



# SG1 (2018 & After) Pure Water System

Effective August, 2020

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## Pure Water Window Cleaning System Operation and Maintenance Manual

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## Overview

Congratulations on your purchase.

Thank you for purchasing the SG1 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. The SG1 will help you clean faster, safer, and better than ever before, leaving spot free results that you and your customers will love!

The following is provided to help you understand how your system purifies water. The SG1 is a multi-stage water purification unit using sediment, carbon, reverse osmosis, and deionization to remove impurities from water before delivery to surfaces for cleaning. *General lifespan 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. Lower TDS levels in the source water will allow for a longer lifespan, while a higher TDS source levels will lead to a shorter lifespan. 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. Failure to properly maintain the RO membranes will reduce the life of the filter.

## In The Box

### Parts Check

- SG1 System
- TDS Meter
- 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 SG1 comes with all filters installed. Inspect your SG1 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 during shipping.

## 2. Initial Setup

Refer to your quickstart guide for more information.

You can also watch the quickstart video at:  
[www.abcWindowSupply.com/SG1QS](http://www.abcWindowSupply.com/SG1QS)



1. Attach the male end of the 24" connection hose from the top of the Carbon filter to the top of the RO filter canister. 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.
2. Unscrew the male garden hose fitting on the black bypass tube from the bottom of the Carbon filter. These two fittings are connected to seal the system while in transit but will not be connected during use.
3. (optional) Attach a standard garden hose (not included) to the end of the bypass tube to further control where bypass water will flow.
4. Fully open the valve on the bypass tube, positioning the red handle in line with the black tubing.
5. Attach feed hose to carbon inlet on system and to source water.
6. Ensure that the valve on the wye fitting leading to the DI filter is open and the other valve is shut.
7. Thread the black plastic shut off valve onto DI outlet (on the top of the filter) and connect pole tubing. The push in connector on the pole tubing goes in easier with the valve in the off position. Ensure valve is in open position.
8. (optional) A length of standard garden hose or hose reel (neither included) can be placed in between the DI filter and the pole tubing shut off. This will allow the user to leave the system in place and use the garden hose to carry the water to where they are working.
9. Turn on source water.
10. Wait for water to begin flowing out of the bypass tube.
11. Lay unit on its handle and elevate the wheels until air has been purged from the RO housing. Failure to bleed the air out of the system can result in lower production and possible damage to the filter housings. Trapped air may also result in the plastic overheating and pressure rating of the RO housing dropping. Setting up your system up out of direct sunlight on hot days will also help protect the plastic RO housing from heat damage.

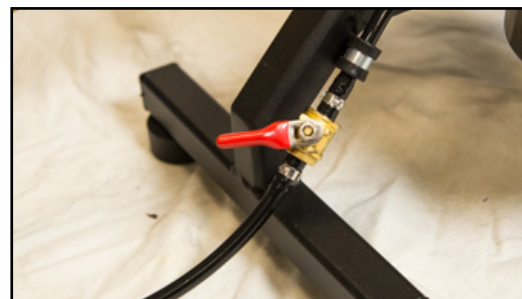
12. Once the air has been pushed out of the filters, close the bypass valve partially to begin producing pure water. **DO NOT CLOSE OFF FLOW THROUGH THE BYPASS LINE WHILE USING THE SYSTEM** (some bypass water should always be flowing out). See Bypass Valve Operation section below for more information.
13. Start cleaning windows

## 3. Hooking Up To Water Source



Your SG1 is designed to be operated while standing up or laying down. Locate an external water source. Attach one end of the feed hose (not supplied) to the water source. A ¾" garden hose is preferred. Attach the other end of the feed hose to the female connection on the Carbon/Sediment filter. Open bypass valve fully and turn on source water. Once the air in the filters has left the bypass line, adjust valve to desired flow rate. 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.**

## 4. Bypass Valve Operation



The system comes with a bypass tube and valve that control the amount of water leaving the RO filter. This is the black tubing with a valve located on the bottom of your system. RO membrane filters use the bypass flow to remove concentrated dissolved solids from the filter. **There should always be water flowing out of the bypass tube.** Inadequate bypass flow will result in fouling and possibly damage the RO filter.

The water coming out of the bypass tube may initially appear milky. This milky appearance is actually small air bubbles being pushed out of the filter housing through the bypass line.

The bypass valve is also the primary way you can control the pressure of your system. 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 will lead to higher flow rates at the brush. Closing your valve so that the flow of the bypass is roughly equal to the flow of pure water exiting the system is a good place to start. This will restrict flow for elevated system pressure, but also allows waste water to exit your membranes.

Flushing water through the RO filter after use will remove excess minerals from the housing. **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 extend their life. See Shutdown section of this manual for more details.

## 5. RO Only Valve Operation

There is a brass wye fitting attached to the bottom of your RO Filter with two shutoff valves. During normal operation, the side leading to the DI filter is open and the other side is closed. The wye valve allows users to easily bypass the DI filter. This is helpful for testing filters and gives users the option to produce pure water without consuming DI resin.



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 decide the RO only water is clean enough for your application, attach your pole tubing directly to RO only valve and shut off the flow of water to the DI filter to preserve the life of your DI resin.

When using an 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. This will damage the system and possibly the pump.

## 6. TDS (Total Dissolved Solids) Meter



Total Dissolved Solids are the minerals and salts within source water that lead to spotting on glass as the water evaporates. Your TDS meter measures the amount of dissolved solids using the conductivity of the water. The meter can test water before and after individual filters or the entire system to determine how they are performing. TDS levels are measured in parts per million (ppm).

Remove the cap from the TDS meter and fill with the sample you wish to test. Push the "On" button on the handheld TDS meter to get a TDS reading of the water sample. A TDS reading of 0 – 10 is acceptable for cleaning most windows, though 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 TDS reading to appear higher than it actually is.

Your TDS meter also has a thermometer which reads temperature. This can allow you to monitor the temperature of your feed water. Running your system at feed water temperatures of less than 10 °C (50 °F) will result in low flow exiting the system. RO membranes require more pressure to create the same amount of clean water as the temperature of the water gets colder. A pump can help to compensate for low source water temperatures. Do not let the system or any filter freeze when operating in lower temperatures.

## 7. Using A WaterFed® Pole



Once your SG1 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. 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, such as 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. Learn more about basic technique at [www.abWindowSupply.com/StartingWF](http://www.abWindowSupply.com/StartingWF)

## 8. Soap Residue

Getting spotting when your TDS levels are below 10? 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 may be seen on the glass after drying. Most often this is soap and or detergent residue left behind by previous traditional cleanings and brought out of the pores of the glass by the pure water cleaning process. The soap can take up to 30 minutes to dissolve if it has been baked on or pushed into seals and frames. Soaking the glass 15-20 minutes before performing a normal agitation and rinse cycle will remove soap spotting. Repeat agitation and rinse if the spots persist.

## 9. Shutdown

1. With the water still running, open the bypass fully then close both sides of the wye fitting on the bottom of the RO filter cartridge. Let the water run for 2-5 minutes to flush out any excess minerals in the housing out the bypass line.
2. Turn supply water off and disconnect source hose.
3. Open both arms of the brass 2 way wye and fully open bypass valve to drain water from housings for transport. Disconnect the hose from the top of the RO to speed up draining. RO and DI filters need to stay moist but do not need to be full of water.

## 10. Maintenance

The Carbon should be replaced every 6 months with frequent use and should not be kept in service for more than a year. **Failure to replace the carbon filter regularly can lead to chlorine reaching your RO filter and result in damage to the membrane.** We often recommend that users should replace both their carbon and DI filters at the same time as this usually ensures that the carbon is kept fresh without having to track service dates.

RO membranes have the potential to process 100,000 gallons of water when properly maintained. To test the health of your RO membrane compare the TDS levels of the source water to the level of pure water leaving the RO filter. For example, 100 TDS source water with 10 TDS leaving the RO indicates 90% rejection. When RO rejection rates drop below 80% it is generally time to replace the RO filter canister. As stated above, bleeding the RO at the beginning of each use and flushing the RO at the end of each use are essential to achieving maximum RO lifespan. Trapped air can result in the plastic

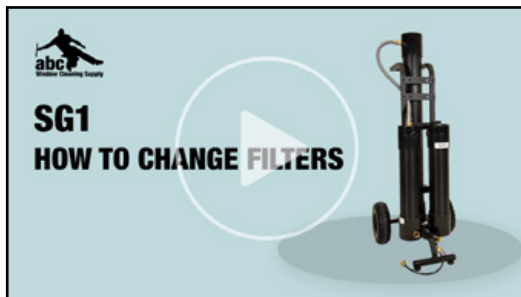


overheating and pressure rating of the RO housing dropping. Setting up your system out of direct sunlight on hot days will also help protect the plastic RO housing from heat damage.

The lifespan of your DI filter depends on the TDS of the water entering the filter. Periodically check the TDS of the purified water leaving the DI filter 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) the DI filter is completely exhausted and should be replaced. See troubleshooting section below for more information on high TDS levels coming from the system.

## 11. Filter Replacement

Learn how to change your filters by video:  
[www.abcWindowSupply.com/SG1Change](http://www.abcWindowSupply.com/SG1Change)



Learn when to change your filters with this guide:  
[www.abcWindowSupply.com/FilterTime](http://www.abcWindowSupply.com/FilterTime)



### 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

**SG1&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

Unscrew the pure water outlet wye from the center fitting on the bottom of the RO filter canister and the male end of the 24" connection hose from the top of the RO filter (P/N WF3CRO-40). Remove the black bypass regulator tube from the RO filter by pushing down on the retaining ring of the port while pulling on the tubing in the opposite direction. Using a 7/16 socket, unscrew the single lag bolt holding both sets of saddle clamp halves together to release the filter.

Put new RO filter into the saddle clamps so that the bypass and outlet fittings are down. Reattach the lag bolts holding the filter in place. **Do not over tighten** or you could damage both the clamps and the filter canister. Normally you want to leave a  $\frac{3}{8}$ " gap between the top and bottom parts of each saddle clamp on the screw side and you want the lag bolt to be tight enough that the filter will not spin in the the clamps.

Re-attach the pure water outlet wye to the bottom center of the filter and then the black bypass line to the push to fit fitting. Attach the male end of the 24" connection hose to the top of the RO filter Canister. Screw both fittings on tightly enough to engage the rubber gaskets. Fittings should be tight enough to avoid leaks, but over tightening could result in damage to the brass fittings or the plastic housing. Reattach bypass line by inserting the tube into the push to fit connector on the bottom of the RO filter.

## 12. Storage

### Storage - Short Term (2-4 Weeks)

**Do not allow the filters or system to freeze.** Failure to do so could result in damage to your filters and SG system. **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. RO and DI filters need to stay moist but do not need to be full of water. 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. **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. RO and DI filters need to stay moist but do not need to be full of water.

Store filters indoors over the winter. **Do not allow the filters or system to freeze.** Failure to do so could result in damage to your filters and SG system. 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.

## 13. Troubleshooting

### 1. Low supply water flow or pressure:

1. Low tap pressure is the most common cause of low pure water production from multifilter style units. Source water pressure is the primary driver of system performance for RO filters. Even sources that appear to have plenty of flow out of the tap may not have enough pressure to push water through the RO membrane. Ensure that the tap pressure is sufficient using a pressure gauge. Trying a different source may lead to better performance. Also check all hoses (incoming and outflowing) for kinks or blockages, especially hose reels that are wound too tight. Trying a larger diameter hose (½" or more) or a shorter hose length between the system and the tap can also improve flow. Adding a pump, such as the abc boost pump (WF1000-BP) or the SG1->2 upgrade kit (TSSG-Upgrade), can help compensate for low source pressure. **Do not exceed 130 PSI** when using a pump.

2. Mineral fouling of the RO membrane will lead to reduced pure water production from your system. Processing water through the RO membrane without enough (or any) bypass flow will lead to increasing mineral concentration within the RO housing. In minor cases, this will result in a temporary drop in production from the RO membrane. Flushing the excess minerals from the housing will return the filter to normal production rates. In extreme cases the mineral buildup will permanently reduce the flow rate of the filter. These cases can only be fixed by replacing the filter.

3. Biologic fouling is another potential cause of reduced pure water production from the RO filter. Algae, bacteria and fungi can land and grow on the surface of the RO membranes. These organisms eventually block off pores in the membrane leading to reduced production levels. Letting filters sit for long periods of time without running any water through them increases the chances of biological fouling. After long term storage, running a series of long flushes will often return the RO membrane to normal production levels. Remove the bypass regulator tube and then shut off both valves on the brass wye fitting. Run it like this for 10 minutes and then open the RO only outlet on the brass wye fitting and restrict your bypass to its normal running setting for a minute or two. Doing this flushing process 2 or 3 times may be required to return to normal production levels.

4. Expect decreased production rates when running your RO with colder source water. The ideal temperature for source water is 77°F. You can expect around half the flow for water at 50 degrees that you would get at 75 degrees, even if both sources are at the same PSI. Use your TDS meter to measure the temperature of your source water to determine if this is the cause of lowered flow rates.

5. Leaks in the system and the pole tubing can release pressure and take flow away from the jets in your brush. A couple of small leaks in the pure water lines can cut pressure to the jets in half. Read the “leaks” section below for more information on eliminating leaks in the system.

## 2. High TDS coming from the system:

1. Retest your water sample. When you get a higher than expected reading on your handheld TDS meter, it is a good idea to use the water you are testing to wash out both the measuring lid and the measuring prongs of the meter itself. Do not get the body of the meter wet, it is not waterproof. Minerals can stay in the cup from other measurements and can make the sample appear to have a higher TDS than it actually does. Taking multiple samples ensures maximum accuracy.

2. High TDS coming out of the system usually indicates that the DI filter is spent. Testing before and after the DI filter will verify that there is not another issue. If the TDS levels before and after the DI filter are the same, the filter is completely depleted. Replace the DI filter (P/N WF2CDI-21) once depleted. If water coming from the RO filter has high TDS levels, check the RO performance as well.

3. Elevated TDS levels coming from the RO membrane can indicate that both the RO and DI need to be replaced. The best way to test your RO is to use your handheld TDS meter to measure the TDS water coming out of the RO and compare that to the TDS levels of the source water. Your RO should have a rejection rate of over 80%. If the rejection rates are below normal, follow the step below to ensure that the RO filter needs to be replaced.

4. If your RO rejection is lower than expected, you can try running a 10 minute flush. Increasing flow through the filter housing will help the flushing process. Remove the bypass tube from the bottom of the filter and then shut off your system's pure water outlet at the DI filter. Water should be flowing out of the now open push to fit connector at the bottom of the RO filter. Run it like this for 10 minutes and then open your pure water outlet and restrict your bypass to its normal running setting. Check your RO TDS to see if it is dropping to more acceptable levels. Repeat the forward flush 2-3 times if necessary to drop the RO TDS.

If the TDS levels coming from the RO membrane do not drop, your RO is faulty. You can continue to use the faulty RO, however you will use up your DI resin faster than normal. Replace the faulty RO filter (WF3CRO-40) as soon as possible.

## 3. Leaks:

### Leaks between brass fitting and plastic housing

1. Unscrew leaky brass fitting.
2. Check brass fittings for damage or deformation. If necessary replace brass fittings. Replacement parts can be ordered from abc or bought from a local store. The plastic hole size is ½” national pipe thread (NPT) and the Brass fitting connection are a standard ¾” Garden hose thread (GHT).
3. Fittings should be attached with an adhesive to prevent leaks. We recommend Liquid Nails Perfect Glue from Home Depot.
4. If leak persists replace filter.

### Leaks between brass garden hose fittings

1. With the source water off, check that fitting is properly tightened. Tighten until you feel the gasket engage. **Do not over tighten.**
2. Unscrew the leaky connection. Check gasket in the female fitting for damage or deformation. Replace gasket if necessary.
3. Check brass fittings for damage or deformation.
4. If necessary replace brass fittings. Replacement parts can be ordered from abc or bought from a local store. The plastic hole size is ½” national pipe thread (NPT) and the Brass fitting connection are a standard ¾” Garden hose thread (GHT). Fittings should be attached to the housing with an adhesive to prevent leaks. We recommend Liquid Nails Perfect Glue from Home Depot.

### Leaks on push to fit connection

1. Make sure that tube is properly inserted into fitting. Inserting the tube part way into the fittings will cause leaks.
2. Bending the tube as it enters the push to fit connection can also cause leaks. Reduce strain on the tube to prevent this.
3. Damage to the tube, such as scratched or cracking, will interfere with the sealing elements. Cut off any damaged tube and reinsert into the fitting.

### 4. Water coming out of bypass regulator tube:

1. Strong bypass flow is normal during system operation. This water is the discharge water and it contains a very high TDS. This water is non-potable but is also not harmful to plants. **DO NOT DRINK DISCHARGE WATER.**
2. Milky white bypass flow is a common occurrence when starting up the system or using a new RO membrane. It is trapped air being pushed out of the filter housing and will stop once the air is gone.

## Expressed Warranty

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

abc Window Cleaning Supply 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 Supply 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. If the equipment is found to be a manufacture defect abc Window Cleaning Supply 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 Supply before attempting any repairs or modification to the system. Failure to do so will void your warranty.

abc Window Cleaning Supply holds no responsibility for loss of labor, time or any costs associated with using the equipment. abc Window Cleaning Supply 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 a new resellable condition. The customer is responsible for all costs associated with returning damaged merchandise to a 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 a new resellable condition. abc Window Cleaning Supply will issue a refund to the credit card on file once all repairs are completed.



## Replacement Parts



RO Filter  
WF3CRO-40



Wheel  
WF65000-WH



Replacement Feet  
WF7000-RF



Carbon Filter  
WF2CSC-21



DI Filter  
WF2CDI-21



Shut-off Valve  
WF601311



TDS Meter  
HMTDS-3

Replacement Hoses available upon  
request. 1-800-989-4003



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