

*Cal Salt*<sup>TM</sup>  
FILTRATION  
By Cal Spas



OWNER'S MANUAL

*Cal Spas*

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## OPERATION MANUAL

READ THIS MANUAL BEFORE USING SYSTEM

Toll Free: 1-800-225-7727

Fax: 1-909-629-3890

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### CONTACT INFORMATION

For customer service, please contact your authorized dealer immediately. If you need additional information and/or assistance, contact:

**LMS Customer Service Department  
1462 East Ninth Street  
Pomona, CA 91766.**

# 1. Introduction

## INTRODUCTION

Your new Spa Sanitation System produces a pure form of chlorine by electrolysis of salt (NaCl) in order to sanitize your spa water. After the salt is converted to chlorine and the bacteria are killed, the chlorine converts back to salt in a continuous process. The salt concentration used is very low (less than that in a human tear). Chlorine output can be easily adjusted by the timer on the control panel. The chlorine level in your spa can be checked by using a standard chlorine test kit. One unit can treat up to 2,200L (600 gallons) of spa water (or up to 5700L - 1500 gallons - for Swim Spa water).

## IMPORTANT SAFETY INSTRUCTIONS



### **WARNING: RISK OF ELECTRIC SHOCK.**

Connect only to a grounding type receptacle protected by a ground-fault-circuit-interrupter (GFCI). Contact a qualified electrician if you cannot verify that the receptacle is protected by a GFCI.



**WARNING:** To reduce the risk of electric shock do not use extension cords to connect unit to electric supply; if necessary, contact a qualified electrician to provide a properly located outlet.



**WARNING:** Make sure the setting on the control panel is set to zero when cleaning/servicing the cell assembly.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. Unless given proper supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

### **SPECIFICATIONS:**

#### **Power Supply:**

Size: For Spas or Swim Spas up to 5700L (1500 gallons)

#### **INPUT:**

120VAC, 50/60HZ, 0.33AMP

#### **OUTPUT:**

5.0 VDC, 2.0 Amp (40°C / 104°F)

#### **Cell:**

Normal output equivalent to 32 grams (1.1 oz) of free available chlorine per day.

#### **Reverse Polarity Function:**

The reverse Polarity Function is designed to automatically clean the cell plates, maximizing the cell's ability to manufacture chlorine.

**SAVE THESE INSTRUCTIONS.**



**WARNING:** To reduce risk of injury, do not permit children to operate the device.



**WARNING:** Heavy spa usage and higher temperatures may require higher chlorine output to maintain proper free chlorine residuals.

If additional chlorine is required due to heavy bather loads, use granulated chlorine to maintain an appropriate chlorine residual amount in the water.

**DO NOT add spa chemicals directly to the skimmer. This may damage the cell.**

Maintaining high salt and chlorine levels above recommended range can contribute to corrosion of spa equipment. Check the expiry date of the test kit as test results may be inaccurate if used after that date.

The life expectancy of the electrode is 7,000 hours under normal use conditions. When replacing the electrode, only use replacement electrodes having a label that clearly states that it is a replacement electrode for the chlorine generating device.

For proper sanitation, spas should be completely drained periodically. The number of days between COMPLETE SPA DRAINAGE is equal to the volume of spa water in liters, divided by 10 times the maximum number of daily spa users. Refill spa with water and repeat DIRECTIONS FOR USE of the device.

#### **Health and Hyperthermia warnings for spa devices:**

People with a medical condition should consult a physician before entering spa water.

Maximum spa water usage temperature is 40°C / 104°F. Bathing in spa water at 40°C / 104°F should not exceed 15 minutes.

## 2. Installation and Operation

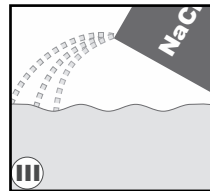
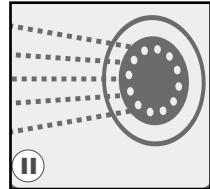
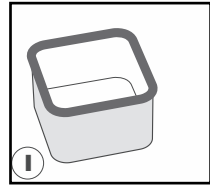
### Operation of the Unit

- I. Turn on the power to the spa equipment
- II. Turn on main spa pump
- III. Add required type and amount of salt to spa. Spread over the surface and allow salt to dissolve for at least 1 hour  
(Add the required free chlorine residual before startup to have balanced water.)

**NOTE: The spa chemistry must be balanced before installing the system to the spa. (See page 12.)**

**During startup, add chlorine between 2-4 ppm as base amount.**

**Be sure to test the chlorine level for the next few days and properly adjust the chlorine output by adjusting the “Hours Per Day” on the “Topside Control Panel”.**



### DO NOT EXCEED RECOMMENDED CHLORINE LEVELS!

Confirm the required adjustment and allow the spa to react to this change for a minimum of 2 days.

After 2 days, retest the spa water and make any further adjustments as required until the unit maintains an adequate Free Available Chlorine residual.

**NOTE: The system works based on a natural convection of water, not a forced convection as with an in-line systems. This operation is independent of the main circulation pump. The cell must be submerged underwater for proper operation. As the cell is energized to generate chlorine, bubbles will appear and it is normal. If the cell is removed from the spa water, chlorine generation will automatically stopped.**



1. Chlorine Cell / Cell Holder (located behind filter housing)
2. Power Supply (Inside spa cabinet)
3. Grommet
4. Lanyard
5. Control Panel

## Control Panel Function

### 1. **When the spa power is turned on:**

All three LED lights and the display will be ON for approximately 3 seconds while the unit self-tests.

### 2. **Normal Operation:**

If your salt level is within proper range 2000-2500 ppm, the Green light LED will display solid GREEN and the display will show the operation hours per day. This indicates power is being delivered from the power supply unit to the cell and is producing sanitizer. Your spa is being sanitized by Hypochlorous Acid (chlorine).

**While sanitizer is being produced, bubbles can be seen coming from the cell**

### 3. **Abnormal Conditions:**

The LED lights will flash rapidly and/or the display will also flash to indicate a problem or failure. For further explanation of the abnormal conditions, please refer to the Troubleshooting Guide.

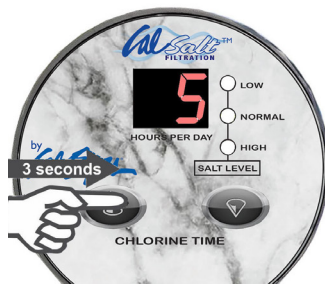
### 4. **Chlorine Output Control:**

The Chlorine output is controlled by adjusting the Timer of the power supply. The Timer determines the amount of hours per day the unit is in operation in order to maintain the chlorine residuals as needed.

The output is only regulated by the chlorine timer. It operates independently from your filter pump run time.



Control Panel




#### Recommended Spa water conditions

Salt level: 2000 - 2500 ppm:  
Free Chlorine 2.0 - 4.0 ppm (Ideal 3.0 - 4.0 ppm):  
pH: 7.2 - 7.8 (Ideal 7.4 - 7.6):

**NOTE: Any interruption of electrical power will cause the current memory cycle to reset when power is restored.**

## CHLORINE ADJUSTMENT

After everything is set up, the display will show you a default screen with the current hours of operation per day. You may change this setting anytime by holding down the  button for 3 seconds straight. (See figure.) The display will flash, indicating it is now ready for time-setting changes. To determine the proper chlorine timer setting for your spa, measure the free chlorine level every day. Adjust the time accordingly to achieve 2.0-4.0 PPM of Free Chlorine. It is advised to check the chlorine level daily to make sure the spa is properly sanitized. Weather, bather load, and sunlight have a major influence on the chlorine demand of the spa water.

**NOTE: If the spa has reached an undesirable amount of chlorine, it is recommended to lower the amount of hours per day to zero. Check chlorine levels each day until the desired level is reached. Adjust the settings to maintain the chlorine level in within the desired limit.**

### 3. Salt Requirement

The best salt is food-quality granulated salt, 99.9% pure salt or solar salt. These types of salt should be purchased from Cal Spas and are designed for use with chlorine generators.

Do not use rock salt, iodized salt or salt with anti-caking additives. Do not use salt with more than 1% yellow prussiate of soda.

The optimum salt level is between 2000-2500 ppm. Use the chart below to determine the amount of salt for your spa. The column on the left is the amount of water in your spa.

The column on the top is the current salt level measured in your spa. Always check your salt level before adding salt to the spa especially if it is your first time.

Prior use of granulated chlorine could have caused an increase in salt levels. Salt should not be removed from the spa unless the salinity exceeds 4000 ppm or the salinity of the water is undesirable. The only way to remove salt is by draining the water and adding fresh water.

**NOTE: Turn unit off before adding sodium chloride and other chemicals, and wait until complete dissolution before turning it on.**

**Salt Table: Amount of salt needed to achieve 2000-2500 ppm level in your spa**

Spa Size in Gallons	Salinity (ppm) measured in SPA						
	0 ppm	500 ppm	1000 ppm	1500 ppm	2000 ppm	2500 ppm	3000 ppm
400-450 Gallons 7 ft. Spa	Add 8.4 lbs	Add 6.7 lbs	Add 5.0 lbs	Add 3.3 lbs	Add 1.7 lbs	0	0
450-500 Gallons 8 ft. Spa	Add 10.4 lbs	Add 8.4 lbs	Add 6.3 lbs	Add 4.2 lbs	Add 2.1 lbs	0	0
750-850 Gallons 11 ft. Spa	Add 14.3 lbs	Add 12.0 lbs	Add 9.7 lbs	Add 7.4 lbs	Add 5.1 lbs	0	0
1550-1650 Gallons 13 ft. Swim Spa	Add 30.0 lbs	Add 27.5 lbs	Add 25.0 lbs	Add 22.5 lbs	Add 20.0 lbs	Add 17.5 lbs	0

## 4. Spa Size Calculation

Use these three formulas to calculate the volume of water in the spa :

### **Rectangular:**

Length(M) x Width (M) x Average Depth(M) x 1000 = Total Liters

Length(Ft) x Width(Ft) x 7.5 = Total U.S. Gallons

### **Round:**

$3.14 \times \text{Radius(M)} \times \text{Average Depth(M)} \times 1000 = \text{Total Liters}$

$3.14 \times \text{Radius(Ft)} \times \text{Radius(Ft)} \times \text{Average Depth (Ft)} \times 7.5 = \text{Total U.S. Gallons}$

### **Free Form:**

Average Length(M) x Average Width(M) x Average Depth(M) x 1000 = Total Liters

Average Length(Ft) x Average Width(Ft) x Average Depth(ft) x 7.5 = Total U.S. Gal.



## 5. Unit Maintenance

### Removing and inspecting the cell:

Note: The cell should be inspected every 3 months.



Step 1. Adjust the chlorine level to zero when cleaning or servicing the cell assembly.



Step 2. Inspect the cell for scaling (white) deposits.



Step 3. If scaling exists, the cell should be cleaned.

### The Cell is Attached to a Lanyard



Carefully remove grommet.



Grommet has a slice to allow it to slip off and reattach to the cord



Pull out about a foot of lanyard until the connector appears

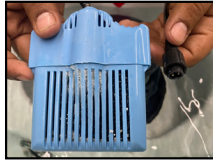


Twist and detach connector to free cell for cleaning or replacement.

**(DO NOT LET THE SPA END OF THE CORD SLIP BACK INTO THE SPA'S HOLE!)**

### **Cleaning the cell:**

Once the setting on the control panel is set to zero, the cell can be cleaned. Scale build up will look similar to the image on the left. You will need a cup large enough to submerge the entire cell, white vinegar (such as the one shown on the right image) to submerge the cell, and an area where fresh water is available to rinse the cell.



***Scale build up***



***White vinegar***

**Step 1.** Fill the cup with the white vinegar.



**Step 2.** Submerge cell into the container and ensure it is completely covered by vinegar.



**Step 3.** Allow the cell to soak in the vinegar for 1 hour.



**Step 4.** After 1 hour has passed, remove the cell from the container.



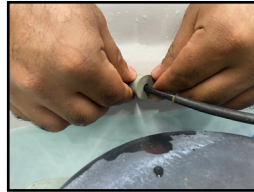
**Step 5.** Rinse the cell with fresh water until unit appears clean.



**Step 6.** Reattach the power connector cord to the cell, and slip cord back inside spa.



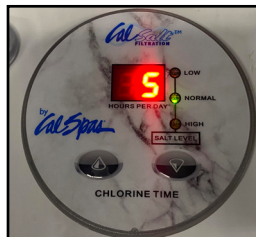
**Step 7.** Reattach grommet and firmly place inside the hole



**Step 8.** Put the cell back into the holder.



**Step 9.** Adjust the control panel to be set to the desired chlorine level.



## 6. Spa Chemistry Chart

This system is designed to automatically generate the chlorine for your spa. It is important to note that chlorine is just one component of your spa chemistry. Please make sure your spa meets the optimum chemistry levels in the following spa Chemistry Chart.

### FACTORS

FACTORS	PREFERRED LEVELS
1 Salt _____	2000 – 2500 ppm (3000 ppm for Swim Spa)
2 PH _____	7.2 - 7.8
3 Free Chlorine _____	<b>2.0-4.0</b>
4 Total Alkalinity _____	100- 120 ppm
5 Calcium hardness _____	150-200 ppm

# 7. Operation Mode and Troubleshooting

## Operation Mode and Trouble Shooting

	Symptom on Power Supply		Possible Causes	Solution
	Display	LED		
1	no display	no lights	1 - power outage 2 - power supply failure	Make sure there is power to the unit. Need to replace the power supply.
2	"_ _"	no lights	unit in rest mode	No action is needed. If you want it to operate immediately, unplug/plug the power or adjust the timer. Both will start the operation right away.
3	"_ _" and Hours (05 by default) alternating	no lights	1 - chlorinator cell is outside water 2 - open circuit in chlorinator cell 3 - salt level low	Put it back in to the water. Check the wire connections and make sure no cut or broken wire. Add more salt to spa and allow time for it to dissolve.
4	"LO" and Hours (05 by default) alternating	Yellow light	1 - salt level low 2 - water temperature low 3 - chlorinator cell at its life end	Add more salt to spa and allow time for it to dissolve. Don't use if the water temperature is under 15°C (65°F). default) Need a new cell replacement
5	Hours (05 by default)	Green light	normal operation mode	No action is needed.
6	"HI" and Hours (05 by default) alternating	Red light	1 - salt level high 2 - water temperature high	No action is needed. Stop adding salt to water if you are doing so. Using unit for water temperature above 45°C (110°F) is not recommended.
7	"HI"	Red light blinking	1 - salt level too high or high TDS Levels 2 - water temperature too high 3 - short circuit in chlorinator cell	You will have to dilute your spa water with fresh water until the salt level is less than 3000 ppm. Dead Sea Salt can cause HI on the Mini. Also, check your TDS Levels. Stop using unit until water cools down. Check to make sure there are no metal objects caught in between electrode plates.
8	"88" blinking	All lights blinking	Power supply failure	Unplug and plug in the power cord to reset the power supply. If the problem persists, call customer service.
<b>Symptom in Spa Water</b>				
9	chlorine level is low		Hours set too low	Adjust the hours setting to higher number (the maximum is 24 hours/day). Make sure cyanuric acid level in your spa is between 50 - 80 PPM.
10	chlorine level is too high		Hours set too high	Adjust the hours setting to lower number (the minimum is 0 hours/day).

# Appendix

## Replacement Parts

### Control Panel

#### Cal Salt Generator Control Panel

ELE09021180



### Base Holder

#### Cal Salt Generator Base Holder

ELE09021183



### Cell

#### Cal Salt Generator Cell

ELE09021181



### Grommet

#### Cal Salt Generator Grommet

ELE09021184



### Power Supply

#### Cal Salt Generator Power Supply

ELE09021182



# LIMITED WARRANTY

## **Cal salt Filtration System 1-Year limited warranty**

### **One-Year Limited Warranty on Cal Salt Filtration System**

Cal Spas warrants to you, the original consumer purchaser, that the Cal Salt Filtration System will be free from defects in materials and workmanship for one year from date of installation.

### **Extent of Warranty**

This warranty extends only to the original consumer purchaser of the Cal Salt Filtration System when installed within the country of purchase.

### **Warranty Performance**

Cal Spas Dealers or its Authorized Service Agent will repair or replace, free of charge, during the warranty period (as described above), any part of the Cal Salt Filtration System that proves defective in material and/or workmanship under normal installation, use and service. This warranty does not apply to the Cell used with the Cal Salt Filtration System. The Cell is a consumable item and must be replaced in accordance with the instructions in the Cal Salt Filtration System Owner's Manual. In some cases, the servicing dealer may charge you a reasonable repair person travel/ service charge that is not covered by this warranty. Please contact the servicing dealer for information regarding any such charges.

### **Limitations**

The Manufacturer disclaims all warranties, expressed or implied, in fact or in law, to the extent allowed by your State's Law, including the warranty of merchantability and fitness for use, except as stated specifically herein. All warranty service must be performed by the Manufacturer or its designated representative using authorized Cal Spa parts. No agent, dealer, distributor, service company or other party is authorized to change, modify or extend the terms of this limited warranty in any manner whatsoever. The Manufacturer will not be responsible for any statements or representations made in any form that go beyond, are broader than, or are inconsistent with any authorized literature or specifications furnished by Cal Spas.

### **Disclaimers**

The Manufacturer and its representatives shall not be liable for any injury, loss, cost or other damage, whether incidental or consequential, arising out of any defect covered by this limited warranty, including without limitation, loss of use of the spa and cost for removal of defective product even if the Manufacturer was advised of the possibility of damage. The liability of the Manufacturer under this limited warranty, if any, shall not exceed the original amount paid for the defective product. Coverage under this limited warranty shall commence as of the original date of delivery and the duration of such coverage shall not extend for any reason whatsoever beyond the stated time periods. These disclaimers shall be equally applicable to any service provided by the Manufacturer and its designated representatives.

### **Legal Rights**

This Limited Warranty gives you specific legal rights. You may also have other rights that vary from state to state. Some states do not allow limitations on how long an implied warranty lasts, so this limitation may not apply to you.

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