips before EACH spa use to ensure that the correct levels of sanitizer are being maintained. If required, adjust accordingly.

CAUTION: Excessive Free Available Chlorine(>5.0 ppm) causes corrosion of any metal components in contact with spa/hot tub water. Staining and premature failure of heaters, filters, and other metal components will be the result. Do not exceed recommended sanitizer ranges. NOTE: Standard (DPD) pool water test kits do not read chlorine levels above approximately 8.0 ppm. Test reagents, at high levels, return to a clear liquid. **AVOID HIGH SANITIZER LEVELS!**

NOTE: Homeowners with water softening/treatment equipment, which utilize salt, may already have substantial levels of salt in their drinking water.

Before adding softened water to your spa, test the level of salt, then determine the amount of salt still needed to be added to bring the level up to the suggested 3000 ppm start-up level. Before adding any make-up water to your spa, it is suggested that pretesting the make-up water for high pH, total alkalinity and calcium hardness will aid in the adjustment of these levels before they become excessive.

Maintaining constantly high levels of salt and chlorine above the recommended range can contribute to corrosion of the spa equipment. Salt levels exceeding the recommended concentration can be reduced by diluting the spa water with fresh water.

NOTE: Heavy uses of the spa (excessive contamination) may require longer recovery times (a return to a minimum of 3 ppm chlorine).

Recovery time may be reduced by adding a shock compound to the water. Follow instructions of the shock compound being used.

MANUAL CLEANING OF SALT CELLS

In normal conditions the Trainers Pal Salt Water Spa Chlorinator salt cell should not require manual cleaning. If manual cleaning is required, check water chemistry for possible imbalances or call the factory for consultation, and use the following procedure:

STEP 1 - Remove the cell.

STEP 2 – Using a bucket, add 1 part muriatic acid to 4 parts of water.
PUT WATER IN THE BUCKET FIRST!

CAUTION: Always add acid to WATER, never water to acid. Muriatic acid is corrosive, please follow safety instructions and wear protective clothing.

STEP 3 - Submerge the cell in the solution.

STEP 4 - After 10 - 15 minutes of foaming, remove the cell. Rinse with fresh water.

STEP 5 - If cell blades still have white crusty scale deposits on them, repeat the process, not to exceed 15 minute intervals.

DO NOT attempt to mechanically clean the salt cell.

Start up Procedure

Before operating the Trainers Pal Salt Water Spa Chlorinator System, perform the following steps to ensure proper installation and operation:

Fill the spa to a level that matches the bottom of the pillow pockets.

Check to ensure that there are no water leaks in the location of the salt cell and ORP sensor. Repair if required.

Turn ON all circuit breakers to the spa equipment. Turn on jet pump. Add required type(s) and amount of salt to spa. Broadcast over the surface and allow salt to COMPLETELY dissolve (15 – 20 minutes).

Using Salt test strips, check to confirm that the salt concentration is in the correct range.

Make the required adjustment and allow the spa to react to this change, retest the spa water and make any further adjustments as required.

Check to see if the electrode is producing chlorine. There should be a fine mist of bubbles produced in the spa water by the electrode.

If there are no bubbles being produced, check the electrical connections to the unit. The LED display on the Trainers Pal Salt Water Spa Chlorinator generator should be lit up with the ORP reading.

Monitor the spa until the Trainers Pal Salt Water Spa Chlorinator unit maintains an adequate Free Available Chlorine levels.

To obtain service for your Trainers Pal Salt Water Spa Chlorinator system, contact the Dealer/Service Centre listed below,

or:

**Blue Falls Manufacturing,
4549 – 52 Street,
Thorsby, AB
T0C 2P0
PHONE: (780) 789-2626**