

SOLAR-POWERED WATER PURIFIER

Model AC 41203 CFSI



Table of Contents

IMPORTANT SAFETY INSTRUCTIONS.....	2
STARTING UP.....	4
ION TEST.....	5
GUIDE FOR FIRST FEW WEEKS.....	6
ELECTRODE CLEANING.....	7
ROUTINE INSPECTION.....	9
ELECTRODE REPLACEMENT.....	10
CLOSING/REOPENING.....	11
TROUBLESHOOTING.....	12
TIPS.....	13

Installation and Operation Manual

The CFSI includes:

Anode, Screen, Screw, Brush, Test Strips

IMPORTANT SAFETY INSTRUCTIONS

When you receive the solar ionizer equipment, basic safety precautions should always be exercised, and do the following:

1. Check the solar panel to see any visual damage or imperfections may have occurred during shipping. If any damage or imperfection are noticed, contact your dealer for service.
2. Lay the unit face down on a smooth surface.
3. Hold the spring electrode down in a compressed condition to avoid interference by one hand.
4. Screw either end of the mineral electrode clockwise onto the silver metal stud in the center of the unit, which is also centered on the spring electrode.
5. Tighten tightly by hand and contact the black rubber seal on the base for approximately a quarter of a turn.
6. Place the end cap/gasket on the end of the mineral electrode and inside the spring.

7. Place the screen cage on the electrode and align the center hole with the threaded hole at the mineral electrode end.
8. Turn the black thumbscrew screw clockwise into the electrode and tighten or clasp by hand. If over tightened, the plastic thumbscrew will peel or break and do not over tighten.

NOTES

1. The spring electrode is permanently mounted and is not removable. Do not attempt to remove by twisting or pulling. May cause permanent deformation.
2. Save the original box and inserts for safe and convenient storage during the off-season.
3. The purpose of the screen cage is to capture deposits or residues that may form on the electrodes during normal operation. The screen prevents any particles from falling into the water.

Now the solar ionizer is ready – see STARTING UP

STARTING UP

CFSI will protect your swimming pool from microbial infestation. Its solar ionization process transforms your water into bio-healthy and algae-resistant mineral water. The initialization time ranges from approximately one week to several weeks depending on the amount of water, weather conditions and usage. CFSI does not ionize the cell immediately because it is designed as a trickle charger with a safe and efficient low power output. Therefore, it is important to maintain a normal level of disinfectant during this initialization until the ion concentration reaches the level of protection.

Start with normal chlorinated water to give your swimming pool a normal pH. Maintain a residual chlorine content of approximately 1.0 ppm (parts per million) using a conventional chlorine test kit. More chlorine may be required. If your water is not clear enough, you may need a “shock” dose of oxidizer/chlorine. Remove floating CFSI prior to shocking.

Use the ion detection kit to check for copper ions in the water. See 'ION TEST'. Typical readings at this time are zero to trace (.0 - 0.1 ppm). If a higher concentration is detected, this is usually due to previously added copper-based algicide and, if so, follow the instructions in the “ION TEST” chapter.

Allow the CFSI to float freely while ensuring the device is in direct sunlight. If desired, the CFSI can be tethered in a sunny portion of the pool and any suitable restraint can be attached to the tethered chain.

When CFSI produces ions, operate the pump and filtration system during the day. This will allow proper mixing and circulation of the minerals. Pump operation is not necessary and is optional at night and the unit can be left in the pool overnight.

ION TEST

Mineral electrodes are made of a unique alloy of several specific metals, mainly copper. The ion test kit detects the presence of copper ions, allowing you to determine if the water contains enough protective minerals. The reagents in the kit are very sensitive and the readings are subject to various disturbances. Therefore, ion testing is used as a basic and general indicator. Test only once a week; more often is unnecessary.

1. Read the ion test kit instructions on the test kit.
2. Weekly inspection should show an increasing concentration over time.
3. The target is 0.3 ppm and once it is reached, it will begin to reduce chlorine.
4. If the ion reading rises to 0.5 ppm or higher, remove the device from the water for one week and monitor the ion level (weekly).
5. Once the water level drops to 0.3 ppm or lower, restore the float and continue the weekly ion check.
6. If the ion level remains at 0.3 ppm, then continue to float all the time.

The purpose of the ion test is to determine first that it is safe to reduce chlorine and then establish a floating schedule resulting in a stable ion reading of approximately 0.3 ppm. Depending on the conditions, 20,000 gallons or more of the pool usually needs to float all the time. Smaller pools typically maintain sufficient ion levels and have a part-time floating schedule. For example, one day in, one day out, two days in, one day out, one week in, one week out, etc. Pools with shielded enclosures may need to float all the time because the output is about half as normal and full of sunlight.

Guide for first few weeks

During this time, you should see an ion level of up to about 0.3 ppm. Float the device daily and do not reduce the floating schedule unless the ion level tends to be too high. Remember that more ions are not better. Water has only a certain amount of minerals retained and attempts to exceed the capacity known as the "saturation point" may cause the mineral to collect the surface of the pool. It is important to take a few minutes a week to check the ion level and keep the electrode clean (see "Electrode Cleaning").

1. Recommended ion level of 0.3 PPM is reached, the chlorine reduction is initiated by reducing the chlorine concentration to approximately half of the normal level, or approximately 0.5 ppm.
2. The pH range can now be expanded from 7.2 - 7.8. CFSI works well at higher pH values, so if you are within this recommended range, don't try to adjust the pH at will. Keep in mind that the general idea is to use your CFSI only enough to maintain sufficient ion

concentration and determine how little chlorine is necessary to keep the water clear. Let the water stabilize and seek your own balance.

3. Clean the electrode weekly.

ELECTRODE CLEANING

The CFSI is the only purifier that, in addition to producing beneficial mineral ions, collects unwanted minerals such as calcium and iron. This has the effect of softening the water. Sacrificial mineral electrodes are designed to erode slowly, and scale buildup will occur during this process, which will require occasional cleaning. The spring electrode can also form scale, which is usually composed of calcium and should also be cleaned. In harder water, the initial buildup rate is faster and slows as the water softens. Heavy-duty electrodes limit current and slow down the ionization process, so it is beneficial to clean them weekly:

1. Place the unit face down, preferably on the grass.
2. Remove the thumbscrews, screen and end caps.
3. Spray water from the garden hose nozzle and spray from different directions to eliminate loose material and scale.
4. Reduce the water flow; the water flows through the electrode and accumulates, use a cleaning brush to remove most of the remaining residue.

OR

When water flows through the electrodes, the spring slides up and down while contacting the center electrode from all directions. The residue will be washed away by the water.

Although the spring is relatively easy to clean completely, it is not necessary to clean the center electrode into bare metal. If most of the scale is removed, the float will perform satisfactorily. It is not possible to clean the electrode too much or too often. The cleaner the electrode, the more effective the operation. Sometimes the screen needs to be cleaned to ensure free flowing water and ion exchange. Because the mesh is very small, the deposit slowly blocks the opening in the screen and restricts water flow. To clean the white grid screen:

1. Remove loose debris.
2. Immerse screen in a jar of vinegar until visually free of blue / white scale buildup,

OR

Mix approximately 1/3 muriatic / hydrochloric acid into 2/3 of water and place the screen in a jar containing the mixture. The cleaning process takes a minute or less. Do not expose the screen to an acidic mixture for more than a minute as it will soften the plastic. Flush the screen and reinstall it.

Notes

Dilute acid impregnation can also be used to clean the electrodes. Place the electrode on the top of the tank, immerse the electrode, and remove it when the bubbling action stops. Do not immerse the electrode in water for more than a few minutes. Rinse and reinstall the screen.

ROUTINE INSPECTION

It is important to take a few minutes a week to monitor the water balance, clean the equipment and understand the trends. After a few months of experience, you should know how much chlorine or oxidant is needed, the working float time, the best way to clean the electrode and the frequency.

CFSI can be used with traces of chlorine or any other oxidant of your choice. Algaecide, conditioner, clarification, etc. are not necessary. As the water temperature increases, the swimmer's contamination load increases, and rainfall or new water increases, which may require higher levels of chlorine. If liquid chlorine is used, add it at sunset or after sunset because the sun's rays will quickly neutralize the chlorine. The recommended level is not absolute and may vary with water. What is best for your swimming pool depends on experience. Let your water seek its own balance. Do not arbitrarily change the pH, use large doses of chlorine (AKA 'shock'), add algaecide, add conditioner, or try to change completely clear water. Keep your pool water stable and remember that simplicity is the key.

ELECTRODE REPLACEMENT

The mineral electrode is sacrificial and designed to slowly disintegrate. After an average of 12-24 months, depending on the conditions, the electrodes wear out and need to be replaced. You will know this when it is "pencil thin" or about 1/4 inch at the thinnest point. To remove the waste electrode:

1. Remove the screen and end caps and clean the parts.
2. When compressing the spring electrode with one hand, rotate the center electrode counterclockwise. Use pliers for leverage if necessary.
3. Continue to unwind until free.

The steps for installing the electrodes are reversed and can be found in "INITIAL ASSEMBLY on page 3".

Note: Always keep the same end of the electrode on the float. Do not change the end when removing and replacing the electrode.

CLOSING/REOPENING

Whether you're winterizing your pool or just closing it to go on vacation, if you're properly preparing the pool, your pool water should be kept clean for months:

1. Make sure the ion reading is between .3 and .5 ppm.
2. Mineralized water prevents algae; ions act as algaecides, so there is no need to add additional algaecides.
3. Turn off all equipment, including pumps, chlorinators, etc.
4. If the water is clear, no oxidation is required. If not clear, add chlorine/oxidizer.
5. Remove CFSI
6. If winterizing pool, follow your manufacturer's instructions (winter pump, cover, etc.)
7. Clean and remove the electrode from the CFSI device and store in a sealed plastic bag.
8. Store CFSI indoors. Avoid freezing.

If the pool is closed with insufficient ion levels, or if severe conditions are encountered during the late off-season, you may experience less than clear water. When opening:

1. Fill the water level as needed, backwash and vacuum.
2. Add Chlorine remove any turbidity, if any.
3. Test ion levels. The float is re-established at .3 ppm.
4. If the ion level is below .3 ppm, temporarily increase the chlorine for protection.
5. Keep enough oxidizer to ensure the transparency of the water.
6. Verify that the pH is in the range of 7.2 - 7.8. Correct if necessary.

TROUBLESHOOTING

If CFSI does not ions, the following quick check will visually prove power generation:

1. Fill a transparent quart-size jar or can with pool water or tap water
2. Clean the electrodes and turn off the screen.
3. Place the CFSI on top of the jar, immersing the electrode in water.
4. After the solar panel is illuminated with complete sunlight, very small bubbles are observed after a few seconds of spring coil generation. This indicates that a current is being generated. No bubbles indicate a problem.

TIPS

1. Dispose of any cleaning acid according to manufacturer's instructions.
2. Allow a newly plastered pool to cure for a month before using the CFSI.
3. Use your pool manufacturer's recommended pH increase product to adjust pH to the correct level.
4. Use your pool manufacturer's recommended Shock treatment increase chlorine level.
5. Use your pool manufacturer's recommended chlorine and dispensing device to provide a constant oxidant input to the cell.
6. The included brush is used to clean the electrode and screen.

7. Store chlorine according to manufacturer's instructions.
8. Store the ion detection kit in the refrigerator.
9. Water hardness is measured by the total dissolved solids (TDS). A reading of approximately 2000 PPM or higher indicates that the water is too hard and dilution is required. Partial drainage and refilling may be beneficial. High TDS water does not readily absorb and retain minerals.
10. When replacing the mineral electrode, make sure the thread is dry and free of water.
11. Under hard water conditions, over time, solar panels may form calcium deposits that are left by evaporation of water. To remove scale quickly and easily, apply a diluted acid/water with a brush (as described in "Electrode Cleaning"). Allow deposits to dissolve and rinse. Although it takes more time, vinegar may be used.

Also you need to pay attention to following

1. Do not add any clarifier or metal removers which will eliminate the beneficial mineral ions generated by your CFSI.
2. Do not use with Baquacil or Soft Swim brand products, or others with similar chemistry. These chemicals must be removed from the water first.

Floating Solar-Powered Water Purifier

CFSI

READ MANUAL BEFORE USING

