Installation Manual for Certified Professionals

resilience

Model: 305PX

June 2019

This is an installation manual for qualified installers; a separate operating manual is included for the homeowner.

solaxx
WATER TREATMENT SOLUTIONS
An AWG Company

MET US
UL 1081

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IMPORTANT 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 this electrical equipment, basic safety precautions should always be followed, including the following:

DO NOT OPEN THE DISPLAY COVER OF THE 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 5 ft (1.5m) (or more, if local codes so require) from the pool/spa.
- **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 correct the problem before using.
- The Input circuit (LN1 & N/LN1) must be connected only after OVER CURRENT 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 permanent connected, with copper wire, not less than 14 Awg (1.5 mm).
- The wiring of the unit must be performed according to the wiring instructions on page 10.
- A 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 an approved 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.
- SAVE THESE INSTRUCTIONS.

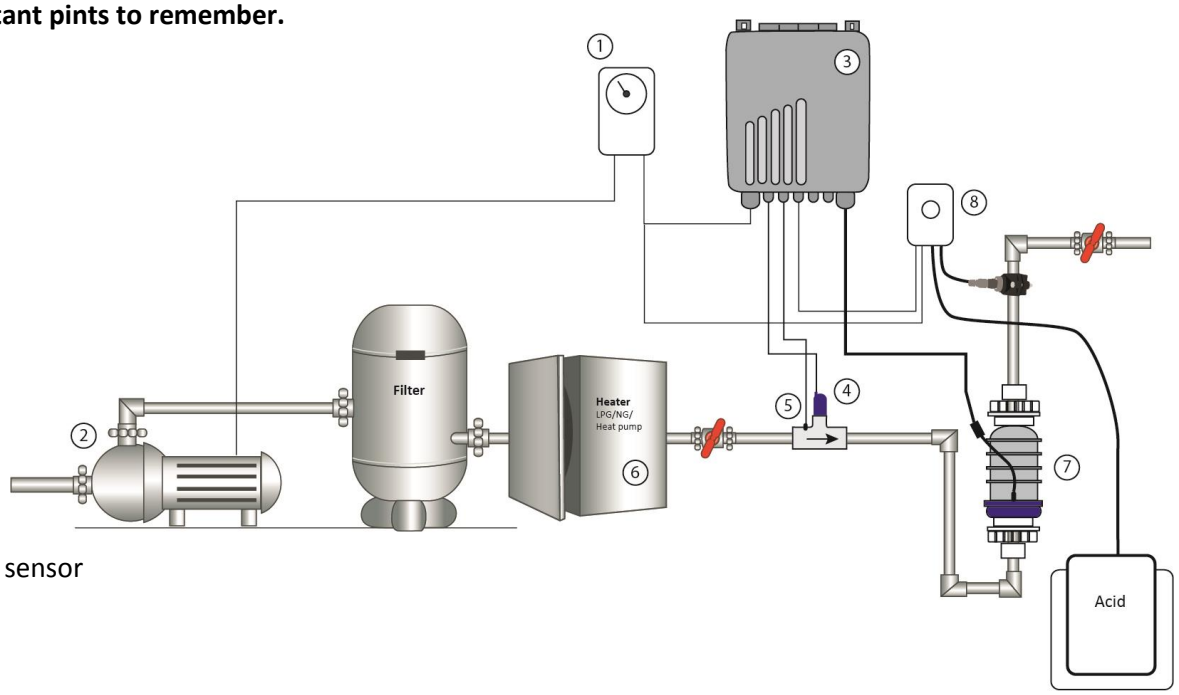
TABLE OF CONTENTS

SYSTEM OVERVIEW

This installation manual is designed for the pool professional. It assumes that 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.

= Short-cut tips or tricks that help complete the installation quickly and professionally.

= Important pints to remember.



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.
3. See the plumbing configurations chapter for more detailed instructions and several acceptable options.

A simpler "Operation manual" is included for the homeowner. To maximize clients' satisfaction, please instruct the client to read through it and follow its warranty registration instructions to qualify for warranty coverage.

Add the salt as soon as you arrive on the job so that it will be dissolved enough to start up the system and instruct the homeowner on its operation before leaving the site. Also, leave the hard-wire portion of the electrical installation for last so that you may run the pump as much as possible during the installation process to help dissolve the salt in the pool.

PACKAGE CONTENTS

Control Box

Cell

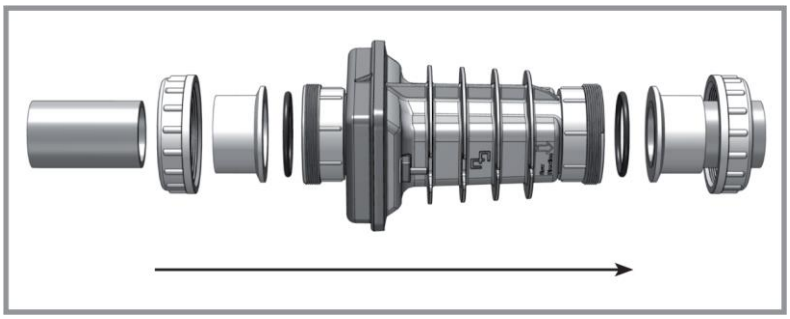
Flow Switch T & Temp Sensor

Your particular install will consist of the above components with a dosing acid pump being an optional feature. Even if you are not installing an acid pump at this time, plumb the system so that the dosing acid pump can easily be added at a later date (see the plumbing configurations chapter. In doing so you are leaving the option for the customer to upgrade much easier and also creating an opportunity to provide an additional service for the customer.

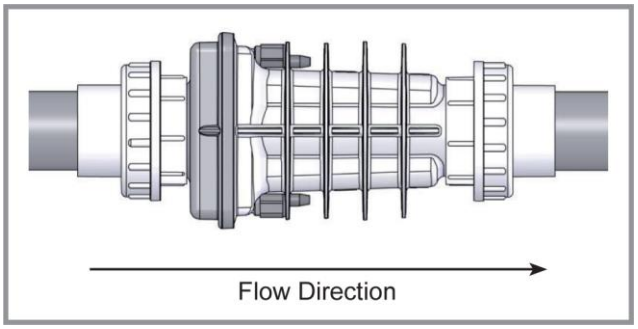
PLUMBING CONFIGURATIONS

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 15 inches (380 mm) 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 11 3/4 inches (300 mm) 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.

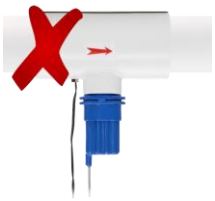


5. Hold up the cell with the second unions to gauge the proper distance before threading the second nut and gluing the second clip.
6. After letting sufficient drying time for the glue, place the cell with the O-rings into the opening between the two ends of the pipe and tighten the unions making sure 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).

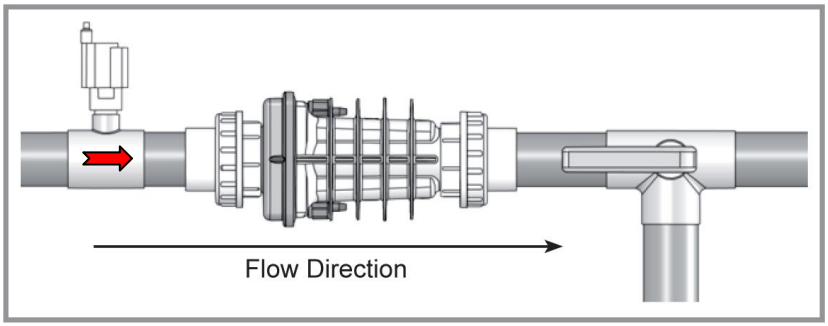


INSTALLING THE FLOW SENSOR

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

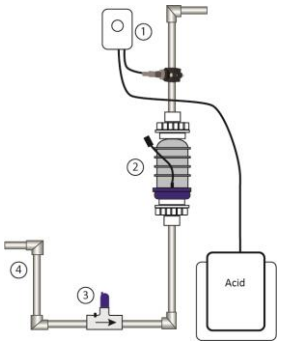
The dosing acid pump should be installed right after the chlorinator cell, in a way that ensures the cell stays full of water when the circulation pump turns off. Choose one of the plumbing configuration options below:

A. U shape installation

B. Horizontal installation

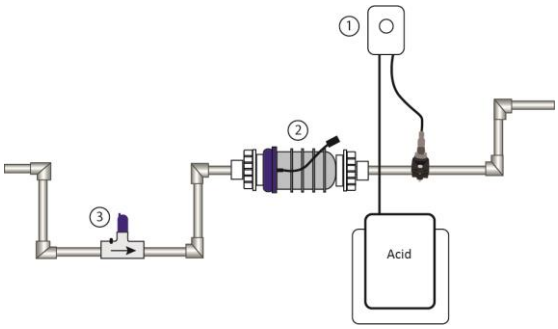
U SHAPE PLUMBING CONFIGURAITON

1. Dosing acid pump and saddle
2. Chlorinator cell
3. Flow switch Tee & Temp. sensor
4. ~ 21 inch (54 cm) 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.

MOUNTING THE CONTROL BOX

1. The control box must be mounted vertically on a flat surface, and a minimum horizontal distance of 5 ft (1.5m) or more, if local codes require, from the pool/spa.
2. Select a position for you Control Box within 10 ft (3½ meters) from the intended Cell and Flow Switch installation place to ensure that enough cable is available (the actual cable length is 12').
3. Secure the unit to the wall – see fig. 1
4. Remove the access cover located at the lower part of the Control Box by opening the two screws that hold it to the main box.
5. See Wiring Diagrams on the following page.

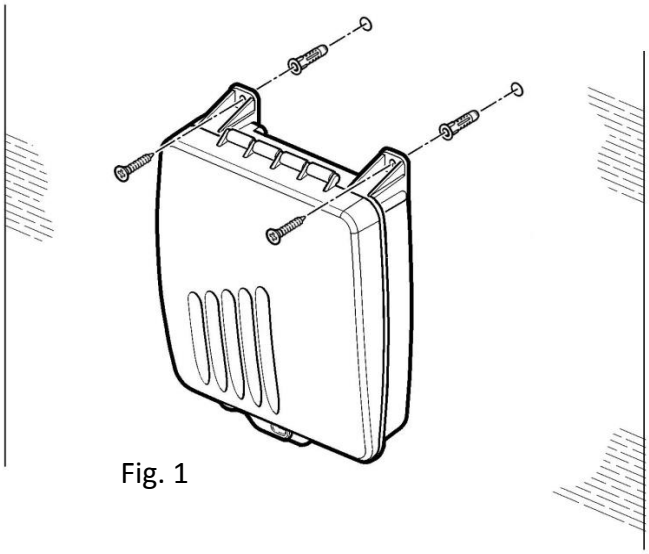


Fig. 1

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

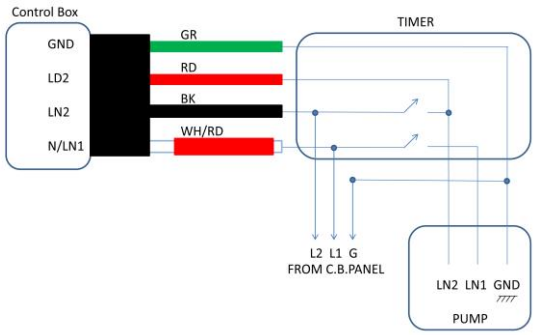
WIRING TO TIME DEVICE

CAUTION!

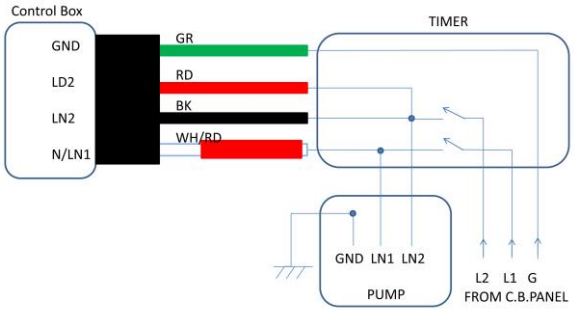
- Disconnect all power supply to the main timer/main power source before hardwiring the input voltage cables to the timer control box.
- Hardwire all accessory equipment: Permanent pH, Temp. sensor etc'. and close the access cover before resupplying main voltage to the unit.

ELECTRICAL WIRING SCHEME

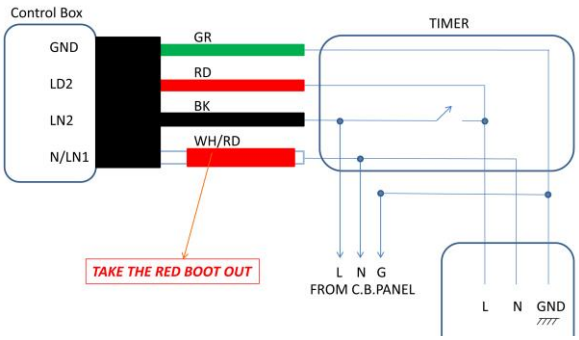
240 VAC INSTALLATION ALLOWING CELL CLEANING MODE



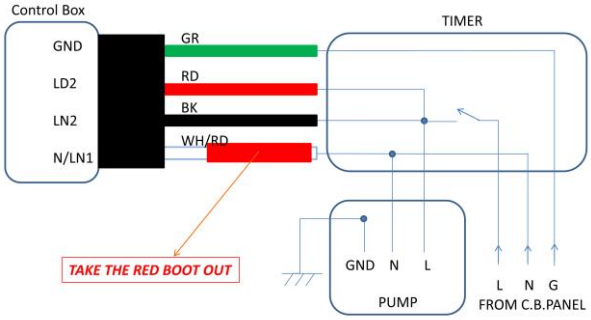
240 VAC INSTALLATION ELIMINATING CELL CLEANING MODE



120 VAC INSTALLATION ALLOWING CELL CLEANING MODE



120 VAC INSTALLATION ELIMINATING CELL CLEANING MODE

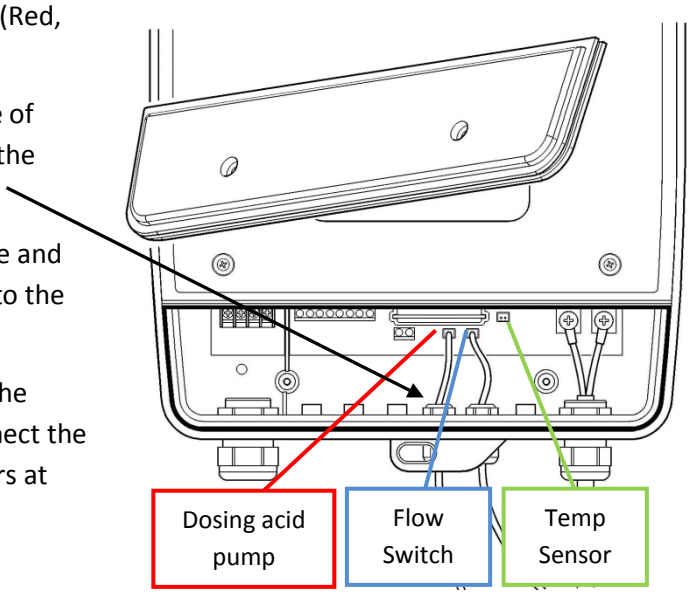


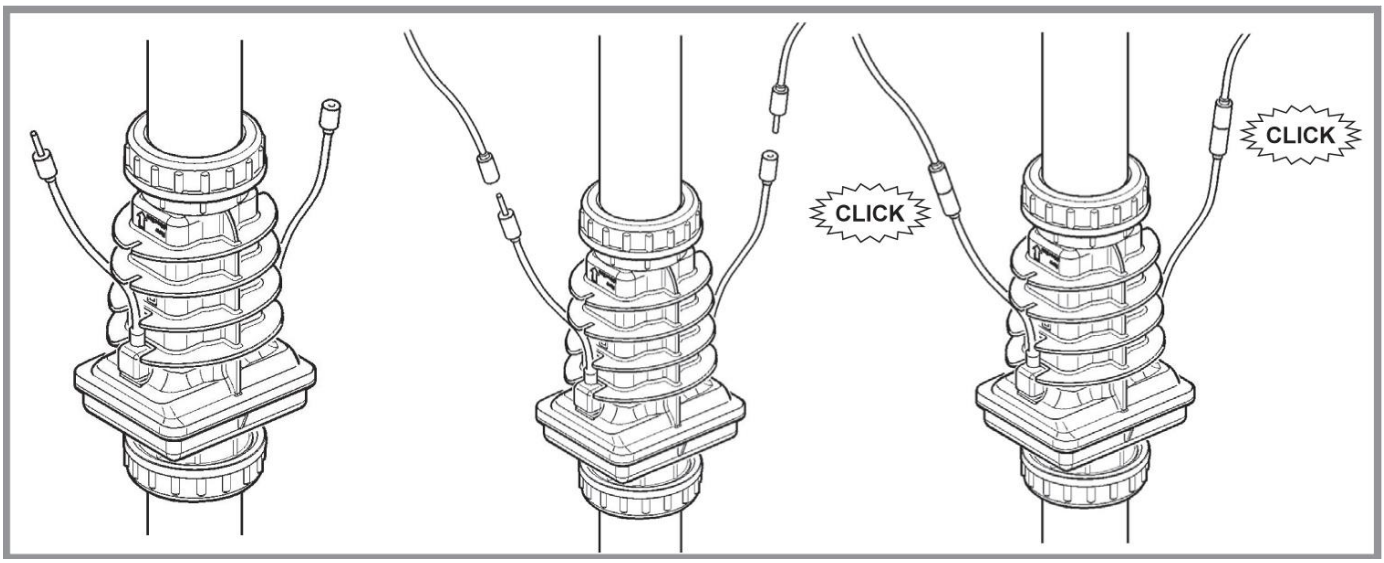
Wiring Rule: Either diagram above requires four (4) wires connected to the control box:
<u>240V</u> requires 2-lines, 1-load, 1-ground
<u>110V</u> requires 1-nuetral, 1-line, 1-load, and 1-ground

If connecting to an automatic-control panel, connect the wires to the pool pump relay in the same manner as above.

WIRING COMPONENTS

1. Connect the color coded plugs with matching sockets (Red, blue and white).
2. Stress-relief bushings are already attached to the wire of each accessory. **DO NOT REMOVE** the bushings from the wire.
3. Remove the nut from the bushing, then insert the wire and bushing through the Control Box and tighten the nut to the bushing of each connection.
4. Connect the cell cables as shown below. 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.**



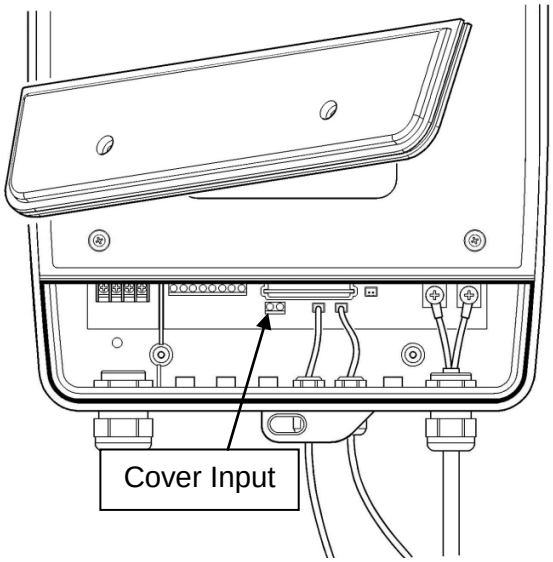


CAUTION!!! Do not extend the original cables leading to the cell. This decreases the system efficiency and will void the warranty coverage.

ADVANCED FEATURE WIRING

POOL COVER

The unique pool cover function enables the chlorinator to reduce the chlorine output while the pool is covered. When the pool is cover covers the pool, the chlorinator will automatically reduce its chlorine output to 20% from the maximum level and a "AUX" note will appear on the numerical display. Pressing + , - buttons while the system is in pool cover mode enables to permanently set new output values to the unit (e.g. – the default setting is 20% total, but when the pool is covered you may change the default setting to 40%. The setting will remain 40% for future "pool covering" events). In order to activate this function properly make sure that the chlorine generator is getting a "closed contact" from the pool cover control when the pool is covered.

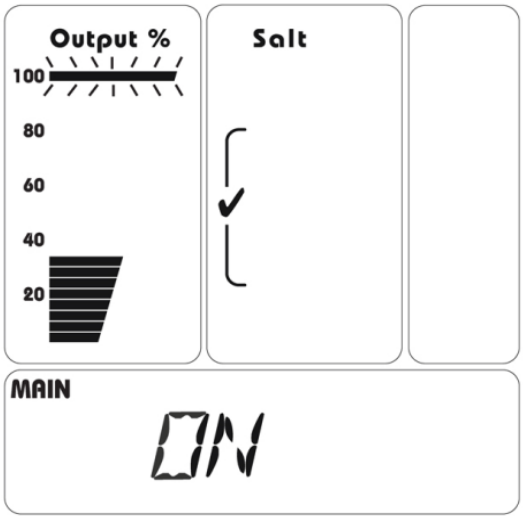


STANDBY MODE / INSTALLATION TEST

When the main circulation pump turns off, the system automatically goes into the standby more. This is a safety action that prevents chlorine production without water flowing through the chlorinator cell. Automatic cell cleaning is executed during standby more.

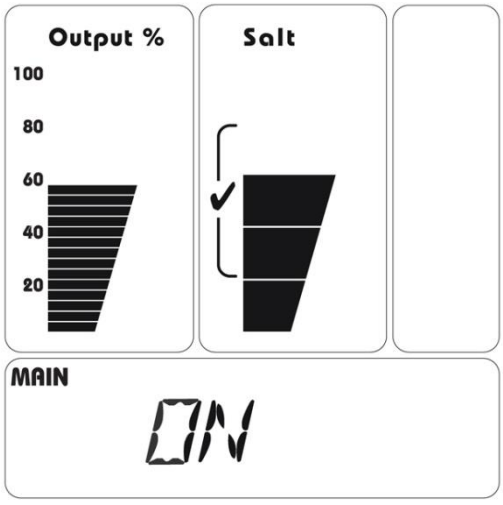
Confirm that the system is properly installed by checking that it goes into "**ST:BY**" mode when the circulation pump is off and into "On" mode when the circulation pump is on. When turning the system on, wait up to 1 minute for it to count down and ramp up.

OPERATION



- Ensure the main circulation pump is ON.
- Press ⏻ to turn the unit on.
- Adjust the chlorine production level using the ▲ or ▼ buttons.

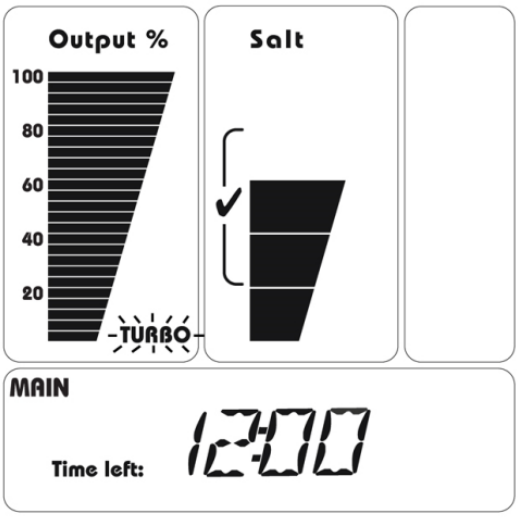
Wait up to 1 minute for the system to test and display the "Output %" and salinity reading. A blinking bar in the "Output %" area shows the amount of chlorine that system is trying to produce, while the solid bars show the amount of chlorine the system is actually producing.



TURBO SETTING

Press the (T) (Turbo) button. This action increases chlorine production output to 100% for a preset time period. Default is 12 hours.

Adjust the time by holding down the ▼ or ▲ buttons.



If the salinity level is too low, the solid bars will display the maximum production level the system is reaching, but the 100% bar will blink to show the system is trying to reach the 100% production level.

To turn off Turbo mode, wait 5 seconds, and then press the (T) button again.

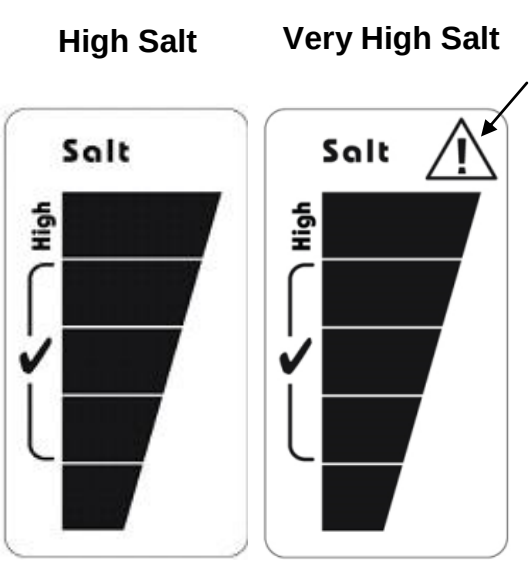
SALT READOUT

Normal salt level

Salt levels are normal when the salt level bar is in the "✓"area.

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

High Salinity Indication

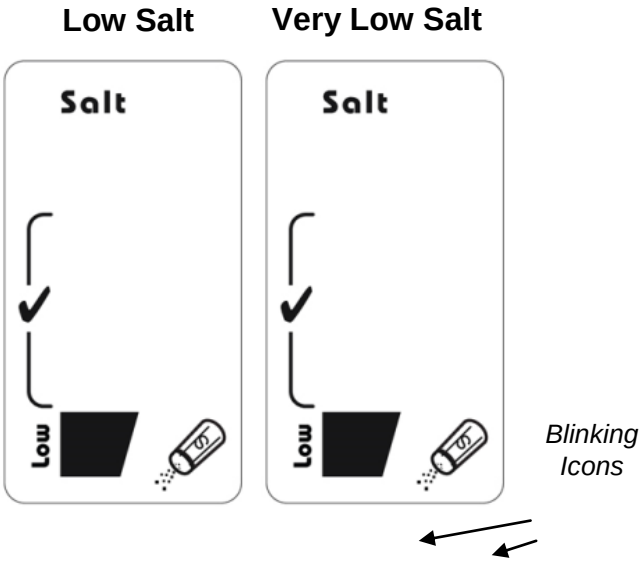


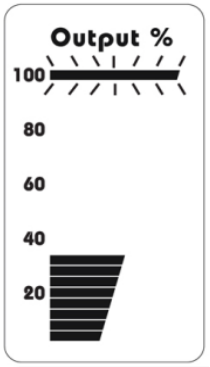
The system safely operates in up to 6,500ppm of salt, but the "High" salt indicators illuminate to warn against adding more salt. If the High salt indications stay on, a pool professional should test the water and dilute it as necessary.

CAUTION: Check with you local pool professional prior to draining or diluting the pool.

Low Salinity Indication

Scaling or coating of the cell blades affects the salinity readout. Ensure the cell is clean, then have the pool water tested by a pool professional and adjust the salt level 3000-4000ppm. See the "Adding the Salt" chapter.





The system safely operates in low levels of salt, but its ability to produce chlorine decreases as the salt level drops below 3000ppm. A blinking bar in the "Output %" area shows the amount of chlorine the system is trying to produce, while the solid bars show the amount of chlorine the system is actually producing.

PH REDUCING MODES

Ensure the circulation pump is ON, then press the (M) button to go to the "**pH Reducing**" Modes.

pH reducing: Auto

Press the (▼) or (▲) buttons to adjust the amount of acid to infuse into the water each week (e.g. 5 Units/Week).

1 Unit ≈ 2.5 oz (70 cc).

To eliminate this function, set the "Units/Week" to 0.

For very small pools, set the Units/Week parameter to "0". For larger pools customer can begin with "3", then test & adjust as needed. Cell cleaning mode may infuse enough acid to lower pH.

pH reducing: Manual

Use the (▼) or (▲) buttons to infuse the desired number of acid units immediately (e.g. "3 Units Now").

1 Unit ≈ 2.5 oz (70 cc).

To eliminate this function, set the "Units Now" to 0. Turning off the circulation pump also cancels this manual acid infusion.

Now would be a good time to test the dosing acid pump and draw acid into the tube by placing the system in the pH Reducing mode manually. This will activate the dosing acid pump and allow the pump to run long enough for you to confirm operation and draw from acid container. Once you are done be sure to reset "Units now" to 0.

PH REDUCING MODES

The dosing acid pump ensures the cell remains clean by automatically washing it with acid when the circulation pump is off. The factory preset (Level 9) allows a cell wash after the circulation pump logs at least 6 hours or run time. A small amount of acid is used, so this cleaning function has a very little influence on the pH level in average pools. In small bodies of water or in acidic environments, the automatic cleaning should be scheduled less frequently.

Adjust frequency of the Automatic cell cleaning

Turn the circulation pump OFF to get to standby mode.

Press the M button to get to the "**Cell Cleaning Auto**" mode.

Use the ▼ or ▲ buttons to adjust the cleaning level (e.g. Level 3).

LVL 0 = No cleaning; LVL 9 = most frequent cleaning.

Initiate immediate cell cleaning

Turn the circulation pump OFF to get to standby mode. Press the M button to get to the "**Cell Cleaning Manual**" mode.

Use the ▼ or ▲ buttons to adjust the strength of the cleaning (e.g. Level 3).

LVL 1 uses 1 unit of acid; LVL 4 uses 4 units of acid.

1 Unit ≈ 2.5 oz (70 cc).

Turning the circulation pump ON cancels this manual cleaning function.

If the cell is heavily calcified, the cleaning process can take more than 3 hours. If the cell remains calcified, purge it out by turning the circulation pump on for a few minutes, and then repeat the cleaning function.

NOTE: Regularly check the integrity of the container, the integrity of the suction tube, and the acid level in the container.

WINTERIZING

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

STARTING UP

BEFORE ADDING THE SALT

1. **Balance the chemicals**: See the section titled "Pool chemistry explained" on page 22 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 21. 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

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

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Oval	Length X Width x Average Depth X 6.7	Length X Width X Average Depth X 893

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 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.

POOL CHEMISTRY EXPLAINED

The following chemistry levels must be monitored and adjusted regularly. They significantly affect the system's ability to maintain pure healthy water as well as the bathers comfort and safety.

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 19 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. Ideal ORP levels range from 650 to 750 mV.

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 7.2 to 7.6; chlorine is much more effective within this range and the water is most comfortable for bathers. **pH levels above 7.8 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.

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.

Phosphates and Nitrates set very high demands on chlorine; most nitrates and phosphates often bring the chlorine level down to zero (0). You can have your water tested for nitrates and phosphates by a local professional. **Your pool should NOT contain Nitrates or Phosphates.** To reduce Phosphate levels, use a phosphate remover from your local pool professional. To reduce Nitrate levels, the pool must be partially or fully drained. Please check with your local professional prior to draining the pool.

Metals can cause loss of chlorine and can stain your pool. If a water test reveals the presence of metals, refer to your local pool professional for recommended methods of removal. Be sure to use a phosphate-free metal remover to avoid replacing a metal problem with a phosphate problem.

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.

Total Dissolved Solids (TDS) is a measure of many types of dissolved materials, including salt. High effective TDS levels (e.g. 1500 ppm and up) cause cloudy water and significantly increase chlorine demand.

To obtain the effective TDS level in a pool using a salt system, subtract the salt level from the TDS reading (e.g. 5000 TDS – 4000 salt = 1000 effective TDS).

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 too low in relation to chlorination demand (e.g. higher number of bathers, warmer weather, increased debris in pool)	• Increase output setting and/or increase pool pump operation time
	• Low salt level	• Check the salinity level (see the "salinity readout" chapter) adjust accordingly
	• 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)
	• High phosphate levels	• Check phosphate levels at your local professional and reduce to below 100 ppb
	• Chemical imbalance	• Check other chemistry and balance chemicals (see "Pool chemistry explained" chapter)
Green Pool	• Chemical imbalance	• See "chlorine level low" above
	• Chemical imbalance, dirty filter	• Have water tested by a pool professional, clean filter
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 "Installation manual for certified professionals")
	• Other malfunctions in control box	• Contact customer service
Flow icon turn on and off (blinking)	• Normal at initial start-up or if air bubbles are in the pipes	• Wait a few minutes for air to release. If continuous, check plumbing to see if air enters the system in any way

Problem	Possible Causes	What to do
Flow icon is on and NO FLOW message appears in the numerical display	• Insufficient water flow 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'
	• Obstruction or lime-scale build up in cell	• Clean cell according to instruction manual (see "maintenance" section of this manual)
	• 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
	• 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 80 ^{O}F) 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 • It is recommended to periodically test the salt level by a professional and adjust according to the salinity demand table in this manual
	• 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 light	• 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 light up	• 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
	• 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
	• 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
NO Cell message is displayed on the numerical display	• Short circuit in the cell wires	• Check cell wires, connections and inspect cell for damage
	• Disconnected cell cables	• Check cell wires, connections and inspect cell for damage
	• Salinity low	• See "Salinity low" above
	• Dirty or worn cell	• Clean cell (see "maintenance" chapter) or replace cell if worn

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
	• Chemical imbalance	• Balance chemicals (see "Understanding the chemistry" chapter
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"
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" • Shock the water to eliminate build-up of any organic matter
Colored water	• Metals in the fill water may have been oxidized • Algae may be trying to form	• Have a pool professional test the pool water. If high in metals use phosphate-free metal remover • Increase circulation time if needed and clean the filter

Problem	Possible Causes	What to do
Algae	• May be due to low chlorine levels or a chemical imbalance	• Have the water tested for chemical balance including pH, phosphates and nitrates • 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