

# SALT CHLORINE GENERATOR



## USER'S MANUAL

(CFICGEN20, CFICGEN40, CFICGEN60)

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# IMPORTANT SAFETY INSTRUCTIONS

Use basic safety precautions when using electrical equipment, including the following:

## **Cautions:**

Please note, the total working hours for the CFICGEN 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 kick the speed up until the salt system works.

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## **READ AND FOLLOW ALL INSTRUCTIONS**

- Disconnect all the AC power during installation.
- Children should not be permitted to use this product.
- To reduce the risk of personal injury, the power supply pack must be installed on and wired to the load side of the time clock or relay load side.
- To reduce the risk of electric shock, the power supply pack must be grounded.
- All field-installed metal components such as rails, ladders, drains, or other similar hardware located within 10 feet (3 meters) of the pool, spa, or hot tub shall be bonded to the equipment grounding bus with copper conductors not smaller than 8 AWG US/ 6 AWG Canada.
- Consult professional pool serviceman to advice you on proper use, especially on material selection, installation advises, pool care. As the salt is an inherently corrosive material, the CFICGEN cannot make sure any other pieces of equipment in or around pool will not corrode.
- Avoid chlorine gas build up. When the pump is OFF, a buildup of flammable gases will result in hazardous conditions.
- Add acid to water, do Not ever do opposite.

# Water Chemistry

**CAUTION:** Dry acid can cause a buildup of by-products that can damage the chlorinator cell.

## **CHEMISTRY TIPS**

**New Pool Water:** A recently filled or newly-refinished pool may contain undesirable matter. This undesirable matter could interfere with the CFICGEN's ability to chlorinate properly. Make sure the water is tested by a pool professional and properly balanced before switching on the CFICGEN.

**Super Chlorination:** Clears out the swimmer waste that has combined with chlorine. This frees the chlorine for sanitizing. This is accomplished by raising the chlorine level quickly and dramatically. When the chlorine level is raised to ten (10) times the amount of combined chlorine, the pool water is said to have been super chlorinated. As pool water is continuously circulated through the CFICGEN while the unit is powered on, the water inside the CFICGEN is being super chlorinated.

*Note: On the initial start-up of a pool, it is best to super chlorinate using an outside source, i.e., use a shock treatment available at your local pool supplier.*

**Chloramines** should not be present in pool water. Chloramines are formed when ammonia (which is found in urine and sweat) combine with free chlorine. This ties up the free chlorine in your pool and does not allow the chlorine in your pool to disinfect. Chloramines also burn the eyes and are foul-smelling. Super Chlorinate to remove chloramines at the initial start-up of the pool and as needed to maintain proper levels of free chlorine.

**Cyanuric acid** is needed in outdoor pools to help stabilize and maintain proper levels of chlorine.

90% of un-stabilized chlorine is destroyed by the UV radiation from the sun within two hours. Cyanuric acid stabilizes chlorine in the water and protects from UV degradation. When using the CFICGEN, the cyanuric acid level should be maintained between 30-50 ppm. (See on page 8)

**NOTE: DO NOT USE CYANURIC ACID IN INDOOR POOLS.**

**Total Dissolved Solids (TDS):** Adding salt to pool water will raise the TDS level. While this does not adversely affect the pool water chemistry

or clarity, the pool water professional testing for TDS must be made aware the salt has been added to the CFICGEN system. The individual performing the TDS test (see page 17) may then subtract the salinity level to arrive at a TDS level that would be compatible to a TDS reading with a non-salt water pool.

**Metals:** Some metals (i.e. copper and iron), can cause loss of chlorine. Also, metals can stain your pool and can cause damage to the CFICGEN. Have your local pool professional check for metals and recommend methods of removal.

**Nitrates and Phosphates:** can cause extremely high chlorine demands and will deplete chlorine from your swimming pool. In some cases, nitrates may even lower your chlorine levels to zero. Your local pool professional can test for nitrates and phosphates. While a 0-ppm level of nitrates is ideal, the pool owner should make sure that nitrates **DO NOT** exceed 10 ppm.

## **IDEAL WATER CHEMISTRY LEVEL**

Voltage input:	230VAC/115VAC
PH:	7.2-7.8
Calcium Hardness:	200-400 ppm
Total Alkalinity:	80-100 ppm
Salt:	2800-4500 ppm (ideal 3400 ppm)
Cyanuric Acid:	30-50 ppm
Chlorine:	1-3 ppm

### **How to test chlorine**

It is recommended that chlorine test samples be taken from two (2) locations in the pool and then compare the samples. A higher level should be found at the pool return line. The higher level at the pool return line indicates the CFICGEN is producing chlorine. Take chlorine samples for testing at:

- The pool return line.
- 18 inches (457 mm) below the surface and well away from the pool return line.

### **What kind of salt?**

It is important to use only sodium chloride (NaCl) that is 99% pure. This is a common food seasoning or water softener salt available in 40-80-pound bags your local store. It is also acceptable to use water conditioning

salt pellets; however, it will take longer for them to dissolve. Do not use rock salt, salt with more than 1% yellow prussiate of soda (sodium ferrocyanide), salt with more than 1% of anti-caking additives, or iodized salt.

#### **FOR ALL NEWLY SURFACED PLASTER POOLS:**

Do not operate the CFICGEN with a newly surfaced pool plaster. Salt is a corrosive element and severe salt damage can occur to your pool. Wait at least ONE (1) MONTH after construction to allow the plaster to cure before adding salt and operating the CFICGEN. Follow the pool surface manufacturer's guidelines for your specific pool, salt and operating CFICGEN.

**FOR NEW VINYL LINER POOLS:** Prior to adding, contact the manufacturer for recommended guidelines.

#### **How Much Salt to Use?**

Use the table on page 7 to determine how much salt will be needed. Most pools contain some salt, depending on the water source and chemicals used for sanitizing. Therefore, the pool owner must always test salt levels before adding salt. A handheld meter calibrated for NaCl (salt) can be used to determine the salt levels of the water. The LED Lights will give info on the salt level.

- 3400 ppm of salt is recommended for optimum water conditions.
- Low salt concentration below 2300 ppm or above 6000 ppm will cause the unit to turn off

*Note: Salt measurements will vary between measuring devices (salt test strips, electronic testers, and titration). The salt sensor reading is within +/- 300 ppm accuracy. For more troubleshooting information about high salt levels, see "Troubleshooting," on page 21.*

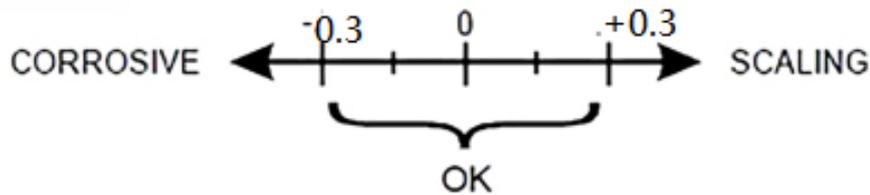
#### **Saturation Index**

The saturation index is a formula that measures a solution's ability to dissolve or deposit calcium carbonate and is used as an indicator of the corrosivity of the solution and temperature. Correctly balanced water chemistry will have a formula result ranging between -0.3 and +0.3. Outside this range, the pool water is considered out of balance, potentially damaging pool equipment or scaling the CFICGEN. The equation to calculate Si is: **SI = pH + CHF + AF + TF + TDSF.**

Cyanuric acid in the form of cyanurate ions which contributes to alkalinity. Thus, a correction must be made to total alkalinity. We subtract 1/3 of the cyanuric acid level from the reading obtained in the total alkalinity test.

$$\text{Total Alkalinity} - \frac{1}{3} \text{Cyanuric Acid} = \text{Corrected Alkalinity}$$

This correction can be considerable in established pools with high cyanuric acid levels; for example, at 100 ppm cyanuric acid, the correction amounts to 33 ppm ( $100/3 = 33.3$ ).



°C	°F	T i	Calcium Hardness	Ci	Total Alkalinit y	Ai
12	53	0.3	75	1.5	75	1.9
16	60	0.4	100	1.6	100	2.0
19	66	0.5	125	1.7	125	2.1
24	76	0.6	150	1.8	150	2.2
29	84	0.7	200	1.9	200	2.3
34	94	0.8	250	2.0	250	2.4
39	103	0.9	300	2.1	300	2.5
			400	2.2	400	2.6
			600	2.4	600	2.8
			800	2.5	800	2.9

**Note:** Use the reading on the chart that is most applicable. Total alkalinity in this context refers to the total amount of carbonate and bicarbonate alkalinity. If cyanuric acid is used, a correction factor must be used when determining.

## **How to Add or Remove Salt**

Check salt level before add or remove salt

**IN-Ground POOLS:** Turn the filter pump on and add the salt directly into the pool at the shallow end.

**ABOVE GROUND POOLS WITH MAIN DRAINS:** Add directly in front of the return jet to pool. Run the filter pump for 24 hours with the suction coming from the main drain (use the pool vacuum if there is no main drain) to allow the salt to evenly disperse throughout the pool.

**ABOVE GROUND POOLS WITHOUT MAIN DRAINS:** Add directly into the pool. Brush the salt to speed up the dissolving process—to not allow the salt to sit in a pile on the bottom of the pool. --ELIMINATE THE FOLLOWING--(Run the filter pump for 24 hours with the suction coming from the main drain (use the pool vacuum if there is no main drain) to allow the salt to evenly disperse throughout the pool).

**ON ANY POOL, DO NOT ADD SALT DIRECTLY TO THE SKIMMERS OR DIRECTLY ONTO THE MAIN DRAIN. THIS WILL SHUT DOWN OR SHORTEN THE LIFE OF THE CELL DUE TO HIGH SALT CONCENTRATION AND REDUCED FLOW TO THE PUMP.**

## POUNDS and (Kg) OF SALT NEEDED FOR 3400 PPM

Current salt level ppm	Gallons and (Liters) of Pool/Spa water																
	8,000 (30,000)	10,000 (37,500)	12,000 (45,000)	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	213 (97)	267 (121)	320 (145)	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)
200	200 (91)	250 (114)	300 (136)	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)
400	187 (85)	233 (106)	280 (127)	327 (148)	373 (170)	420 (191)	467 (212)	513 (233)	560 (255)	607 (276)	653 (297)	700 (318)	747 (339)	793 (360)	840 (382)	887 (403)	933 (424)
600	173 (79)	217 (98)	260 (118)	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)
800	160 (73)	200 (91)	240 (109)	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)
1000	147 (67)	183 (83)	220 (100)	257 (117)	293 (133)	330 (150)	367 (167)	403 (183)	440 (200)	477 (217)	513 (233)	550 (250)	587 (267)	623 (283)	660 (300)	697 (317)	733 (333)
1200	133 (61)	167 (76)	200 (91)	233 (106)	267 (121)	300 (136)	333 (152)	367 (167)	400 (182)	433 (197)	467 (212)	500 (227)	533 (242)	567 (258)	600 (274)	633 (289)	667 (304)
1400	120 (55)	150 (68)	180 (82)	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 (273)
1600	107 (48)	133 (61)	160 (73)	187 (85)	213 (97)	240 (108)	267 (121)	293 (133)	320 (145)	347 (158)	373 (170)	400 (182)	427 (195)	453 (207)	480 (219)	507 (231)	533 (243)
1800	93 (42)	117 (53)	140 (64)	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)
2000	80 (36)	100 (45)	120 (55)	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)
2200	67 (30)	83 (38)	100 (45)	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)
2400	53 (24)	67 (30)	80 (36)	93 (42)	107 (48)	120 (55)	133 (61)	147 (67)	160 (73)	173 (79)	187 (85)	200 (91)	213 (98)	227 (104)	240 (110)	253 (117)	267 (123)
2600	40 (18)	50 (23)	60 (27)	70 (32)	80 (36)	90 (41)	100 (45)	110 (50)	120 (55)	130 (59)	140 (64)	150 (68)	160 (73)	170 (77)	180 (81)	190 (86)	200 (90)
2800	27 (12)	33 (15)	40 (18)	47 (21)	53 (24)	60 (27)	67 (30)	73 (33)	80 (36)	87 (39)	93 (42)	100 (45)	107 (48)	113 (51)	120 (54)	127 (57)	133 (60)
3000	13 (6)	17 (8)	20 (9)	23 (11)	27 (12)	30 (14)	33 (15)	37 (17)	40 (18)	43 (20)	47 (21)	50 (23)	53 (24)	57 (26)	60 (27)	63 (28)	67 (30)
3200	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal	Ideal
3400	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
3600+	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute	Dilute

**Amount of stabilizer (cyanuric acid) needed to obtain 40 ppm in pool  
(The cyanuric acid should be at 30-50 ppm)**

**POUNDS and (Kg) OF STABILIZER (CYANURIC ACID) NEEDED FOR 80 PPM**

Current Stabilizer Level (ppm)	Gallons and (Liters) of Pool/Spa water																
	8,000 (30000)	10,000 (37500)	12,000 (45000)	14,000 (52500)	16,000 (60000)	18,000 (67500)	20,000 (75000)	22,000 (82500)	24,000 (90000)	26,000 (97500)	28,000 (105000)	30,000 (112500)	32,000 (120000)	34,000 (127500)	36,000 (135000)	38,000 (142500)	40,000 (150000)
0 ppm	5.3 (3.6)	6.7 (4.3)	8.0 (3.6)	9.4 (4.3)	10.7 (4.9)	12.0 (5.4)	13.4 (6.1)	14.7 (6.7)	16.0 (7.3)	17.3 (7.9)	18.7 (8.5)	20.0 (9.1)	21.3 (9.7)	22.7 (10.3)	24.0 (10.9)	25.3 (11.5)	26.7 (12.0)
10 ppm	4.7 (3.2)	5.8 (3.7)	7.0 (3.2)	8.2 (3.7)	9.4 (4.3)	10.5 (4.8)	11.7 (5.3)	12.9 (5.9)	14.0 (6.4)	15.2 (6.9)	16.4 (7.4)	17.2 (8.0)	18.7 (8.5)	19.8 (9.0)	21.0 (9.5)	22.2 (10.0)	23.3 (10.5)
20 ppm	4.0 (2.7)	5.0 (3.2)	6.0 (2.7)	7.0 (3.2)	8.0 (3.6)	9.0 (2.2)	10.0 (4.5)	11.0 (5.0)	12.0 (5.4)	13.0 (5.9)	14.0 (6.4)	15.0 (6.8)	16.0 (7.2)	17.0 (7.7)	18.0 (8.1)	19.0 (8.6)	20.0 (9.0)
30 ppm	3.3 (2.3)	4.2 (2.7)	5.0 (2.3)	5.9 (2.7)	6.7 (3.0)	7.5 (3.4)	8.4 (3.8)	9.2 (4.2)	10.0 (4.5)	10.8 (4.9)	11.7 (5.2)	12.5 (5.6)	13.3 (6.0)	14.2 (6.3)	15.0 (6.7)	15.8 (7.1)	16.7 (7.5)
40 ppm	2.7 (1.8)	3.3 (2.1)	4.0 (1.8)	4.7 (2.1)	5.4 (2.4)	6.0 (2.7)	6.7 (3.0)	7.4 (3.3)	8.0 (3.6)	8.7 (3.9)	9.3 (4.2)	10.0 (4.5)	10.7 (4.8)	11.3 (5.1)	12.0 (5.4)	12.7 (5.7)	13.3 (6.0)
50 ppm	2.0 (1.4)	2.5 (1.6)	3.0 (1.4)	3.5 (1.6)	4.0 (1.8)	4.5 (2.0)	5.0 (2.3)	5.5 (2.5)	6.0 (2.7)	6.5 (2.9)	7.0 (3.2)	7.5 (3.4)	8.0 (3.6)	8.5 (3.9)	9.0 (4.1)	9.5 (4.3)	10.0 (4.5)
60 ppm	1.3 (0.9)	1.7 (1.1)	2.0 (0.9)	2.3 (1.1)	2.7 (1.2)	3.0 (1.4)	3.3 (1.5)	3.7 (1.7)	4.0 (1.8)	4.3 (2.0)	4.7 (2.1)	5.0 (2.3)	5.3 (2.4)	5.7 (2.6)	6.0 (2.7)	6.3 (2.8)	6.7 (3.0)
70 ppm	0.7 (0.45)	0.8 (0.54)	1.0 (0.45)	1.2 (0.54)	1.4 (0.64)	1.5 (0.68)	1.7 (0.77)	1.8 (0.82)	2.0 (0.91)	2.2 (1.0)	2.3 (1.1)	2.5 (1.2)	2.7 (1.2)	2.8 (1.3)	3.0 (1.3)	3.2 (1.4)	3.3 (1.5)
80 ppm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

# Introduction: CFICGEN Salt Chlorinator

The CFICGEN 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.

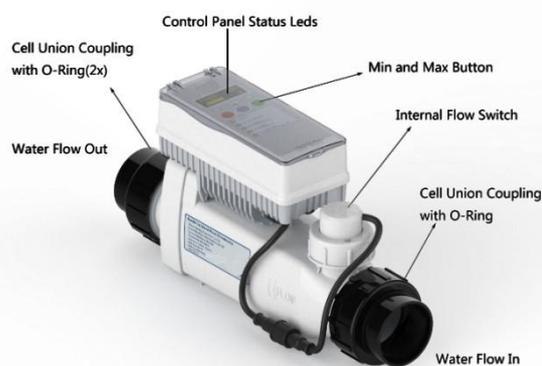
Best of all, the process continuously recycles the salt: after cleaning the pool, the original molecules reform and the whole process begins again. The salt doesn't get used up!

## The CFICGEN CHLORINATOR CONSISTS OF A CELL UNIT AND A POWER CENTER:

The cell unit with LED screen readings, buttons, temperature sensor, and salt level sensor are used to produce chlorine at the defined output.

If the salt level in the pool water is too low or too high, the Red LED will illuminate, the cell will remain turned off until salt or water is added to the pool.

The CFICGEN has a built-in self-cleaning cycle.



CFICGEN includes:

- Flow sensor
- Temperature sensor
- Salt sensor

**Mark: The salt reading is around +/-300 ppm accuracy.**

**CFICGEN Dual Voltage 115V-230V Power Center:**

The CFICGEN Power Center is a dual voltage power supply which means both 115V/230V, and no wiring is required. The Power Supply converts AC electrical current to a low-voltage DC electrical current, which is required to produce chlorine.

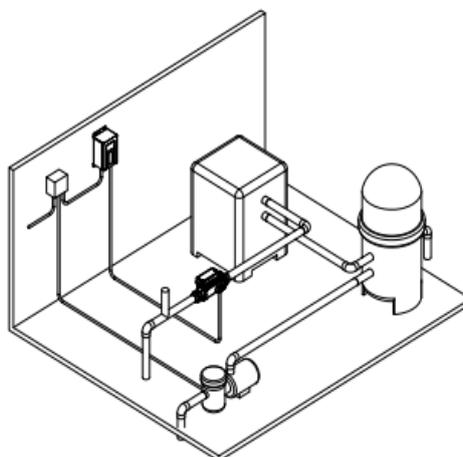
The Power Center contains the transformer, needs on end of fuse, connector to the cell, and the AC electrical current wiring configuration with the DC electrical current output cable to the CFICGEN. A fuse is mounted in the enclosure for additional protection. For information about installing and proper use of the Power Center, see the “CFICGEN installation”.

**WARNING: CHLORINE GAS BUILDUP CAN OCCUR WITH IMPROPER WIRING:**

To reduce the risk of personal injury, the Power Center must be installed on and wired to the load side of the time clock, electronically controlled switch, or relay load side, so that it will receive power only when the pool pump is on. Otherwise, dangerous chlorine gas buildup can occur. The CFICGEN should never be powered when the pool pump is OFF and water is not flowing through the unit.

Before plugging and unplugging the model, turn off the AC power to the power center.

The CFICGEN can be used in 115v/230v, and converts them automatically.



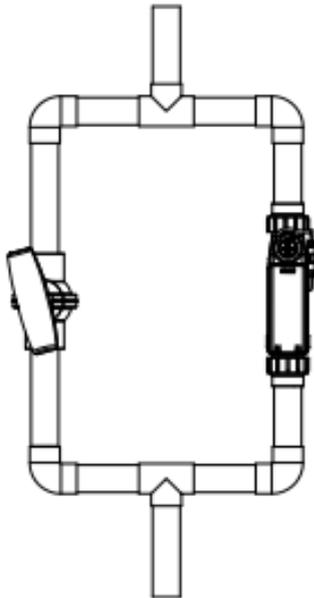
# CFICGEN Installation

## Ensure to Install Chlorine/Bromine Feeders after the CFICGEN cell

When using the CFICGEN with an in-floor cleaning system, it is recommended that a separate return line be used for the cleaner to reduce the increased water pressure stress on the CFICGEN cell.

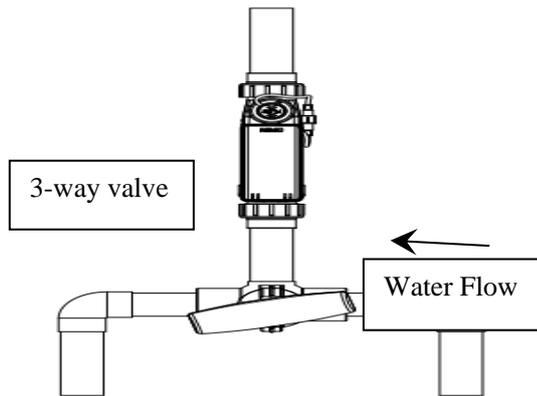
## Loop Plumbing Diagram

The CFICGEN is designed to operate with water flow rates from 25+/-5 gallons per minutes (GPM) up to 105 GPM. Over 80 GPM you must use a bypass loop for the best chlorine production. Installations with flow rates over 80 GPM include those that have in-floor cleaning systems or booster pumps. These systems must use a bypass loop with the CFICGEN with a flow control valve that assures that the flow through the CFICGEN is maintained within it's designed operating water flow rates.



## Plumbing Diagram

- Always install the CFICGEN AFTER the filter and heater. The CFICGEN should be at least three (3) feet away from the heater outlet.
- If the CFICGEN is installed on a pool/spa combination system, install (see diagram below) BEFORE the pool/spa return valve to allow proper chlorination of both the pool and spa and also to avoid creating gas being trapped in the pool plumbing.
- Horizontally install the CFICGEN cell.



## Determining Pool Size (Gallons of Water in Your Pool)

Rectangular Pools: Length x width x average depth x 7.5

Circular Pools: Diameter x diameter x average depth x 5.9

Oval Pools: Length x width x average depth x 6.7

Sloping Sides: Multiply total gallons by 0.85 = gallon capacity

### Determining Pool Size (liters of water in your pool)

Rectangular Pools: Length x width (meters) x average depth x 1000

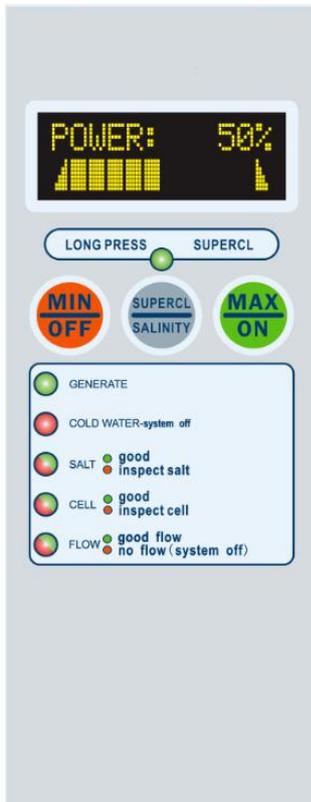
Circular Pools: Diameter x diameter x average depth x 785

Oval Pools: Length x width (meters) x average depth x 893

Sloping Sides: Multiply total liters by 0.85 = liter capacity.

**CAUTION - To protect the lifetime of the CFICGEN, never use dry acid (sodium bisulfate) to adjust pH in arid geographic areas with excessive evaporation and minimal dilution of pool water with fresh water.**

# LED Light Instruction



**SUPERCL /SALINITY:** SHORT PRESS: Show the salinity

LONG TIME PRESS: Enter into SuperChlor mode, long time press again to exit setup.

SuperChlor mode will auto-exit after 24 hours.

**GENERATE:** The cell is operational and ready.

**COLD-WATER:** It warns water temperature either below 10°C or above 50°C--system off.

**SALT: GOOD LED ON:** Good salt. It shows the Ideal Salinity: 2800 PPM to 4500 PPM

**INSPECT SALT RED ON:** Salt Level below 2300 PPM or above 6000 PPM

**INSPECT SALT RED (flashing):** Salt Level:2300 PPM to 2800 PPM/4500 PPM to 6000 PPM

**CELL: GOOD LED ON:** The cell is good and producing chlorine.

**INSPECT CELL RED:** The cell needs to be inspected. The blades may have calcium. The cell is not producing chlorine.

**FLOW: GOOD FLOW LED ON:** Sufficient water flow to produce chlorine.

**NO FLOW LED FLASHING:** There is water flow. Continuous detection of water for one minute is necessary.

**SANITIZE OUTPUT SETTING:** Press the button MIN and MAX, 10% for each setting.

# Operation

## **IMPORTANT! Use of an external Pool Pump Timer is Required**

The CFICGEN is designed to supply a sufficient amount of chlorine to sanitize the pool water daily. If the pool pump is continuously running 24 HOURS and the CFICGEN is operated at 100%, too much chlorine would be generated than would be needed by most pools (2-4 ppm). The CFICGEN has an own internal timer built-in, which cycles the electrolytic cell on and off depending on what percent the Sanitizer Output is set. For instance, at 100% the cell works all the time while the pool pump is running. When set at 80%, the cell is allowed to rest 20% of the time while the pool pump is running and prolong cell life. In order to fine tune the CFICGEN to your pool size just increase or decrease the Sanitizer Output from 10% to 100% of the time.

**CAUTION** - The CFICGEN is designed to only produce chlorine. The CFICGEN does not monitor or control chlorine levels in the pool or spa water. It is the pool owner's responsibility for monitoring and maintaining free chlorine levels at 2.0 to 4.0 parts per million (ppm) according to APSP recommendations. It is the pool owner's responsibility to check the free chlorine level while the pool pump is running on a regular basis and adjust the Sanitizer Output on the CFICGEN accordingly.

## **Start-up Procedure (Super Chlorination)**

**Super Chlorination is recommended before pool start-up.**

Super Chlorination should start with clear, chlorinated pool water.

The CFICGEN will build up a sufficient level of chlorine for sanitation in several hours. The CFICGEN will not be able to produce enough chlorine to reach breakpoint chlorination. It is better to use super chlorination at the time of pool start-up until the chlorine level has returned to 2.0 to 4.0 ppm before switching on the CFICGEN.

## **Output Settings and Adjustments**

Chlorine output is shown by LED DISPLAY, before working, there will be 1/2 minutes self-checking the salt level. If the salt level is in the normal range it will begin working, if not, adjust accordingly to the warning showed on the LED-display.

For example, if salt level is at 2600 ppm, both the LED-Display and LED INSPECT SALT light will indicate that there is not enough salt in the pool to produce chlorine

To set at desired output, just press the **MIN** or **MAX** button.

First-time installations after running 24 hours, use a reliable test method to test the pool water for free available chlorine. The ideal range to maintain is 2.0-4.0 ppm.

**If the free chlorine level of the pool water is too low, increase chlorine production by pressing the Max button. If the free chlorine level of the pool water is too high, decrease chlorine production by pressing the MIN button.**

Due to a varying free chlorine demand of pool water, it may take a few days to determine the number of daily pool operating hours and “Sanitizer Output” percentage setting for your pool. Continue adjusting as necessary, allowing 24 hours between adjustments until the free chlorine level of the pool water is stabilized at 2.0 - 4.0 ppm, per APSP recommendations.

### **Cautions**

- Do not get fertilizer in your pool. Fertilizers contain nitrates, which cause a high chlorine demand.  
Never use dry acid to adjust pH in arid geographic areas with
- excessive evaporation and minimal dilution of pool water with fresh water. A buildup of byproducts can damage the CFICGEN.
- Do not add any pool water balancing chemicals (including salt) unless the CFICGEN is switched off.
- Do not let the Cyanuric Acid level drop below 30 ppm in outdoor pools.

**NOTE: DO NOT USE CYANURIC ACID IN INDOOR POOLS.**

# Maintenance

Every salt system needs maintenance during use, the following describes the recommended maintenance procedures.

## Weekly service

**pH Level Test:** 7.4 to 7.6, although 7.2 to 7.8 is an acceptable range under APSP's guidelines.

*Note: Never use dry acid (sodium bisulfate) to adjust pH in arid geographic areas with excessive evaporation and minimal dilution of pool water with fresh water. A buildup of byproducts can damage the CFICGEN.*

**Total Alkalinity Test:** Test the pool water for total alkalinity with a reliable test method. Adjust according to your pool professional's recommendations. APSP's recommended ideal range for total alkalinity is 80 to 120 ppm.

**Chlorine Test:** Test the pool waters free chlorine level with a reliable test method. Maintain ideal range by adjusting CFICGEN Sanitize Output settings. See "MIN", "MAX". Desired Free Chlorine is 2.0-4.0 ppm.

*Note: Above 4.0 ppm of chlorine may cause excessive corrosion of metal components and possibly cause damage to associated pool equipment.*

## Monthly Service

To ensure that the correct chemical balance is maintained in your pool, it is important to perform the following recommended salt and pool water tests every month using a reliable test method.

- Adjust the salinity according to the LED warning and LED DISPLAY.
- Test the salinity: By pressing the Salinity button to view the reading, or taking a sample of the pool water to your local pool store for testing.
- Cyanuric Acid: Sample the pool water and test for cyanuric acid level using a reliable test method. When using the CFICGEN the recommended ideal cyanuric acid level is 30-50 ppm.
- Calcium Hardness: Test pool water for calcium hardness level using a reliable test method. If necessary, adjust according to your pool professional's recommendations. APSP's recommended ideal range for calcium is 200 to 400 ppm for pools.
- **Metals Test:** It is recommended that the pool water be sampled and tested periodically for the presence of metals such as copper, iron, and

manganese. These metals can damage the cell and other related pool equipment and should not be present in the pool water. If those metals are present, contact your pool professional.

- **TDS (Total Dissolved Solids):** Test pool water for TDS level by using a test kit or by having a water sample tested by a pool professional. If necessary, adjust according to your pool professional's recommendations. APSP standard of 3000 minimum to 5700 - 6000 maximum ppm (which includes the salt) is recommended for salt pools.

## **Cleaning Blades**

**Note: Before acid washing, remove the calcium buildup in the cell:** Use a garden hose on the jet setting and spray directly into both ends of the cell. Most of this calcium buildup has a slushy consistency and will be blown out of the cell. Once the majority of the calcium has been removed, continue with acid washing which will now be more effective since most of the calcium has been removed.

**Automatic Cleaning:** The CFICGEN has an automatic cell blade cleaning feature (cell plate reversal) that helps remove scale deposits from the CFICGEN blades. **Note:** Automatic cleaning does not interrupt chlorine production. "Scale" is a white crusty deposit that forms in excessively hard water or from the pool water that is out of balance and in a scaling condition. If the blades show excessive scaling, you need to perform an acid wash cleaning.

**Acid Wash Cleaning:** If the CFICGEN blades show a tendency to scale, it is recommended that every two (2) months the CFICGEN be removed and inspected for scale formation and/or debris on the CFICGEN blades. High hardness areas may require more frequent cleaning. Some filters allow debris to pass through to the CFICGEN, possibly lodging between its blades the CFICGEN. A small amount of scale formation is normal. If by looking through the CFICGEN it is observed that there is excessive scale formation between the blades or debris is present, the CFICGEN must be cleaned as follows:

Use a high-pressure jet of water from a garden hose. If the blades cannot be reasonably cleaned, Disconnect the AC power from the Power Center.

- Mix one (1) quart of muriatic acid with one (1) gallon of tap water in a plastic bucket.

**When cleaning the CFICGEN always wear rubber gloves and eye protection. Always add acid to water, do not add water to acid.**

- Screw the cap with washer and O-ring onto the threaded end of the CFICGEN cell (*the cap, O-ring and washer are provided with the cleaning kit*).
- Place the CFICGEN horizontally in a five (5) gallon bucket. Pour the acid solution (as described in step) into the CFICGEN until the cell blades and salinity probes are just covered. Allow the acid solution to bubble, and to clean the blades.

*Note: The acid should only be contained inside CFICGEN covering the blades. Try not to spill the acid on the outside of the CFICGEN. If acid does spill on the outside of CFICGEN wash it off with water.*

- A foaming action will begin, which is caused by scale (calcium carbonate) being dissolved from the blades. If rigorous foaming action does not begin, the blades do not need to be cleaned

**STOP THE CLEANING PROCESS and continue to next step.**

**Otherwise, allow the blades to remain immersed in the solution until the foaming has stopped. However, do not leave acid in the CFICGEN for more than thirty (30) minutes. Excessive acid washing will damage the blades.**

- Remove the CFICGEN from the bucket and place it in an empty five (5) gallon bucket. Rinse the inside and outside of the CFICGEN thoroughly with clean tap water and inspect. If deposits are still visible, repeat the acid cleaning process.
- Once clean, replace the cell and resume normal operation.
- If the acid wash procedure is necessary, it is recommended that a sample of pool water be analyzed by a pool professional for excessive calcium hardness (i.e. ideal range is 200 to 400 ppm) and/or improper water balance.
- **Inspect the inside of the CFICGEN every two (2) months (or more frequent in hard water areas).** If no scale or debris deposits are observed inside the CFICGEN after four (4) months, it is not necessary.
- Continue inspections every two (2) months. However, due to possible changes in pool water chemistry and filtering effectiveness, it is recommended that the cell be removed for inspection at least twice a year.
- Reconnect the CFICGEN communication cable plug in the Power Center, then reconnect AC power to the CFICGEN Power Center.

# Installation

**Attention: Before installation, ensure power is disconnected!**

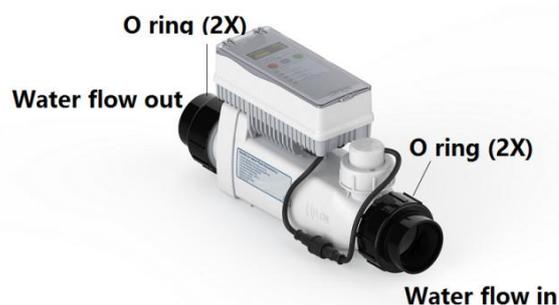
Grounding (earth bonding) is required. The unit should be installed by a qualified service person and grounded. Installation should allow access to cell buttons and power center.

**Read Safety Precautions and Important Instructions on page 1. Before attempting any electrical wiring, be sure to read and follow Safety Instructions. Wiring should only be performed by a qualified professional.**

- Install the CFICGEN unit a minimum of three (3) feet away from the heater outlet.
- Pipe couplings: Schedule 80, maximum pressure 75 psi at 70F (21°C).

## How to install Cell:

1. Using PVC glue, mount the PVC couplings to the plumbing pipe. Allow the glue to dry.
2. Mount the cell vertically. Allow access to the cell operator control panel. Install the cell onto the couplings. Ensure the O-rings are seated properly.
3. Switch on the pump and visually inspect for leaks around the couplings.



### **Connecting the CFICGEN Cell Cable to the Power Center**

**WARNING** - Switch OFF main system power to the Power Center before making any connections.

1. Be sure that AC power is switched OFF before connecting the power cord to the Power Center.
2. Align the three (3) pins of the cell power cord connector with the socket on the top of the Power
3. Center and insert the connector. Turn the round socket nut until it locks the connector in place.

The power center is dual voltage 115V-230V, it will auto convert, no additional wiring this is not necessary.

# Troubleshooting

Problem	POSSIBLE CAUSE:	SUGGESTED ACTION:
<b>Low or no chlorine residual in pool</b>	Sanitizer Output percentage set too low or off at 0%	Increase Output Level.
	Insufficient run time	Increase run time to at least 1 hour per 10° ambient temp.
	Heavy pool use, inclement weather, organic matter	Activate Super CL mode or chemically shock pool.
	Water chemistry issues: Low Chlorine Stabilizer Low salt in the pool (less than 2300 ppm) Phosphates in pool Nitrates in pool	Contact pool professional, ensure all chemicals
	The cell is dirty, clogged, or Has excessive scaling or mineral build-up	Remove Cell from plumbing, inspect and clean (see p.13).
<b>Low or no Chlorine residual in pool after recent installation</b>	Water chemistry was not balanced prior to system installation and a high chlorine demand persists	Contact pool professional, ensure all chemicals on p.6 are within range, chemically shock pool if necessary.
<b>Red Inspect cell Led is on</b>	It is time to clean the Electrolytic Cell.	The Cell must be cleaned
	Cell efficiency has been greatly reduced	Inadequate water flow exists, or Cell must be replaced.
<b>Red Inspect Salt LED is on</b>	Pool water salt is too low or too high, system is off. Less than 2300 or Over 6000 ppm	Correct the salinity level.
<b>Red Inspect Salt Led is flashing</b>	Pool water salt is low or high, 2300 PPM to 2500 PPM/4500 PPM to 6000 PPM 2300-2500, the system is still working	Correct the salinity level.
<b>No Power</b>	Fuse/Reset has tripped	Check fuses on power center
	No AC Power to the power center	Check the connection
<b>No Flow LED is on</b>	Incorrect installation	Verify Sensor probe correct orientation
	Sensor probe	Ensure correct

	is dirty or clogged	connection, clean the sensor probe if necessary.
	Insufficient circulation	Ensure operation of the pump, at least 25-30 GPM. Check water level, filter pressure, or for air or blockages in PVC plumbing.
<b>Water leak</b>	O-Ring improperly seated	Ensure O-Rings are clean and in good condition.
	Threaded collars are cross-threaded	Inspect threads for damage, ensure that each screws back on without resistance.
<b>Cell frequently has mineral buildup</b>	This is due to imbalanced water chemistry and a high Saturation Index	Ensure that your Saturation Index is at or near zero, to avoid damage or premature cell failure.
<b>Cell never or rarely has mineral buildup</b>	Water may be corrosive due to imbalanced water chem. and a low Saturation Index	Ensure that your Saturation Index is at or near zero, to avoid damage or premature cell failure.
<b>COLD Water Led is on</b>	Water temperature is too hot or cold for operation	Check operation of the heater, or turn off until the water temp is between 50° F TO 122 °F.
	Bad contact line contact of Sensor probe	Ensure Sensor probe is well-connected.
	Damaged Sensor probe	Contact manufacturer.

## How to calibrate salinity?

If the user wants to calibrate salinity, please press "MIN" and "MAX" in the meantime and press quickly three times. The display will show "SALT Tsys:" By pressing "MAX" to reduce salt level, and "MIN" to increase the salt level. By pressing "MENU" to return to display for SALINITY.

## WARRANTY

The CFICGEN is warranted to be free from defects in materials and workmanship, under normal use and non-commercial application, for one (1) year, plus one year PRO-RATA (50%), per the schedule below. Proof of purchase is required. This limited warranty is extended exclusively to the original purchaser of the CFICGEN system and is non-transferable. The CFICGEN is intended for residential pool use and any commercial application voids all warranties.

Two (2) year limited warranty schedule for the CFICGEN and its components. During year one: 100%, during year two: 50%.

**TERMS OF SALE:** If, after receiving this item you discover that it was not the one you wanted, simply return it for a full refund within 30 days. You will have to pay for the return shipping charges. 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. Cleared Payment via PayPal must be received within 3 days of transaction and prior to shipping.

For Commercial use (any pool that is not for private single-family use, or the use of which is subject to regulation), parts are warranted against defect for a period of 2 months.

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, reinstallation, 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-transferable.

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 reinstallation of its equipment and parts.

This warranty is valid only in the United States of America. This warranty gives you specific legal rights and you may also have other rights, which vary from state to state. This warranty supersedes all previous publications. Any dispute between the original purchaser and Products will be settled by

binding arbitration, conducted in Mecklenburg County, NC, under the rules of the American Arbitration Association.

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 state to state. 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.