resilience®

D Series

Installation Manual

Model: PSC5

PREFACE

Resilience D (model PSC5) is an automatic natural chlorine generator for pool sanitation. The system uses a very low concentration of salt (less than the concentration in a human teardrop) and converts it into free chlorine that destroys algae and bacteria in the pool. After removing the algae and bacteria, the chlorine reverts back into salt. This process of purification continues, making the need of adding extra sanitizing chemicals to the pool virtually unnecessary.

Congratulations on the purchase of your Resilience D Chlorine Generator. Your purchase will minimize the efforts needed to maintain your pool and maximize your enjoyment. Before installation or operation, please take the time to read this entire manual, compare package contents with the parts list, and gather tools required. Improper installation may void the warranty and create unnecessary hazards. This manual contains step-by-step instructions to help ensure that your installation meets the recommended standards. Spending the time to understand your system and its functions will assure successful, trouble-free operation. If you are unsure about any of the information in this manual, please contact your installer/dealer. When working around your pool, please take care to avoid hazards such as electrical wires and chemicals. CAUTION! Safety comes first!

SAFETY INSTRUCTIONS

Read and follow all instructions

All electrical work must be performed by a licensed electrician and conform to all national, state, and local codes. Improper use or installation can badly harm the unit and its surroundings. When installing and using electrical equipment, basic safety precautions should always be followed, including the following:

DO NOT OPEN THE DISPLAY COVER OF THE CONTROL BOX – NOT A SERVICABLE UNIT.

- Disconnect all AC power before installation.
- **WARNING** – to reduce the risk of injury, do not permit children to use this product.
- The Control Box must be mounted **vertically** on a flat surface and at a minimum horizontal distance of 1.5 m (5ft) (or more, if local codes require so) from the pool.
- **WARNING – risk of electric shock!** Connect only to a grounding type circuit protected by a ground-fault circuit-interrupter (GFCI) outlet. The installer should provide this GFCI requirement. The GFCI should be rated for minimum 6 Amps and tested on a regular basis by pushing the test button. If the GFCI fails to operate correctly, there is ground current flowing indicating the possibility of electric shock. Do not use this unit. Disconnect unit and have a qualified professional fix the problem before using.
- The Input circuit (LN1 & N/LN1) must be connected only after OVERCURRENT DEVICES, such as fuse or circuit breaker to limit the amperage in the input wire to the maximum that is permitted by the National Electrical Code.
- The Unit must be permanently connected, with copper wire, not less than 1.5 mm^2 (14 Awg).
- Do not bury the cord. Place the cord so to minimize damage by lawn mowers, hedge trimmer and other equipment.
- **WARNING!** To reduce the risk of electric shock, replace a damaged cord immediately.
- **WARNING!** To reduce the risk of electric shock, do not use an extension cord to connect the unit to electric power supply; provide a properly located outlet.

● Wiring of the unit must be performed according to the wiring instructions detailed in this manual or on the front box cover.
● Build-up of flammable fumes can result in a hazardous condition if the cell is allowed to operate without flow. This device must be operated only with the original in-line flow sensor.
● The Flow Sensor must be installed between the last piece of apparatus and the cell.
● Ensure that equipment and materials used in or around the pool and spa are compatible with salt-based sanitation systems. Certain materials may be susceptible to salt and chlorine damage.
● ALWAYS ADD ACID TO WATER, NEVER WATER TO ACID.

● Make sure the pool's machine room is properly vented to avoid damage from acid vapors.

● Under no circumstances should the machine room be used to store equipment, furniture, sports gear or any other equipment that is not related to the pool including spare acid containers. The machine room must be aired and vented prior to entering it.

● Acid container must be stored inside a spill containment vessel (a basin to hold acid in case of overflow or tipping of the acid container).
● **KEEP THESE INSTRUCTIONS.**

TABLE OF CONTENTS

PACKAGE CONTENTS

Please unpack your new controller carefully. Do not use a knife or sharp instrument to remove contents. Enclosed in the packing you should find the following:

Control Box

4 PVC hose reducer couplings

Flow Switch T & Temp Sensor

Dosing acid pump

(Only if purchased with the system)

Cell

If purchased with the system, dosing acid pump kit includes: 2 saddles (50 + 63mm), 3/8" to 1/2" adaptor, none return valve, internal replacement tube, 2 x 3m polyethylene tube, foot filter and weight.

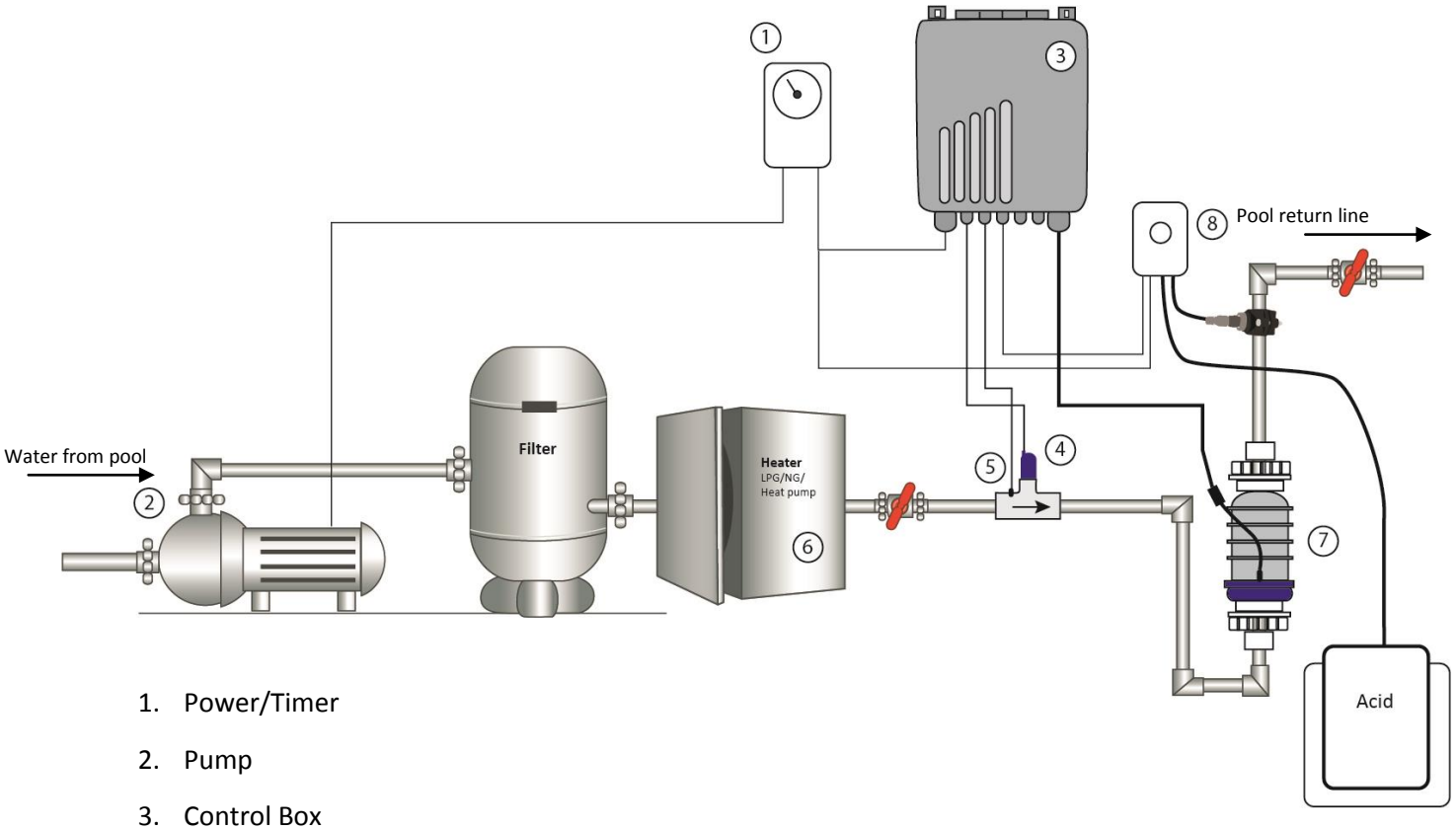
ADDITIONAL MATERIALS REQUIRED (NOT SUPPLIED IN PACKAGE)

1. PVC solvent cement and priming fluid
2. Hacksaw or pipe cutters and petroleum jelly
3. Screwdrivers
4. Drill needed for systems with 1½ inch plumbing
5. Conduit
6. Silicone lubricant (DO NOT use silicone glue)
7. Pipe adaptors (i.e. reducer couplings)

8. High voltage wires (copper conductors only)

SYSTEM OVERVIEW

This installation manual is designed for the pool professional. It assumes the installer has a working knowledge of basic pool-service operations. It is based on actual field installations and the natural flow of progress found to be most efficient.



1. Power/Timer
2. Pump
3. Control Box
4. Flow switch
5. Water temperature sensor
6. Heater (optional)
7. Cell
8. Dosing acid pump (optional)

The Natural Chlorine Generator consists of 4 main units: Control box, Cell, Flow Sensor and dosing acid pump (if purchased with the unit). These assemblies are manufactured using to most advanced corrosion resistant materials that are extremely durable. Installing them in an area that is sheltered from the sun and water will protect them from extreme weather conditions.

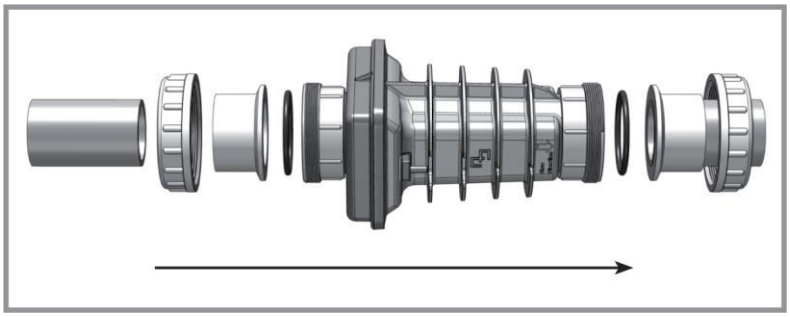
SAFETY MEASURES

1. Operate the system **ONLY** with the original flow sensor supplied with the system.
2. See important safety instructions on page 2 of this manual.

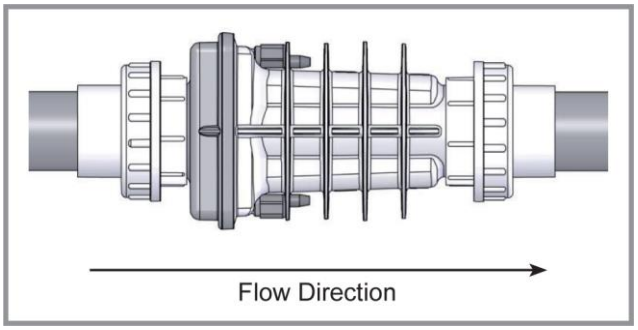
PLUMBING CONFIGURATIONS

CELL PLUMBING (WITHOUT DOSING ACID PUMP)

1. The cell and flow sensor must be installed downstream from the filter and heating devices before any Tees in the return line. The cell may be installed horizontally or vertically as long as is pointing in the flow direction (i.e. into the blue and out of the clear side).
2. Approximately 380 mm (15 inches) of pipe length is required for a horizontal installation for the flow sensor and cell. Vertical installations may require less pipe length.
3. On the pipe where the cell is installed, mark two lines 300 mm (11 3/4 inches) apart and cut out using a hacksaw or pipe cutter.
4. Unscrew and remove the barrel unions (i.e. barrel nuts and slip connections) from either end of the Cell. Thread one of the barrel nuts over the pipe and glue its slip connection to the cut pipe.

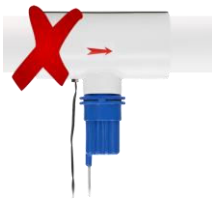


5. Hold up the cell with the second unions to gauge the proper distance before threading the second nut and gluing the second clip.
6. After letting sufficient drying time for the glue, place the cell with the O-rings into the opening between the two ends of the pipe and tighten the unions making sure that the cell is installed with the arrow pointing in the direction of the flow (i.e. water should enter from the side with the blue cap).

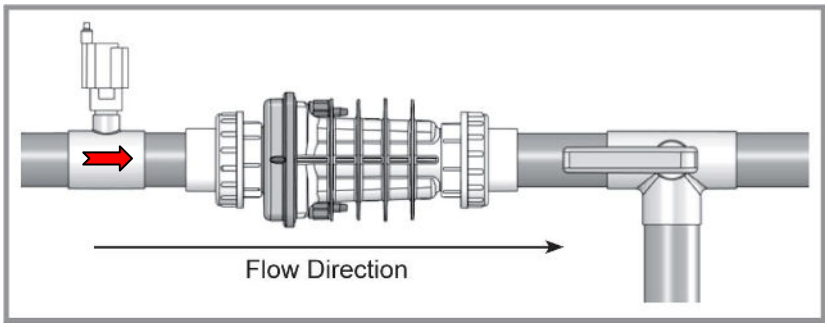


INSTALLING THE FLOW SENSOR

1. The flow sensor must be installed before the cell. Make sure that there is no valve between the cell and the flow sensor. The flow sensor may be installed vertically, in an angle, but **MUST NOT** be installed upside down. This could cause debris to settle in the flow sensor body and restrict the paddle movement.
2. Clean and glue the Tee connector (included) to the pipe, making sure that the threaded end with the sensor is on the pipes topside (as illustrated here ->).



3. **Make sure that the arrow at the top of the flow sensor points in direction of the flow and that no glue or pipe cleaner touches the paddle inside the sensor as it may cause it to jam.** Double check that the flow sensor operates properly by reducing the flow for five seconds and checking if the low flow indicator on the control box lights.



CELL PLUMBING (WITH A DOSING ACID PUMP)

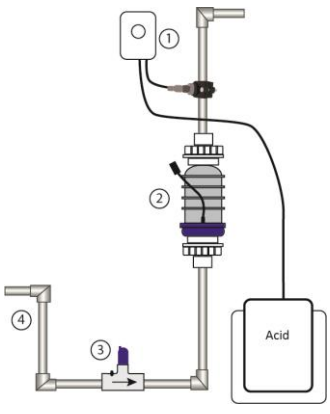
The dosing acid pump is a unique acid injection pump that automatically cleans the cell and reduces the pH water levels. Only the PSC-5 control box can operate this unit.

INSTALLING THE DOSING ACID PUMP

The dosing acid pump should be installed right after the chlorinator cell, in a way that ensures the cell stays full of water when the circulation pump turns off. Choose one of the plumbing configuration options below:

A. U shape installation

B. Horizontal installation

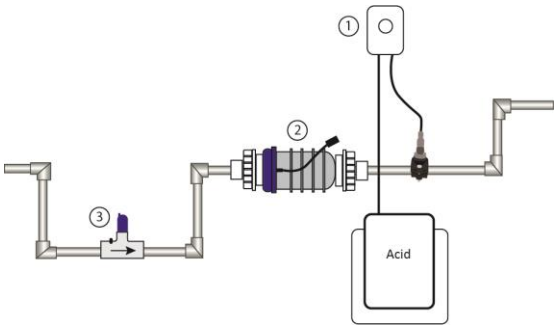


U SHAPE PLUMBING CONFIGURAITON

1. Dosing acid pump and saddle
2. Chlorinator cell
3. Flow switch Tee & Temp. sensor
4. ~54 cm (21 inch) straight 2" PVC pipe for keeping the cell filled with water when there is no flow in the line.

HORIZONTAL PLUMBING CONFIGURATION

1. Dosing acid pump
2. Chlorinator Cell
3. Flow Switch Tee & Temp. sensor



The examples illustrated above are with the dosing acid pump installed. A plumbing trap is required to keep the cell flooded with water when the dosing acid pump washes the cell during the circulation pump downtime. Create the trap so the acid injected by the dosing acid pump will be focused on the cell and not flow back to the pool or equipment set. If installing without the dosing acid pump, we recommend following the same examples as above and leaving room for adding the dosing acid pump in the future.

INSTALLATION OF DOSING ACID PUMP

- **Disconnect ALL power before work commences.**
- **Open the control boxes' lid to make sure the unit is turned OFF.**
- **It is recommended to wear rubber or polyethylene protective gloves and safety glasses. It is also advisable to protect your clothes or wear dispensable ones.**
- **Make sure the pool's machine room is properly vented to avoid damage from acid vapors.**
- **Under no circumstances should the machine room be used to store equipment, furniture, sports gear or any other equipment that is not related to the pool, including spare acid containers. The machine room must be aired and vented prior to entering it.**
- **Acid container must be stored inside a spill containment vessel (a basin to hold acid in case of overflow or tipping of the acid container).**

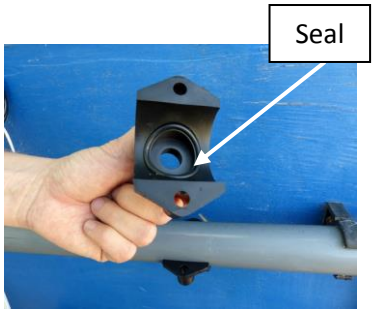
1. Determine the location where you wish to install the acid pump on the wall.
2. Check that the all components: electrical wiring, tubes etc. reach their position.
3. Drill and attach the acid pump's clip to the wall and hang the pump on it.

Installing the pipe saddle -

The injector non-return valve on the pipe saddle must be installed as pictured in the images with the Check mark.

The injector non-return valve MUST NOT be installed upside down!!! This could cause debris to settle inside it and restrict its functionality.

4. Establish the pipe diameter you have installed and make sure you have the correct pipe saddle (50 or 63mm).
5. Acid pump's pipe saddle must be installed right after the electrolysis cell.
6. With the proper sized saddle for your piping, locate the position where the acid will be infused through and drill a 9mm hole in the pipeline.
7. Turn the top part of the saddle and make sure the seal is properly placed. Position the two parts over the hole you just drilled.

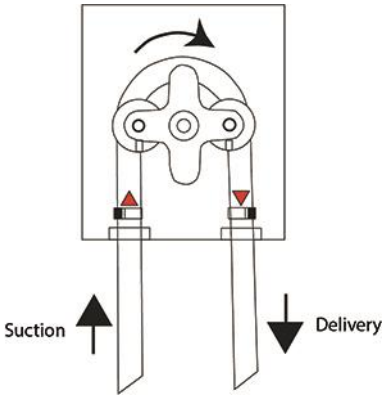


8. Insert the two screws through the saddle's holes and tighten them (13 mm wrench is needed).

9. Wrap the threads of the saddle fitting adapter (½ to ⅜) with Teflon tape and thread it into the acid pipe saddle.
10. Wrap the injector non-return valve threads with Teflon tape and thread it into the saddle fitting adapter.

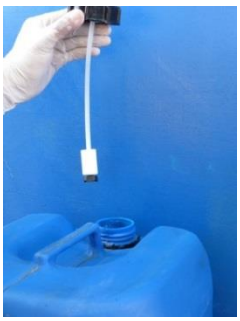
11. Cut the supplied tube to the required length - this will become the injection tube. Attach one end to the outlet of the acid pump (right side) and the other end to the injector non-return valve attached to the pipe.

Note the arrows impressed on the acid pump transparent cover indicating the suction and injection direction of the acid.



12. Cut another piece of tube to the required length - this will become the suction tube. Attach one end to the inlet of the acid pump (left side)**.**

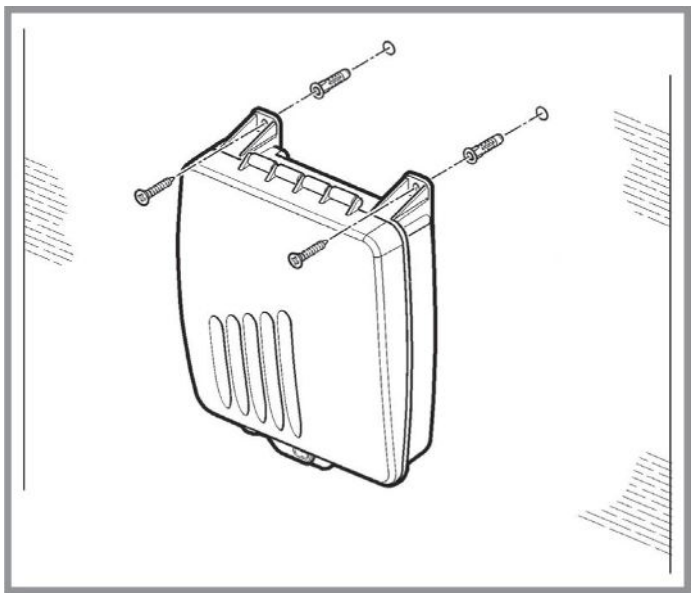
13. Thread the other end other suction tube through the lid of the acid container and attach to it the weight and foot filter.
14. Close the lid of the acid container and make sure the suction tube cannot be pulled out of the container.
15. Place the acid container inside a spill container vessel (a basin to hold acid in case of overflow or tipping o the acid container).
16. **Place the acid container and spill container vessel in a safe place and in such a way that it cannot cause damage if it falls. Make sure it is positioned away from children!**



17. Turn the control box on. Manually operate the acid pump in manual mode for a number of minutes.
18. Make sure the red light on the pump is on, that it is spinning and that acid it sucked from the acid container and injected to the pipe.

After the system has been started, make sure to check the dosing acid pump and all connections for leaks.

MOUNTING THE CONTROL BOX



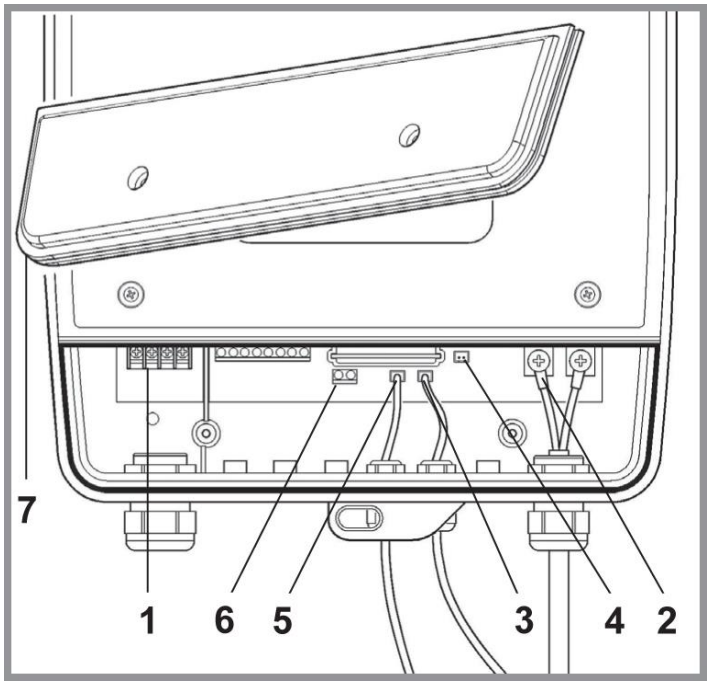
1. The control box must be mounted vertically on a flat surface, and a minimum horizontal distance of 1.5 m (5 ft) (or more, if local codes require) from the pool.
2. Select a location for your control box within 3½ meters (10 ft) from the intended cell and flow switch installation, to ensure that enough cable is available (the actual cable length is 3.7 m/ 12 ft)
3. Secure the unit on the wall using the enclosed screws and anchors. Use 8 mm (¼") drill bit for the anchor holes.
4. Remove the access cover at the lower part of the control box by opening the two screws holding it in place.
5. Hardwire the power cable to the time clock as indicated in the instructions below.

CAUTION

Do not mount the system above a heater, inside a panel or tightly enclosed area. This can overheat and damage the system.

- Do not block the vents of the control box, located at its back.

1. Input high voltage terminals
2. Cell connectors
3. Flow switch socket (blue)
4. Water temperature sensor socket (white)
5. Dosing acid pump socket (red)
6. Pool cover input
7. Access cover

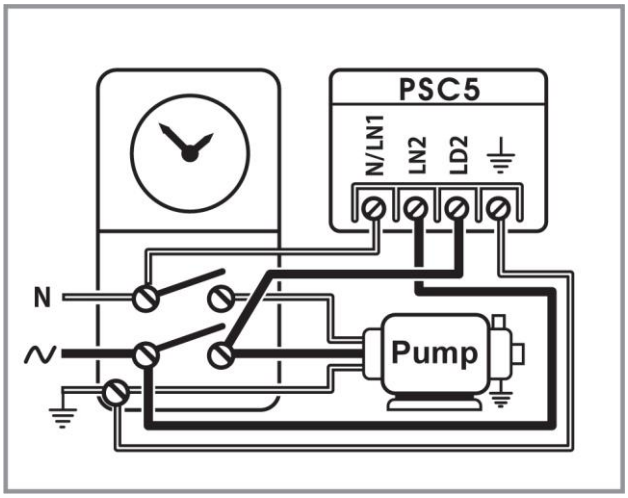


ELECTRICAL WIRING OF THE CONTROL BOX

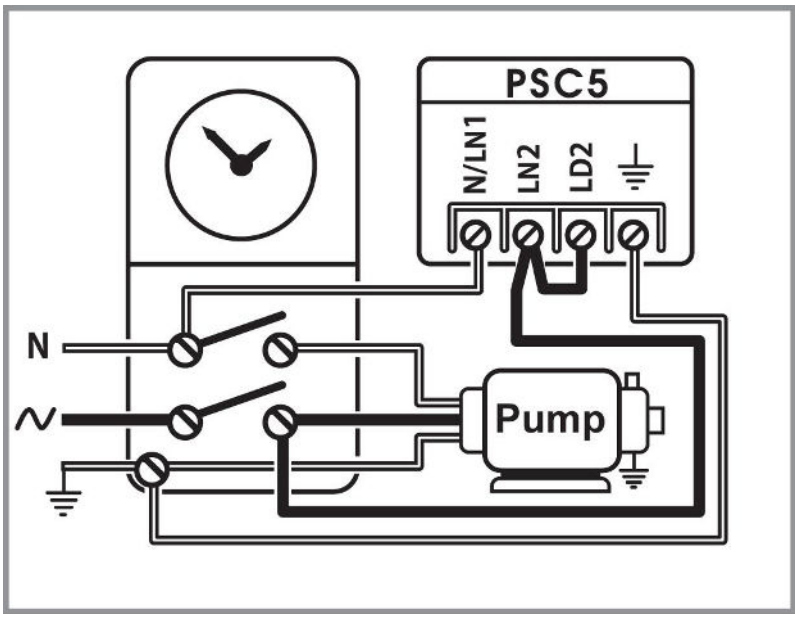
CAUTION!

- Disconnect all power supply to the main timer/main power source before hardwiring the input voltage cables to the timer and control box.
- Hardwire all accessory equipment: dosing acid pump, Temp sensor etc. and close the access cover before resupplying main high voltage to the unit.

Wiring for a system with the dosing acid pump

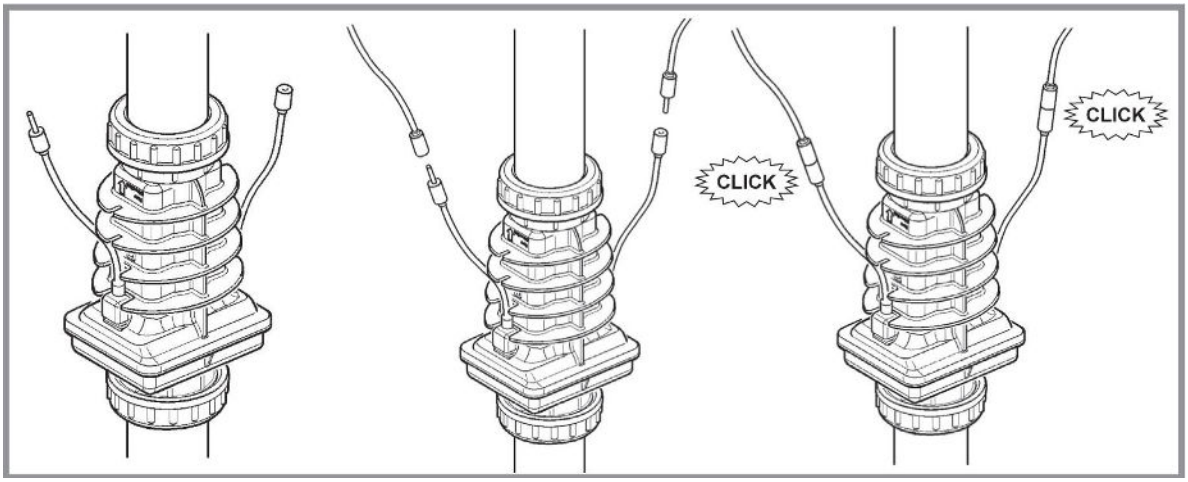


Alternative wiring (only if not planning to use dosing acid pump)



WIRING THE CELL

Ensure that the connections are perfectly clean from any debris. Connect the two black wires from the control box to the connectors at the sides of the cell **until they "click" together**.



NOTE: do not extend the original cables leading to the cell. This decreases the system efficiency and will void warranty coverage.

WIRING THE FLOW SENSOR

Locate the flow sensor terminals at the lower part of the control box. Insert the flow switch cable through the connector hole in the lower part of the control box, and plug it into the flow sensor socket. Tighten the threaded adaptor firmly, until the cable cannot be pulled out from the box.

WIRING THE TEMPERATURE SENSOR

Locate the temperature sensor terminals in the lower part of the control box. Insert the temperature sensor cable through the connector hole in the lower part of the control box and plug it into the temperature sensor socket. Tighten the threaded adaptor firmly, until the cable cannot be pulled out from the box.

WIRING THE DOSING ACID PUMP

Locate the terminals marked "acid pump" in the lower part of the main control box. Insert the dosing acid pump "signal" cable (marked and has red connector) through the connector hole in the lower part of the control box and plug it into the acid pump socket. Tighten the threaded adaptor firmly until the cable cannot be pulled out from the box.

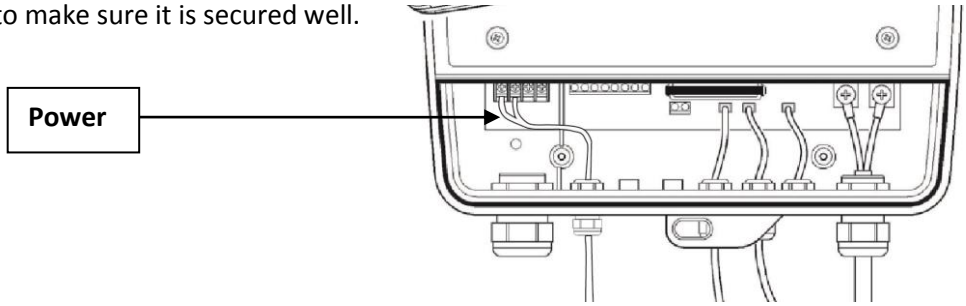
The second cable marked "power" can be wired in two ways:

1. Wire the electrical cable of the acid pump to the main power source in the machine room (240V) parallel to the circulation pump. **This must be performed by a licensed electrician!**

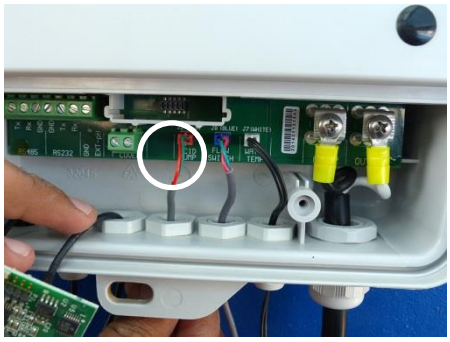
   OR

2. Insert the "power" cable through the connector in the lower part of the control box. Wire one strand to the left most socket. The remaining strand should be connected to one of the center sockets.

   Gently pull on the cable to make sure it is secured well.



Find the acid pump connection point marked "acid pump". Insert the signal cable that originates from the pump through the hole at the bottom of the control box and connect it to the acid pump terminal. Make sure the cable is secured and reattach the service panel's cover.



Wire the electrical cable of the acid pump to the main power source in the machine room (240V) parallel to the circulation pump. **This must be performed by a licensed electrician!**

WIRING THE POOL COVER INDICATION

Hardwire 2 wires that deliver dry contact signal from the pool cover control to the "pool cover" terminals in the lower part of the control box. Make sure to use a proper strain relief (PG/Heyco) that will not enable that cable from being pulled out from the control box.

STARTING UP

BEFORE ADDING THE SALT

1. **Balance the chemicals**: See the section titled "Understanding the chemistry" on page 36 for recommended water balance. This will ensure that the transition to the natural chlorine generator system is quick and reliable.
2. **New Pools**: wait 30 days or longer if specified by your pool builder, for plaster to cure before adding salt or operating the natural chlorine generator.
3. **Biguanide Pools:** if installing the system in a pool that has Biguanide sanitizers, all Biguanide must be removed prior to system startup.
4. Now that your new controller has been physically installed, water chemistry should be tested and adjusted prior to initiating automated control of the pool. Check that your pool water conforms to the following ranges before powering on and setting up the Resilience D Plus.

IMPORTANT! It is compulsory to control and adjust water balance parameters **BEFORE** operating the system.

Parameter	Value
Salt	3000-4500
pH	7.0-7.6
Free Chlorine (ppm)	1-3
Stabilizer - Cyanuric Acid (ppm)	20-60
ORP (mV)	650-850
Total Alkalinity	80-120
Calcium Hardness	100-400

ADDING THE SALT

1. Measure the pre-existing salinity of your pool. Previous chlorine use may cause the salinity reading to be higher due to residual salt in the chlorine.
2. Determine how much salt is needed from the Salinity Demand Table on the page 19. This table is based on a salt concentration of 4000 ppm (approximately ⅓ %). More may be added for larger pools (e.g. 4500 ppm).
3. Keep the circulating pump on.
4. Distribute the determined amount of salt evenly around the pool. To avoid clogging the filter or damaging the control box and pump, do not add salt through the skimmer or surge tank. Brush the bottom to help dissolve the salt.
5. The readout on the chlorine generator may fluctuate until the salt is fully dissolved.
6. Turn the control box OFF. **Failure to do so will cause the fuse to blow**.
7. Keep the pump on to circulate the water.
8. Distribute the required amount of salt evenly around the pool. It will take about 8 hours for the salt to disperse evenly in the water.
9. Once the salt has fully dissolved, adjust the chlorinator to the desired setting.

Calculating the size of the pool

	Liters (dimensions in meters)	**Gallons** (dimensions in feet)
Rectangular	Length X Width X Average Depth X 1000	Length X Width X Average Depth X 7.5
Round	Diameter X Diameter X Average Depth X 785	Diameter X Diameter X Average Depth X 5.9
Oval	Length X Width X Average Depth X 893	Length X Width x Average Depth X 6.7

What type of salt should I use?

Good	Bad – do not use!
The best salt is an evaporated, granulated pool salt	Iodized salt
99.9% pure salt	Salts with more than 1% anti caking agents (e.g. yellow prussiate of soda or sodium ferrocyanide) – because they contain iron and will yellow the fittings. These anti caking agents are commonly found in water softener salts
	Rock salt – because of the dirt mixed with the rock salt
	Calcium chloride- is not a salt. Use only sodium chloride

Salinity demand table (in kg.)

Salt level before addition (in ppm)

How much salt to add? (In kg.)

Your pool water volume – in thousands of liters

	0	500	1000	1500	2000	2500	3000	3500	4500
10	40	35	30	25	20	15	10	5	0
20	80	70	60	50	40	30	20	10	0
30	120	105	90	75	60	45	30	15	0
40	160	140	120	100	80	60	40	20	0
50	200	175	150	125	100	75	50	25	0
60	240	210	180	150	120	90	60	30	0
70	280	245	210	175	140	105	70	35	0
80	320	280	240	200	160	120	80	40	0
90	360	315	270	225	180	135	90	45	0
100	400	350	300	250	200	150	100	50	0
110	440	385	330	275	220	165	110	55	0
120	480	420	360	300	240	180	120	60	0
130	520	455	390	325	260	195	130	65	0
140	560	490	420	350	280	210	140	70	0
150	600	525	450	375	300	225	150	75	0
160	640	560	480	400	320	240	160	80	0
170	680	595	510	425	340	255	170	85	0
180	720	630	540	450	360	270	190	95	0
190	760	665	570	475	380	285	190	95	0
200	800	700	600	500	400	300	200	100	0

Identify the current salt concentration at the top of the chart (e.g 1000 ppm). Then find the size of your pool on the left (e.g. 100,000 liters). Run these figures down and across until they meet. That is the amount of Kilograms of salt that needs to be added to your pool.

Salinity demand table (in lbs.)

Current Salt concentration in pool (before addition) [ppm]

Water volume in thousands of Gallons	How much salt to add (in pounds)								
	0	**500**	**1000**	**1500**	**2000**	**2500**	**3000**	**3500**	**4500**
4	117	100	83	67	50	33	17	0	OK
6	175	150	125	100	75	50	25	0	OK
8	234	200	167	133	100	67	33	0	OK
10	292	250	209	167	125	83	42	0	OK
12	350	300	250	200	150	100	50	0	OK
14	409	350	292	234	175	117	58	0	OK
16	467	400	334	267	200	133	67	0	OK
18	525	450	375	300	225	150	75	0	OK
20	584	500	417	334	250	167	83	0	OK
22	642	550	459	367	275	183	92	0	OK
24	701	600	500	400	300	200	100	0	OK
26	759	651	542	434	325	217	108	0	OK
28	817	701	584	467	350	234	117	0	OK
30	876	751	626	500	375	250	125	0	OK
32	934	801	667	534	400	267	133	0	OK
34	992	851	709	567	425	284	142	0	OK
36	1051	901	751	600	450	300	150	0	OK
38	1109	951	792	634	475	317	158	0	OK
40	1168	1001	834	667	500	334	167	0	OK
42	1226	1051	876	701	525	350	175	0	OK
44	1284	1101	917	734	550	367	183	0	OK
46	1343	1151	959	767	575	384	192	0	OK
48	1401	1201	1001	801	600	400	200	0	OK
50	1460	1251	1043	834	626	417	209	0	OK
52	1518	1301	1085	868	651	434	218	0	OK
54	1577	1351	1127	901	676	450	226	0	OK
56	1635	1401	1169	934	702	467	235	0	OK
58	1694	1451	1211	968	727	483	243	0	OK
60	1752	1501	1253	1001	752	500	252	0	OK

Locate the current salt concentration at the top of the chart (e.g. 1000 ppm). Then locate the size of your pool on the left (e.g. 12 thousand gallons).

Run these figures down and across until they meet. That number is the number of lbs. of salt required for your pool.

OPERATING INSTRUCTIONS

FILTRATION

Proper filtration is critical for maintaining clean and healthy water. It is typically required in the pool industry that all the water of the pool pass through the filter at least one and a half (1½) times per day (at least eight hours in most pools). During very heavy use, the filter run time should be increased. If needed, the filter circulation pump and chlorine generator may run continuously.

Note: inadequate filtration reduces water clarity and causes the generator to work harder.

Related chemistry

Other chemical levels must be monitored and adjusted because they can greatly reduce the effectiveness of the chlorine produced by the system. If you use a good quality pool test kit and follow the simple instructions outlined in this manual, your natural chlorine generator will help you maintain a sparkling-clean, trouble-free pool for many years with minimal effort. See the section titles "Understanding the chemistry", page 36 for more information.

BASIC OPERATION

The natural chlorine generator produces a pure form of chlorine to sanitize and oxidize the pool water. The chlorine residual needs to be maintained at 1 to 3 ppm. This may be tested using a standard kit or by your local pool store. To obtain the optimal residual buildup of chlorine, the best time to run your filter is in the early morning and after 4pm when there is less UV to destroy the chlorine produced, leaving chlorine in the pool to oxidize the unwanted foreign matter.

Modes:

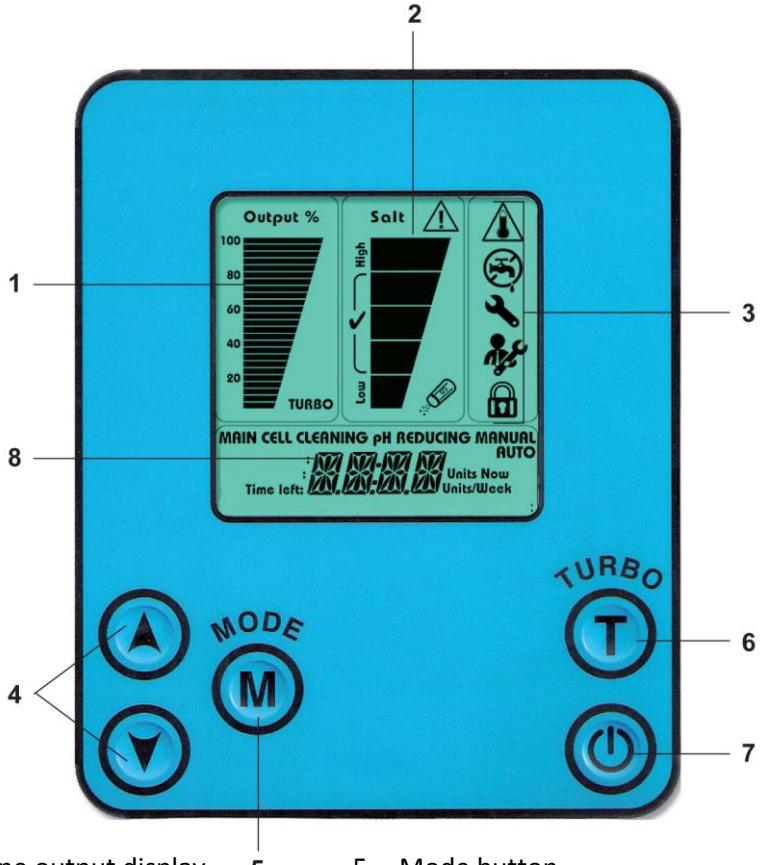
ON – the system is ON and the circulation pump is on – the system is fully operational and produces chlorine.

OFF – the unit is OFF by manual shut down of the controller using the ⏻ button. All system functions are off.

WARNING: the controller still receives power from the line.

ST:BY – The unit is in STAND-BY mode: it is waiting for the circulation pump to turn on before producing chlorine if the unit if off because the circulation pump if off, the OFF indication appears in the numerical display.

AUTO – Automatic control pH/ORP.

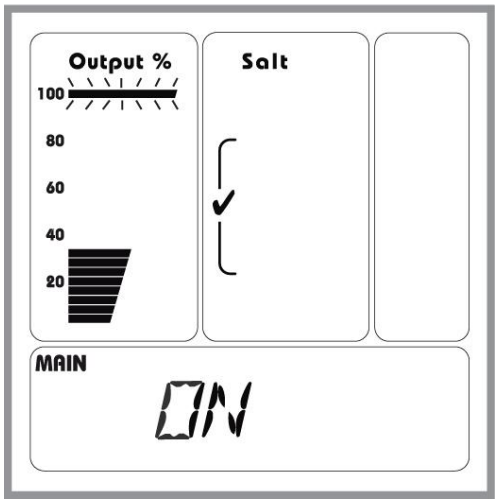


1. Chlorine output display
2. Salinity bar
3. Special icons
4. Up/Down buttons
5. Mode button
6. Turbo button
7. ON/OFF
8. Numerical display

TURNING THE UNIT ON

1. Ensure that the main circulation pump is on.
2. Press the ⏻ button.
3. The controller turns on and automatically executes the following actions:
    - The system goes to the last setting before it was turned off.
    - The main screen is active
    - Turbo time (if previously in this mode) goes back to zero (initialized).
    - The system measures the water's salinity and only after ~1 minute displays it.

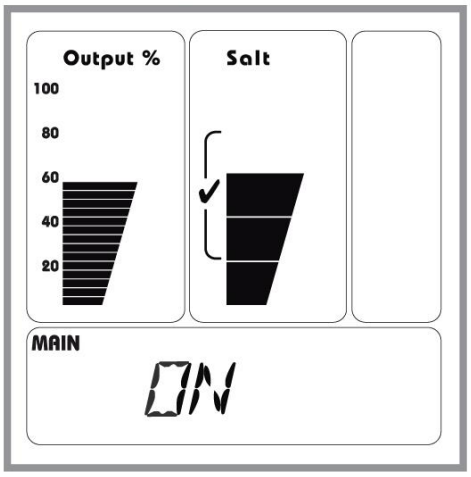
System Startup Display



Make sure all readings are ok:

- The output % bar indicators are on upon demand.
- The salinity bar indicators are on at normal level (the salinity readout takes a little longer to display as the water has to be tested).
- ON indication appears in the numerical display

All Reading Are OK Display



FROM NOW ON THE SYSTEM WILL BE OPERATING AUTOMATICALLY

OPERATING ACTIONS

In order to change the operation statuses of the system use the following operating actions:

Increasing chlorine output

Press the ▲ button: 1,2,3….100%. A quick press on the button causes one-digit increments; a long press runs the digits faster. A 0-100 display appears in the numerical display according to user settings, and the setting output bar blinks, until the output level reaches the desired setting.

Decreasing chlorine output

Press the ▼ button: A 0-100 display appears in the numerical display and the setting output bar blinks.

Turbo setting

Press the T button (Turbo): this action increases chlorine output to 100% for a preset period of the timer. For further details about the Turbo mode see page 26.

Mode changing

Press the M (Mode) button: transfers to cell cleaning & pH reducing screen. If the user does not have a dosing acid pump, it will display "NEED PUMP" message. After five seconds, or another press on the Mode button, the system reverts to Main mode.

Automatic ST:BY Mode

When the main circulation pump turns off the controller shuts down the current supply to the chlorinator cell. "ST:BY" display appears in the numerical display. This action is a safety act that prevents chlorine production without flow in the chlorinator cell.

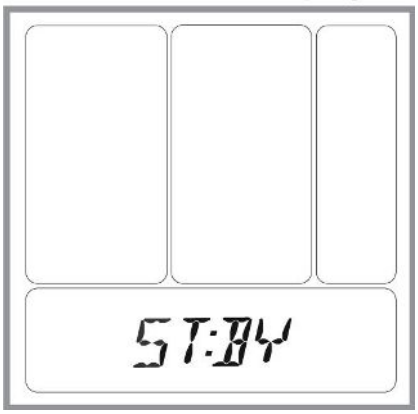
In ST:BY mode only the CELL CLEANING modes of the dosing acid pump are active.

<u>Unit turns ON from ST:BY Mode:</u>

When the main circulation pump will turn on, the chlorinator will revert back to ON position.

- The system goes to the former setting before it was turned off.
- The main screen is active.
- The system goes back to the former OUTPUT setting in soft-start mode (i.e. slowly increasing the output from 0 to the former setting).
- Turbo time (if previously in this mode) continues to count back its remaining time.

ST:BY Mode Display



SALINITY READOUT

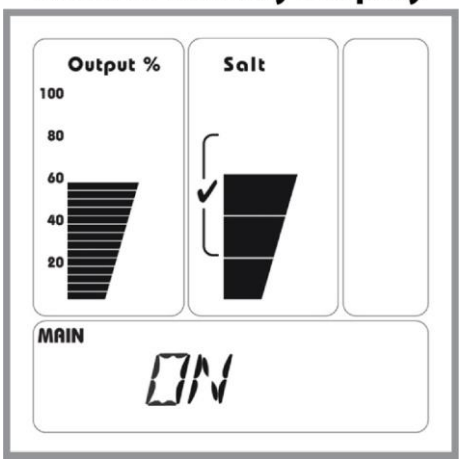
NOTE: the salt readout takes up to one minute to test and display the salt level.

NOTE: The chlorinator cell should be tested as lime-scale build up on its blades may affect the readings. Clean the blades if necessary. If the cell is clean and readings are still inaccurate please refer to the troubleshooting section of this guide, page 39.

Normal salt level

When salt level is between the recommended ranges of 2800-4700 ppm the salinity bar is in the (√ icon) area.

Normal Salinity Display



High salinity indication

Above 5500 ppm – the upper bar turns on with High salt indication.

Above 6500 ppm – the alarm salinity lamp is on.

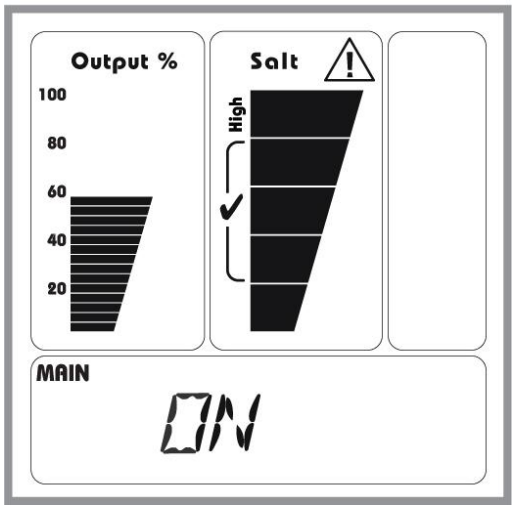
Above 8000 ppm – the upper salinity bar icons blink.

In all high salinity situations and alarms between 5,500-10,000 ppm the unit continues its normal operation.

In case of high salinity indication, the pool water should be tested by a pool professional. If levels are above 5,500 ppm, it is recommended to drain part of the pool water and refill with fresh water. Please check with your local pool professional prior to draining the pool.

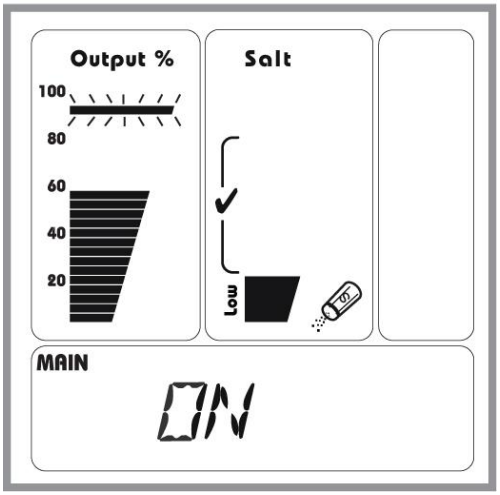
At ~10,000 ppm: A monkey wrench icon lights up, output turns off but salt meter stays flashing and a HIGH SALT or SHRT CELL indication appears on the numerical display. The unit attempts to recover every few seconds.

High Salinity Display



Low salinity indication

Low Salinity Display



Below 3000 ppm – the low salinity bar and the saltshaker icon are turned on.

Below 2000 ppm – the low salinity bar and saltshaker icons blink.

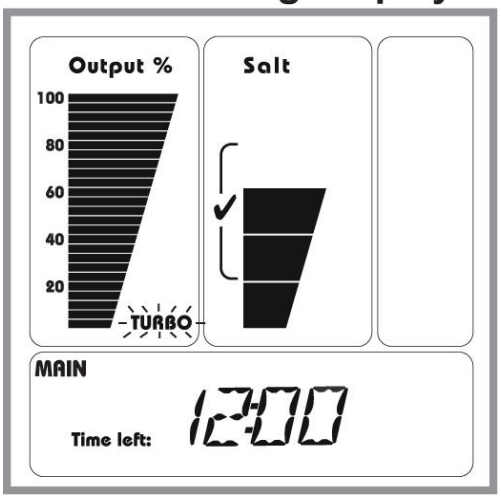
In all low salinity situations and alarms the unit continues its operation. If the salinity is too low the requested value on the output % bar blinks and the maximum achievable output value is visible.

The chlorinator cell should be tested as lime-scale build up on its blades may affect the low salinity readings. Clean the blades if necessary.

In case of low salinity indication, the pool water should be tested by a pool professional and if the salinity is lower than 3000 ppm it is recommended to add salt according to the table on page 19.

Turbo setting

Turbo Setting Display



Pressing the Turbo button starts turbo operation. The unit goes to 100% output for the adjusted time interval; the Turbo icon starts flashing.

The default turbo setting is 12 hours. To increase the turbo setting in 12 hour intervals, press the Turbo button one/two more times just after the first press. Then you may set the turbo time for 24, 36, 48, 60 or 72 hours.

The unit starts a Turbo time counter. The turbo counter is displayed on the numerical display.

Pressing ▲ or ▼ allows extending or shortening the Turbo time in intervals of minutes.

Minimum 0 and Maximum 72 hours values are accessible (use the same method of short and long pushes on the ▲ and ▼ buttons).

Cancelling Turbo Setting –

To cancel the adjusted Turbo setting you may do one of the following actions:

1. Wait for 5 seconds and press the Turbo button again. Verify that the Turbo icon stops blinking.
2. Turn the unit ON and OFF using the ON/OFF button.
3. During the first 5 seconds of Turbo adjusting procedure, press the Turbo button several times until the countdown display goes from 72 hours to 00:00.

Turbo mode additional information –

- Counting is performed only when the unit is ON.
- During the first 5 seconds in Turbo screen, additional presses on the Turbo button increases the timer in increments of 12 hours with each press: 12, 24, 48, 72 or 0 hours.
- Cancelling the Turbo option reverts back to the previous output selection.
- Pressing the Mode button while Turbo is on, allows changing between screens, while the Turbo lamp continues to blink.
- If Turbo mode is activated, the numerical display in the main screen shows the turbo timer and not the word ON.
- Power rises to 100%. In case of low salinity, the reading is similar to low salinity condition (i.e. the maximum output might be 60% so the blinking bar will show 100% setting and the solid output bar will show 60%).

POOL COVER FUNCTION

The unique pool cover function enables the chlorinator to reduce the chlorine output while the pool is covered.

When the pool cover is over the pool the chlorinator will automatically reduce its chlorine output to 20% of the maximum level and a "AUX MODE" message will appear on the numerical display.

Pressing  and  buttons while the system is in pool cover mode enables to permanently set new output values to the unit while the pool is covered (e.g. the default setting is 20% total, but when the pools is covered you may change the default setting to be 40%. The setting will remain 40% for the next pool covering occurrences). In order to activate this function properly, make sure the control box is getting a dry contact from the pool cover control when the pool is covered.

ERROR MESSAGES

NO FLOW

The "faucet" icon is displayed and "NO FLOW" message appears on the numerical display.

If the faucet icon blinks it means that the flow switch is in "transient" position. Wait a few seconds for the icon to stop blinking and remain on the display. If the icon continues to blink, verify that you have proper flow without air bubbles in the cell pipeline.

NOTE: For installations with flow below 3 m^3/h (25 GPM) a "low flow" switch must be obtained from the manufacturer.

HIGH TEMPERATURE IN THE UNIT

High temperature icon will be turned on when unit temperature is higher than 65 °C (149°F).

If the temperature is higher than 70°C (158 °F) the control unit will reduce the chlorine output to 50%. The system will return to the full adjusted power and turn off the high temp icon when the unit temperature drops back below 65 °C (149 °F).

LOW TEMP

In case of low water temperature – below 15 °C (59 °F) the unit will display "LOW TEMP" message on the numerical display and will reduce power output to maximum 50%.

If the water temperature drops below 10°C (50 °F) the unit will reduce power output to maximum 25%.

NOTE: If the water temperature sensor is not connected, the unit is preset for water temperature of 26.5 °C (79 °F). Refraining from wiring the temperature sensor may cause deviation in the salinity readings and may damage the cell in low water temperatures.

SHRT CELL

If the cell cable is shorted by some way or the salinity is much too high (above 10,000 ppm) a "SHRT CELL" indication will appear on the numerical display. The unit will reduce the power output to 0. The unit will attempt to recover from this state ever few seconds and will automatically detect when the short is removed or the salinity is reduced.

NO CELL

If the cable is disconnected, the salinity is much too low (below 1000 ppm) or the cell has collected large amounts of scale deposits a "NO CELL" indication will appear on the numerical display and the unit will reduce the power output to 0. The unit will attempt to recover from this state every few seconds and will automatically detect when the cable is reconnected or the salinity and/or lime-scale is removed.

NEED PUMP

If the unit is attempting to reach the dosing acid pump when the pump is disconnected a "NEED PUMP" message appears on the numerical display. The unit will automatically detect if the dosing acid pump is connected.

ACID PIPE

The Check Valve and the internal tube of the dosing acid pump require replacing every 180 days. "ACID PIPE" message appears on the numerical display when they need to be replaced.

PH CONTROL

The dosing acid pump enables the system to reduce pH levels by periodically infusing small amounts of acid into the pool. More acid in the water balances the pH levels, less acid units allow pH to rise.

NOTE: Test the pool water regularly and adjust as necessary.

PH REDUCING MODE

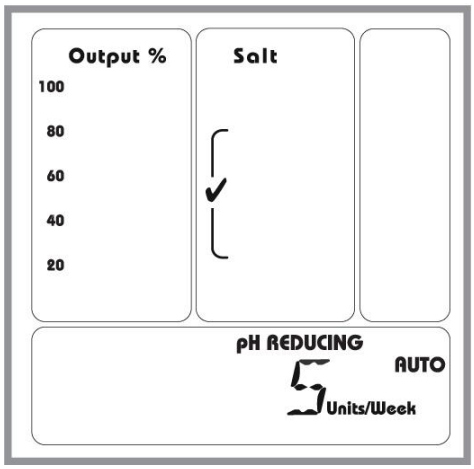
Ensure that the circulation pump is ON, then press the (M) "MODE" button to go to the "pH reducing" modes.

pH reducing: Auto

Press the ▲ and ▼ buttons to adjust the amount of acid to infuse into the water each week (e.g. 5 Units/Week). To eliminate this function, set the "Units Now" to 0.

NOTE: 1 Unit ~ 70 cc (2.5 oz).

pH Reducing Auto Display

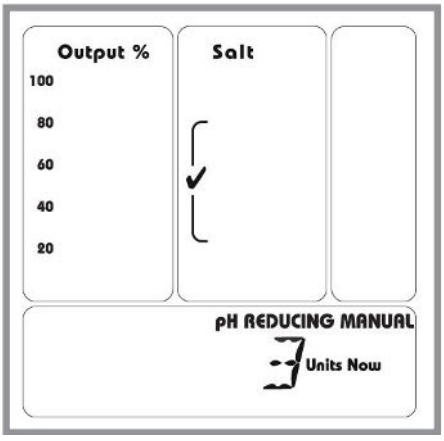


pH reducing: Manual

Use the ▲ and ▼ buttons to infuse the desired number of acid units immediately (e.g. "3 units now"). To eliminate this function, set the "Units Now" to 0. Turning off the circulation pump cancels this manual acid infusion.

NOTE: 1 Unit ~ 70 cc (2.5 oz).

pH Reducing Manual Display



CELL CLEANING MODE

The dosing acid pump system ensures the cell remains clean by automatically washing it with acid when the circulation pump is off. The factory preset allows a cell wash after the circulation pump logs at least 6 hours of run time (e.g. level 9).

A small amount of acid is used (approximately 70 cc / 2.5 oz), so the cleaning function has virtually no influence on the pH level in an averaged size pool. In small bodies of water or in acidic environments, the automatic cleaning should be scheduled less frequently.

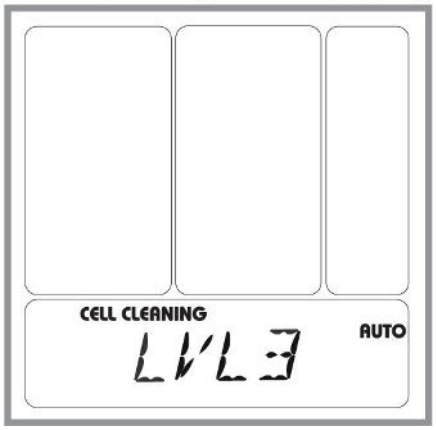
Adjusting the frequency of the cleaning

1. Turn the circulation pump OFF, then press the (M) "MODE" button to get to the "CELL CLEANING: AUTO" mode.
2. Use the (▲) (▼) buttons to adjust the cleaning level (e.g. Level 3).

LVL 0 = No cleaning.

LVL 9 = most frequent cleaning.

Cell Cleaning Auto Display



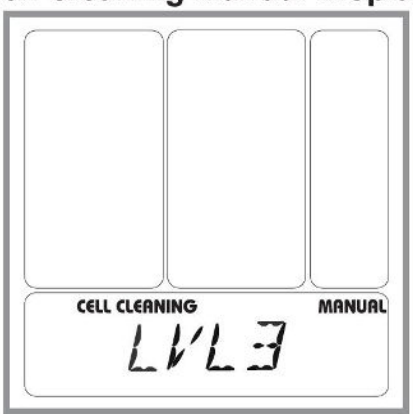
Immediately initiating a cell cleaning

1. Turn the circulation pump OFF, then press the (M) "MODE" button to get to the "CELL CLEANING: MANUAL" mode.
2. Use the (▲) (▼) buttons to adjust the cleaning level (e.g. Level 3).

LVL 1 uses 1 unit of acid.

LVL 4 uses 4 units of acid.

Cell Cleaning Manual Display



NOTE: the cleaning process can take more than 1 hour. If the cell remains calcified, purge it out by turning the circulation pump on for a few minutes, and then repeat the cleaning function.

Turning the circulation pump ON cancels this manual cleaning function.

NOTE: In cases that the automatic settings of the dosing acid pump does not reduce the pool's pH level or doesn't keep the cell clear, make sure that the acid container is full and that the suction tube is installed properly.

ACID PIPE REMINDER

The Check Vavle and the internal tube of the dosing acid pump unit require replacing every 180 days, therefore the system is set to begin counting down 180 days upon first operation. An "ACID PIPE" message appears on the numerical display every 180 days, when the check valve and internal tube requires replacing. Both the Check Valve and the Peristaltic tube require replacing when ACID PIPE message is visible.

Tube need replacing, see "Replacing the internal tube of the dosing acid pump", page 33.

Once the Check Valve and the internal tube are replaced the 180 days counter needs to be reset. To reset it do the following:

1. Press the M "MODE" button three times. ACID PIPE will display again.
2. Press the ▲ button once. A "NEW PIPE" and "180 DAYS" message will be displayed.
3. The systems default is to display a reminder every 180 days (recommended). Use the ▲ ▼ buttons to decrease the number of days in steps of 10 days. Once set, confirm by pressing the M button once.

MAINTENANCE

Maintaining your natural chlorine generator maximizes the performance and life of the system and requires minimal work.

POOL WATER TESTING: Pool water should be tested weekly, but MUST be tested at least once a month.

CELL MAINTENANCE

The clear cell body allows easy, regular inspection for scale and calcium build up. Monthly inspection and cleaning of the cell will prolong its life span. The cell **MUST** be visually inspected **every month** for scale build up (white flakes or crust on or between the plates) and cleaned. Cleaning the cell does not damage it! If in doubt, the cell should be cleaned. **Warranty does not cover cells with scale!**

Cell cleaning

CAUTION – do not use metal or other hard objects to clean the cell.

DO NOT insert anything into the cell.

Both actions detailed above may scratch the precious coating on the plates and void the warranty.

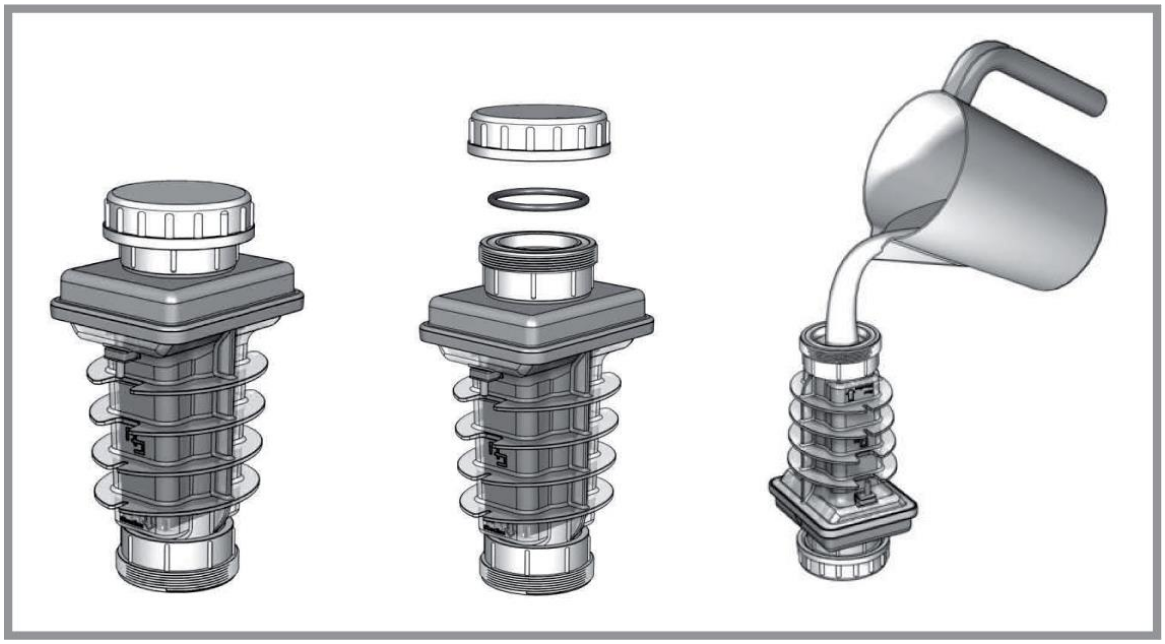
Always add acid to water NOT water to acid.

Diluted muriatic acid solution = 1 part acid to 10 parts water.

Follow the instructions of the acid manufacturer.

Cleaning using the cleaning cap

1. Disconnect the wires connecting the control box to the cell.
2. Remove the cell from the line by unthreading the barrel unions from the cell ends.
3. Remove the black O'ring on one end of the cell.
4. Attach the cell cleaning cap to the other end of the cell.
5. Pour into the cell, either undiluted white distilled vinegar, or a solution of diluted muriatic acid (one part muriatic acid to 10 parts water).
6. Wait for foaming to stop (5-10 minutes when using muriatic acid; vinegar takes longer).
7. Safely dispose of the acid solution by pouring it into your pool.
8. Rinse the cell with water hose.
9. Put the O'ring back in place and re-install the cell in the line.
10. Reconnect the wires from the control box to the connectors at the sides of the cell **until they "click" together**.



WINTERIZING

Just like the pool plumbing, freezing may damage the system cell and flow sensor. If severe or extended periods of freezing temperatures may occur, drain all water from the pump, filter, cell, supply and return lines before temperatures drop.

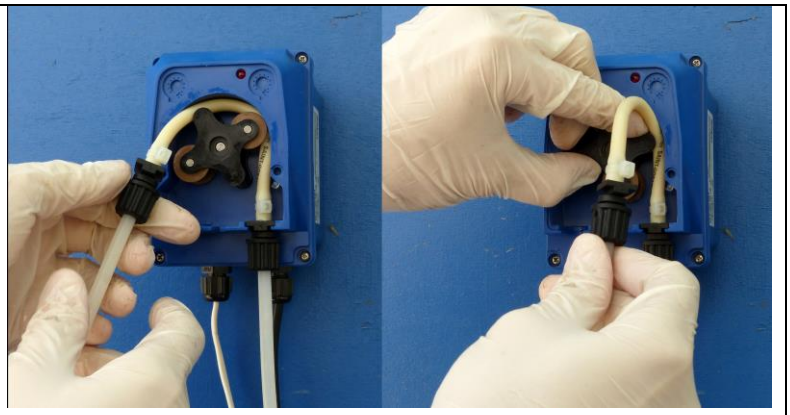
SPRING STARTUP

DO NOT turn on the system until the pools' water chemistry has been brought to the required levels. See the "Turning the Unit On" chapter on page 23 for more information.

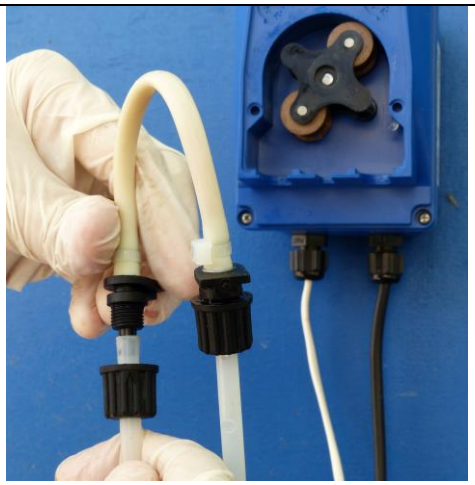
REPLACING THE PREISTALTIC TUBE OF THE DOSING ACID PUMP

It is recommended to replace the check valve and internal tube of the dosing acid pump before starting a new bathing season and/or every six months during the season. Please contact your local dealer to obtain a new tube. The internal tube requires replacing when ACID PIPE message is visible.

WARNING: In order to perform this operation, you MUST wear rubber or polyethylene protective gloves and safety glasses. It is also advisable to protect your clothes or wear dispensable ones.

	
Remove the transparent protective cover	Carefully slip off the rubber tube from its slot. Gently pull the tube out (clock wise) assisting with the other hand to turn the pump's engine wheel and help free the tube until it is completely out.

Note: It is advisable to flush the pump with running tap water in order to dilute any remaining acid which may have spilled from the tube.

	
Disconnect both ends of the internal tube by unscrewing the nuts from the nipples.	Screw in both ends of the NEW internal tube making sure the nuts are tightly secured.

	
Gently insert the tube back into place making sure the black bases of the tubes are tightly in their slots in the casing.	Return the transparent cover to its place.

Check for leaks and leave the pump running in manual mode for 10-20 minutes in order to release the air in the system.

UNDERSTANDING THE CHEMISTRY

The table shows the recommended balance levels followed by a more detailed explanation of the factors affecting the water chemistry. Maintaining these levels ensures maximum enjoyment of the pool. You should test your water periodically. If the water chemistry needs adjustment, your authorized dealer or most pool stores can supply you with the appropriate chemicals and procedures. We recommend either taking a copy of the Water Balance Table to the pool store, or notifying the pool store that you are using Magen eco-Energy's natural salt chlorine generator (model PSC5).

Factors	Ideal levels
Salt	**3000 – 4500 ppm**
Free Chlorine	**1 – 3 ppm**
pH	**7.0 – 7.6**
Total alkalinity	**80 – 120 ppm (depending on the saturation index)**
Stabilizer (a.k.a Cyanuric acid or conditioner)	**20-60 ppm**
Calcium Hardness	**100-400**
Saturation index	**-0.3 to 0.3 (0 is ideal)**

Salt is the source of the Natural Chlorine. The ideal salt level to ensure maximum benefits using our system is 3500 ppm (parts per million). A lower concentration of salt may hinder the generator effectiveness. A concentration of salt above 5500 ppm may cause corrosion damage to the pool fixtures. See the "Adding salt" chapter, on page 18 for more information.

Free Chlorine vs. Combined Chlorine: The unpleasant smells and side effects often associated with chlorine are actually caused by combined chlorine (e.g. chloramines). Combined chlorine is a chlorine molecule that attacks a noxious particle in the water but is unable to destroy it. This chlorine particle remains attached to the noxious particle until one of the two is burned off; hence the term Combined Chlorine (a.k.a chloramines). To burn off the noxious particle and free up the chlorine again, pool owners have to periodically shock (with chlorine) the pool. In the natural chlorine generator the noxious particle is burned off within the generator cell and the combined chlorine is continuously converted back to free chlorine.

The free chlorine level in the pool should be maintained at 1 to 3 ppm. This level of free chlorine is comfortable to swim in with no unpleasant smells, and maintains proper sanitizing.

pH is a measure of the acidic or basic solution. A scale of 0 to 14 is used to measure pH. Pure water has a pH of seven (neutral), acid solution have a pH of less than seven, and basic (alkali) solutions have a pH of more than seven. The recommended range is 7.0 to 7.6; chlorine is much more effective within this range and the water is most comfortable for bather. **pH levels above 7.6 drastically reduce the effectiveness of the chlorine.**

To lower the pH, add muriatic acid or dry acid. Be sure to read and follow the respective manufacturer's instructions.

Total Alkalinity mitigates changes in pH. It is often referred to as the "big brother of pH". Keeping proper levels of total alkalinity helps reduce unwanted fluctuations in pH levels. Total alkalinity is also used to offset high or low levels of calcium hardness (see "saturation index" on page 38).

Add muriatic acid or dry acid to lower the total alkalinity and sodium bicarbonate to raid the total alkalinity. Be sure to read and follow the respective manufacturers' instructions.

Stabilizers (Cyanuric Acid or Conditioner) is necessary in most outdoor pools to maintain appropriate levels of chlorine. Chlorine stabilizer helps provide an appropriate residual chlorine level in the water. Without stabilizer, UV radiation from the sun will destroy most chlorine within 2 hours, but excessive amounts of stabilizer can decrease the effectiveness of chlorine. Chlorine stabilizers should be maintained at 60 ppm to offset the harmful effect of the sun while maintaining the effectiveness of the chlorine. Where pH/ORP automatic sensors are used, 40 ppm of stabilizer suffices.

Calcium Hardness, like pH and alkalinity, affects the water tendency to be aggressive or scale forming. Lower levels of calcium hardness improve the chorine generators' ability to stay clean and provide softer silkier water for the swimmers. Check with your local pool professional for proper calcium levels for your pool surface.

Saturation Index determines whether the pool water is balanced, aggressive, or scale forming by comprehensively taking into account all the relevant factors, including pH level, alkalinity level, calcium hardness, and temperature. These factors should be periodically tested, then included into the worksheet on the following page to verify the proper balance of the pool and make adjustments as necessary.

SATURATION INDEX

Test the water for pH, Alkalinity, Calcium hardness and temperature, and then follow the simple steps detailed below:

1. Write your pool pH level here → pH: _____
2. Find your Alkalinity level in the chart below,

   And write the corresponding Alkalinity factor here: → Alkalinity Factor: _____

Pool Alkalinity	5	25	50	75	100	150	200	300	400
Factor	0.7	1.4	1.7	1.9	2.0	2.2	2.3	2.5	2.6

3. Find your Calcium (CaCO3) level in the chart below,

   And write the corresponding Calcium factor here: → Calcium Factor: _____

Pool Calcium	5	25	50	75	100	150	200	300	400
Factor	0.3	1.0	1.3	1.5	1.6	1.8	1.9	2.1	2.2

4. Find your pool temperature in the chart below,

   And write the corresponding temperature

   Factor here: → Temperature Factor: _____

Pool Temp	32	37	46	53	60	66	76	84	94	105
Factor	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9

5. Add the results from steps 1 through 4 above and write

   The result here: → Total of above: _____

   -12.2

6. Subtract 12.2 from step five and write the result _____

   here: → Saturation Index = ☐

- If the saturation index above is between -0.3 and +0.3, the water is well balanced.
- If the index is higher than 0.3, the water will tend to cause scaling or get cloudy. The Alkalinity and pH should be reduced accordingly, but maintained within the recommended levels.
- If the index is less than -0.3, the water will tend to be aggressive towards the pool surface, equipment, and bathers. The Alkalinity and pH should be increased accordingly, but maintained within the recommended levels.

TROUBLESHOOTING

NOTE: Evaluating the possible causes for each problem from top to bottom (first to last) will void extra labor.

Problem	Possible Causes	What to do
Chlorine level is low	• System is turned off	• Turn the system on to the desired setting
	• Output level is set too low in relation to chlorination demand (e.g. higher number of bathers, warmer weather, increased debris in pool)	• Set the output bar to higher setting and/or increase pump operation time
	• Low salinity	• Check the salinity level (see the "salinity readout" chapter, page 25)
	• Pump operation time is too short	• Run the pump at least eight hours per day (1.5 turnovers of all the pool water) or more if necessary
	• Low stabilizer (cyanuric acid)	• Check water chemistry; stabilizer should be 60-80 ppm. If low, add stabilizer (see "Understanding the Chemistry" chapter, page 36)
	• Chemical imbalance	• Check other chemistry and balance chemicals (see "Understanding the Chemistry" chapter, page 36)
Green Pool	• Chemical imbalance	• See "chlorine level low" above
LCD is totally OFF – No power	• System is turned off	• Turn the system on to the desired setting
	• Breaker activated	• Check the breaker leading to the pool control
	• Power wires cut, disconnected or incorrectly wired	• Check for correct wiring (see page 14)
	• Other malfunctions in control box	• Contact customer service
Flow icon turn on and off	• Normal at initial start-up or if air bubbles are in the pipes • In rare instances bad contacts in the flow sensor might cause this	• Wait a few minutes for air to release. If continuous, check plumbing to see if air enters the system in any way • Replace flow sensor with a new one

Problem	Possible Causes	What to do
Flow icon is on and NO FLOW message appears in the numerical display	• Insufficient water flows from pump to flow sensor and cell	• This is normal if there is air in the lines or for a few minutes at initial startup • Clean filters and strainers • Check for closed valves, pump cavitation, faulty pump etc'
	• Flow sensor was not installed in the correct direction	• Turn flow sensor so arrow faces direction of water flow
	• Flow sensor is not fully threaded into the Tee connector	• Fully thread the Flow sensor into the Tee connector. Be careful not to damage the wires or sensors.
	• Cut wires or insufficient wire connections	• Check the connection to ensure proper wire contact
Output bar lights but does not reach 100%	• Output bar set too low	• Push the ▲ button to set the output level to a higher setting
	• Dirty cell	• Check the cell to ensure that the blades are in good condition and not coated with calcium buildup. Cleaning the cell is recommended if it is calcified or if the readout seems questionable. See "cell cleaning" in the "maintenance" chapter, page 32
	• Poor connection of quick connectors	• Check for debris inside the connectors. Ensure that the quick connectors are connected
	• Low pool water temperature	• In cold water (lower than 26 ºC/80 ºF the salt meter may indicate a lower salinity level. This is normal
	• Not enough salt due to heavy rain, initial miscalculation etc'	• Add salt to the pool. See :"Adding salt" chapter for more information, page 18 • It is recommended to periodically test the salt level by a professional and adjust according to the salinity demand table in this manual, page 19
	• Worn cell	• If none of the above resolves the problem the cell may be worn out.

Problem	Possible Causes	What to do
Salinity high	• Salinity high - Enough salt has been added causing the red light above the power meter to turn on	• This does not harm the natural generator, but simply indicates that the salt level is high • It is recommended to periodically test the salt levels by a professional. If above 5000 ppm, it is recommended to drain part of the pool water and refill with fresh water (please check with your local pool professional prior to draining the pool)
	• Salinity is very high - Too much salt has been added causing the high salinity icon to turn on	• The salt level in the water is very high. Drain part of the water and refill the pool to bring the salinity levels down. • It is recommended to periodically test the salt levels by a professional. If above 5000 ppm, it is recommended to drain part of the pool water and refill with fresh water (please check with your local pool professional prior to draining the pool)
	• Salinity far too high – way too much salt has been added causing the unit to display a SHRT CELL message	• The salt level is exceeding high. Drain part of the water and refill the pool to bring the salinity levels down • It is recommended to periodically test the salt levels by a professional. If above 5000 ppm, it is recommended to drain part of the pool water and refill with fresh water (please check with your local pool professional prior to draining the pool)
Salinity low	• Low salinity in the pool	• Add salt according to the table on page 19
	• Scale buildup in cell	• Check for debris in the cell; inspect blades for wear and tear or calcium buildup. Clean if necessary, instructions to be found in "maintenance" chapter page 32
	• Faulty Temp. sensor	• Replace temperature sensor
	• During start up there is air in the system	• Air should be cleared after about one hour of run time

Problem	Possible Causes	What to do
SHRT CELL message is displayed on the numerical display	• Salinity is very high	• Drain part of the water and refill the pool to bring the salinity levels down. See troubleshooting section – salinity high (above) for more information • It is recommended to periodically test the salt levels by a professional. If above 5000 ppm, it is recommended to drain part of the pool water and refill with fresh water (please check with your local pool professional prior to draining the pool)
	• Short circuit in the cell wires	• Check that the cell wires are properly fastened and there is no reason for short circuit between them
Scale build-up inside cell	• Standard occurrence that needs cleaning approximately once a month	• Clean cell as instructed in the maintenance chapter, page 32, or purchase a dosing acid pump
	• Chemical imbalance	• Balance chemicals (focus mostly on the Saturation index in the "Understanding the chemistry chapter, page 36)
White flakes in the water	• Normal occurrence when cell cleans itself	• Keeping the water well balanced reduces this occurrence focus mostly on the Saturation index in the "Understanding the chemistry chapter, page 36)
Cloudy water	• May be due to chemical imbalance or insufficient water flow	• Make sure your filtration system is working properly (e.g clean filter and/or skimmer) • Make sure the circulation time is adequate – if not, increase pump run time • Balance all chemicals referenced in the "Understanding the Chemistry" chapter, page 36 • Shock the water to eliminate build-up of any organic matter

Problem	Possible Causes	What to do
Colored water	• Algae may be trying to form	• Have a pool professional test the pool water. Increase circulation time if needed and clean the filter
Algae	• May be due to low chlorine levels or a chemical imbalance	• Have the water tested for chemical balance including pH • If chlorine level is low, see "Chlorine level low" in this troubleshooting section • Use nonmetallic (polyquat) algaecide as instructed on the bottle and brush the side of the pool often • Clean the filter and shock the pool with chlorine daily until the water clarity returns

DOSING ACID PUMP TROUBLESHOOTING

WARNING! You are about to manipulate components which are in contact with concentrated Muriatic Acid. USE PROTECTIVE GLOVES, GOGGLES and CLOTHING FOR YOUR SECURITY. In case of involuntary contact with acid, flush the affected areas with running water. In case of contact with eyes, flush with water and contact a physician!

Problem	Possible Causes	What to do
Scale build-up in cell	• Automatic cell cleaning level setting is too low	• Adjust dosing LVL to a higher level (1 to 9)
	• Hydrochloric (Muriatic) Acid container is empty	• Replenish acid in container or replace with a new container • After replacing the acid container, enter manual mode and run the system for 1-2 sequences in order to release air (priming)
	• Acid inlet tube is not in contact with the acid (above acid level)	• Push the tube to the bottom of the acid container. Observe the priming procedure as described above
	• Pump does not run during self-cleaning mode (manual and automatic)	• Check the electrical connection between the dosing acid pump and the control box and the electrical wiring from the pump to the timer/main board - If red led on the pump Is illuminated but the pump is not operating the problem may be in the wiring to the main board
	• Internal tube is worn out or ruptured	• Replace ruptured tubing • IMPORTANT: follow the instructions listed in the "Replacing the internal tube chapter", page 34
	• If there are no faults listed above, the small check valve may be obstructed	• Carefully unscrew the check valve from saddle. Disconnect the tube from the check valve. Replace with a new valve (sold separately) discard old valve
pH level in pool is too high	• Automatic pH reducing units setting is too low	• Adjust dosing level to a higher level (1 to 50 units/week)

Problem	Possible Causes	What to do
pH level in the pools is too high – no reaction to a higher setting	• Hydrochloric (Muriatic) acid container is empty	• Replenish acid in the container or replace with a new one • After replacing acid container, enter manual mode and run the system for 1-2 sequences in order to release air from the system (priming)
	• Wrong acid is used	• Verify the you are using muriatic acid (33% HCL) • Check that your acid is still active
	• Acid inlet tube is not in contact with acid (above acid level)	• Push the tube to the bottom of the acid container. Observe the priming procedure as described above
	• Pump is not running during "pH reducing mode" (manual and automatic)	• Check the electrical connection between the dosing acid pump and the control box and the electrical wiring from the pump to the timer/main board - If red led on the pump Is illuminated but the pump is not operating the problem may be in the wiring to the main board
	• Internal tube is worn out or ruptured	• Replace ruptured tubing • IMPORTANT: follow the instructions listed in the "Replacing the internal tube chapter", page 34
	• If all of the above mentioned are all right, the small check valve may be obstructed	• Carefully unscrew the check valve from saddle. Disconnect the tube from the check valve. Replace with a new valve (sold separately) discard old valve
pH level in pool is too low (<7.1) – water becomes acidic	• Automatic pH reducing units are set too high	• Adjust/reduce the dosing level to a higher level (1 to 50 units/week) • Check that you are using the correct acid concentration (HCL 33%)