



SG2

Pure Water System

Effective August 30, 2016

Pure Water Window Cleaning System Operation and Maintenance Manual



Overview

Congratulations on your purchase.

Thank you for purchasing the Time Saver Series SG2 Pure Water System. With proper care, this unit will provide you with years of trouble free service. This system was designed with professional window cleaners in mind. Bringing the latest technology & advancements to the pure water window cleaning industry, abc & Waterfed.com have produced the finest pure water window cleaning system available today. Only the highest quality parts & materials have been used to assure you years of system longevity.

The SG2 is an AC powered multi-stage water purification unit using sediment, carbon, reverse osmosis, and de-ionization to remove impurities from water before delivery to surfaces for cleaning. Most water sources will have some amount of minerals and chemicals dissolved in the water. *General life span of the filters will vary depending on feed water TDS (Total Dissolved Solids).* Based on an average TDS of 100 ppm (parts per million) in your water, approximately 10,000 gallons of water can be passed through the sediment/carbon and DI filters before replacement filters are needed. It is recommended that the sediment/carbon and DI filters be replaced at the same time. The RO membrane is rated to process 100,000 gallons under ideal conditions. A lower TDS source water will allow for a longer lifespan, while a

higher TDS source will lead to a shorter lifespan for all filter types. Failure to properly maintain the RO membranes will reduce the life of the filter.

In The Box

Parts Check

- SG2 System
- 24" Connection Hose
- 16" Connection Hose
- Inline Pressure Gauge
- TDS Meter
- "T" Wrench
- Shutoff Valve
- Owner's Manual

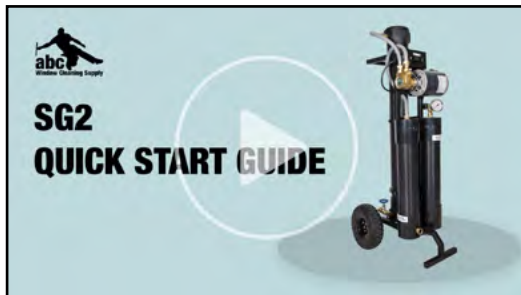
1. Unpacking/Inspecting The System

Your system is packaged to stay undamaged in transit. Please inspect all components to ensure no damage has occurred prior to continuing. Carefully remove the packaging material from around the system and discard. Your SG2 comes with all filters installed and ready for use. Inspect your SG2 unit for any shipping damage. If damage has occurred notify the shipping company that made delivery to begin a damage claim. Check all fittings to ensure that they are connected tightly as they may loosen up during shipping.

2. Initial Setup

Refer to your quickstart guide for more information.

You can also watch the quickstart video at:
www.abcWindowSupply.com/SG2QuickStart

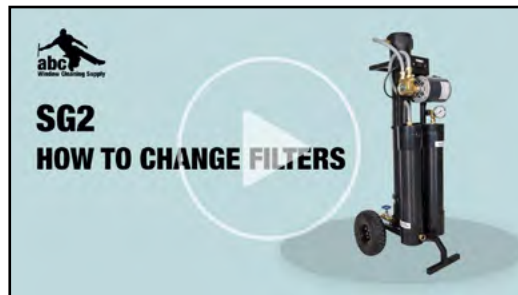


1. (optional) Attach a hose (not included) to bypass outlet to control where bypass water will flow.
2. Use the 24" connection hose to connect your Carbon Sediment filter to the Pump. Attach the female end of the 24" connection hose to the top of the carbon. Attach the male end of the 24" connection hose to the water inflow of the pump. Screw on tight enough to engage the rubber gasket. **Do not over tighten**, or you could damage your brass fittings. Normally you want to tighten the fitting to the point where the female side will no longer swivel.
3. Use the 16" connection hose to connect your pump to the RO. Attach the female end of the 16" connection hose to the water outflow of the pump. Attach the male end of the 16" connection hose to the top of the RO filter housing. Screw on tight enough to engage the rubber gasket. **Do not over tighten**, or you could damage your brass fittings. Normally you want to tighten the fitting to the point where the female side will not longer swivel.
4. Fully open the bypass valve on the bottom of the RO filter housing by rotating blue handle.
5. Attach feed hose to carbon inlet on system and to source water.
6. Thread inline pressure gauge onto the top of the DI filter.
7. Thread plastic shut off valve onto the pressure gauge and connect pole tubing. The push in connector on the pole tubing goes in easier with the valve rotated to the off position. Ensure valve is in open position before proceeding to next step.
8. Turn on source water.
9. Wait for water to begin flowing out of the bypass valve/line.
10. Close bypass valve partially until desired bypass flow is achieved. Do not close the bypass fully during operation (some bypass water should always be flowing out). (see section 5)

11. If pump is required, plug into outlet and turn on.
Do not run the pump dry, connect to power source after water has filled the system.
12. Start cleaning windows.

3. Filter Replacement

Learn how to change your filters by video:
www.abcWindowSupply.com/SG2Filter



Carbon/Sediment Filter

Unscrew brass fitting on top of the Sediment/Carbon filter (P/N WF2CSC-21). Unscrew the wingnut at the top of the carbon filter cartridge. Remove the carbon filter by first pulling top of the filter away from the frame removing it from top bolt. Next, lift up to remove the filter from the clip at the bottom. Discard used filter. Slide the female end of the new filter into the clip at the bottom of the frame so that the female inlet fitting is pointed forward. Swing the top so that the bolt is inserted in the hole on the cap of the filter labeled SG 1&2. Tighten the wingnut on the bolt to secure the filter (checking to make sure that the filter is seated in the bottom clip. Attach your 24" connection hose to the new carbon/sediment filter. Fittings should be tight enough to avoid leaks, but over tightening could result in damage to the brass fittings.

DI Filter

Unscrew brass fitting from the bottom of the Deionization (DI) filter (P/N WF2CDI-21) and any hoses attached to the top of the filter cartridge. Unscrew the wingnut at the top of the DI filter cartridge. Remove the DI filter by first pulling the top of the filter away from the frame pulling it off of the bolt at the top. Next, lift up to remove the filter from the clip at the bottom. Discard used filter. Slide the bottom of the new filter into the clip at the bottom of the frame and swing the top so that the bolt is inserted in the hole on the top cap of the filter. Tighten the wingnut on the bolt to secure the filter, checking to make sure that the filter is seated in the bottom clip. Attach your brass fitting to the bottom DI filter. Fittings should be tight enough to avoid leaks, but over tightening could result in damage to the brass fittings.

RO Filter

Ensure the system is unpressurized by fully opening the bypass valve and the RO only valve. Failure to do so could result in injury as the pressure is released or create a vacuum that will hold the old RO membrane in place. Remove the yellow wedge piece from the top of the RO housing with a phillip's screwdriver, then remove the white retaining ring by pulling it out of the groove around the inside of the housing. Remove the black cap from the top of the filter housing using the "T" wrench. Insert the wrench into the threads on the top of the housing and lift up to remove the cap. There is an o-ring underneath the black cap, remove and inspect this for any cracks or signs of wear. Replace if necessary (part number FW7000-COR). Using a pair of needle nosed pliers, remove the old RO membrane from the housing by lifting it up. Apply a small amount of Molykote 111, or similar silicone grease, to the top and bottom protrusions on the new RO membrane. Also apply Molykote 111 to the white rubber sealing ring on the new membrane - this white ring will be on the upper end of the filter when it is properly installed in the housing. Insert the new RO membrane into the housing by pushing it down and into the o-rings on the bottom of the assembly. Coat the o-ring with molykote and insert into shelf on the top of the RO housing. Insert the black cap on the top of the housing by pushing it down below the retaining groove. Insert the white retaining ring in the retaining groove. **Ensure the white retaining ring is properly seated and reinstall the yellow retaining wedge.** Both of these keep your pressure vessel top from shooting off.

4. Hooking Up To Water Source



Your SG2 is designed to be operated while standing up. Locate an external water source. Attach one end of the feed hose (not supplied) to the water source. Open the faucet at the building and make sure all air is out of your source hose. Turn off water and attach to the female connection on the Carbon/Sediment filter. Turn water back on fully and adjust bypass valve to desired flow rate.

5. Bypass Valve Operation



The system comes with a Bypass/Pressure Regulator valve. The bypass valve is the primary way you can control the pressure of your system. It also controls the amount of water that your RO membranes lose as bypass discharge during normal operation. **There should always be water flowing out of the bypass valve.** Opening the bypass valve more will reduce the amount of pressure that is used to produce pure water, resulting in lower flow rates at the brush. Closing the bypass valve will increase the amount of pressure which can lead to higher flow rates at the brush, but can diminish the life of the filter. RO membrane filters use the bypass flow to remove concentrated dissolved solids from the filter. Operating the system with the bypass open (until the bypass flow is approximately the same as the pure water flow) is one of the best ways to ensure maximum life from the RO membrane filters. Closing your valve so that the flow of the bypass is roughly equal to the flow of pure water is a good place to start. This will restrict flow for elevated system pressure, but also allows some brine to exit your membranes. **It is recommended that you run your system with the bypass valve fully open for a few minutes each time you finish using your system** to help clean out your RO membranes and help extend their life.

6. Inline Pressure Gauge



The SG2 comes with an inline pressure gauge. You can move the inline to any of the garden hose connections on the system to take readings. We recommend you attach the pressure gauge to the inlet of the DI filter cartridge. **Do not run system with the DI filter pressure above 100 PSI.**

Your tap pressure can be measured anywhere in the system. **Do not attempt to measure the tap pressure with the motor running.** With the source water flowing, close the bypass valve and the shutoff valve on the pole tubing quick connect. The resulting pressure is your tap pressure.

abc recommends that for normal use, you should leave the gauge attached to the system outlet on top of the DI as instructed by the Initial Setup. This will allow you to monitor the pressure of your DI filter and ensure that it doesn't go above 100 psi. We do not recommend using the shutoff valve with the pump running as this can cause the pressure to build up in the DI filter cartridge. Check the pressure throughout the day to ensure that it does not exceed 100 psi. To reduce pressure on the DI, remove restrictions downstream (kinked pole tubing for example) and open the bypass valve.

7. Pump Operation



Your SG2 system comes with a direct drive rotary vane pump. This pump has graphite vanes which push the water through your system. **Do not run the pump dry.** Running the pump without water could result in damage to these vanes and a loss of pump function.

When running the pump, **abc recommends that you don't shut off the valve on the pole tubing quick connect or the outflow of water anywhere on the pole.** This also includes restricting flow of the outgoing pure water. A restriction or shutoff can allow more of the pressure before the RO housing to travel through the membrane and into the DI filter. The RO housing is able to handle more pressure than the DI filter and the resulting pressure transfer can damage the DI filter. If you wish to shut off the flow of water out of your pole while the motor is running, make certain to set your bypass valve so that the max DI filter pressure doesn't exceed 100 psi.

8. Operating Without Power

If your tap pressure is sufficient to run the system or electricity is not available, you can run your SG2 without power. **A minimum tap pressure of 50 psi is needed to push the water through the system, but 80 is preferred.** Water should flow freely through the pump, but the position of the vanes in the pump could block the free flow of water while not running. After checking to ensure that water is reaching the pump, quickly turning the pump on and off will move the vane and allow water to flow freely through the pump again.

Alternately you can bypass the pump by disconnecting the 16" connection hose from the top of the RO and the 24" connection hose from the pump. Use the 24" connection hose to connect the top of the RO housing with the top of the Carbon Sediment filter. This effectively plumbs your SG2 like an SG1.

9. Producing Pure Water

Connect your WaterFed® pole to the end of the production water hose. Open the shut-off valve between the hose and the pole to allow water to flow through the pole and wash glass. **Do not drink pure water made from your system.**

10. RO Only Valve Operation

There is a 2 way wye located on the bottom of your RO housing. This can be used in several ways.

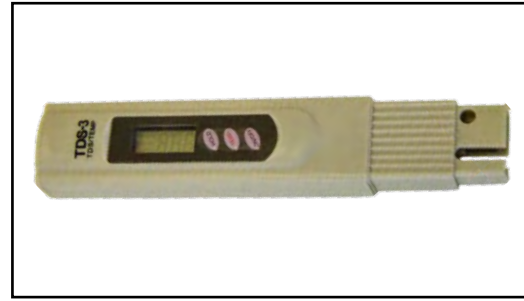
First, it allows you access to the clean water coming out of the RO membrane before it is run through the DI filter. You should periodically test the TDS of this RO water to assess the condition of your RO membrane.

Depending on the TDS of your source water, your RO membrane may purify the water sufficiently for your cleaning application (abc recommends that TDS be at least 10 ppm or below for most window cleaning applications). If you, as the window cleaner, decide the RO only water is clean enough for your application, you can attach your pole tubing directly to the RO only valve and shut off the flow of water to the DI filter to preserve the life of your DI resin.

When using a RO membrane, there is a spike of higher TDS water that passes through the membrane each time you start using it. Users that wish to avoid passing this higher TDS water through their DI resin can shut off the DI side of the wye. Open the RO only side, turn on the source water, run it for about 10-30 seconds, open the DI side again and then shut off the RO only side.

Do not shut off both sides of the RO only wye if you are running a pump, as that could damage the system.

11. TDS (Total Dissolved Solids) Meter



Total Dissolved Solids are the particles dissolved within water that can lead to spotting on glass as the water evaporates. Your TDS meter measured the amount of dissolved solids by measuring the conductivity of the water.

Push the “On” button on the TDS meter (included) – capture a small amount of your production water in the cap of the TDS meter to get a reading of the water. A TDS reading of 0 – 10 is acceptable for cleaning windows, specific conditions and results may vary. When measuring source water before pure water TDS levels, it is important to rinse out any source water with pure water to ensure accurate readings. Even a single drop of source water will cause the pure water’s TDS reading to be higher than it actually is. Read all sections before continuing for optimal system performance.

Your TDS meter also has a thermometer which reads temperature. This can allow you to monitor the temperature of your feed water. RO membranes require more pressure to create the same amount of clean water as the temperature of the water gets colder. Running your system at feed water temperatures of less than 10 degrees celsius (50 degrees fahrenheit) could result in low flow exiting the system.

12. Using A WaterFed® Pole



Once your SG2 system is hooked up, and you have a WaterFed® pole connected to the hose, you're ready to clean windows.

Always begin by cleaning the top row or highest windows first, including scrubbing the frames. Work the WaterFed® pole up one side of the frames, across the top, and back down the other side. Scrub the glass in an up and down motion, moving the pole the entire length of the glass with each stroke if possible. Return the pole to the top of the window, and with a side to side motion, allow rinse water to flow completely down the surface of the glass.

Frame rinsing may not be required. If the height of the glass and the weight of the pole allow for it, hold the brush slightly off of the surface of the glass to rinse. If this is not possible, move the pole side to side slowly with the brush on the glass at the top, and let the water flow down the glass to rinse.

Once you have completed the top row or highest glass on one side of the building, repeat these steps for each tier or level of glass, working your way down. Providing a good initial scrubbing on the glass, followed by a complete rinse, will ensure that the glass dries completely spot-free.

Pure water is a great natural solvent for many soils. In some cases where there are heavy soils, a pre-soak or even a double scrub and rinse may be needed to achieve optimal results. The agitation of the brush, coupled with the flow of water through the brush when scrubbing, should break down and suspend most soils, readying them for complete removal via the rinse step.

As with any new procedure, practicing the use of your WaterFed® pole is the best way to achieve optimal results.

13. Soap Residue

A common issue encountered when transitioning buildings from traditional window cleaning methods to pure water cleaning is soap residue. After the initial cleaning with pure water, small white or gray spots and runs will be seen on the glass after drying. Most often this is soap and or detergent residue actually left behind by previous cleanings and brought out of the pores of the glass and out from under the side gaskets and seals of the glass on commercial installations by the pure water cleaning process. This condition is generally rectified by repeating the pure water cleaning process until it is eliminated.

14. Shutdown

1. Turn off pump, disconnect from power supply.
2. Shut off flow to the pole tubing, then fully open the bypass valve and let the system flush source water through the carbon and the RO filter housing for 3-5 minutes.
3. Turn supply water off. Disconnect source water hose.
4. Optional – Open RO only valve to drain water from housings for transport.

15. Maintenance

Your SG2 system requires little maintenance to operate at peak performance. As stated above, a forward flush of your system after each use will help the ROs remain free of contaminants.

Periodically check the TDS of the purified water with the provided hand held meter. When the TDS levels reach unacceptable levels for your application (ABC suggests 10ppm or less for window cleaning and 40ppm or less for cleaning opaque surfaces) you should replace both your carbon/sediment filter and your DI filter together.

Remember, if you are bypassing the DI using the RO only valve, you will still be using the carbon filter. If you consistently bypass the DI, you should replace your Carbon more often than the DI, to ensure the RO membrane is protected.

abc also recommends that you lubricate your wheels several times a year (or as necessary) to ensure proper mobility for your system.

Periodically check the electrical wiring and system for damage. Test your GFCI by pushing the white button to test the shut off and the red button to reset the system.

16. Storage

Storage - Short Term (2-4 Weeks)

DO NOT ALLOW DI or RO filters to DRY OUT. Dry DI resin will lose its charge and therefore become unable to remove dissolved solids from the water. Dry RO membranes will develop cracks which allow more dissolved solids to pass through the membrane. This will deplete the downstream DI filters at a faster rate. abc recommends that you run water through your carbon and RO membrane filters once every 2 weeks or so, not only to help keep your filters moist but to also wash out any microorganisms that might try to grow in your filters. Always run your source water through the carbon filter before the RO membrane when flushing the filter.

Storage - Long Term (Winterizing)

abc strongly recommends flushing out the RO membrane filter once every 2-4 weeks to ensure the maximum lifespan of the filters. When flushing the RO membrane filter, the source water should be passing through the Carbon/Sediment filter before the RO membrane. This will prevent damage to the membranes from Chlorine and Chloramine. Periodic flushing will ensure that the filter membrane does not dry out and will reduce the chance that biological growth will foul the filter elements while in storage.

If periodic flushing is not feasible, we recommend that users wrap filters tightly in plastic wrap or plastic bags and then seal with tape. This will reduce the chance that the filter dries out when in storage. Store filters and any unit with a pump indoors over the winter. **Do not allow the filters or pump to freeze.** Failure to do so will destroy your filters and pump. After filters have been stored this way, they will need to be flushed thoroughly before use. Leaving filters wrapped for extended periods of time can lead to biological fouling, which is why we recommend periodic flushing over wrapping them for storage.

17. Troubleshooting

1. Low supply water flow or pressure:

- a. Ensure feed water is open and has water to it.
- b. Check all hoses for kinks or blockage.
- c. Check pressure of supply water coming into the system - RO membranes operate ideally with 80 psi.
- d. Increase the diameter of supply hose.
- e. Connect to alternate water source.

2. High bypass flow with low pure water production:

- a. See section 1 on supply water flow and pressure.
- b. Check source water temperature - RO membranes operate ideally with 77° F water temperatures - low water temps will reduce the amount of pure water production.
- c. Flush RO membrane for 5 minutes to reduce any blockages on the membrane.
- d. Check pure water production rates.
- e. Repeat steps c. and d. until production rates improve.
- f. If production rates remain low after multiple flushing cycles, replace RO filter.

3. High pure water flow with high TDS levels:

- a. Measure the TDS of your supply water.
- b. Compare source water TDS to the TDS of water leaving the RO membrane by opening the RO only valve on the bottom of the RO filter.
- c. RO filters typically reject over 90% of TDS from source water, a damaged filter will allow more water and TDS to pass through the membrane.
- d. Replace RO membrane filters if they allow more than 15% of incoming TDS to pass through with bypass set to 1:1 ration with production water.
- e. Check DI filter performance by comparing incoming TDS to outgoing TDS - DI filters will typically reduce water to 0 TDS. Replace DI (and Carbon) filters when the DI becomes exhausted. Operating a system with a damaged RO will increase the amount of TDS entering the DI filter and reduce its life.

4. Normal pure water flow with high TDS levels:

- a. Adjust bypass flow to equal pure water production flow and run for 60 seconds before testings.
- b. Test TDS readings of source water, RO only water, and pure water leaving the DI filter.
- c. Replace DI filter when pure water TDS levels exceed 10 for cleaning glass and 40 for opaque surfaces.
- d. Replace Carbon filter when the DI filter becomes exhausted.
- e. Compare source water TDS to the TDS of water leaving the RO membrane by opening the RO only valve on the bottom of the RO filter.

Expressed Warranty

abc Window Cleaning Supply warrants new water purification systems against manufacturing defects under normal use to the original purchaser.

abc Window Cleaning warrants new equipment for one year from the original purchase date to be free from manufacture defect. Any parts sent out for warranty are warranted from the original purchase date of the machine.

The customer must first contact abc Window Cleaning to notify them of the problem. abc may require the merchandise to be shipped back to them at the customer's expense to evaluate the warranty claim. It is the responsibility of the customer to package the product properly so that it arrives for evaluation undamaged. If the equipment is found to be a manufacture defect abc Window Cleaning will reimburse shipping expense and parts will be sent out at no charge including standard ground shipping. Rush shipping will be the sole responsibility of the customer.

Wear items exempt from warranty include filters and membranes.

This warranty does not apply to misuse or abuse causing failure of the system. The customer must contact abc Window Cleaning before attempting any repairs or modification to the system. Failure to do so will void your warranty.

abc Window Cleaning holds no responsibility for loss of labor, time or any costs associated with using the equipment. abc Window Cleaning holds the sole discretion of whether a claim falls under warranty.

Returns

If for any reason the customer wishes to return the system they may do so at anytime within 30 days of the original purchase date.

The customer must first contact abc Window Cleaning Supply to notify them of their intent to return the merchandise.

The customer is responsible for the return of all merchandise and insuring that the product is properly packaged to arrive in new resellable condition. The customer is responsible for all costs associated with returning damaged merchandise to new resellable condition.

The customer is also responsible for a 20% restocking fee, in addition to any costs associated with shipping and repairing the merchandise to new resellable condition. abc Window Cleaning Supply will issue a refund to the credit card on file once all repairs are completed.



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