AQUASCAPE

POOL TECHNOLOGIES

AQST-CFSC

SMART SALT CHLORINE GENERATOR

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AQST-CFSC

GENERATOR

Installation and Operation Manual

IMPORTANT SAFETY INSTRUCTIONS

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

Cautions:

Please note, the total working hours for the Cell should be less than 8 hours total per day. If you are using a variable speed pump for 24 hours a day be sure to adjust the chlorine output to 25-30%. If the pump is only running 10 hours per day adjust the chlorine output between 60-80%.

You can use this calculation to calculate the appropriate chlorine output for your pool, suggest at 6 hours per day.

Pump running 24(Hours a day) *25% (Chlorine Output) =6hr (cell run time per day at 25%).

Pump running 20(Hours a day) *30% (Chlorine Output) =6hr (cell run time per day at 30%).

Pump running 15(Hours a day) *40% (Chlorine Output) =6hr (cell run time per day at 40%).

Pump running 12(Hours a day) *50% (Chlorine Output) =6hr (cell run time per day at 50%).

Pump running 8(Hours a day) *75% (Chlorine Output) =6hr (cell run time per day at 75%).

Start the VS pump on a low speed and increase the speed up until the salt system works.

READ AND FOLLOW ALL INSTRUCTIONS

WARNING

Risk of Electric Shock. All electrical wiring MUST be in conformance with all applicable local codes, regulations, and the National Electric Code ® (NEC®).

WARNING

To reduce the risk of injury, do not permit children to use this product.

WARNING

Higher temperatures may require higher chlorine output to maintain proper free available chlorine residuals. The actual amount of chlorination required by your pool can change, and varies according factors not limited to bather load, rain, temperature, dirt, debris, and chemical balance.

WARNING

Always turn unit off when operating any plumbing control valves such as for backwashing, water exhaust, or during operation of spa or water features if operation restricts water flow to the cell. A build-up of flammable gases will result in hazardous conditions.

- When install the machine, ensure that materials and parts used in the pool are compatible with the use of chlorinated water and salt. Avoid high salt levels (above the recommended range).

- Ensure that the chlorine generator operates only when the circulation pump is operating. When installed with a pool equipment timer, the Control Module must be to the load side of the timer clock.

- If additional chlorine is required (due to hot weather), use Sodium Hypochlorite to maintain an appropriate chlorine residual in the water.

- Proper pool chemistry must be maintained at all times.

- A green colored terminal is located inside the wiring 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 the equipment.

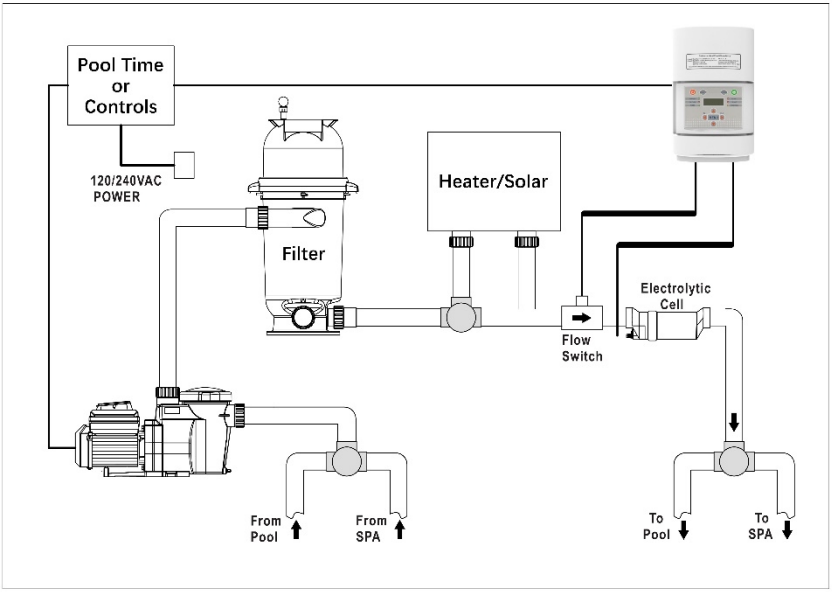
- One bonding for US models is provided on the external surface. To reduce the risk of electric shock, connect the local common bonding grid in the area of the swimming pool, spa, or hot tub to these terminals with an insulated or bare copper conductor not smaller than 8 AWG US.

Introduction:

The CFSC chlorine generator, by electrolysis, creates chlorine to sanitize your pool from the salt molecules (NaCL) in your water. A small electric charge is applied across a set of titanium plates inside the Electrolytic Cell. This produces Sodium Hypochlorite (NaOCl). In water, Sodium Hypochlorite dissociates into sodium (NA+) and hypochlorite (OCl-) ions. It is the hypochlorite ions that form with the hydrogen (H+) ions (from the water) to form hypochlorous acid (HOCl), which is the active agent that destroys bacteria and algae, and oxidizes organic matter. This form of chlorine works quickly in the pipe, leaving only a mild residual in the pool. In addition, the Electrolytic Cell continuously “shocks” the incoming water- burning off any oils, organic matter, or other particles that need to be oxidized.

Best of all, the process continuously recycles the salt: after cleaning the pool, the original molecules reform and the whole process begins again. The salt doesn't get used up

System Overview:



- **There are three main Parts to the CFSC system: The Control Unit, the Electrolytic Cell, and the Flow Switch.**

Control Unit:

Supplies power to the cell and allows you customize the system's operation, in order to meet your pool's unique needs.

Electrolytic Cell: **C**reates chlorine as the water inside passes through and returns to the pool. The Electrolytic Cell ("Cell") contains a number of titanium plates that use a low level of electrical power to generate chlorine from salt in the water. The Cell comes with Unions to connect to the plumbing; each Union has a Threaded Collar that secures the Cell to the Unions, and enables the Cell to be easily removed for cleaning and inspection purposes.

Flow Switch: This component detects the water flow in pipe and protect the system.

Water Chemical:

As with any pool, it is important that you maintain proper water chemistry of the pool water, including pH, alkaline content, and calcium levels. The only special requirement for CFSC is to maintain proper levels of salt and stabilizer. It is important to maintain these levels in order to prevent corrosion or scaling and to ensure maximum enjoyment of the pool. Test your water periodically. It is recommended that pool water be professionally tested a minimum of twice per season. Your local pool store can provide you with the chemicals and procedures to adjust the water chemistry. Be sure to tell the pool store that you are using a salt chlorine generator.

Ideal Chemical Level

	Swimming Pools	Spas
Free chlorine	**1.0 to 3.0 ppm**	**3.0 to 5.0 ppm**
Salinity	**3000 to 4000 ppm**	**3000 to 4000 ppm**
pH	**7.2 to 7.8**	**7.2 to 7.8**
Cyanuric Acid (Stabilizer)	**60 to 80 ppm**	**60 to 80 ppm**
Total Alkalinity	**80 to 120 ppm**	**80 to 120 ppm**
Calcium Hardness	**200 to 400 ppm**	**150 to 450 ppm**
Saturation Index	**-0.2 to 0.2**	**-0.2 to 0.2**

Adding Salt:

IMPORTANT: Before adding salt, ALWAYS perform an independent water test to measure pre-existing salt levels.

Use only evaporated, granulated, non-iodized salt (Sodium Chloride). The purer the salt (at least 99%), the better the life and performance of the Electrolytic Cell.

DO NOT add chemicals or salt directly to the skimmer. This may damage the cell. If the Electrolytic Cell has already been installed, it should not be turned on before adding salt. For pools, it is best to empty the required salt into the shallow end of the pool and run the filter and pump simultaneously in order to circulate the water and dissolve the salt (the purpose is to remain off during this time period). Do not throw the salt bag into the water as chemicals and inks on the bag can interfere with water balance. Salt may take 24 - 48 hours to dissolve in summer, and longer in winter. Finer granules of salt will dissolve faster than compressed pellets.

Water Softener salt (also known as Water Conditioning pellets) is an economical way to buy large quantities of salt. However, only salt that is at least 99% pure NaCl can be used. Pellets are compressed forms of evaporated salt that may take longer to dissolve. Avoid using salt with anti- caking agents (Sodium Ferrocyanide, also known as YPS or Yellow Prussiate of Soda) that could cause discoloration of fittings and surface finishes in pool. Do not use Calcium Chloride as a source of salt. Do not use Rock Salt; insoluble impurities mixed with the rock salt can shorten the life of the unit.

Salt Levels:

The system can work within a broad salinity range, from a minimum of 3000 ppm (parts per million), up to 4000 ppm. However, the ideal level for operation

is about 3400 ppm. To achieve this level of salinity, add approximately 30 lbs. of salt for every 1000 gallons of water (or 3.4 Kilograms of salt for every 1000 Liters). If you are unsure of the number of gallons in your pool, double-check with the following equations.

Notice: When adding large quantities of salt, start with an independent test of the existing salinity level and add in portions, retesting at each stage.

Calculating Gallons (Measurements in Feet)

Rectangular -Length x Width x Average Depth x 7.5

Round -Diameter x Diameter x Average Depth x 5.9

Oval -Length x Width x Average Depth x 6.7

Before adding salt, check your water for any existing salt content and add according to the chart below. If too little salt is added, the result will be reduced efficiency and a low level of chlorine production. In addition, operation at low salt levels will reduce the longevity of the cell. The salt in your pool is constantly recycled, and the loss of salt throughout the swimming season should be small. This loss is due primarily to the addition of extra water to replace water lost from splashing, backwashing, and draining. Salt is not lost due to evaporation.

POUNDS and (Kg) OF SALT NEEDED FOR 3400 PPM Gallons and (Liters) of Pool/Spa water:

Current salt level ppm	14,000 (52,500)	16,000 (60,000)	18,000 (67,500)	20,000 (75,000)	22,000 (82,500)	24,000 (90,000)	26,000 (97,500)	28,000 (105,000)	30,000 (112,500)	32,000 (120,000)	34,000 (127,500)	36,000 (135,000)	38,000 (142,500)	40,000 (150,000)
0	419 (190)	481 (218)	540 (245)	599 (272)	661 (300)	720 (327)	779 (354)	841 (381)	900 (409)	962 (436)	1021 (463)	1080 (490)	1139 (517)	1201 (545)
200	396 (180)	454 (206)	510 (232)	566 (257)	624 (284)	680 (309)	736 (335)	794 (360)	850 (387)	908 (413)	964 (439)	1020 (464)	1076 (490)	1134 (515)
400	373 (170)	427 (194)	480 (218)	533 (242)	587 (267)	640 (291)	693 (315)	747 (339)	800 (364)	854 (388)	907 (412)	960 (436)	1013 (460)	1067 (484)
600	350 (159)	400 (182)	450 (205)	500 (227)	550 (250)	600 (273)	650 (296)	700 (318)	750 (341)	800 (363)	850 (385)	900 (408)	950 (430)	1000 (453)
800	327 (148)	373 (170)	420 (191)	467 (212)	513 (233)	560 (256)	607 (276)	653 (297)	700 (318)	747 (339)	793 (360)	840 (382)	887 (403)	933 (424)
1000	303 (138)	347 (158)	390 (177)	433 (197)	477 (217)	520 (236)	563 (256)	607 (276)	650 (297)	693 (317)	737 (337)	780 (358)	823 (378)	867 (398)
1200	280 (127)	320 (145)	360 (164)	400 (182)	440 (200)	480 (218)	520 (236)	560 (255)	600 (273)	640 (291)	680 (310)	720 (328)	760 (346)	800 (364)
1400	257 (117)	293 (133)	330 (150)	367 (167)	403 (163)	440 (200)	477 (217)	513 (233)	550 (250)	587 (267)	623 (283)	660 (300)	697 (317)	733 (333)
1600	233 (106)	267 (121)	300 (136)	333 (152)	367 (167)	400 (182)	433 (197)	467 (212)	500 (227)	533 (243)	567 (258)	600 (274)	633 (289)	667 (304)
1800	210 (95)	240 (109)	270 (123)	300 (136)	330 (150)	360 (164)	390 (177)	420 (191)	450 (205)	480 (218)	510 (232)	540 (246)	570 (259)	600 (263)
2000	187 (85)	213 (97)	240 (109)	267 (121)	293 (133)	320 (145)	347 (158)	373 (170)	400 (182)	427 (195)	453 (207)	480 (219)	507 (231)	533 (243)
2200	163 (74)	187 (85)	210 (95)	233 (106)	257 (117)	280 (127)	303 (138)	327 (148)	350 (159)	373 (169)	397 (180)	420 (190)	443 (201)	467 (211)
2400	140 (64)	160 (73)	180 (82)	200 (91)	220 (100)	240 (109)	260 (118)	280 (127)	300 (136)	320 (145)	340 (154)	360 (163)	380 (172)	400 (181)
2600	117 (53)	133 (61)	150 (68)	167 (76)	183 (83)	200 (91)	217 (98)	233 (106)	250 (114)	267 (121)	283 (129)	300 (137)	317 (144)	333 (152)
2800	93 (42)	107 (48)	120 (55)	133 (61)	147 (67)	160 (73)	173 (79)	187 (85)	200 (91)	213 (96)	227 (104)	240 (110)	253 (117)	267 (123)
3000	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3200	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3400	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal
3600	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3800	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4000	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
4200	High	High	High	High	High	High	High	High	High	High	High	High	High	High
4400	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute

Install Cell:

Install using the unions provided. Tighten by HAND for a watertight seal. For pool/spa combination systems with spillover, refer to the above Overview to allow chlorination for both the pool and spa during spillover but preventing over chlorination when operating the spa only. For proper plumbing, refer to the overview diagram on page 6. NOTE: The following are basic plumbing instructions for the typical installation, which entail positioning the Flow Switch and Cell adjacent to each other on 2" plumbing. Your installation may vary depending on space available and your specific arrangement of equipment. IMPORTANT: Ensure that the pool pump and all AC power is turned off before installation.

Flow switch:

IMPORTANT: To ensure proper operation, verify that the arrow on the flow switch (located on the side) points in the same direction of water flow.

The Flow Switch and Cell are to be fitted into the return line as the last pieces of equipment the water passes through before returning to the pool: always after the pump, filter, heater (if applicable), etc. If a heater is present, all equipment must be a minimum distance away, per heater manufacturer recommendations. Lay out your equipment to ensure there is enough pipe space available.

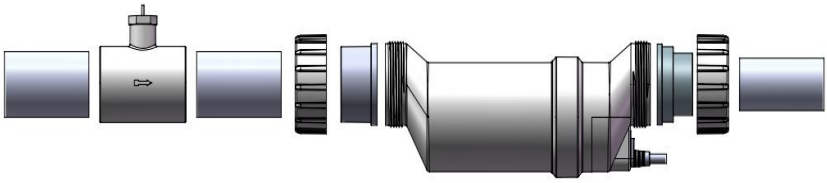
- When positioning the Flow Switch, ensure at least 6 to 12” (30cm) of straight pipe before the Flow Switch. If installed after the Electrolytic Cell, the Cell provides this space. The raised arrow on the black plastic cap must be pointed with the direction of water flow as it returns to the pool. If installed horizontally, ensure that the wire-side faces upwards. The Flow Switch is approximately 4" in length; the typical gap required is 1 ¼".
- When positioning the Cell, you can consider the side of the cell with the cord the "inlet" side. If installed horizontally, ensure that the wire- side

faces upwards. From end to end, the Cell with both Unions is approximately 15 ¾" in length; the typical gap required is 13 ¼".

Refer to the overview diagram on page 6 for alternate configurations. For combined pool and spa systems with a spillover, allow chlorination for both the pool and spa during spillover but preventing possible over-chlorination when operating the spa only. Vertical Installation Kits are also available to minimize plumbing space required and increase ease of installation.

TIP: Double-check that all Cell and Flow Switch cables can reach the Control Panel.

Note: For installations with 1 ½" plumbing, use 2" to 1 ½" reducer bushings with flow switch, and use alternate 1 ½" Cell Unions; be sure to note any new or additional measurements before cutting pipe.

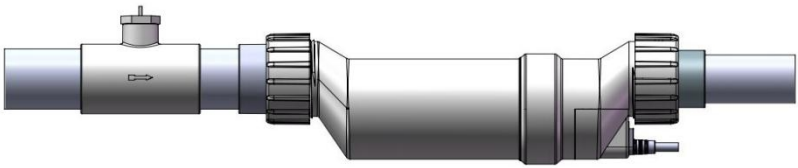


After determining the section of plumbing to install the Flow Switch and Cell, measure out and mark the selected area.

1. To install the Flow Switch, cut out a section of pipe at the desired installation location. Use PVC Primer to clean and prepare the pipe ends and interior of Flow Switch. Using plumbing Solvent Cement, glue the Flow Switch to the pipe ends. Ensure excess glue does not become affixed to movable parts within Flow Switch. IMPORTANT: To ensure proper operation, verify that the arrow on the flow switch (located on the black plastic) points in the direction of water flow; the water flow must

depress the hinged activator inside of the Flow Switch. This portion is threaded and may be turned during service; additional thread seal tape may be added if necessary.

2. To install the Cell Unions, cut out a section of pipe at the desired installation location. Clean parts and plumbing with PVC Primer to prepare the pipe ends and interior of Unions. Place the Threaded Collars over the pipe ends. Using plumbing Solvent Cement, glue one Union to the pipe end.
3. Hold the Cell and second Union up to the first, to gauge the correct distance before gluing the second Union to the remaining pipe end. Allow sufficient time for glue to dry.
4. Ensure that the O-rings are fitted to the Unions. Place the Electrolytic Cell between the Unions and tighten the Collars onto the Cell. For a watertight seal, do not over-tighten the Collars, and only tighten them by hand.
5. When using a Variable-Speed or Multi-Speed pump on a low speed setting, the cell should be inverted in order to ensure adequate flow & efficient chlorine production.



Install Control Unit:

The CFSC control must be mounted a minimum of 5 ft. (2 meters) horizontal distance (or more if local codes require) from the pool/spa. The control is designed to mount vertically on a flat surface facing downward. Because back of enclosure also acts as a heat sink (disperses heat from inside the box), it is important not to block the back sides of the control.

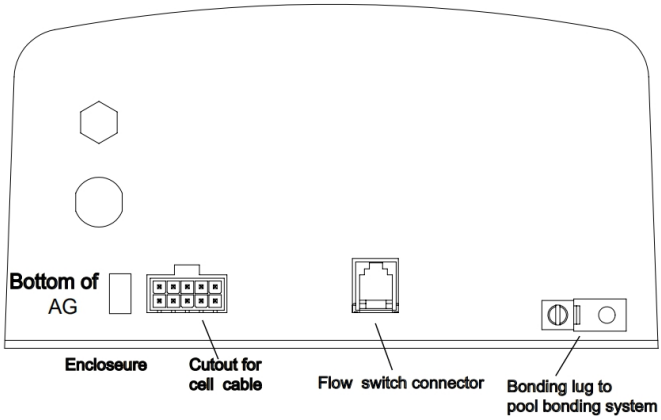
Overview: Using screws, secure the Control unit mounting at a comfortable level on a wall or vertical support, at least 3 feet above ground level. Minimize direct exposure to rain, sunlight, water runoff, and lawn sprinkler systems. As with most electronics, avoid placing the controls in tightly enclosed spaces to avoid a build-up of excess heat. For operation, the Control Unit may be wired in to the pump's power source so that both turn on and off together, or energized continuously for use with variable speed pumps (Flow switch will control Cell power but lights will remain on).

Notice: Do not operate unit until all salt is dissolved in pool water

Wiring: Power must be shut off at the circuit breaker before performing any wiring. Be sure to follow local and NEC/CEC electrical codes. The system has been designed to easily wire into typical in- ground pool systems. To provide safe operation, the unit must be properly grounded and bonded.

Bonding: A lug used for bonding is attached to the bottom of the Control Unit. The Control Unit must be bonded with an 8 AWG copper wire to the pool bonding system.

Electrolytic Cell and Flow Switch Connections: The Cell and Flow Switch cables have easy plug-in connectors, which attach easily to the Control Unit. Refer to the diagram below for the location of these connections.



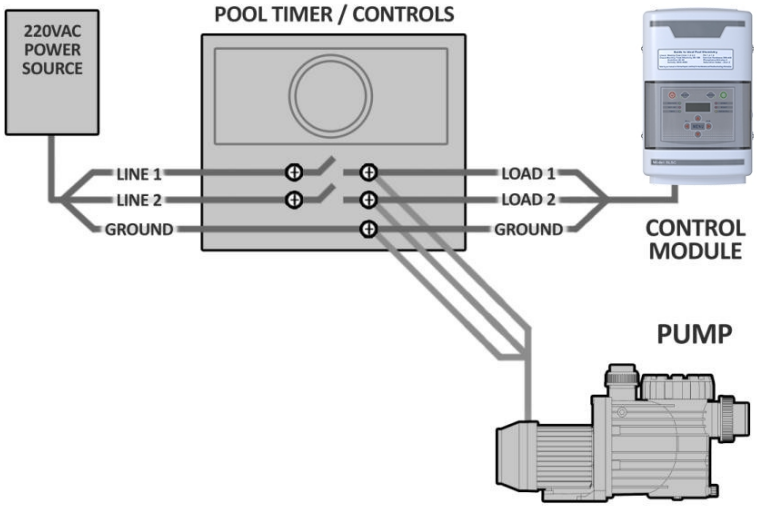
Wiring to Power Source:

The Control Unit comes with an un-terminated Power Cord (AC Input) which is typically connected to an external timer, which will turn the pump and Control Unit on and off together. Have the Control Unit wired to the load side of the timer by a qualified person. See the following diagram for typical wiring. See voltage warning on page 16.

It is shipped from the factory with a 240 VAC configuration. If 120 VAC is needed, move the internal jumpers as shown on page 17. If unsure, seek professional advice.

When used with variable-speed or other electronically controlled pumps, you may wish to wire the Control Unit directly to your power source. This will allow the pump to determine when the Cell is energized or dormant by activation of the Flow Switch.

Always double-check the voltage of your power source. Connection to improper voltage can: a) cause severe damage/harm, or b) cause lights and screen to power on without system function.



In some parts of the United States and Canada, the Control Unit must be connected to a circuit protected by a Class A ground fault interrupter (GFI). Check local codes before connecting.

At this point, this installation of your equipment is complete. If the water has not yet been prepared, then you are ready to begin adding salt and balancing your water chemistry. Turn to Control Unit to the Power Off mode until enough salt has been added to the water.

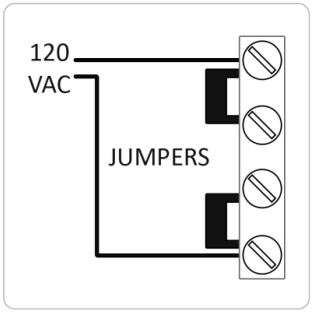
The following information will give you more information about the process of adding salt. Be sure to familiarize yourself with your pool's ideal chemistry levels, which play a critical role in the operation and longevity of your pool and pool equipment.

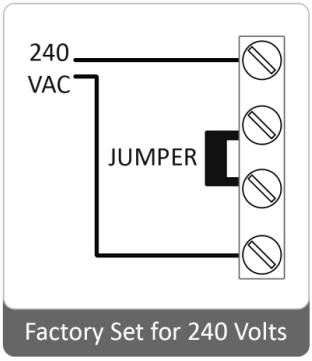
Voltage Conversion:

Always double-check the voltage of your power source. Connection to improper voltage can: a) cause severe damage/harm, or b) cause lights and screen to power on without system function.

All service should only be attempted by a person with appropriate electrical skills, with all equipment disconnected from power.

It is shipped from the factory with a 240 VAC configuration. If 120VAC is needed, move the internal jumpers as shown below. If unsure, seek professional advice.





This set of terminal screws can be located inside of the Control Unit, and accessed by removing the four screws from the Control Unit's aluminum base. The factory voltage setting is the 240V configuration, with a jumper clip inserted between the second and third terminals. The Control Unit can be made to accept 110V by reconfiguring the jumper clips as shown above left, with two jumper clips instead connecting the first and second terminals, and the third and fourth terminals.

Installation Checklist

Cell Unions installed and glued into pipe work.

- Threaded Collars on either side of the Cell are hand tight.
- Flow Switch is installed and oriented properly.
- Control Unit is affixed to wall and wired correctly.
- Cell Cable and Flow Switch are connected to Control Unit.
- You have checked and confirmed that Control Unit switches ON and OFF concurrently with filter pump, or is energized continuously for use with variable speed pump.
- You have checked all connections and joints for leaks.
- Sufficient salt has been added and fully dissolved and circulated throughout pool water.
- Pool has properly balanced water chemistry.

Initial Start Up:

Once installation is complete, ensure that the added salt has been fully dissolved in the pool, and that the pool is clean and chemically balanced.

Apply power to the pool pump switch (or timer controls). This should activate the system, and within moments the green LED lights for "Power" and "Generating" should be illuminated. During this time, you may also see the "No-Flow" light flash for up to 60 seconds as your pump begins its operation.

To find the optimum Chlorine Output setting, start at a setting of 70% and adjust as needed over the initial startup period. Measure your available chlorine in the pool after two to three days, and adjust the Chlorine Output level accordingly. If the available chlorine is too high, lower the Output level; if the available chlorine is too low, raise the Output level. It will take a few adjustments to find the ideal setting for your pool. Once determined, it should only take minor adjustments throughout the season.

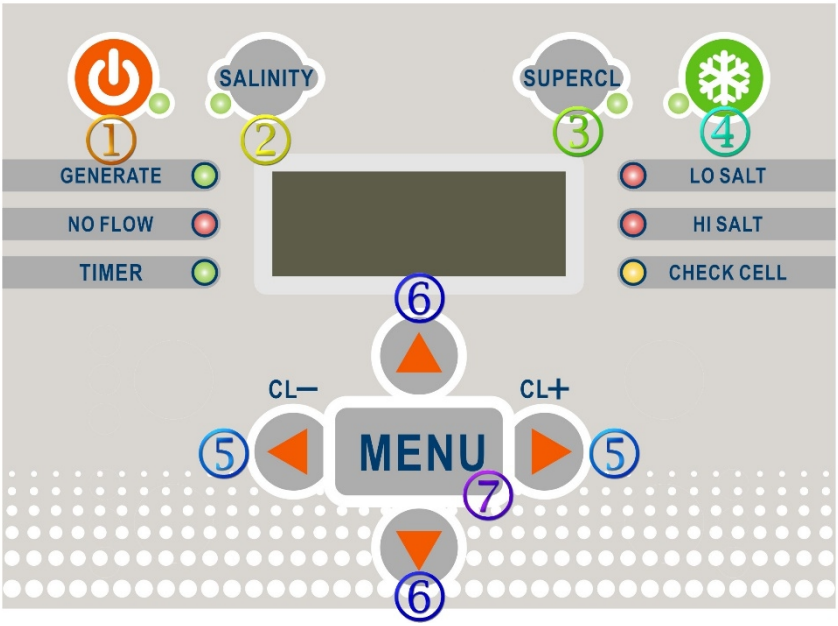
Operation:

By familiarizing yourself with the operation of the CFSC, you can achieve the maximum performance for your pool. There are typically three (3) factors that you can control which directly contribute to the amount of chlorine they will generate:

1) The chosen percentage of Chlorine Output
2) Hours of pump run- time each day
3) Water chemistry balance, including the amount of salt in the pool, and chemicals that minimize chlorine demand, such as stabilizer level in the water. See "Ideal Chemistry Levels" for more important information.

After making the initial adjustments to your chosen Chlorine Output level, additional adjustments are typically only necessary due to changing seasonal temperatures, or changes in pool use and bather load. Ensure that your pump runs long enough each day to move at least two times the amount of water in your pool through the filter daily. This is typically more than a sufficient amount of time for chlorination of the pool, but if the pool has high chlorine demand, running the pool pump longer allows for more chlorination. Measure your water chemistry and chlorine level on a regular basis.

Control Keypad



Control Buttons:

Power: Use this button to manually power the system on or off.

Salinity: Displays the average measurement of the most recent salinity levels in the pool water. The average is constantly being updated by real-time salinity readings.

Notice: When first installed, this reading may display the last salinity readings taken at the factory. This average will begin to update with your pool's operation over the first 24 hours.

Super CL: Temporarily boosts Chlorine Output to Maximum Power for 24 hours, or until power is removed from the system.

Winter Mode: Reduces the chosen Chlorine Output setting by half, for periods of low chlorine demand during cool weather.

Chlorine Output: Use the left/right arrow buttons to raise/lower the system's power setting (the rate of chlorine production), in order to customize operation for your pool's needs.

Select: While in the Menu, the left/right arrows change options for Pool Temperature, Instant Salinity, and Cell Version.

Menu: Press sequentially to cycle through the following information:

1. Pool Temperature (xx degrees Fahrenheit or Celsius)
2. Cell Voltage (in many cases 21.0 to 27.0 volts when chlorine is being generated, otherwise 16-31V)
3. Cell Current (in many cases 2.50 to 7.80 amps when chlorine is being generated, otherwise 0 amps during normal rest cycles.)
4. Real-Time Salinity reading (xxxx ppm or x.x grams/Liter.)
5. System ID
6. Software revision level
7. Cell Version.

LED Indicator Lights

- **Power**: Located on the Power Button, this LED indicates that the Control Unit is receiving input power when illuminated.
- **Generate**: This LED is illuminated during normal operation, and indicates that the system is generating chlorine. When flashing, the pool water is either too hot or too cold for chlorine generation. This light is off during rest periods of the system's duty cycle
- **Super CL**: Located on the Super CL Button, this LED is illuminated when the Super CL mode is active.
- **Winter Mode**: Located on the Winter Mode Button (snow flake icon), this

LED is illuminated when the winter mode has been activated.

- **Salinity**: Located on the Salinity button, this LED is illuminated when the button has been pressed to display the salt level reading.
- **No Flow**: This LED is illuminated when the Flow Switch has detected no flow. This causes the Cell to stop generating chlorine. A flashing LED indicates that the flow is restored, but there will be a 60 second delay before generation is reestablished.
- **Lo Salt**: When this LED is flashing, the salt level is near to its minimum threshold, which is causing the Cell to operate at low efficiency. When this LED is illuminated steadily, the salt level is too low and Cell has shut down. The salt level must be raised before operation is restored. See "Adding Salt" for more information.
- **Hi Salt**: When this LED is flashing, the salt level is higher than necessary. When this LED is illuminated steadily, the salt level is too high and the Cell has been shut down. The pool water must be diluted with fresh water before operation is restored.
- **Check Cell**: When this LED is illuminated, Cell efficiency is greatly reduced,or it is time for regularly scheduled Cell inspection. The Electrolytic Cell should be inspected and cleaned (if necessary). Remove power from the system, and inspect the Cell. If mineral build-up is present, clean Cell according to the instructions on page 25. If after inspection, the Check Cell light is still on after restoring power to the system, then cleaning is necessary even if mineral build-up wasn't immediately visible to the eye. If illuminated after cleaning, Cell replacement may be necessary. This light takes priority over any salinity indicators.
- **SAFETY NOTICE:** Using the Power Button to turn the system OFF does not remove power from the control box. Always disconnect power at the circuit breaker prior to attempting any service procedure.

General Maintenance:

To maintain maximum performance, it is recommended that you remove and visually inspect the cell at least every 3-4 months.

The Electrolytic Cell has a self-cleaning feature incorporated into the electronic control's logic. In most cases, this self-cleaning action will keep the cell working at optimal efficiency and help to inhibit mineral build-up. In areas with very hard water (high calcium and/or mineral content), and in pools with poor water chemistry, the cell may require more frequent cleaning (see below). If the "Check Cell" LED remains on after a thorough cleaning, it may require additional cleaning, or the cell may be at the end of its life cycle and may require replacement.

See "Maintaining the Electrolytic Cell" for cleaning instructions.

Maintaining the Electrolytic Cell:

As a natural result of the electrolytic process which creates chlorine from salt molecules, a white mineral build-up is attracted to the titanium plates in the Cell. The self-cleaning feature helps to inhibit such build-up and scaling. However, the attraction of minerals is inevitable, and eventually it must to be removed. The Control Unit will illuminate the " Cell" light when such cleaning is necessary. With correct water chemistry, the Cell will typically only need cleaning once or twice a season.

When Removing the Cell for Cleaning or Replacement:

1.Turn off all power, close return line valves if applicable.

2.Unplug the cell cable connecting the Cell to the Control Unit.

3.Unscrew threaded collars around the PVC piping that connect the Cell to the return line plumbing.

4.Pull entire Cell away from the Unions.DO NOT pull or hold the Cell by its cable.

To Clean the Cell of Mineral Buildup:

1. Attach Cleaning Cap (sold separately) and orient the Cell vertically. Place on the ground and stabilize so as to remain upright and prevent spilling.
2. In a separate bucket, mix one-part muriatic acid into four parts water. Pour this weak acid solution directly into Cell. Ensure that the cleaning solution COMPLETELY fills the inside of the Cell.
3. Allow solution to soak for NO MORE THAN TEN MINUTES.
4. Properly dispose of acid solution and use a hose to generously rinse the Cell.
5. Reinstall Cell into PVC return line.

Note: If mineral build-up is severe, more than one cleaning may be necessary to dissolve remaining solids. Cleaning the Cell is only necessary to remove an excessive build-up of minerals on the plates. A light coating of minerals does not impede performance. Excessive cleaning will reduce lifespan of the cell. If submerging entire Cell assembly, do not allow Cell cable to be covered by liquid.

IMPORTANT: When cleaning the Cell always wear adequate protection, such as rubber gloves and eye protection. Always add acid to water, do not add water to acid. Always work in a well-ventilated area. Splashing or spilling acid can cause severe personal injury and/or property damage.

Winterizing:

Very little chlorine is necessary at low temperatures. They will not produce chlorine at very cold temperatures, especially below 50° F. This feature extends the lifespan of the Cell. The Electrolytic Cell will be damaged by freezing water just as your pool plumbing would. In areas which experience severe or extended periods of freezing temperatures, be sure to drain all water from the pump, filter, supply and return lines before any freezing conditions occur. The

Control Unit is capable of withstanding any winter weather and does not need to be removed dia.

Spring Start-up:

When opening the pool after a period of inactivity, do not power on and use the chlorine generator until the pool's water chemistry has been balanced and brought to ideal levels.

Replacing the Cell：

When the titanium blades inside the Electrolytic Cell have reached the end of their lifespan, replacements are available so that the whole system does not have to be removed. Replacements are easily switched out. To ensure quality and value, only genuine replacement parts may be used. Bypass cells are available, and may be used to continue to run water through the plumbing without the Electrolytic Cell in place.

HELPFUL NOTES:

Proper operation of the chlorine generator can be easily verified by checking the lights on the control panel.However,if the pool remains cloudy,or the chlorine residual tests low,then the chlorine being produced is being lost due to high chlorine demand or improper water conditions.

To reduce the chlorine demand,check the pH and Stabilizer (Cyanuric Acid) reading. Check for phosphates and nitrates, which commonly contribute to severe chlorine demand.If tests show correct,then a shock treatment with an oxidizer agent is advised. Generally, super chlorination is not necessary if the pool is maintained at correct levels.

Recommended List:

•Read and keep your manual in a safe place.

•Increase Chlorine Production when temperature goes up.

•Increase Chlorine Production when number of guests goes up.

•Use Stabilizer (Cyanuric Acid) to protect free chlorine in pool.

•Mount Control Unit in shade or out of the direct sunlight whenever possible.

•Decrease Chlorine Production when temperature goes down.

•Take pool water sample to a Pool Professional at least once per month.

Not Recommended List:

•Do not allow fertilizer anywhere near your pool. Fertilizers are one of many sources that contain Nitrates or Phosphates which cause severe chlorine demand in pool water.

•Never use dry acid to adjust ph. A build-up of by-products can damage the Cell.

•Do not add any pool water balancing chemicals (including salt) unless the Control Unit is turned off.

•Do not add any chemicals (including salt) to the skimmers.

•Do not let salinity level drop below 3000 ppm.

TROUBLESHOOTING

Situation	Possible Cause	Suggestion
Start the machine without reaction, no display	Check the power connection	Use test pencil to check if there is electricity
		Change the socket
		Check the wire connection
		Check the overload protection device
	Check the fuse	If fuse blow out,replace it
	If the PCB board just be replaced	Check the connection of the PCB is right or wrong
		Check the transformer to see it is good or not
"NO FLOW" light on	No flow or too little low	Check if pump is connected,if use variable speed pump,speed up the water flow.Keep flow rate at least 25-30 GPM
	Wrong flow direction	Remain the flow direction same as the arrow outside the flow switch
	Flow switch or crystal plug is broken	Change the flow switch

"NO FLOW" light is blinking	Start the machine, it is normal that the light blink because it need time to detect the water flow	Normal
	Variable speed pump,water flow too slow	Change the flow switch
"Generating " light is flashing	Check the temperature in the swimming pool is whether too high or too low	Check the temperature,water temp should be above 55°F,less than 122°F
"Check Salt" and "Inspect Cell" light on	Check cell type	Match the right cell type with the program
	If use variable speed pump,water flow too slow	Speed up the water flow
	Actual Salinity is less than 2300PPM	Add salt,ideal salt level 3500-3600ppm
	Cell is blocked	Clean the cell
	Temperature sensor is broken	If not, replace flow switch with a temperature sensor
	PCB or cell may is broken	Contact distributor
"Check Salt" light is flashing	Check cell type	Match the right cell type with the program
	Actual Salinity is between 2300-2500PPM	Add salt,ideal salt level 3500-3600ppm
	Cell is blocked	Clean the cell
"High Salt" light blinking	Check cell type	Match the right cell type with the program
	Actual Salinity is between 4500-6400PPM	Add water,ideal salt level 3500-3600ppm

	Temperature sensor is broken	If not, replace flow switch with a temperature sensor
	The cell plates are short-circuit because they are not fixed in the housing	Change the cell
	PCB is broken	Change the PCB
"High Salt" and "Inspect cell" light is on	Check cell type	Match the right cell type with the program
	Actual Salinity is more than 6500PPM	Add water,ideal salt level 3500-3600ppm
	Temperature sensor is broken	If not, replace flow switch with a temperature sensor
	The cell plates are short-circuit because they are not fixed in the housing	Change the cell
	PCB is broken	Change the PCB
Low or no Chlorine in pool	The water temp too high or too cold	Check the temperature,water temp should be above 55°F,less than 122°F
	PH not normal, the water in alkalinity will influence the chlorine	Keep PH 7.2-7.7
	Bad water quality has large quantity of microorganism or germ will consume the chlorine	Change good quality water
	With chemistry, like Chemical Fertilizers and Pesticides	Ensure all chemicals on page.7 are within range

TWO YEAR LIMITED WARRANTY

(For RESIDENTIAL USE)

Guarantee that CFSC will be free from defects in materials and workmanship, defects in normal use and non-commercial applications within two (2) years specified below.

Two (2)years limited warranty for the CFSC and its components.
During year one:100%
During year two: 100%

WARRANTY (FOR COMMERCIAL USE)

The CFSC Salt Chlorinator Systems carry the following Limited Warranty shoul d failure occur due to faulty manufacture or materials, during normal use and s ervice. For Commercial use (any pool that is not for private single-family use, o r the use of which is subject to regulation), we warrant to the original purchaser that the equipment shall be free of manufacturer's defects at the time of sale, a nd upon examination shall provide replacement parts in accordance with the following schedule:
One (1) year limited warranty for residential use, but for commercial use 6 months only.
Two (2) years limited warranty for residential use, but for commercial use 1 year only.

TERMS OF SALE: Refund is void if you have installed, used or damaged the item in any way. Item must be returned with its original box, packing materials and instructions (if applicable) in the same perfect new condition.

This limited warranty is subject to the following terms, conditions, and exclusions:

1. To obtain the benefits of this warranty, contact the warranty department for troubleshooting.
2. Should a defect in any item or part covered by the warranty become evident during the warranty's term, Products will at its sole discretion repair or replace such item or part. Products reserves the right to replace defective parts with new or refurbished parts. This warranty does not include the cost of labor or transportation charges for equipment or component parts to or from Products, or the removal, re-installation, or any such costs incurred in obtaining warranty replacements or repair.
3. This warranty extends to the original retail purchaser and original installation site only, beginning at the original date of purchase, and is non-transferrable.
4. The warranty contains the following exclusions. O-Rings, rubber gaskets, electrical fuses, and circuit-breaker components are normal replacement items subject to wear and are excluded from the warranty.

- **Product discoloration, or any other cosmetic or superficial damage or deterioration, regardless of its cause, is not covered by this warranty. The warranty is not applicable to problems arising from circumstances outside the control of Products,**

including, but not limited to the following:

A. Damage or premature wear due to improper pool chemistry, and failure to maintain pool water chemistry in accordance with the recommendations contained in the owner's manual.
B. Damage due to improper installation or connection to improper voltages, including materials and workmanship supplied by others.
C. Damage due to negligence or failure to properly maintain equipment, including the maintenance of clean and tight electrical connections.
D. Damage due to improper service, as well as unauthorized equipment modifications and use of non-genuine replacement parts.
E. Damage due to misapplication, misuse, abuse, overuse the cell lifetime (over 10 hours per day) or failure to operate equipment as specified in the owner's manual.
F. Problems resulting from tampering, accident, fire, flood, freezing, lightning, insects, or other natural elements, or other circumstances beyond the control of Products.
G. Damage due to over-tightening of threaded components or excessive pressure or stress.
H. Material supplied or workmanship performed by others in the process of installation.

The liability of Products shall not exceed the repair or replacement of defective items or parts under the referenced limited warranty terms. There are no implied warranties of merchantability or fitness for a particular purpose that apply to this equipment. Under no circumstances shall Products, its agents, employees, and affiliates be liable for any loss, damage, injury, inconvenience or loss of time, incidental expenses such as labor and material charges, or any other incidental, or consequential damages, which may result from the use,

installation, removal, or re-installation of its equipment and parts.

This warranty is valid only in Canada. This warranty gives you specific legal rights and you may also have other rights, which vary from province to province. This warranty supersedes all previous publications. Any dispute between the original purchaser and Products should be addressed to the Consumer Protection Office.

Disclaimer: This limited warranty is the entire warranty. No other warranties apply, expressed or implied. This limited warranty gives you specific legal rights, which varies accordingly from province to province. Under no circumstances shall the manufacturer or authorized agents/installers be responsible for consequential, special, or incidental damage(s) of any kind, including but not limited to personal injury. Property damage or damage to or loss of equipment. The manufacturer or agents/installers are not liable for any other expenses that may be encountered during installation or servicing.
Authorized agents/installers may charge a trip fee for warrantable service work. Some states do not allow the exclusion of limitations of incidental or consequential damages.

Listed exclusions and limitations may not apply to you.
During the full coverage warranty process, we cover all replacements, repairs and labor cost. The customer is responsible for shipping to and from our warranty center.

CFSC CHLORINE GENERATOR CONTROLS BACTERIA AND ALGAE In Swimming pool (Spa) Waters Domestic OR Commercial

- A maximum of 60,000 gallon of water can be treated with one CFSC unit.
- For swimming pools, a range of 1-3 ppm of free available chlorine must be maintained.
- For spas, a range of 3-5 ppm of free available chlorine must be maintained.

READ THE LABEL AND OPERATING MANUAL BEFORE USING & KEEP OUT OF REACH OF CHILDREN

WARNING: operating the CFSC without water flow through the cell can cause a buildup of flammable gases, which can result in FIRE OR EXPLOSION

CFSC CELL REPLACEMENT
The CFSC Replacement electrode is only for this model chlorine generating device.

- This cell must only be used on this model of chlorine generating device.
- Read the Label, the Installation Manual and Operation Manual of the chlorine generating device CFSC before using.

For all warranty related issues contact customer service at 1-833-766-2333 or email info@aquascapepooltech.ca