Emaux
water technology

SSC one®

SALT CHLORINATOR

USER MANUAL

1. IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT: The instruction manual you are holding includes essential information on the safety measures to be implemented for installation and start-up. Therefore, the installer as well as the user must read the instructions before beginning installation and start-up.
Keep this manual for future reference.

When using this electrical equipment, basic safety measures listed below should be followed:

- Disconnect all AC power during installation.
- Warning - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.
- A green colored terminal marked "Earth Ground" 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.
- To reduce the risk of electric shock, connect the local common bonding grid in the area of the swimming pool or spa to these terminals with an insulated or bare copper conductor.
- All field installed metal components such as rails, ladders, drains, or other similar hardware within 3 meters of the pool or spa shall be bonded to the equipment grounding bus with copper conductors.

2. CONTENTS OF THE PACKAGING

The following component should be found inside the box:

SSC one® Control unit	Buffer solution pH 7.0
Electrolytic cell	Buffer solution pH 4.0
1.5 - 2" universal union	2 x saddles 50 mm – ½"
Cell cable	Dosing fitting kit
pH probe	Dosing pump rotator tube

3. TECHNICAL FEATURES

Standard working voltage	120-230 V AC – 50/60 Hz
Maximum chlorine production	50 g/h
Volume of the pool up to	150 m^3
Water salinity required	4 – 6 g/l
Water temperature	15°C - 40°C (50°F – 104°F)
Electrodes	Self-Cleaning coated titanium plates
Range of pH measurements	6 – 9 pH
pH precision	± 0.2 pH
Dosing pump flow rate	1.5 l/h
Dosing pump working pressure	1.5 bar

4. INTRODUCTION

The Emaux ***SSC one***® is an automatic chlorine generation system composed by two main components: an electrolytic cell and a control unit.

4.1 THE ELECTROLYTIC CELL

The electrolytic cell is composed by a number of titanium plates. The control unit regulates the electrical current that passes through the titanium plates. One extreme of the plates will be the anode and the other will be the cathode.
Adding a certain concentration of salt in the water, this passes through the plates and thanks to the electrical current, the Hypochlorous acid is produced.

The following chemical reactions are produced in the plates of the electrolytic cell:

Positive pole (anode): $2\ H_2O \rightarrow O_2 + 4\ H^+ + 4e^-$

$2\ NaCl \rightarrow Cl_2 + 2\ Na^+ + 2e^-$

Negative pole (cathode): $2\ H_2O + 2e^- \rightarrow H_2 + OH^-$

Final chemical reaction: $Cl_2 + OH^- \rightarrow HClO + Cl^-$

The operation requires a certain concentration of salt (4000 ppm), low enough that it normally will not be tasted. The ***SSC one***® automatically sanitizes your pool by converting the salt into Hypochlorous acid which kills bacteria and algae in the pool through a process called electrolysis.
Because chlorine will revert back to sodium chloride after killing the bacteria, the above reactions will continuously recycle virtually eliminating the need to add sanitizing chemicals to your pool. The only time you may need to add more salt to the pool is when water is replenished due to backwashing, draining, or splashing.

4.2 THE CONTROL UNIT

The control unit is provided with a microprocessor driven control system to regulate the percentage of chlorine production, the operating time and the pH value.
The Emaux ***SSC one***® has an automatic cleaning system that avoids scale formation on the electrodes. Moreover, Emaux ***SSC one***® includes a built-in pH peristaltic pump and pH sensor.

5. SAFETY WARNING AND RECOMMENDATIONS

The equipment should be assembled and handled by truly qualified people.
Current electrical and accident prevention regulations should be followed.
Under no circumstances will the manufacturer be held responsible for the assembly, installation or start-up, nor any handling or fitting of components unless they are carried out on its premises.
The Emaux ***SSC one***® operates at 110/230V AC, 50/60 Hz. Do not attempt to alter the system to operate at a different voltage.
Check all the electrical connectors are well tightened to avoid false contacts and their consequent overheating.
Before installing or replacing any component, disconnect the equipment from the mains, and use exclusively spare parts supplied by Emaux.

The control unit must be installed in places with sufficient ventilation. Fan openings should be kept free of any element that could obstruct them. The equipment should not be installed near flammable materials.
This equipment should never be installed in places susceptible to flooding.
It is important to reduce chlorine production to the minimum while the pool is covered. Otherwise, an excess of chlorine could degrade the pool materials.

6. WATER CHEMISTRY

The following table shows the recommended levels of the chemical parameters required for a proper quality of water in the pool by using Emaux ***SSC one***®.
Test your water periodically and ensure the levels are between the recommended range.

Salt Level	3500 – 5000 ppm
Free Chlorine	1.0 – 3.0 ppm
pH	7.2 – 7.6
Cyanuric Acid (stabilizer)	30 – 50 ppm
Total Alkalinity	80 – 120 ppm
Calcium Hardness	200 – 400 ppm
Metals	0 ppm

6.1 SALT LEVEL

The amount of salt required when using Emaux ***SSC one***® is between 3500 and 5000 ppm, with 4000 ppm as a general recommendation. This means to add directly in the pool water 4 Kg/m^3.
Low concentration of salt (below 2500 ppm) will cause premature cell failure.
High concentration of salt (above 6000 ppm) may cause electro-oxidation and corrosion damage to the Stainless Steel pool fixtures.

Salt required according to the volume of the pool:

Pool volume (m^3)	Salt (kg)	Pool volume (Gallon)	Salt (Pound)
10	40	2,642	88
15	60	3,963	132
20	80	5,283	176
25	100	6,604	220
30	120	7,925	264
35	140	9,246	308
40	160	10,567	352
50	200	13,209	440
60	240	15,850	528
70	280	18,492	616
80	320	21,134	704
90	360	23,775	792
100	400	26,417	880
110	440	29,059	968
120	480	31,700	1,056
150	600	39,626	1,320

NOTE: Table based on 4000 ppm of salt per m^3 of water.

6.2 TYPE OF SALT

The most common salt used in swimming pools with Salt Electrolysis is Sodium Chlorine (NaCl) that is 99% pure. DO NOT use the following types of salts:

- rock salt;
- salt with more than 1% yellow prussiate of soda;
- Salt with more than 1% of anti-caking additives;
- Iodized salt.

6.3 ADDING AND REMOVING SALT IN THE SWIMMING POOL WATER

Before adding the salt into the pool, turn your filtration pump on and set your filtration valve manifold in position "Filtration".
Add the salt directly into the pool or balance tank and do not allow the salt to sit in a pile on the bottom of the pool.
Keep the filtration system running for 24 hours using the Main Drain or vacuum suction nozzle as a main suction line.

The only way to remove the salt in the pool water is to partially drain the pool and refill with fresh water.

7. INSTALLATION

7.1 CONTROL UNIT (Fig. 1)

The Emaux ***SSC one***® unit is contained in a rain tight enclosure that is suitable for outdoor mounting (IPX4 rating). However, the following points must be taken into consideration for a correct installation of the Emaux ***SSC one***® unit:

1. Install the Control Unit using the template paper sheet provided with the package in a minimum distance of 3.5 meters (11.5 ft.) from the swimming pool, 1.5 meters (5 ft.) from the ground, within 2 meters (6.5 ft.) from electrical enclosure, and within 4.5 meters (15 ft.) from where the cell will be installed, in a ventilated area and leaving enough free space of min. 50 cm (20") in each side for servicing.
2. DO NOT mount the Control Unit in a direct sun light.
3. The Control Unit must be installed far away from the chemical storage, especially from acid because it can corrode the electronics inside the unit.
4. The unit must be kept away from heat sources and any equipment which produce heat.
5. Plug-in power supply into a suitable weatherproof outlet socket with circuit breaker.
6. Before fixing the Control Unit, make sure that the power cable and cell cable also reach the Control Unit.

7.2 CELL (Fig. 2)

The following points must be noted for a proper installation of the cell:

1. Install the cell always after all the other pool equipment (pump, filter, heating system…).
2. It is very important to install the cell always higher than the top of the filter. The cell installed in a lower level may keep water stored in the cell and cause a wrong message of the flow switch. The presence of water in the cell does not mean getting a circulation flow rate.
3. The cell must be always installed in horizontal position, with the connections placed face

downward and the flow sensor in the top of the cell, so that the flow sensor only will give out a signal when the water is full inside the cell housing.

4. Ensure the water flow rate of the system is enough to fill completely the electrolytic cell. If flow rate is low, the flow sensor will not detect water on the top of the cell housing and will switch off the chlorine production. On the other hand, if flow rate is too high, we recommend installing a by-pass with a valve to regulate the flow rate in the cell.

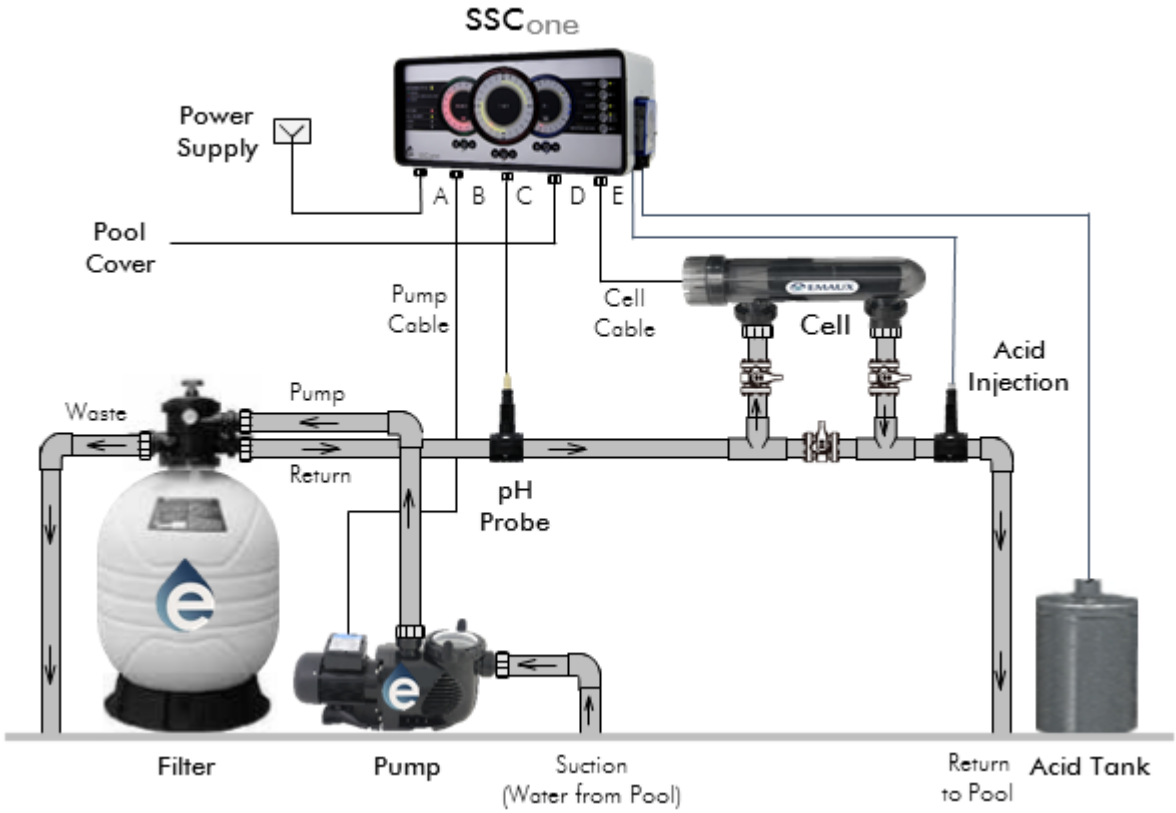

Fig. 1

7.3 ELECTRICAL INSTALLATION

Proceed with the interconnections between the cell and the Control Unit according to the following drawing (Fig 2).

1. You can connect the Emaux ***SSC one***® control unit directly to 230V supply or to the general electric box (A).
2. Connect the filtration pump to the plug 230V (B).
3. Connect the pH sensor into the connector (C). pH sensor includes 1.5-meter cable (10-meter length cable upon request).
4. Connect your automatic pool cover to the connect (D).
5. Connect the electrolytic cell to the connector (E).
6. Do not cut or modify the supplied cables.

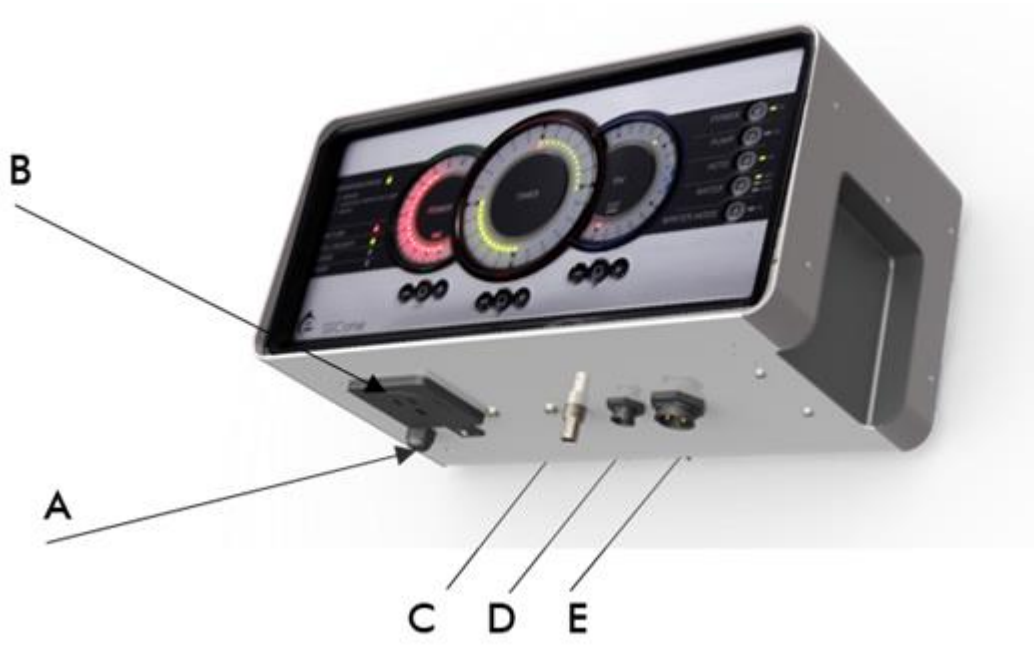

Fig. 2

7.4 INSTALLATION OF THE PH SENSOR

Install the pH saddle in a pipe with minimum diameter 50 mm and before the electrolytic cell. The pH injector saddle must be installed always after the electrolytic cell for its protection. Both must be always installed in a horizontal position.

a) Saddle for the pH sensor (Fig. 3): Before installation, drill a hole in the top of the pipe with size approx. 12 mm and make sure the sensor can pass through. Install the saddle so that the hole in the pipe coincides with the sensor connection of the saddle.

b) Saddle for the pH injector (Fig. 4): Before installation, drill a hole in the pipe after the electrolytic cell with size approx. 9 mm. Install a socket with connection 3/8" female GAS thread connection in the saddle. The injection valve will be connected to the socket.

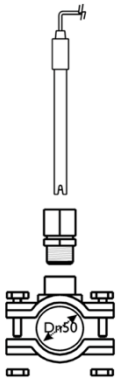

Fig. 3

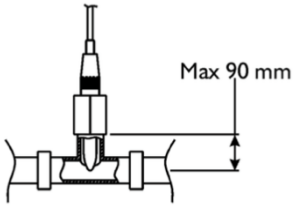

Fig. 4

8. START-UP

For starting-up the installation with the Emaux ***SSC one***® unit, the following points have to be taken into consideration:

1. Check if the filter is completely clean, and ensure that the swimming pool and the installation do not contain any metals dissolved or algae.
2. Ensure that the heating equipment (if any) is suitable for use in salt water.
3. Ensure that the chemical parameters of the pool are maintained within the following values:
   a. pH must be in the range 7.2-7.6
   b. Total alkalinity must be in the range 80-120 ppm
   c. Although the salinity range is between 3500 – 5000 ppm, for starting up the installation is recommended a minimum salt level of 5000 ppm by adding 5 Kg/m^3 of water. As mentioned before, always use common salt (NaCl), without additives like iodides, and never add the salt through the cell. Add it directly to the swimming pool or into the balance tank.
   d. When adding the salt, is recommended carrying out a treatment with chlorine. An initial dose of 2 g/m^3 of trichloroisocyanuric acid may be added.
   e. Prior to starting up the salt chlorinator, let the circulation system work for 24 hours to ensure that the salt is completely dissolved.
   f. Connect the Emaux ***SSC one***® power supply and turn it on, locating the % Power output at 50%.
   g. In outdoor swimming pools it is recommended keeping a level of 30-50 ppm of cyanuric acid (stabilizer) in the pool. This will help to avoid the destruction of produced chlorine by the sun.
4. Once the pool water is balanced, there are three factors that the user can control, which contribute to the amount of chlorine produced:
   a. Filtration time per day (hours).
   b. The amount of salt in the pool.
   c. The % Power output setting.

To find the optimum chlorine generation, start at approximately 50% power output. It will take a few days of adjustments to find the most appropriate setting according to the swimming pool or spa chlorine demand. Once determined, it should only take minor adjustments, if at all, to compensate for differing salt levels due to splashing, backwashing, rain, etc.

The temperature of the water is a parameter that effects the production of Chlorine. The higher is the temperature, the lower is the production of chlorine. For this reason, it is important to adjust the settings if the water temperature increases or decreases.
The Emaux ***SSC one***® will not produce chlorine at temperatures below 10° C. If the water is below this temperature, then the manual chlorination must be proceeded.

The desired level of chlorine generation can be modified according the following parameters:
- Pool water temperatures increases or decreases significantly.
- When there is a higher load of bather than normally.
- When the cell's life time is finishing.
- In a long period of inactivity or winterizing.

9. OPERATION

The Control panel of the Emaux ***SSC one***® unit is composed by three different indicators: Left side indicators, right side indicators and three circle controllers (Fig. 5):

Fig. 5

9.1 LEFT SIDE INDICATORS

9.1.1. OPERATION STATUS

Operation Status informs about the state and operation of the Emaux ***SSC one***® unit:

	SOLID LIGHTS	FAST FLASHING LIGHTS	SLOW FLASHING LIGHTS
GREEN	System is running normally.		
RED	Cell fault. Cell not attached or cell error. Contact Service Agent.	High Salt. Renew with fresh water	Low salt. Add more salt into the pool water.
BLUE	High heat sink temperature. If the temperature of the heatsink reaches the internal thermal setting, the system will automatically reduce the output power until the temperature remains constant.	No probe attached or probe fault.	pH dosing pump error or no acid. (pH readings has not changed after 5 dosing cycles).

Although only 1 error is displayed at any time, multiple errors can exist. In this case, the order of priority is as follows:

1. Cell Error or no cell attached.
2. pH error or no probe attached.
3. Acid Dosing pump error.
4. High Salt.
5. Low Salt.
6. High Heat Sink Temperature.

9.1.2. 

If the red LED light illuminates, this means that the flow sensor does not detect water flow in the cell. Consequently, it will stop producing chlorine immediately.
In this stage, the filtration pump will be programmed for working in cycles of 5 minutes every 20 minutes. This will ensure a minimum flow rate in the system and will avoid the pump to run in dry conditions for a long period of time.
On the other hand, the pH dosing pump will continue working as normally.

9.1.3. 

Emaux ***SSC one***® unit has a self-cleaning cycle which reverses the cell polarity, reducing scale build-up into the titanium plates and maximizing the cell life time.

	GREEN LIGHT	BLUE LIGHT	NO LIGHT
CELL POLARITY	Polarity 1	Polarity 2	Cell is switched off and not producing chlorine

When the cell reverses its polarity, the system will drop down the power to 0%, then will change the polarity and slowly will raise to the previous settings.
By using the indicator WATER, the Hardness of the water can be selected and so, the period of the cell polarity will be different:

- SOFT: 12 hours.
- MID: 8 hours.
- HARD: 4 hours.

9.1.4. 

Emaux ***SSC one***® unit will detect if the pool cover is closed by lighting this indicator in green color. When the pool cover is closed, the system will automatically turn down the cell power to 50% of your established setting power.
However, if the pool cover is closed and the WINTER MODE is ON, the system will turn down the cell power 50% of the cell power turned down by the pool cover.

For example, if during the operating period the cell power is working at 100%, by closing the cover the power will drop down at 50%, and selecting WINTER MODE will drop at 75%.

9.1.5. 

This indicator informs about the status of the filtration pump:

	SOLID LIGHT	FLASHING LIGHT	NO LIGHT
PUMP	Filtration pump is working in normal conditions.	Filtration pump is running but no flow is detected in the electrolytic cell or the flow rate is not enough to fill completely the cell.	Filtration pump is not activated.

9.2 RIGHT SIDE INDICATORS

9.2.1. 

Main power will switch on / off the system. Press the button for 3 seconds to switch the unit off.

	SOLID LIGHT	FLASHING LIGHT	NO LIGHT
POWER	System switched on	System switched off	Power supply is disconnected

When the system turns on again, the timer, operating schedule, output power and pH set point remains the same as per the last session.

9.2.2. 

This button switches on and off the filtration pump:

	SOLID LIGHT	FLASHING LIGHT	NO LIGHT
PUMP	The filtration pump is working and does not depend on the schedule time programed in the unit.	The filtration pump will work according to the time scheduled. (Auto Mode).	The filtration pump is not working.

9.2.3. 

	SOLID LIGHT	NO LIGHT
AUTO	Emaux ***SSC one***® unit will operate according to the time scheduled.	The mode AUTO is switched off and the system will not produce chlorine, even if the filtration pump is working. If filtration pump is working in mode Auto, it will be switched off after few seconds.

If the Salt Chlorinator has to operate according to an external timer, the system must operate in mode AUTO and the timer scheduled for 24 hours, so that only the external timer will be able to switch on/off the system.

9.2.4. 

After checking the Total Hardness in the water of the pool, select the button accordingly:

- SOFT: Total Hardness is lower than 200 ppm $CaCO_3$
- MED: Total Hardness is between 200 and 400 ppm $CaCO_3$
- HARD: water when Total Hardness is higher than 400 ppm $CaCO_3$

By selecting Soft, Med or hard, the polarity of the cell will change.

- SOFT: every 12 hours the polarity will change
- MED: every 8 hours the polarity will change
- HARD: every 4 hours the polarity will change

9.2.5. 

As in the Pool Cover indicator (chapter 9.1.4), in Winter Mode the system will turn down the chlorine production slowly to 50% of the current setting.
If any automatic pool cover is installed due to winterizing the pool, the system will detect when the cover is closed and will drop down the power value 50% more.

9.3 THREE CIRCLE CONTROLLERS

9.3.1. TIMER CONTROLLER

The Timer will provide the following information:
- Production of chlorine schedule.
- Filtration time schedule.
- Current time

There are two different LEDs lighting the Timer:

GREEN LIGHT	RED LIGHT
Is the time schedule. Up to two different working schedules per day.	Is the current time.

For setting the time schedules, proceed as follows:

a) <u>Setting the first working schedule:</u>
- Press the button SET: a single green LED will appear indicating the starting hour of the first working schedule.
- Press + or – to select the starting hour.
- Press SET to confirm the starting time: The range of operating hours will be lighting, and the last hour will be flashing.
- Press + or – to select the last hour of the working schedule.
- Press SET to confirm.

b) <u>Setting the second working schedule:</u>
- The same procedure must be followed for the second schedule.
- At the end, the two different working schedules will be lighting in green in the TIMER.

c) <u>Setting the current time:</u>
- Press and hold the SET button for 3 seconds.
- The red LED will appear in the position 24.
- Press + or – to select the current hour. Each position represents 15 minutes, and alternates red and green LED light color.
- Press SET button to confirm the current time.

9.3.2. POWER CONTROLLER

Power controller regulates the chlorine generates by the cell and is introduced into the pool water.
Two different options are available:

STANDARD CHLORINE PRODUCTION

The higher is the % of power output, the higher amount of chlorine will produce the system up to the maximum cell's capacity.
The range of % output power is lighting in red, from 0% until the desired value.
For setting the desired output power, press the buttons + or – to increase or decrease the value respectively. The new value will be flashing until the system reaches to it.

The system will NOT generate chlorine in the following situations:

a) The Indicator AUTO is not switched on.
b) The current time is out of the programmed schedules.
c) The flow sensor from the cell does not detect flow rate.
d) ***SSC one***® unit is switched off.

BOOSTING CHLORINE

Sometimes, after a higher load of bathers, heavy rain, pool water renewal, etc. the chlorine concentration drops down considerably.
In this cases, by using BOOST button, the Emaux ***SSC one***® will generate chlorine at 100% of output power during 24 hours or until the same button is pressed again by the user.

How to proceed:

1. Before Boosting chlorine, it is recommended checking the chemical parameters, paying special attention to the pH, which should be between 7.2 and 7.4.
2. By pressing BOOST button in the POWER Controller, the green LED lights will go red and BOOST signal will go green. Consequently, the filtration pump will switch on and the output power will be slowly increasing up to 100% of production.
   The time schedule will change to red color and will operate for 24 hours non-stop, unless the operation is cancelled by pressing the button BOOST again.
   During Boosting chlorine, it is recommended check the chlorine concentration more often because it may increase fast in a short period of time.
3. After boosting chlorine, the unit will keep working according to the previously programmed schedule.

9.3.3. PH CONTROLLER

pH Controller regulates pH value of a swimming pool thanks to the pH Probe readings and the control of a peristaltic dosing pump.
Emaux ***SSC one***® unit will read the signal from the pH probe, will compare it with the desired pH value, and will switch on/off the dosing pump accordingly.

There are two different pH signals in the controller:

GREEN LIGHT	RED LIGHT
Desired pH Value (Set point)	Current pH value read by the pH probe

Control procedure:
Press the buttons + or – to increase or decrease the set point.
Remember the recommended range of pH value in a swimming pool is between 7.2 and 7.6.
In order to regulate the pH correctly, the Total Alkalinity of the pool water must be maintained in the range 80 – 120 ppm. Use a pool water test kit to check the Total Alkalinity and adjust it manually if necessary.

PH CALIBRATION:
We recommend you calibrate the pH probe at least once per month during the operating season.

Calibration Procedure:
1. Extract the pH probe from the holder and clean it with fresh water.
2. Green LED light in POWER is slowly flashing.
3. Press and hold the buttons + and – of pH Controller simultaneously. The whole values of pH will turn green.
4. Put the pH probe to the first buffer solution (pH 4). Green lights will count down until the end.
5. Clean the pH probe again with fresh water.
6. Press and hold again the buttons + and – from the pH Controller. This time, the whole values of pH will turn red light.
7. Put the pH probe to the second buffer solution (pH 10). Red lights will count down, and turn off when finish.
8. The complete range of lights (red and green) will indicate the calibration has been done successfully.

PERISTALTIC DOSING PUMP:
While Hypochlorous acid (HClO) generated by the Salt Chlorinator is disinfecting the water, the pH tends to increase.
For this reason, the injection of acid into the water is always compulsory.
Emaux ***SSC one***® unit includes a peristaltic dosing pump that will inject the acid into the circuit.
The dosing pump can work in Auto or Manual Mode:

1) Mode AUTO:
The peristaltic dosing pump will be switched on or off according to the pH value read by the probe and compared with the established Set Point.

The dosage is carried out in cycles of 5 minutes dosing followed by 20 minutes of stand-by. These cycles avoid over-dosage of acid in the pool.
If after 20 minutes the current pH does not reach the Set Point, the dosing pump will switch on again for 5 minutes more or until the pH reaches the set point.
If after 5 cycles the pH reading has not changed, a blue LED light in OPERATION STATUS will be flashing informing there is a problem with the dosing pump or with the acid solution.

The dosing pump will NOT work in AUTO Mode in the following conditions:
1. The current pH reaches the established Set Point.
2. After 5 cycles the current pH does not change the value.
3. The flow sensor in the cell does not detect flow rate.
4. The filtration pump is not working.

2) Mode MANUAL:
Push and hold the button SET from the pH Controller to switch on the dosing pump manually. Once the button is released, the dosing pump will stop dosing.
This mode can help the system to reach the Set Point faster, but it is always recommended allowing a certain period of time between dosages in order to let the acid mix with the pool water.
No special conditions are required for running the dosing pump in Manual Mode.

10. MAINTENANCE

10.1. MAINTENANCE OF THE ELECTROLYTIC CELL

Due to the Reverse Polarity System that avoids scale in the plates of the cell, the first action to consider for ensuring a long cell lifetime is to keep the chemical parameters always in the recommended range, especially the amount of salt, the pH and the water hardness.

1. Keep the salinity of the water always higher than 3000 ppm in order to avoid premature deterioration of the cell plates. The following formula determines the amount of salt to be added in the pool due to low salinity:

$$Q = (4\text{-}S) \times V$$

Where Q = quantity of salt (kg) to be added.
4 = correct salt concentration (constant).
S = Measured salt content in the pool
V = Volume of the pool in m^3.

2. Keep the pH between 7.2 and 7.6. Check and clean the cell plates if the system has been working for a prolonged period with a pH value over 7.6.

3. Check regularly the hardness in the pool water and regulate the Reverse Polarity System indicating if water is hard, medium or soft.

ELECTROLYTIC CELL CLEANING PROCEDURE

If scale has been formed in the plates of the cell, the first cleaning procedure is the following:

1. Turn off power to the ***SSC one***® unit before removing the electrolytic cell.
2. Once removed, look inside the cell and inspect for scale formation (light colored crusty or flaky deposits) on the plates and for any debris which has passed through the filter and caught on the plates.
3. Try to remove the scale using a plastic or wooden tool (do NOT use metal as this will scratch the coating off the plates).

If the scale still remains in the plates, proceed the cell cleaning with acid solution as below:

a) Dilute hydrochloric acid with water: one part of acid in 10 parts of water.
   ATTENTION:
   - Always add acid into the water, NEVER add water into the acid. This prevents splashing of the acid when the water hits it.
   - Wear rubber gloves and appropriate eye protection.
b) Submerge the cell plates in the solution for no more than 10 minutes. Plates plastic housing can be submerged in the solution, but avoid any contact with the cell connections and wires.
c) Rinse the cell with a high pressure hose. If any deposits are still visible, repeat soaking and rinsing.
d) If scaling persists, replace the cell by a new one.

10.2. MAINTENANCE OF THE PH PROBE

1. The pH probe must be calibrated at least once per month. (For calibration procedure, see chapter 9.3.3).
2. Ensure that the membrane placed at the end of the pH probe remains always wet.
3. For cleaning the probe, use fresh water and a soft cloth.
4. If the probe is not going to be used for a long time, keep it submerged in a conservation solution at pH 4.
5. The pH probe is a consumable and it needs to be replaced periodically.

10.3. MAINTENANCE OF THE PERISTALTIC DOSING PUMP

Check periodically if the dosing pipes are leaking or have enough flexibility.
Check the foot valve inside the storage acid tank and clean it if necessary.
Check the injection valve in the circulation pipe and clean it if necessary.

11. WINTERIZING

During a period of low operation, such as winter, the procedures are as following:

a) Minimum working operation
- Activate WINTER MODE. The production of chlorine will drop at half.
- If an automatic pool cover is installed and connected to the ***SSC one***® unit, the system will detect it and the production will drop the half again. So from the initial chlorine production, now is reduced 75%.
- Reduce the schedule time at minimum working period according to the aims of the pool in winter season.
- Check periodically the complete installation, the storage acid level and the electrolytic cell.

b) Non-working period

If the installation is not working during a long period of time, the following recommendations have to be carried out:
- Switch off the ***SSC one***® unit and disconnect it from the power supply.
- Close the valves from the by-pass and remove the water from the cell.
- Clean the cell plates with fresh water and dry them with a soft cloth. Check if scaling has been formed. If so, proceed with the cleaning of the cell plates (see chapter 10.1).
- Remove the pH probe and keep it submerged in a conservation solution at pH 4 in an indoor place.
- Remove the suction pipe of the dosing pump from the acid solution. Clean the dosing pipes from the acid by dosing manually fresh water.
- Clean the foot valve and the injection valve of the dosing pump with fresh water.

12. TROUBLESHOOTING

	PROBLEM	SOLUTION
OPERATION STATUS light signals	1. Solid red light: Cell fault. No cell connected.	Check the cell plates. Verify the electrical cables between the cell and the Control unit. Check the salinity of the water.
	2. Fast flashing red light: High amount of salt in the water.	Renew the water of the pool with fresh water.
		Check again the salinity of the pool
	3. Slow flashing red light: Low amount of salt in the water.	Add more salt into the water.
	4. Solid blue light: High heat sink temperature.	The system will automatically reduce the output power until the temperature remains constant.
		Install the Control unit in a ventilated area, away from heat sources and any equipment which produce heat.
	5. Fast flashing blue light: pH probe fault. No pH probe connected.	Check pH connections. Calibrate the pH probe. Replace the pH probe if it cannot be calibrated.
	6. Slow flashing blue light: pH dosing pump error or no acid solution.	Check dosing pump pipes, foot valve and injection point. If necessary, clean the components with fresh water.
		Check the volume of acid solution in the chemical storage tank.
		Prepare an acid solution more concentrated.
	Free chlorine level is very low	Check the output power range. Check the flow rate in the electrolytic cell. Verify the water parameters of the pool, and especially the pH (range 7.2 - 7.6), and cyanuric acid (stabilizer) which must be between 30-50 gr/m^3. Increase the operation schedule.
	pH dosing pump is not working	Verify is the pH of the water is between 6-9 pH
		Check if the control unit is in Auto Mode. Dosing pump will work only if the control unit is in mode Auto.
		Dosing pump works in cycles of 5 minutes every 20 minutes to avoid over-dosage in the water.
	pH CONTROLLER does not show the correct values	The cable of the pH probe is not connected properly. Check the cable connections or replace the cable. Calibrate the probe and if the problem persists, replace it for a new one.

13. WARRANTY POLICY

Emaux manufactures its products with the highest standard of workmanship, using the best materials available through state of the art process. Emaux proudly warrants its products as follows:

EXTENDED WARRANTY FOR SPECIFIC PRODUCTS (OFFERED FROM DATE OF INVOICE)	
Product	**Warranty Period**
Filters & Filter Systems	2 years
Pumps	1 year
Underwater Lights	1 year (bulbs 90 days)
Ladders	1 year
Control devices	1 year
Heat Pumps & Heat Exchangers	1 year
Salt Chlorinators & UV Systems	1 year (2 years for cell material)
Pool Fittings	1 year
Cleaning Equipment & All others	1 year

13.1. EXCEPTIONS THAT MAY RESULT IN DENIAL OF A WARRANTY CLAIM

1. Damage caused by careless handling, improper repackaging or shipping.
2. Damage due to misapplication, misuse, abuse or failure to operate and install the equipment as specified in this manual.
3. Damage caused by a misuse, abuse or failure to operate and install the equipment out of the scope of a professional level demanded in similar equipment or installation type.
4. Damage due to unauthorized product modifications or failure to use Emaux original replacement parts.
5. Damage caused by negligence or failure to properly maintain products as specified in this manual.
6. Damage caused by failure to maintain water chemistry in conformity with the standards of the swimming pool industry for any length of time.
7. Damage caused by water freezing inside the product.
8. Accident damage, fire or other circumstances outside the control of Emaux.
9. Items repaired or altered in any way by any person that is not authorized by Emaux.
10. Wear & tear parts.

13.2. CLAIM PROCESS

Summary of Emaux Claim Process in 3 steps:

1. Claim: Customer contacts Emaux salesperson and provides complete details of the claim which includes:
   a. Information about the failed product such as the part number(s) and serial number(s).
   b. Description of the complaint/failure.
   c. Pictures
2. Once the complaint is received, the product quality incident will then be reviewed by Emaux Quality Department following the "Emaux Warranty Policy".
3. Conclusion: After the investigation is completed, Emaux will inform the distributor accordingly.

13.3. WARRANTY OBLIGATION

Emaux warrants any of above items from workmanship and/or material(s).
Should a defect become evident during the term of warranty, Emaux will, at its option, repair or replace such item or part at its own cost and expense. Customer will need to follow the warranty claim procedures from Emaux in order to obtain the benefit on this warranty.
Emaux is not, however, responsible under this warranty for any cost of shipping or transportation of the equipment or parts thereof "to" or "from" our technical operations. Emaux is not liable for any loss of time, inconvenience, incidental expenses such as labor cost, phone calls, legal cost or material cost incurred in connection with the replacement or removal of the equipment, or any other consequential or incidental damage on persons or assets. Emaux will be not responsible for any business profit loss or operation stop due to the non-conformity product equipment. No indemnity or damages can be claimed on any account whatever.

13.4. WARRANTY OR REPRESENTATIONS BY OTHERS

No dealer or other person has authority to make any warranty or representation concerning Emaux or its products.
Accordingly, Emaux is not responsible for any such warranty or representation.