SALT WATER CHLORINATOR

USER MANUAL

CHLORINATOR INFORMATION

PLEASE NOTE IN THE FOLLOWING CARD THE REGISTRATION DATA OF THE EQUIPMENT YOU HAVE PURCHASED, WHICH ARE FOUND ON THE SIDE LABEL.

THESE DATA WILL BE OF USE IF YOU WISH TO MAKE ANY ENQUIRY TO YOUR SUPPLIER

MODEL.....
REF. .....
VOLTAGE.....
SERIAL NUMBER.....

CONTENTS

ATTENTION

Before installing the salt water chlorinator, please read this manual carefully. If you need to clarify any point or have any doubts, please contact your distributor.

1- GENERAL DESCRIPTION

1.1- N-BSSALT salt water chlorination equipment

Thank you for purchasing our salt water chlorinator, which will enable you to enjoy your swimming pool in perfect conditions, without the need to add any chemical disinfectants.

The salt water chlorination system produces chlorine directly in the filtering installations by means of electrolysis of slightly salted water. "Free chlorine" (hypochlorous acid, HClO) is produced which is a strong bactericide. Results are similar to the chemical products that are normally added.

Saline electrolysis is a reversible process, meaning that once active elements react with organisms present in the water, it reverts to common salt and water.

The equipment includes an electronic monitoring and regulation control and an electrolysis cell through which the pool water circulates and which is installed in the filtering circuit return

If the salt water chlorinator equipment is left to work permanently, it will not be necessary to change the swimming pool water for several years (8 to 15 depending on its use). You will therefore be collaborating with environment preservation policies and water management and saving.

1.2- Technical specifications

- HClO production from 10 to 35g/h
- Manual production adjustment (%)
- Indication of warnings and alarms on the control panel
- Flow switch and cover detection
- Advanced features and data display through an LCD screen.

1.2.1 Equipment

Model	NBSSALT10	NBSSALT15	NBSSALT20	NBSSALT25	NBSSALT35
Supply voltage	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz	230Vac 50/60Hz
Chlorine production g/hour	10	15	20	25	35
Max. power	75W	112.5W	150W	187.5W	263W
Cell current	10A	15A	20A	25A	35A
Dimensions	280x250 X135mm	280x250 X135mm	280x250 X135mm	280x250 X135mm	280x250 X135mm
Weight	4Kg	4Kg	4Kg	4Kg	4Kg
Protection	IP65	IP65	IP65	IP65	IP65
Max. Room Temperature	40ºC	40ºC	40ºC	40ºC	40ºC

- Adjustment of chlorine production by switched mode power supply
- Power supply performance >90%
- Automatic switch-off owing to lack of water flow
- Automatic switch-off owing to the accumulation of gas in the cell, with automatic restart once the water flow is restored.
- Automatic current and voltage adjustment depending on the concentration of salt and the temperature, keeping continuous chlorine production.
- Automatic cleaning cycle of electrodes.
- Automatic restart in the event of supply failure.

1.3- Recommendations and safety precautions

- The equipment should always be installed by qualified staff.
- Disconnect the equipment from the mains before performing any assembly or maintenance operation.
- **Make sure that the electrical installation has all compulsory protection elements (circuit breaker and differential switch) in perfect condition.**
- **It is important to ensure that the supply cables of the electrolysis cell are tightly connected, otherwise the equipment could overheat and break down.**

- Ensure that the heatsink wings (in the rear part of the equipment) are not blocked and that air can easily circulate through them.
- All the BSV equipment incorporate protection systems against short circuits in the cell, absence of water detector and other safety systems that give an acoustic and visual alarm in the event of any anomaly. However, for optimum results, you should ensure the correct hydraulic operation of your swimming pool.
- Equipment housing has IP65 protection. However, it is highly recommended not to install the equipment directly exposed to sunlight.
- Corrosive environments may reduce the lifespan of the equipment. Do not leave open containers with acids near the equipment.

2- PREPARING THE SWIMMING POOL

2.1- Adding salt to the water

To ensure that the chlorinator works correctly, a small amount of salt should be added and the pH level should be suitable.

The recommended **salt and pH** levels are the following:

	Salt Concentration (g/l)	pH
N-BSSALT	4 a 6	7,1 a 7,4

Although the equipment will start to operate with lower amounts of salt, the optimum production of salt will be reached with concentrations of over 4kg/m3. We recommend a concentration of 5Kg/m3 to offset small losses of salt occurring when cleaning the filter, the effect of rainfall, etc.

To calculate the salt to be added, multiply the total m3 of your swimming pool x 5.
Example : A swimming pool measuring 9m in length x 4.5m in width x 1.6m in depth.
9 x 4.5 x 1.6= 64.8 cubic meters. 64.8 x **5** = 324 Kg of salt to be added.

We recommend using salt that is especially prepared for use in salt water chlorination installations, as it is especially prepared for rapid dissolution and to achieve optimum results. You can find it at retailers specializing in swimming pool products.

ATTENTION
When adding salt to the swimming pool, first disconnect the chlorinator (position **OFF)**, and start-up the filter for 3 or 4 hours, in order for the salt dissolving and not to overload the equipment. Once dissolved, switch on the chlorinator.

It is advisable to add salt to the swimming pool gradually, in 2 or 3 times so as not to exceed the recommended amount. Excess salt can overload the chlorinator, in which case it will automatically stop working and water will have to be added to reduce the concentration.

We also recommend not to add salt near the drain, to avoid undissolved salt from circulating in the water circuit.

2.2- Chemical balance of the water

The effectiveness of chlorination and the quality of water for healthy bathing, depends largely on the pH of the water. Therefore, it should be checked regularly and adjusted as necessary.

There are other parameters which should be considered for the correct operation of the salt water chlorinator. We recommend an in-depth analysis of the water when installing a salt water chlorinator.

Parameter	Minimum Value	Maximum Value
PH	7.0	7.8
FREE CHLORINE (mg/l)	0.5	2.5
COMBINED CHLORINE (mg/l)	--	0.6
TOTAL BROMIDE (mg/l)	3.0	6.0
BIGUANIDE (mg/l)	25	50

ISOCYANURIC ACID (mg/l)	--	<75
OZONE (GLASS) (mg/l)	--	0
OZONE (before)	0.4	--
TURBIDITY (NTU)	--	<1
OXIDES (mg/l)	--	<3
NITRATES (mg/l)	--	<20
AMMONIA (mg/l)	--	<0.3
IRON (mg/l)	--	<0.3
COPPER (mg/l)	--	<1.5
ALKALINITY (mg/l)	100	160
CONDUCTIVITY (us/cm)	--	<1700
TDS (mg/l)	--	<1000
HARDNESS (mg/l)	150	250

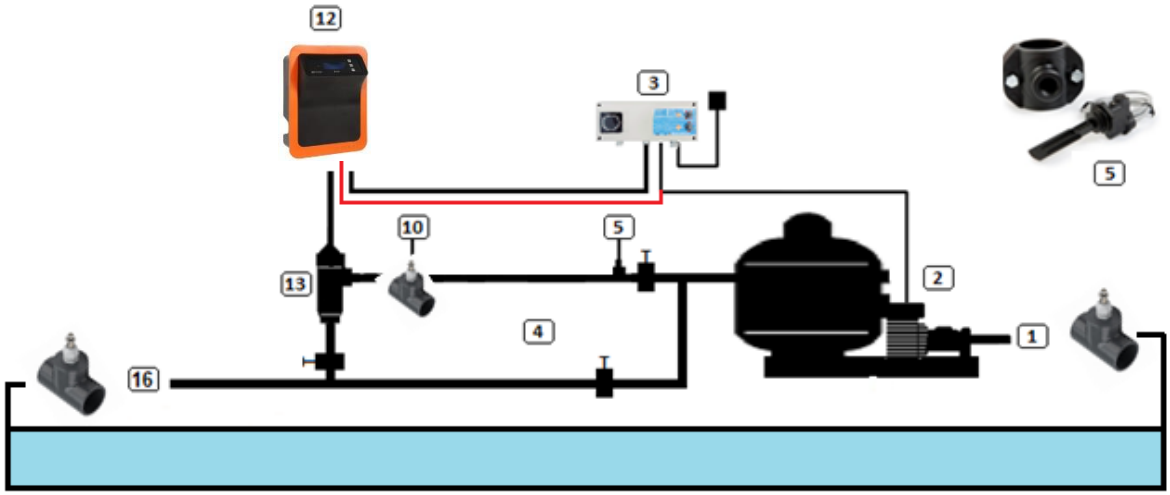
3- INSTALLATION OF THE EQUIPMENT

3.1- General considerations:

- Place the chlorine cell in a vertical position with electrical connections facing upwards. If this is not possible, it can be assembled in a horizontal position, ensuring that the small auxiliary electrode faces upwards.
- Place the chlorination cell in the highest position possible of the purification circuit and always after the filter.
- If possible, it is recommended to install the cell with a by-pass system with its corresponding shut-off valves. This is to facilitate maintenance of the cell.

3.2- Hydraulic connection diagram

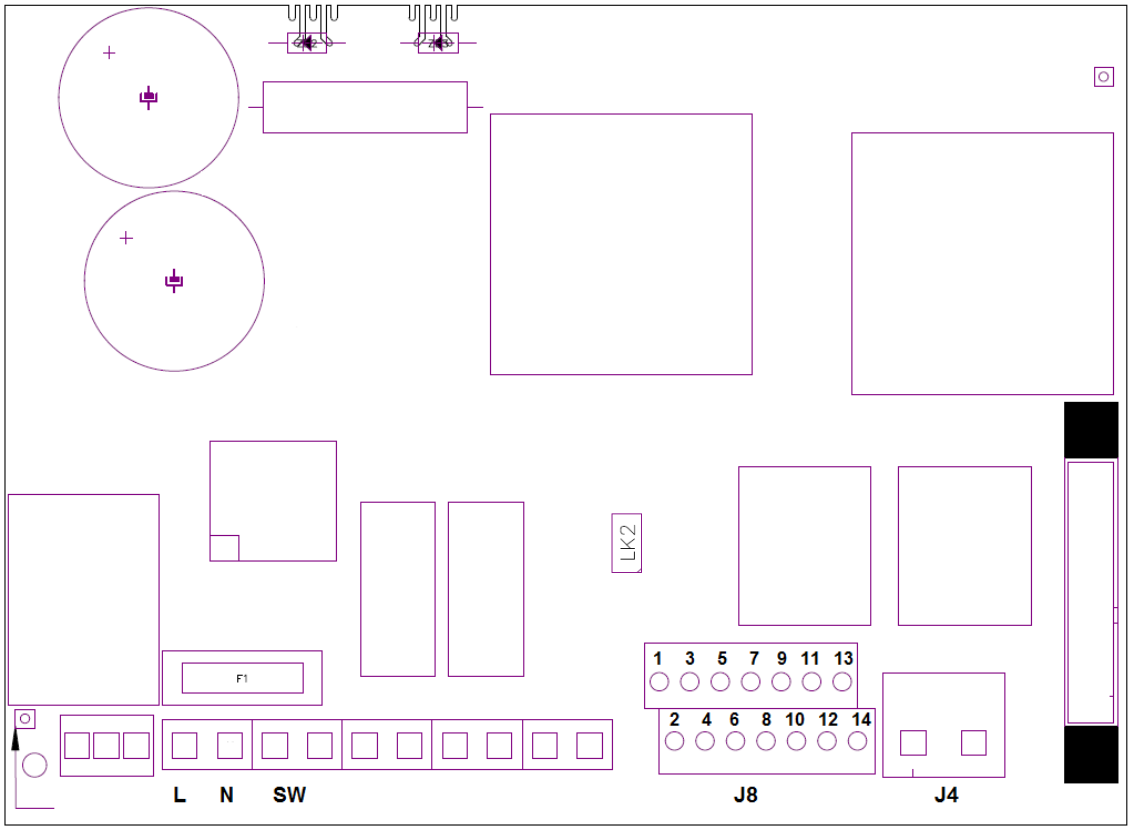
3.2.1- N-BSSALT Series Equipment



1. From the swimming pool.
2. Filter
3. Electrical Panel
4. Bypass
5. Flow Switch
12. N-BSSALT Unit
13. Electrolysis Cell
15. To the swimming pool

3.3- Electrical wiring diagram

3.3.1- N-BSSALT series equipment



Earth connection
L, N: Supply 220v
SW: On / Off Switch
J4: Terminal block of cell
J8:

1- Unused
2- Unused
3- (purple) Cover
4- (purple) Cover
5- (white) Water sensor (white cable)
6- (white) External flow switch (5-6)*
7- Unused
8- Unused
9- Unused
10- Unused
11- Unused
12- Unused
13- Unused
14- Unused

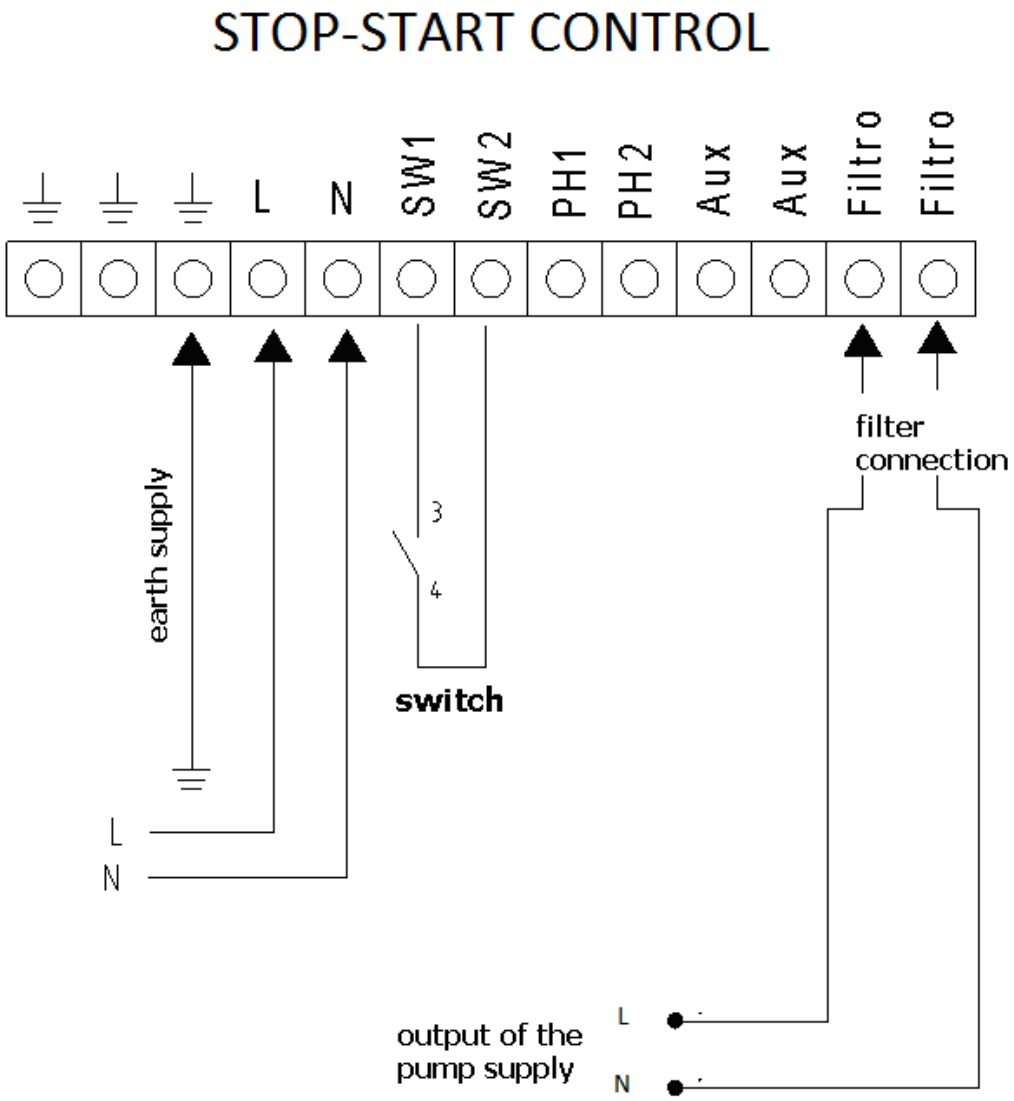
F1: **Fuse**
LK2: Stop/Start jumper (see 3.3.2.1)

3.3.2- Advanced Functions

3.3.2.1- Stop-start control

This mode enables you to keep the equipment on permanently, so that when the filtering pump starts up, it will instruct the chlorinator to start-up. When the pump stops, the screen of the chlorinator will display the message "stop".

To activate this mode, remove jumper "LK2" from the power board, supply the chlorinator directly at 230 V, and connect the "filter" inlets in parallel to the supply of the filtering pump. In this way, when the filtration pump turns on, the "filter" input must be connected to 220V, and when the pump stops, "filter" input connector must be at 0V.



4- START-UP AND ADJUSTMENTS

Once the BSV salt water chlorinator has been installed, you can start up your salt water chlorination equipment. Follow the instructions carefully.
The following sections detail the operation of different models.

4.1- N-BSSALT series equipment

4.1.1- Operation

The N-BSSALT series equipment has an LCD screen, in which you can view and configure all operations of the equipment. The following table shows how to organize the configuration menu of the equipment:

Chlorinator Menu:
Main menu
Chloride (%)
Configuration
Configuration menu
Cleaning (h)
Language
Cover (N)Y
Buzzer (Y)N
Flow switch

When browsing through the menus, an arrow is displayed on the left hand side ✹ which indicates the selected line.
When there is more than one line to select, the buttons 🡻 🡹 enable you to move the arrow up or down to select the required option. The **OK** button confirms selection.
When a value has to be adjusted, for example the time or level of chlorine, the buttons 🡻 🡹 enable you to increase or decrease the value. Press the **OK** button to confirm the value.

4.1.2- Main screen

On starting up the equipment, a screen will be displayed with the main parameters.

- The upper line displays the production %, the voltage of the electrolysis cell.

- The second line displays the ✹Menu (press the **OK** button to access the menu). If any alarm or warning occurs, it will also be displayed on this line.

4.1.3- Main menu

Press the "OK" button from the main screen to access the main menu.

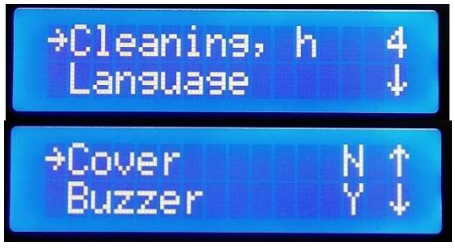
Using the buttons ↓ ↑ you can select a line of the menu, indicated by the arrow (✹). The **OK** button is used to confirm the selection.
To access the configuration menu, you need to confirm the operation by selecting (S) through the arrow,↑ and pressing **OK.**

4.1.4- Chloride production (%)

Configuration of the maximum production of chlorine.
From 0% to 100% Press "OK" and use the arrows ↓ ↑ to change the value.
Press "OK" to confirm the adjustment.

4.1.5- Configuration

In the configuration menu you can select the configuration parameters, which usually only have to be adjusted when installing the equipment.



4.1.5.1- Cleaning, h

The equipment includes an automatic cleaning system, based on reversing polarity in the electrolysis cell. These cleaning cycles are performed regularly. The time between cleaning (in hours) can be adjusted depending on the water hardness of your swimming pool.

It is possible to select cleaning intervals from 1 to 8 hours.

4.1.5.2 - Language

From the configuration menu select "Language", press the OK button, and once the required language has been selected, press the **OK** button and **EXIT**.

4.1.5.3- Cover

The equipment may detect the presence of a cover on the swimming pool **(only for automatic covers)**. In this case, it is only necessary to place the limit switch of the cover in the terminal block, as indicated in the section on electrical installation.

On placing the cover, the chlorinator automatically reduces production to 20%. This variation will be reflected in the production %, and the letter "C" will be displayed on the right side of production in the main screen. This will indicate that the cover is activated.

If chlorination is carried out with the cover in place, when it is removed, the pool should not be used straightaway. It is better to wait ½ hour for any vapours between the water and cover to dissipate.

4.1.5.4.- Buzzer

When an alarm occurs, the unit stops its production and shows an acoustic and visual alarm to indicate that it's necessary to correct the problem.
However, it is possible to disable the acoustic alarm selecting Buzzer = N.
The unit comes with the alarm activated by defalult (Buzzer = Y).

4.1.5.5 – Flow switch

The flow sensor detects whether or not there is water flow in the piping. If it detects that there is no flow, the production will stop, and an alarm will sound accompanied by a red warning LED. Once the flow has been reestablished, the equipment will return to normal operation.

The "Flow Kit" is necessary to activate the flow sensor, which is done by pressing OK in the menu **Flow Switch = Y**.

4.2- Warning and alarm messages (N-BSSALT)

In the event of an abnormal situation in the operation of the equipment, it will inform you through an **alarm** (the equipment cannot operate under these conditions and gives an acoustic and visual alarm) or a **warning** (the equipment cannot continue operating and corrective action is required)

Messages will be displayed through LEDs as indicated in the following figure:

Warning message example:

Alarm message example:

4.2.1- Warnings

Message:	Causes:	Action required:
"LACK OF SALT"	Lack of salt in the water.	Add salt to the swimming pool.
	Incrustations or objects in the electrolysis cell causing lack of current.	Clean the cell.
	The electrolysis cell is worn.	Replace the electrolysis cell with a new one.
"EXCESS SALT"	Excess salt in the water.	No action required if excess is not very significant.
	Incrustations or objects in the electrolysis cell causing excess current.	Clean the cell.

4.2.2- Alarms

NO FLOW	Excess gas in the electrolysis cell. It may be because the pump has shutdown. The gas is hydrogen gas which is highly flammable.	The piping should be drained to eliminate gas or accumulated water. Check the pump.
	Sensor cable of the cell is incorrectly connected or broken.	Check the sensor cable (white cable)
	Cell sensor is dirty.	Clean. See maintenance.
	No water flow	Check the water system
SHORT CIRCUIT	The cell is incorrectly connected.	Check wiring.
	Metal body in the cell.	Turn off the equipment and remove the metal body from the sheets
OPEN CIRCUIT	Cell is incorrectly connected.	Check the cell connection and ensure that cables and connection terminals are in good condition.

	Cell is damaged or completely worn down.	Check the condition of the cell electrodes, and replace it if any damage is observed.
	Swimming pool water with very low salt concentration.	Ensure that the water has salt and that it is dissolved.

4.3- Electrolysis cell life

The electrolysis cells from our units are designed to reach a lifespan of 10.000 hours (10K models) and 5.000 hours (5k models). However, this lifespan is directly related with the quality of the water and specially with the correct use of the equipment. Please, read the following suggestions in order to guarantee that your cell reaches the specified lifespan.

a) **Salt concentration:** It is very important that the water of your swimming pool has a sufficient salt concentration, otherwise the cell will degrade prematurely if you keep it working permanently in low salt conditions. It is important to add salt when the unit shows the "lack of salt" indication.
b) **Low temperature operation:** Don't keep the system work in low water temperature conditions (under 15ºC). As an alternative, there are some hibernation products that keeps the water in good conditions in winter time. If you still want to use it in low water conditions, please consider to reduce the maximum production value, for example, set it at 50% instead of 100%.
c) **Automatic cleaning cycles:** The time between automatic cleanings can be adjusted in Evo units, so it can be adapted to the water hardness of your swimming pool. The chlorinator is configured by default to 4 hours. If your swimming pool water is very hard, you can decrease this value, so the automatic cleanings will perform more frequently, but the lifespan of the cell will be reduced. On the other hand, if the water is soft, you can increase the cleaning time cycle, and the cell's lifespan will be increased.
d) **Deficient cleaning:** If you observe calcium deposits between the cell electrodes, clean it as shown in the 5.1 section. Don't allow to keep the cell working in these conditions for a long time.

5- MAINTENANCE

Carefully follow the recommendations and safety warnings detailed in section 1.4 of this manual.
The chlorinator has a self-cleaning system of the chlorination cell, which reduces maintenance considerably.

Bear in mind that the electrolysis cell will wear out through use. If after cleaning, the equipment does not work normally, the cell should be replaced. Your dealer will be able to advise you on the need to change this element.

5.1- Cleaning the electrolysis cell

The electrolysis cell should be cleaned in the following circumstances:

- If the low level of salt indicator comes on and the concentration is correct.
- If the overload indicator comes on and the level of salt is correct.
- If lime scale is observed on the surfaces of the electrodes. In this case, the equipment can also be adjusted so that the frequency between each automatic cleaning operation is less. This frequency will depend on the hardness of water in your area.

Submerge the cell in a hydrochloric acid solution, or use a commercial product to clean electrolysis cells (CELLCLEAN). Do not use sharp objects that could damage the titanium coating of the electrodes.

6- GUARANTEE AND SERVICE

This unit is guaranteed for a period of 3 years in control main unit.

The electrolysis cells have a control of two years, as long as they have not exceeded 10,000 hours of use (10K models) and 5.000 hours (5K models).

This guarantee is given to the owner of the equipment and it is not transferable. All chlorinators are checked at the factory before packing. If any electrical or mechanical problems occur within 24 months from purchase, owing to unlikely malfunctioning or to faulty components, the parts will be repaired or changed. A part will not be changed unless the faulty component is returned.

This guarantee does not cover damage caused by corrosion, excess damp, current, temperature or vibration, or by incorrect installation, unsuitable handling, overvoltage, accidents or any other cause beyond the operation of the equipment.

In the event of an equipment failure, it should be returned to the manufacturer or distributor. Transport costs will be covered by the equipment owner.
It is important to bear in mind that all repairs under guarantee are performed at the factory, or by an authorized BSV Electronic technical service.