



c o n t e n t s

You have chosen a CLEARWATER® salt chlorinator by ZODIAC because it makes life stress-free and relaxed.

The LM2 is a pole reversal model. The electrodes are self-cleaning to minimise your maintenance time.

Processing is non-stop and reduces maintenance to a simple check of the water pH levels.

Thank you for purchasing our CLEARWATER® water processing system, we recommend that you read these instructions carefully before installing and using it.

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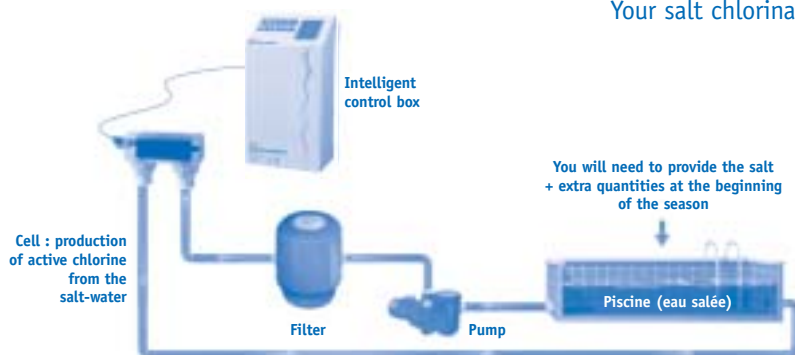
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How does your CLEARWATER® system work ?

When your CLEARWATER® system is installed, a pre-defined quantity of salt is dissolved into the swimming pool's water. This very slightly salted water is then passed through the CLEARWATER® cell. Chlorine is produced which destroys the microbes. The cell constantly replenishes the active chlorine that vanishes under the sun's UV rays. You don't have to do anything.

Your salt chlorinator is operational during the filtering processes.

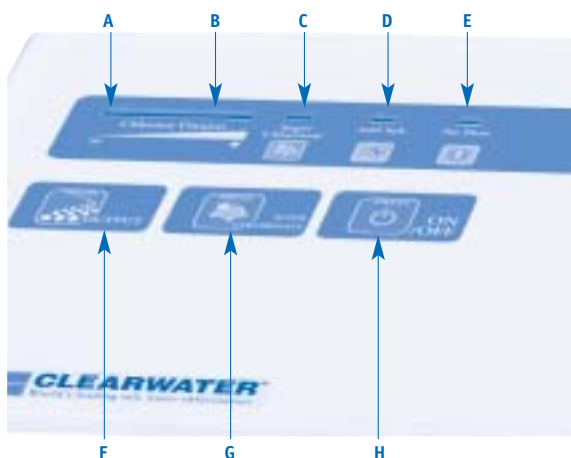


Everyday, therefore, during the filtering process, dust and residue are collected by the filter, while your CLEARWATER® system is disinfecting the water and making it healthy and crystalline.

All you have to do is to check water balance as usual, and in particular maintain the pH and TAC levels.

The controls on your CLEARWATER® system

Indicators and buttons



(H) ON/OFF : Controls the starting and stopping of the salt chlorinator. Useful for maintenance operations.

N.B. : For the models without a clock, when the chlorinator is stopped by the "OFF" button, it restarts automatically the 1st time the pump restarts.

(F) Output : regulates the hourly production of chlorine. Pressing the button moves the cursor from left to right (maximum). Press it once more and it goes back to the minimum.

(G) Super-chlorination : Used for rapidly increasing the chlorine in the swimming pool on a one-off basis. To do this, leave the filter pump on override during the super-chlorination period. The pump must run for 24 hours and pushing the super chlorination button automatically sets the chlorine production level to maximum.

This super-chlorination process can be interrupted or restarted at any given time by using the super-chlorination button. When this function is activated, previous settings are ignored.

(B) Chlorine Output : A series of 6 lights indicate the CLEARWATER® production setting. The further the light is towards the right of the scale, the higher the level of production

N.B. : This indicator does not give the level of chlorine in the water, it gives information on the hourly production of the system.
To find out the level of free chlorine in your pool, you must use your usual test kit.

(A) Production of chlorine, first yellow diode flashing :

This diode flashes for a few minutes when the cell is in pole reversal phase. During this period, the production of chlorine is stopped. The polar reversal cycle is 5.8 hours.

(C) Super-chlorination :

Indicator lit-up, this is indicating that the super-chlorination function has been selected. It will go out as soon as the super-chlorination process has finished.

Indicator not lit-up, the function has not been selected.

(D) Add salt :

Indicator lit-up, this indicates an insufficient level of salt, between 3 and 4 g/litre. Network voltage that is too low or cold water temperature can also cause it to light up, even if the salt level is correct. Operating the LM2 with salt levels that are too low reduces the life-span of the electrode.

Indicator not lit-up, This indicates that the salt level is correct.

(E) No flow : This indicator lights up to show that the flow of water in the cell is insufficient (generally as a result of a pump stoppage). The production of chlorine is therefore stopped.

This red indicator can also be triggered by the disconnection of the third wire on the electrode (the blue one).

None of the indicators are lit up : This means that the LM2 is not functioning. Check the fuses and switches.

Installation

Warning

It is imperative that the salt chlorinator is installed by an experienced swimming pool professional.

The CLEARWATER®, LM2 model salt chlorinator has been IP24 tested and approved. Its connection to the mains electrical network and its positioning in relation to the pool must be carried out in accordance with the standards and regulations in force in each country.

It is important that salt is put into the pool before starting up the chlorinator (see chapter 4.b : the water balance).

Volume of water (m ³)	Quantity of salt (kg) to be added when starting up, to obtain 4 g/l
40	160
50	200
60	240
70	280
80	320
90	360
100	400

It must be positioned after the heating and the filter.
This must be **the last fitting before the inlet.**

The cell must be horizontal : The water input and output will be pointed downwards.

Water can circulate in both directions.

For the gluing : the pipe unions are in moulded ABS polymer.
They can be glued to the PVC pipes using a suitable PVC glue.
First of all clean the surfaces to be glued with a solvent and then glue.
Hold in position for at least 30 seconds.

If you choose to install the cell with a bypass routing, we recommend that you use a non-return valve and not a manual valve between the CLEARWATER® and the inlet.

Installation of the cell



Important :

- > The water pressure in the cell must not exceed 2 bars.
- > The water temperature must not exceed 40°.
- > If you choose to install shut-off valves, stop the pump then the CLEARWATER® system before handling the valves. No current must reach the electrodes when the valves are closed because this can damage the cell. Make sure that the valves are open again before re-starting the pump and the CLEARWATER® system.

Installing the control box

Fix the control box to a wall within 1.5 m from the cell and 1.2 m above the ground, respecting safety regulations in terms of the distance from the pool (this must be at least 3 metres from the edge of the pool).

If the control box is installed on a pillar, it must be placed on a flat and watertight panel at least 24 cm wide and 44 cm high.

Do not enclose the control box in an outer shell.

Do not install it above a source of heat.

It is preferable, but not essential, to place it in a shady area, sheltered from the rain and direct sunlight.

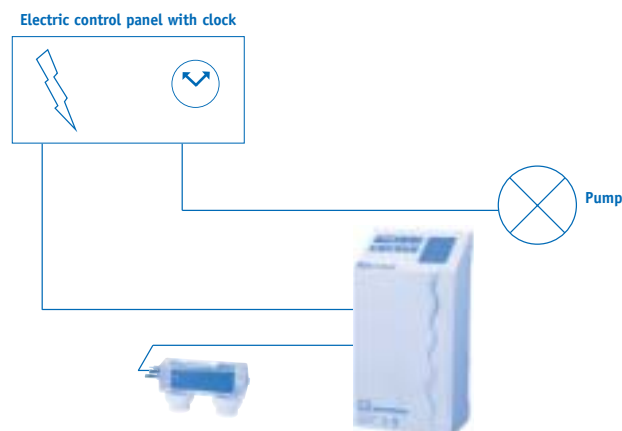
How to connect the control box to the cell

Connect the power cable to the electrode terminals.
Blue with blue and black with black.

Make sure that the connections are firmly attached.

How to connect the control box to the pump

Connect the electric cable from the CLEARWATER® electrolyzer's control panel to the clock in the switch cabinet that controls the pump (servo-system from the electrolyzer to the pump).



Wait 24 hours to allow the PVC glue to set perfectly on the cell's connections.

Usage recommendations

Filtering times

The LM2 functions only operate during the filtering process.

For an outdoor pool, run the pump + chlorination system for 6 to 8 hours per day. To reduce the effect of UV reduction of chlorine it is preferable to run it at the end of the day or early in the morning when it is cooler.

During very hot periods, it can be necessary to increase operation time to approximately 10 hours per day.

If the filtering system has to be in operation for more than 10 hours per day (in particular during the period when the temperature rises, when there is a heating system), it can be necessary to reduce the production level (button E) so as to avoid over-chlorinating the pool.

In winter, operation time should be reduced to 2-3 hours or the system is stopped completely and the pool is closed down for the winter, so as to prolong the life-span of the electrodes.

For indoor or covered pools, these standard times should be heavily reduced or the production of chlorine lowered to avoid excessive chlorine levels.

Water balance

To be sure that your chlorinator is operating at its optimum, the water balance must be regularly checked and maintained :

Salinity	4 kg of salt per m ³
pH	7.2 to 7.6
Chlorine stabiliser	40 to 75 g per m ³
TAC, total alkalinity	8 to 12° (French)
Free chlorine	1.5 to 3 ppm
TH	10 to 30° (French)

- **Free chlorine level**

You can modify this by changing the operation time or varying the hourly production (button E).

- **Salinity**

From time to time extra salt is necessary. The best times are just before the summer or when you start up the system after a prolonged stoppage.

- > First of all you should analyse the salt level.
- > Turn off the chlorinator before adding the salt.
- > Add boiled salt at 99.9% to attain a concentration level of 4 g/litre.
- > A bag of 25 kg of salt increases the concentration level by 0.5 g/litre for a pool of 50 m³.
- > Add a maximum of 2 bags of 25 kg at a time.
- > For the salt directly into the swimming pool and not into the skimmers.
- > Run the filtering system for 4 or 6 hours to disperse the salt, but 24 hours are necessary for it to be completely dissolved.
- > Repeat the operation if you have not obtained the ideal level of concentration.

Only now can one restart the chlorinator.

- **The pH**

It is desired that the water's pH is maintained between 7.2 and 7.6 (7 for pools in polyester).

Low pH : Irritates one's eyes and corrodes metal parts.

To increase it, use pH +. Check the water's pH 2 hours after each new input has completely dissolved.

High pH : Increases lime deposits, makes the water cloudy and hinders the disinfectant qualities of the chlorine.

To lower it, use a pH - or hydrochloric acid. Work in stages, 1 litre of acid at a time and checking the pH between each new input.

If you are unable to maintain a correct level of pH, check your TAC.

- **The TAC, total alkalinity**

Total alkalinity must be between 8 and 12° (French).

This is the measurement of all the alkaline products present in your swimming pool's water.

If the alkalinity is too low the pH will continually go up and down.

To increase it, add some TAC equaliser or some sodium bicarbonate.

Add small quantities at a time once a day to attain 8 to 12° (French).

If the alkalinity is too high deposits will accumulate on the electrodes of the chlorinator and on the walls of the pool...

To reduce it, add 0.4 g/litre of pH - or hydrochloric acid each day until the alkalinity value measured at least 24 hours afterwards is back down to between 8 and 12° (French).

- **The TH (Total Hardness of the water)**

It is preferable for correct operation that the TH be no higher than 30° Fr (300 ppm).

To soften the water, use the dealkalization process :

> Fill up the pool to its maximum, add some pH + or sodium carbonate (Na_2CO_3) to bring the level of pH up to the zone between 9.5 and 10. Use the non-filtering circulation mode (position "circulation" on the 6-way valves).

> Allow for 100g of Na_2CO_3 per m^3 of water and for every 10° of reduced hardness.

E.g. : Pool of 80 m^2 with water at 40° TH that you want to reduce to 20° TH.

100 x 80 x 2 = 16 kg of Na_2CO_3

> Stop the pump when the water in the pool becomes cloudy.

> Allow this precipitation process to continue for 12/24 hours, taking care not to disturb the water. The particles will go down to the bottom of the pool.

> When the deposit is on the bottom, vacuum with the hand sweeper and evacuate directly into the drain.

> Then bring down the pH.

- **Chlorine stabilizer**

The sun destroys the chlorine. In order to protect it, a chlorine stabilizer should be used to obtain a minimum level of 40 g per m^3 of water.

Do not exceed 75 g per m^3 , this would have gradually the reverse effect by reducing the power of the chlorine.

Standard maintenance checks

Every week :

- > Visual inspection of the electrodes: remove the foreign bodies that have come through the filter and sometimes remain stuck in the body of the cell. Be careful not to deform or scratch the electrodes.
- > Check the level of free chlorine.
- > Check the pH.
- > Check the sand filter, and clean it if necessary (*backwash**).
- > Check the pump's pre-filter

Every month :

- > Check the level of salt in the water.
- > Check the TAC.
- > Check the level of chlorine stabiliser.

***Backwash :**

We recommend that you set the production rate of your electrolyzer to minimum when carrying out a backwash of the filter. If you prefer to turn it off and isolate it during the backwash, we recommend that you disconnect the blue wire on the sensor. The appliance will then remain switched-off and will ignore the re-start command sent by the pump. In this case, remember to re-connect the blue wire on the sensor once you have finished your maintenance operation.

Maintenance of your CLEARWATER® system

Cleaning the electrodes



In certain regions, where the water is very hard, the self-cleaning electrodes can very occasionally need a manual clean.

Proceed as follows :

- > Stop the CLEARWATER® system.
- > Stop the filter pump.
- > Disconnect the blue wire from the electrode.
- > If there are valves, close them to isolate the cell. Never close the valves without making sure that the CLEARWATER® system has been stopped and that it cannot restart. If it were to restart, the cell could explode.
- > Disconnect the power cable from the electrode terminals.
- > Unscrew the two pipe unions that attach the body of the cell to the piping and carefully remove the assembly. Lay it down flat, with the entry/exit openings facing upwards.
- > Pour the cleaning solution into the body of the cell until the electrodes are completely covered.
- > Allow the solution to act for about ten minutes, enough time for the calcium scale to dissolve.
- > When the electrodes have been cleaned, remove the solution.

N.B. : This cleaning solution can be purchased from your specialist swimming pool dealer. To make it up yourself, add one part hydrochloric acid to 10 parts water. Always add the acid to the water and never the reverse. Mix it thoroughly to make the solution uniform.

- > Rinse the electrodes in running water.
- > Reassemble the electrodes, tighten the pipe unions and make sure that there are no leaks.
- > Open the stop valves.
- > Replace the electrical connections on the electrodes.
- > Restart the filter pump and the LM2.
- > Make sure the chlorine production setting is correct.

Damage caused by insects

The LM2 control box is equipped with small openings designed to avoid the overheating of the internal components in hot climates.

Small insects can sometimes cause problems if they get into the box. To avoid this, spray the surfaces near the openings with insecticide.

Solutions to possible problems

PROBLEMS	CAUSES	SOLUTIONS
The water looks fine, but the chlorine is not shown in the analysis	<ul style="list-style-type: none"> > High PH > Not enough stabilizer 	<ul style="list-style-type: none"> > Set the pH between 7.2 & 7.6 > Check that the electrodes are clean > Check the stabiliser level (cyanuric acid)
Green water and no chlorine shown in the analysis	Chlorine level too low	<ul style="list-style-type: none"> > Super-chlorination > Or immediate chlorination using normal oxidising product
Smell of chlorine	Not enough chlorine	<ul style="list-style-type: none"> > Super-chlorination > Or immediate chlorination using normal oxidising product
Sticky sides of the pool	Algae growing	<ul style="list-style-type: none"> > Sweep the sides of the pool and vacuum or filter > Then immediate chlorination
Eye or skin irritation	Incorrect level of pH or presence of chloramines in the water	<ul style="list-style-type: none"> > Adjust the pH to between 7.2 & 7.6 > Immediate chlorination process if no improvement
Scale forming on the equipment and pool sides	<ul style="list-style-type: none"> > Incorrect pH and very hard water 	<ul style="list-style-type: none"> > Adjust the pH to between 7.2 & 7.6 > Or lower the TH (10 to 30° Fr.)
	<ul style="list-style-type: none"> > Or total alkalinity too high 	<ul style="list-style-type: none"> > Lower the TAC
The production of chlorine cannot reach the maximum level.	<ul style="list-style-type: none"> > Level of salt below 4g/l > Or cold water 	<ul style="list-style-type: none"> > Add salt > Or increase the production time
	<ul style="list-style-type: none"> > Or the electrodes are in pole reversal phase 	<ul style="list-style-type: none"> > Wait 3 minutes for the electrodes to go back into their normal cycle
	<ul style="list-style-type: none"> > Or the electrodes are damaged 	<ul style="list-style-type: none"> > Replace the electrodes
The "water safety" indicator is lit up	<ul style="list-style-type: none"> > Flow of water is nil or insufficient. 	<ul style="list-style-type: none"> > The filter needs cleaning, or a pocket of air has built up in the cell
	<ul style="list-style-type: none"> > Or the blue sensor is not connected 	<ul style="list-style-type: none"> > Reconnect the blue sensor
None of the chlorinator's indicators are lit up	<ul style="list-style-type: none"> > The unit has been stopped 	<ul style="list-style-type: none"> > Use the Start/Stop control (Button H)
	<ul style="list-style-type: none"> > Or the power supply has been cut or a fuse has blown 	<ul style="list-style-type: none"> > Check the power supply and check the chlorinator's fuse

Warnings

a > The CLEARWATER® salt chlorinator must be installed by a professional swimming pool specialist. Its installation and its usage must respect the recommendations made in this manual.

b > Do not handle the sand filter's 6-way valves or the stop valves when the pump is in operation. You could damage the cell. The valves must all only be handled when the pump has been stopped and the pressure has dropped.

c > Handling of the stop valves should be carried out in the following manner :

- Stop the LM2 (button H).
- To prevent any false manoeuvre from hindering maintenance operations, remove the third small blue wire from the electrode and make sure that it is not in contact with the terminals : you are now certain that your appliance cannot restart.
- Close your valves.
- Proceed with your maintenance operations.
- When maintenance is finished, open all the valves again to operate as normal, then re-start the pump, and finally reconnect the third small blue wire to the electrode.

If you do not follow these instructions, there is a risk that the cell/electrode assembly could explode.

d > Do not scrape the electrodes with a metal object, and do not deform them.

e > Protect the electrode terminals with a little silicon grease. Only use silicon grease, any other type of grease can damage the waterproofing seal and the joints. Do not submerge the terminals in hydrochloric acid, and avoid contact with salted water.

f > Water above a temperature of 40° must not pass through the cell.

g > The water pressure in the cell must not exceed 2 bars.

h > Periodically check the cell to remove any debris that the pool's filter might have allowed through.

i > The control box must not be installed directly above a source of heat such as the pump or the heating system. It must be at least 30 cm from the ground to enable the air to circulate freely all around, and it must not be fitted into a closed outer shell.

j > The life-span of the electronic fittings of the LM2 and of the appliance in general will be increased if protected from direct sunlight.

Your guarantee

a > Conditions

All our technical experience and concern for quality has been used in the construction of our equipment. It is subjected to numerous quality controls.

Our models are regularly updated and improved to make the most of technological advances. It is understood that these improvements cannot be added to previous models within the context of our guarantee.

If, in spite of all the care and know-how used in the manufacture of our products, you were to have need of the guarantee, please be aware that it only applies to the free replacement of faulty parts. Transport and labour costs remain your responsibility.

b > Length of guarantee

The control box and the cell of your CLEARWATER® chlorinator have an unconditional guarantee: whatever the causes of their deterioration, they will be mended or exchanged within a period of 24 months following your purchase.

c > Object of the guarantee

During the guarantee period defined above, any part recognised as faulty will be mended or exchanged by the manufacturer with a new part or in correct operating condition.

In all cases, travel and labour costs will be the responsibility of the user. In the event of a return to the workshop, return transport costs will be the responsibility of the user, but labour costs remain the responsibility of the manufacturer.

The immobilisation and the prevention of possession of an appliance in the event of any necessary repairs cannot give rise to compensation. In all circumstances, the legal guarantee of the seller continues to be applied in accordance with article 4 of decree n° 78-464 of 24 March 1978. The legal guarantee of article 1641 of the civil code is applied.

d > Transport damage

Appliances always travel at the risk and peril of the user. It is up to the latter, before taking delivery of the appliance, to check that it is in perfect condition and if necessary to voice reservations on the haulage contractor's delivery slip. Under no circumstances can we be held responsible for transport damage.

e > Laws and disputes

This guarantee is subject to French law and to all European directives or international treaties that are applicable in France and in force at the time of the complaint. In the event of a dispute over its interpretation or its execution, French courts have exclusive jurisdiction.