



Salt Chlorination

SC-Pro series



USER MANUAL

I. Presentation

SC Pro series salt chlorine generator is an intelligent device with advanced microcomputer technology, which automatically generates chlorine through the generator cell. Easy to install and operate, equipped with high efficient chlorine production, enable to select time or quick mode control, automatic liquid level detection, overheat protection, self-cleaning function tips and fault alarm. It is applicable to small pool disinfection, recycling integrated control equipment.

The Salt Chlorine Generator is elaborately designed:

- ◆ Two optional outlets make installation more convenient. (see figure 1~2, 1~3).
- ◆ Removable titanium panels are easy to clean, maintain and install.
- ◆ With epoxy resin protective layer, strong and anticorrosive.

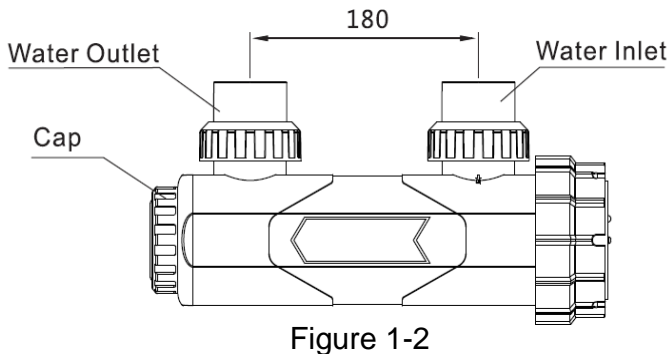


Figure 1-2

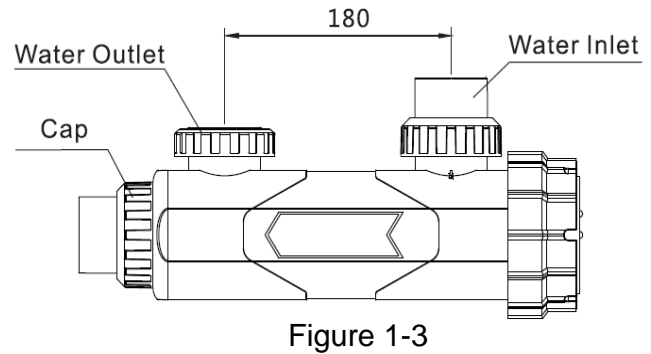


Figure 1-3

II. Important information

1. Please read all instructions prior to installation or operation of your SC Pro salt chlorine generator.
2. Should the installer or owner be unfamiliar with the correct installations or operation of this type of equipment you should contact the distributor/manufacturer for the correct advice before proceeding with the installation or operation of the product.
3. The chlorinator should be mounted in a weatherproof location so it is not exposed to rain or direct sunlight. The controller must be mounted in a solid vertical surface, to ensure the gap surrounding no less than 10mm, with sufficient ventilation for its heat dissipated.
4. The chlorinator should be mounted in an environment no chemical smoke or excessive heat, maximum temperature should not exceed 50 °C (110 °F), and as far as possible away from the location of electrical interference source.
5. In accordance with applicable national and local (NEC) regulations, check input power supply voltage to meet the equipment provisions, connect well equipment to power supply.
6. Make sure the power of external control device is met and compatible.
7. If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.



Note

To avoid a hazard and possible damage to the equipment, must be installed by a licensed and certified electrical professional in accordance with national electrical codes and all applicable local codes and regulations. Electrical hazard may occur due to improper installation, resulting in users or installers death or serious injury, it may cause property damage.



Ensure the power switchgear is closed before installing or performing any maintenance work, or it may cause death or serious injury to the installer or other personnel.



III. Control Panel Instructions

Power: power indicator

Operate: Operation indicator



: Fast chlorine control / Long press query state.



: Add / Cursor up.



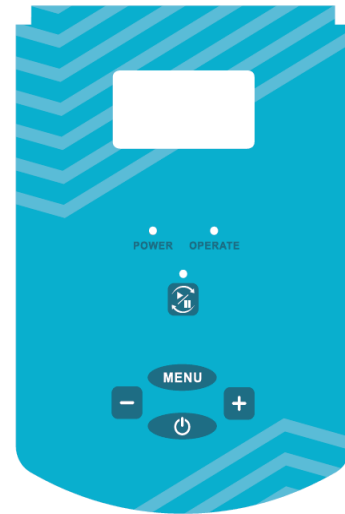
: Decrease / cursor down / Clear fault display.



: Enter system menu setting / Enter.



: Initiate Chlorine generation / exit to previous level in menu.



technical Data

Model No.	Electrolytic Cell Dimensions L*W*H(mm)	Chlorine production	Voltage (V)	Power (Max)	Pool Volume (m ³)
SC-Pro-50	365*260*140	42	AC220~240V/50Hz	250W	≤210
SC-Pro-35	365*260*140	33	AC220~240V/50Hz	250W	≤165
SC-Pro-25	365*260*140	25	AC220~240V/50Hz	250W	≤125
SC-Pro-16	365*260*140	16	AC220~240V/50Hz	250W	≤80

V. Salt chlorine generator installation instructions

1. Install the electrolytic cell on the bypassed pipes after filtration of the pool cycling pipe system. And a adjustable valve must be installed in the main pipe.(see figure 5-1)

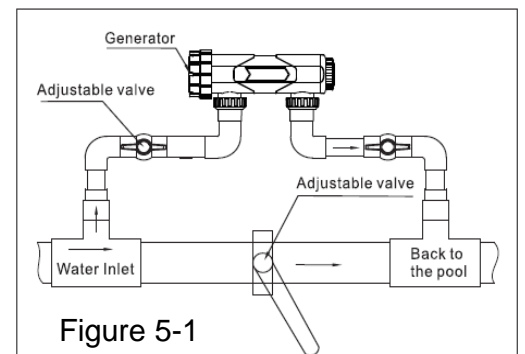
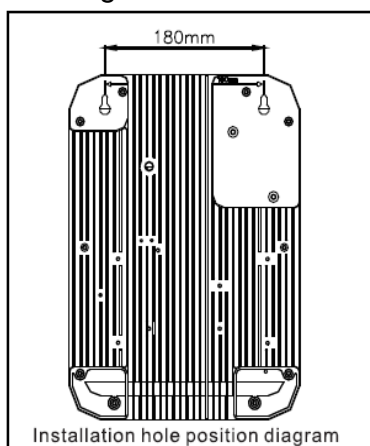


Figure 5-2



2. The chlorinator should be mounted in a well-ventilated, dry and shady location, so it is not exposed to drain or direct sunlight. And the power pack should be mounted onto a post or wall 1.5 meters above the pool water, to ensure the gap surrounding no less than 100mm, with sufficient ventilation for its heat dissipated. The left side of power pack is for cooling exhaust, where should not be blocked or too close to other equipment to affect its heat dissipated.

Using the template supplied in this manual, mark two holes distant 180mm for fitting the power pack to the wall, drill two holes for fixing 2 pieces M8 screws, align two holes of power pack backside and push it down for fix. HINT if fitting against a limestone wall, use a piece of wood as backing to prevent corrosion of the power pack bracket.



3. Connect the 2 red and 1 black electrode contact to the two poles of the generator, 2(+) pole tip and 1(-) pole tip correspondingly; then connect the control box and the generator with the water level / temperature joint wire correspondingly. (see figure 5-3/5-4)

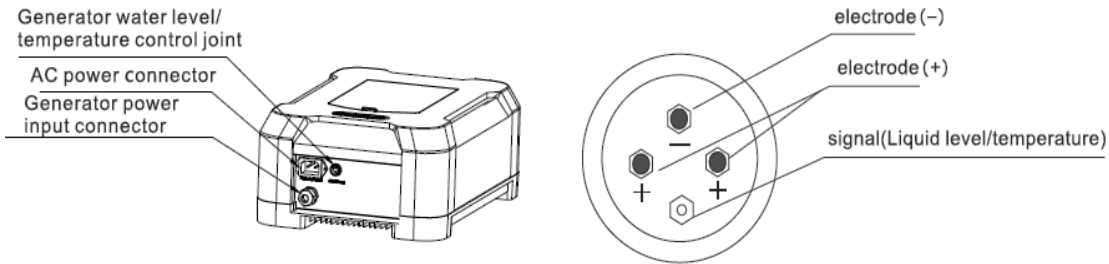


Figure 5-3

Note: The chlorinator must be supplied by power supply with a leakage switch (AC220V-240V/50Hz, 16A), and supplied through a residual current device (RCD) with a rated residual operating current not exceeding 30mA.

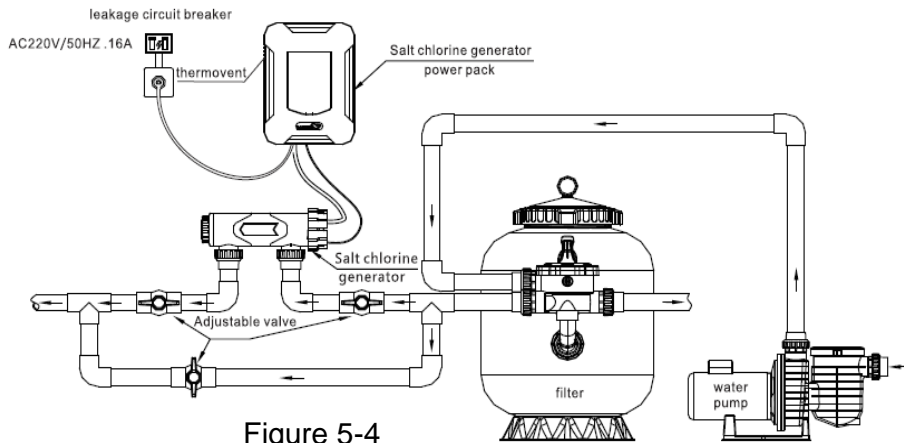
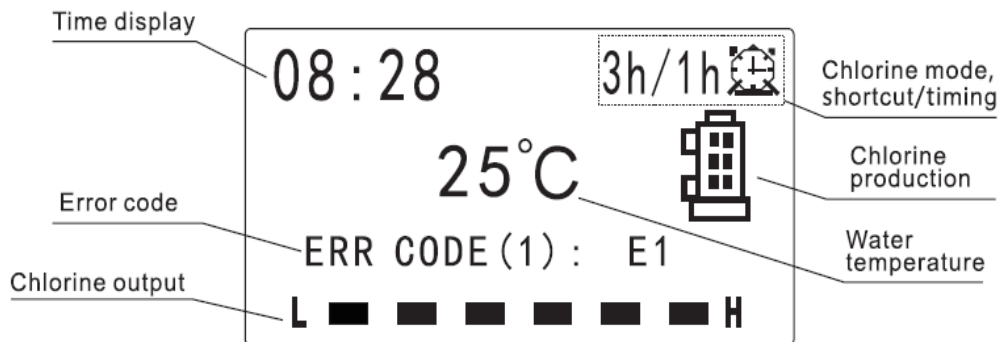


Figure 5-4

VI. Chlorinator operation

1. After installation, supply the power to generator, the "Power" indicator will be lit and the LCD display will show the time and the water temperature inside the generator.(Details as follows)

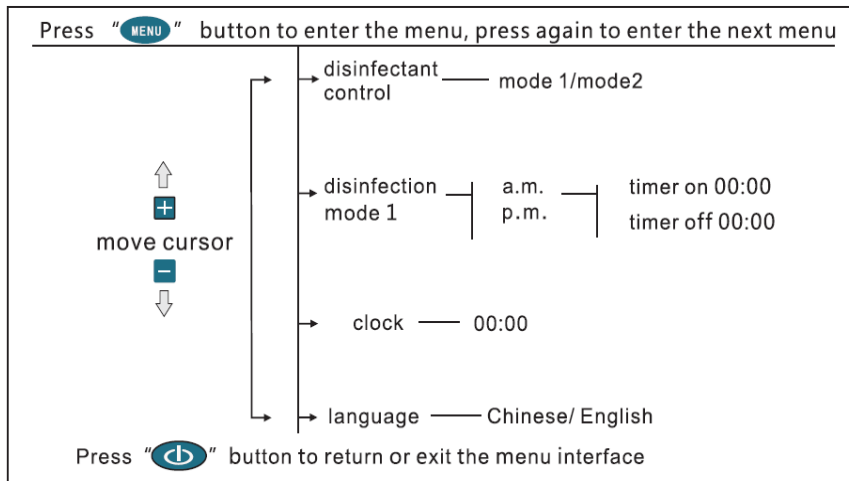


Remarks:

- (1). Time display: show the local time.
- (2). When the underwater light is on, a light icon is displayed.
- (3). Circulation pump: when circulation pump is on, dynamic icon is displayed.
- (4). Chlorine mode: shortcut or timed chlorine control.
- (5). Error code: when the work is abnormal, the corresponding fault code is displayed .
- (6). Chlorine production: this icon indicates chlorine production.
- (7). Chlorine production: "L" low chlorine production, "H" high chlorine production, the more "-", the higher chlorine output.
- (8). Temperature display: show the water temperature inside the generator.



2. Function setting interface, as shown below:



3. Function setting

(1) Language

Language selection, enter the menu interface, move the cursor to language, press "MENU" to enter, press "-" / "+" button to choose English. (see figure 6-1).

```
menu (2/2)
> language English
```

Figure 6-1

(2) Setting the clock

The generator inbuilt with clock function. The initial use should set the local time. Press the "MENU" button to page 2/2, move the cursor to Clock. Press "MENU" button to enter time setting. Press "ENTER" to select the setting clock Hour and Minute. Setting the Clock by "-" / "+" button. (24 hours system).

```
menu (1/2)
disinfectant
control mode 1
Disinfection model 1- >
> clock 08:58
```

Figure 6-2

(3) chlorination cell on based upon the programmed times for Timer-1 and Timer-2.

Timer-1: automatic control of chlorine production by preset time.

Timer-2: permanently switch pool pump and chlorination cell, thus overriding the timing function.

A. Press "MENU" button to page 1/2 (shown as follows). Move the cursor to chlorination by "-" / "+" button. Press "MENU" button, select Timer-1 or Timer-2 by "-" / "+" buttons. Press "MENU" button to save setting.

```
menu (1/2)
> Disinfection control mode 1
Disinfection model 1 ->
> clock 08:58
```

Figure 6-3

(4) When set Timer-1, the start time and end time setting are required, divided into morning and afternoon. Press "MENU" button to page 1/2. Move the cursor to Timer-1. Press "MENU" button into morning time setting (shown as figure 6-4). Press "MENU" to set the start morning session running time by "-" / "+" buttons (1-12 hours), same to set end time (shown as figure 6-5). Save and back to LCD, "🕒" is shown, as (figure 6-6). Timer-1 is running. Note: end time must be larger than start time, or system defaults no setting time.

```
Disinfection model 1
> a.m. ->
p.m.
```

Figure 6-4


```
a.m.
> timer on 00:00
timer off 00:00
```

Figure 6-5

```
08:58 🕒
28°C
L ■ ■ ■ ■ ■ H
```

Figure 6-6



(5) When set Timer-2, Display cycle time above the display screen "2h/1h" as figure 6-7. And for 3 kinds of periodic time choice. Press "  " button, select switch.

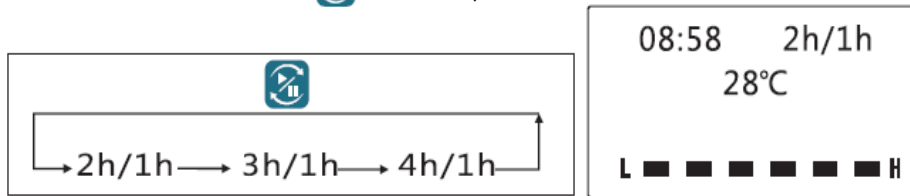



Figure 6-7

- ◆ 2h/1h: recycling of operation for two hours and breaking one hour.
- ◆ 3h/1h: recycling of operation for three hours and breaking one hour.
- ◆ 4h/1h: recycling of operation for four hours and breaking one hour.

4. Operation

(1) Chlorine production: press "  " button, the "power indicator will be lit and the pool pump will be showed on the LCD display and start. Delay 5 seconds". Chlorine icon will be showed in LCD display and start to product chlorine. If the system is to Timer-2, the chlorine starts and stops upon based programmed time, shown as figure 6-8.

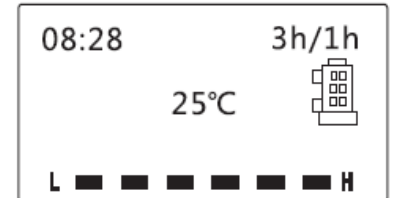




Figure 6-8

(2). Setting the chlorine output level: 6 levels options. Press "  /  " button to increase or decrease chlorine output, and shown on small blocks under screen. More bright blocks signifies more chlorine output. Maximum is 6 blocks. shown as figure 6-9.

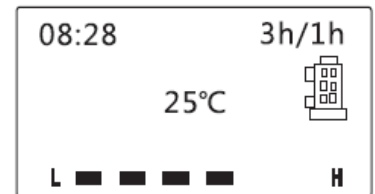



Figure 6-9

(3). Tate view: press and hold "  " button, original display chlorine production, now change to display controller internal temperature, operating voltage, liquid level detection, shown as figure 6-10. Note: the state view function is convenient for trouble shooting.

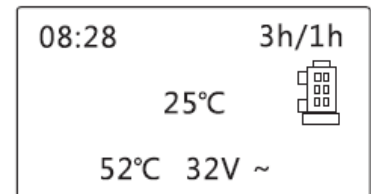



Figure 6-10

(4) Fault reset: when "ERR Code (1): E1" icon shown on LCD screen, as figure 6-11, check the fault code table, according to the excluded method, long press "  " button, Error code disappears.

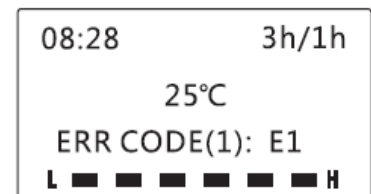


Figure 6-11



VII. Trouble Shooting

1. When "ERR CODE (*) E" is displayed, it indicates that controller has an abnormal fault. Check the following table for trouble shooting.

Error code	Reason of trouble shooting	Note	Solution
E1	Indicates that air-cooling fin temperature is too high	the maximum temperature is 65°C	First check whether there is E6 error code, if yes, please ensure that the temperature sensor is connected, if connected well please change the sensor; if E6 error code is not present, please check the hardware circuit.
		the fault display must be cleared manually	
E2	indicates the water temperature exceeds the normal temperature range	Normal working temperature range: 10~45°C	first check whether there is E7 error code, if yes, please ensure that the temperature sensor is connected, if connected well please change the sensor; if E7 error code is not present, please make sure the operating water temperature is within the normal range.
E3	indicates no water	normal operation should be with sufficient water flow through the cell.	first ensure the water level sensor has been connected, if already connected, then check whether it is lack of water or with air, if there is water, then clean the water level probe.
E5	means the salt concentration is low	normal working salt concentration 3500ppm	first use a salimeter to check the salt concentration in the pool. When the salt concentration is below 3500ppm, add right amount salt into the pool. When pool salt concentration reaches to the normal working range, the error code will be cleared automatically and the machine will start to work normally.
E6	indicates the temperature sensor inside the control box has malfunctioned	the fault display must be cleared manually	first check if the corresponding temperature sensor is connected, if it is connected please change the sensor.
E7	indicates the water temperature sensor has malfunctioned	the fault display must be cleared manually	first check if the corresponding temperature sensor is connected, if it is connected please change the sensor.
E8	indicates the system power input is too high or too low	the fault display must be cleared manually	please change the hardware of the power supply.
E9	indicates controller current output is too high	the fault display must be cleared manually	please contact the supplier to replace or examine the control box.
EA	indicates that the electrode has malfunctioned	the fault display must be cleared manually	first check the electrode is connected, if connected well please change the electrode.
EB	indicates the system memory chip has malfunctioned.	the fault display must be cleared manually	contact supplier to examine or replace the memory chip
EC	indicates the system detects a circuit fault	the fault display must be cleared manually	turn the power off and reboot, if not report failure, can start normally, if the fault occurs repeatedly, please contact the supplier to examine or replace the control box.

2. Power switch on, if "power" indicator of control panel is not on, please check if there is AC220V power input at the electronic board input connection. If there is power input, please check if the fuse on the circuit board has burned out. If everything is normal, may the electronic board have been damaged, please contact the supplier.



VIII. Check Chlorinator output

1. Four (4) factors directly affect the chlorine production:

- (1) Pool salt concentration
- (2) Chlorinator working time
- (3) Chlorine output setting
- (4) Pool water temperature

In order to achieve the optimal chlorine production, first check whether the pool salt concentration meets the requirements (appendix the environment and maintenance of salt chlorine generator). Secondly, set the filtration time according pool volume. Initial use salt chlorine generator, it is suggested to lower a half chlorine output for few days, regularly test the amount of chlorine every day, and correspondingly adjust chlorine output. After several debugging to determine the best settings. As general guide it is suggested adjust the amount of chlorine production according to actual use of the swimming pool, such as increasing chlorine output in summer peak season with increasing number of swimmers, and reducing chlorine output when water temperature is high and low frequency use in cold period.

2. Salt chlorine generator production test:

- (1) Start the salt chlorine generator, by observing flow water whether with white mist, if there is, means chlorine production normally.
- (2) Get water sample from backwater/outlet of swimming pool to detect the chlorine content, and record the measured data.
- (3) When the cycle is filtered and the maximum chlorine production is generated, get water sample from water inlet of the pool to detect chlorine content. The result is 1PPM larger than the first sample, meaning the salt generator is normal working.

Note The operating environment and maintenance of salt chlorine generator

1. The operating water environment of the salt chlorine generator

1.1 Water chemistry condition

May the pool brings you a lot of fun, may secure your swimming, may prevent from corrosion and scale on your pool equipment, please keep regular test and check your pool's water quality. The following chart is the national and international standard of water chemistry environment for swimming pool, and also the best water quality condition for salt chlorine generator working.

Chemicals	Recommended value
free residual chlorine	1~3.0ppm
salt	2700~3400ppm
Ph value	7.2~7.8(within this range, the chlorine requirement is minimized but the disinfectant effect is maximized)
total basicity	75~250ppm
stabilizer	60~80ppm
calcium hardness	75~500ppm
total dissolved solid amount(including salt)	3500~5700ppm, Maximum does not exceed 6000ppm
metal (iron, copper, manganese)	0
nitrates	0
phosphate	0
saturation index	- 0.2~0.2 (0 is the most optimal)



1.2 Saturation index

The saturation index (SI) is related to the calcium and alkali amount in the pool water, it is an indicator if the water is balanced in a swimming pool. The SI is between 0~0.2 or -0.2~0, the water quality in the pool is perfectly balanced; if the SI is higher than 0.2 or lower than -0.2, the water may cause damage or corrosion to the pool and pool equipments.

Saturation index calculation formula:

Saturation index=PH value + Calcium Hardness coefficient + total basicity ratio coefficient + temperature coefficient +total dissolved solid coefficient.

$$SI=PH + CHF + AF + TF + TDSF.$$

calcium hardness	calcium hardness coefficient	total basicity	total basicity coefficient	celsius degrees	fahrenheit degrees	temperature coefficient	total dissolved solid coefficient
75	1.5	75	1.9	12	53	0.3	- 12.1
100	1.6	100	2.0	16	60	0.4	
125	1.7	125	2.1	19	66	0.5	
150	1.8	150	2.2	24	76	0.6	
200	1.9	200	2.3	29	84	0.7	
250	2.0	250	2.4	34	94	0.8	
300	2.1	300	2.5	39	103	0.9	
400	2.2	400	2.6				
600	2.4	600	2.8				
800	2.5	800	2.9				

1.3 Water environment maintenance

1.31 Weekly test

A. Free residual chlorine level. Use reliable instrument and methods to check the level of free residual chlorine in the pool. Normal range is 1~3PPM. Chlorine concentration can be increased or decreased by adjusting the chlorine output via salt chlorine generator.

Attention: chloride ion sample collecting shall be 2 at least, positioning:

- ◆ near water surface of pool inlet as collecting point 1.
- ◆ away from water surface of pool inlet as collecting point 2.

Comparing two samples of free residual chlorine, the higher value should be the sample near the insets, which is produced by salt chlorine generator.

B. PH value. Normal PH value is 7.2~7.8. If the value is too high, add acid to adjust. Add alkali to adjust if it is too low.

1.32 Monthly maintenance

A. Total basicity. Normal value ranges from 75 to 250PPM. If the value is too high, add acid to decrease the basicity, if the value is too low add baking soda.

B. Salt content. The normal value is from 2700 to 3400PPM, add salt according to need to reach the optimal salt concentration.

1.33 Seasonal maintenance

A. Stabilizer. the normal value is from 60 to 80PPM, could add pyrolytic acid to increase the concentration of the stabilizer.

B. Calcium hardness. The normal value is from 75 to 500PPM, when the value is too low, calcium can be added to increase its value; when the value is too high, pool water can be released and fresh water added to the pool will decrease the value.

C. Electrolytic cell: due to electrolytic cell is major component to produce chlorine, regularly checking and clean electrolytic cell is very necessary.



D. Metal. Pool water should not contain metal such as copper, iron, manganese, etc.



Note

Salt chlorine electrolytic cell has self-cleaning function, self clean by reverse the polarity every other four hours, which prevents calcium from accumulating and keeps the electrolytic cell in optimal performance. If water hardness is high or the water chemistry is out of balance, the cell will need to be cleaned regularly.

2. Pool water salt concentration adjustment and maintenance.

2.1 Pool water volume calculation

Knowing the volume of the pool is the first step to add salt to the pool.

Rectangular pool: $\text{Length(m)} \times \text{Width(m)} \times \text{Average depth(m)} = \text{water volume of the pool (m}^3\text{)}$.

Circular pool: $\text{Diameter(m)} \times \text{Diameter(m)} \times \text{Average depth(m)} \times 0.785 = \text{water volume of the pool (m}^3\text{)}$.

Elliptic pool: $\text{Length(m)} \times \text{Width(m)} \times \text{Average depth(m)} \times 0.893 = \text{water volume of the pool (m}^3\text{)}$.

Edge pool: $\text{Area of the pool (m}^2\text{)} \times 0.85 = \text{water volume of the pool (m}^3\text{)}$.

2.2 The type of salt that can be used

The higher the purity of the salt, the better the salt chlorine generator performs and lengthen its service life. The Sodium Chloride (NaCl) in the salt should be higher than 99.6%. Dehydration treatment food grade non-iodized salt would be the best choice.



Note

A. Do not use rock salt, since it may contain impurities or other compound that may shorten the life time of the salt chlorine generator.

B. Do not use CaCl_2 as a source of salt, use NaCl only.

C. Avoid to use of anti-caking agent salt (NaCN, YPS, it is toxic and corrosive), this type salt may result in color change of pool surface and equipment.

D. Water treatment salt pallets can be used, but the time it takes to dissolve into the water may be .

2.3 Adding the appropriate amount of salt.

Most swimming pools contains a certain amount of salt, the concentration of the salt in the water may vary depending on the water source and sterilization chemicals in the water. A handheld NaCl measuring instrument or salinity pen can be used to test for the current salt concentration in the water. Please use the chart on the back to see how much salt needs to be added.

♦ Suggested salt concentration is around 2700~3400 ppm (between 0.27% to 0.34%), this would be the optimal water quality.

♦ When below 2400ppm, the salt chlorine generator would stop working, and indicate E5.

♦ When higher 4500ppm, may corrode and damage pool equipment, the salt chlorine generator will stop working and indicate E4.



Note

with different measuring practices, the salt concentration will differ. The tolerance scope is +/- 500ppm (0.05%).

2.4 Regulated swimming pool salt concentration

2.41 The correct way of increasing the salt concentration.

1. Activate the swimming pool circulation pump and start the pool water circulation.

2. Turn off the power source of salt chlorine generator.

3. Test and find the current salt concentration of the pool.

4. Calculate the amount of salt needed to be added from the chart.

5. Pour the salt along the side of the pool slowly, allowing it to dissolve evenly and quickly into the water. Do not allow the salt to pile up on the bottom of the pool, stir the water when necessary.

6. Run the circulation pump for 24 hours for the salt to be evenly distributed through the whole pool.

7. After 24 hours, measure the salt concentration of the pool again to see if it has reached the desired level.

8. When the salt concentration has reached the desired value, activate the salt chlorine generator to produce chlorine according to your setting.



2.42 Decreasing salt concentration.

The only way to decrease the salt concentration is to discharge some of the water, then add fresh water to the pool and measure the concentration of the pool referring to 2.41.

The weight of salt needed to maintain 3200ppm (0.32%) for each ton of water. Unit in kilograms.

The salt concentration ppm before	0	100	200	300	400	500	600	700	800	900
The weight of salt needed to add per ton of water	3.210	3.111	3.012	2.912	2.813	2.713	2.614	2.514	2.415	2.315
The salt concentration ppm before	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
The weight of salt needed to add per ton of water	2.216	2.116	2.017	1.917	1.817	1.718	1.618	1.518	1.419	1.319
The salt concentration ppm before	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900
The weight of salt needed to add per ton of water	1.219	1.119	1.020	0.920	0.820	0.720	0.620	0.520	0.420	0.320
The salt concentration ppm before	3000	3100	3200	3400	3600+					
The weight of salt needed to add per ton of water	0.220	0.121	Best	OK	Excess					

Note:

1. This diagram is used as a reference to calculate the amount of salt to add to water.
2. Calculate the amount of salt needed to add to the pool according to 2.1. for example for 153 square cube (153 ton) of water, the original salt concentration is 400ppm, to reach 320ppm check the diagram. The diagram states that for each ton of water at 400ppm 2.813kg salt needs to be added, therefore for 153 ton of water the amount of salt needed is $2.813 \times 153 = 430\text{kg}$.
3. The readings of different measuring instruments is different, set 3200ppm as the optimal value. The actual salt added to the water should be precise to each kilogram. The salt concentration of the water needs to be between 2700~3400ppm for the optimal working environment of the salt chlorine generator.

The stabilizer needed for each ton of water to be kept at 75ppm (0.0075%). unit: kg

The concentration of stabilizer before, ppm	0	5	10	15	20	25	30	35	40	45
The weight of stabilizer needed to be added to each ton of water	0.075	0.070	0.065	0.060	0.055	0.050	0.045	0.040	0.035	0.030
The concentration of stabilizer before, ppm	50	55	60	65	70	75	80	80+		
The weight of stabilizer needed to be added to each ton of water	0.025	0.020	0.015	0.010	0.005	Best	OK	Excess		

Note:

1. This chart is used for referencing and calculating the amount of stabilizer to add to the pool. The optimal value of the stabilizer should be around 60~80ppm, and 75ppm should be the standard.
2. According to 2.1 to calculate the amount of stabilizer needed to add in pool. For example, for a pool of 153 m^2 , the initial stabilizer concentration is 35ppm, to reach 75ppm, the weight of the stabilizer needed to add = $0.04 \times 153 = 6.12\text{kg}$.

3. Maintenance of salt chlorine generator.

3.1 Maintenance of electrolytic cell

To ensure the salt chlorine generator work in best working performance, self clean by reverse the polarity every other four hours, check the electrolytic cell every 3 months or after cleaning the filter.

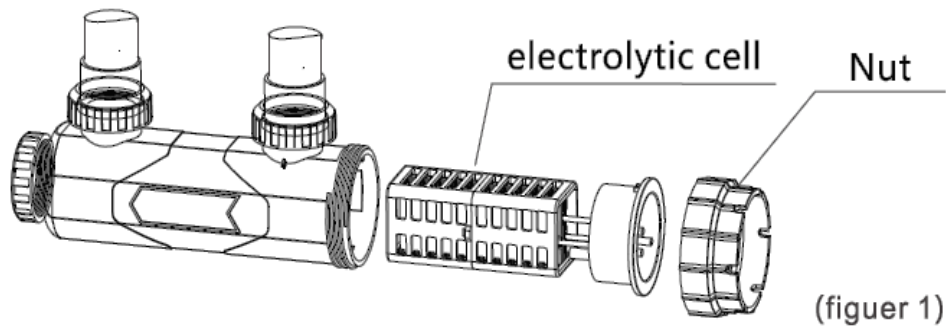
A. Before removing the electrolytic cell, first power off the salt chlorine generator 5~10 minutes, then close inlet/outlet valve.

B. After removing the electrolytic cell, check the cell wall for flaky sediment, debris, light color crust or other dirty.

C. If no fouling, re-install the electrolytic cell; if there are fouling, first rinse with high pressure water jet.

D. If fouling not able to remove, please use plastic or wooden tools to assistance (do not use metallic tools).

E. If there is serious fouling not able to clean, please contact your supplier for expert advice in a professional cleaning solution.



Note

The sediment in the cell is usually due to excessive calcium in the water. Please regulate the calcium hardness according to "calcium hardness maintenance method (1.33-B)". To reduce the cleaning cycle of electrolytic cell, the simplest way is to keep the good swimming pool water quality chemistry environment.

3.2 Antifreezing

When the pool water temperature is below 15 degrees, the amount of chlorine needed to sanitize the water decreases. Stop chlorine at low temperature could extend the life time of the cell. If pool water freezes, it may damage the cell and other components. To prevent damage to the chlorine generator and other equipment caused by freezing, please prepare well in advance to prevent cold, such as in the icing season to do the water warm-keep measures, or drain pumps, filters, water pipes and return pipes, etc.

3.3 Initiation environment

Do not turn on the salt chlorine generator when the pool water quality has to reached the optimal balance to avoid any damage to the unit. For the operating water balance please refer to "The operating water environment of the salt chlorine generator".