

Introduction to Spectra Chemicals

We use four types of chemicals: SC-1, SC-2, SC-3, and propylene glycol antifreeze. SC-1 and propylene glycol are for system storage, while SC-2 and SC-3 are for membrane cleaning. **Do not use metasodium-bisulfate, citric acid, or any other storage chemical not supplied by Spectra.** These chemicals, used to store other watermaker brands, are very acidic and will damage the Clark Pump and void the warranty.

Note: Never use any chemicals with the system pressurized! Always open the pressure relief valve 1/2 turn. Always follow the instructions for purging the chemicals as shown in the New System Startup section on pages 25-26.

Storage

SC-1 prevents biological growth when your system is idle. It should not be used as a cleaning chemical, nor will it protect your system from freezing. A jar of SC-1 is mixed with 1 to 3 gallons of product or dechlorinated fresh water in a bucket and circulated through the system for 10 minutes. This treatment will protect the system for six months, after which the SC-1 treatment must be repeated. To use SC-1, follow the instructions for **Storage Procedure** on page 36.

Spectra systems should be stored with propylene glycol if freezing is likely to occur. Propylene glycol can be used instead of Spectra SC-1 storage chemical for storage in any climate, and treatment is effective for one year. Propylene glycol is a food-grade antifreeze used to winterize RV's, boats, and cabins. Do not use ethylene glycol automotive antifreeze, which is toxic and will damage the system.

The propylene glycol formulations sold in marine and RV stores are usually diluted with water. The water remaining in the watermaker before the storage procedure will further dilute the antifreeze, reducing the microbial protection and increasing the temperature at which the mixture will freeze.

Antifreeze labeled "Minus Fifty" is a 25% solution and will begin to form an icy slush at about +15Degrees F (-10C) and will only provide burst protection to about Zero F (-18C). After a further 50 percent dilution by water remaining in the watermaker, "Minus Fifty" antifreeze will only protect from bursting down to about +25F (-4C). Therefore if low temperature freezing protection is required a 60% or stronger antifreeze should be used. 60% solutions are labeled "Minus 100" and will provide burst protection to -15F (-27C) even after a 50 percent dilution with residual water. "Minus 200" formulations are pure propylene glycol.

Introduction to Spectra Chemicals continued...

Complete microbial preservative protection requires a 25% solution of propylene glycol, so care must be taken that the solution remaining in the watermaker during long term storage is at least 25%, even if freeze protection is not required. For these reasons Spectra recommends that all pickling be carried out with a 60% or greater concentration.

See **Winterizing with Propylene Glycol** on page 37.

Propylene glycol can be difficult to flush from a membrane, especially after extended storage periods. This results in high salinity water (high PPM) and residual flavor in the product water. We recommend flushing the system WITH THE PRESSURE RELIEF VALVE OPEN for 4-6 hours after storage with propylene glycol—the longer the better. If, after extended flushing, you still experience low product water quality, cleaning with SC-2 usually removes all traces of propylene glycol and returns the salinity to the level it was before storage with propylene glycol. See the **Cleaning Procedure** on page 38.

Cleaners

Cleaning can be detrimental to the membrane and shorten its life. Avoid unnecessary cleaning, and avoid cleaning as a diagnostic tool.

SC-2 is an alkaline cleaner used to remove light oil, grime and biological growth. It is most effective if heated to 120 deg. F (49 deg. C), which is difficult on a boat. In most cases the water quality will increase in PPM (salinity) after an SC-2 cleaning. After a few hours it should recover to near the level it produced before the cleaning.

SC-3 is an acid cleaner used to remove mineral and scale deposits. In most cases this is used first and if there is no improvement, go on to the SC-2. SC-3 will in most cases lower the product PPM and overall pressures. Scaling is a slow process that may take several months or years. SC-3 is less harmful to the membrane and will almost always improve the performance of an older membrane.

For cleaning with either SC-2 or SC-3, see the **Membrane Cleaning Procedure** on page 38.

Storage Procedure

NOTE: When storing with SC-1 you only need to use one feed pump to circulate the storage solution through the watermaker, but you should briefly alternate pumps to ensure that the SC-1 solution is circulated throughout the system. The watermaker will contain about 2 gallons (8 liters) of water, so starting with one gallon in the bucket there will be about 3 gallons (12 liters) of solution.

Make sure the pressure relief valve on the Clark pump is Open (unpressurized), 1/2 turn counter-clockwise OR THE MEMBRANE WILL BE DAMAGED.

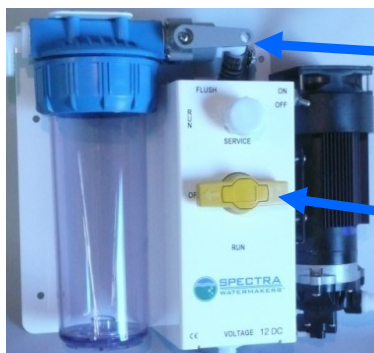
1. Perform a fresh water flush (page 28). Turn off the feed pump and close the grey fresh water flush valve. Leave the yellow service valve OFF.
2. Disconnect the brine discharge hose from the Clark Pump, and replace with the brine service hose from your service kit. Lead the brine service hose into a bucket.
3. Do another fresh water flush and run the feed pump until you have one gallon (4 liters) of fresh water in the bucket. Turn off the feed pump and close the grey fresh water flush valve.
4. Mix one container of SC-1 storage compound with the water in the bucket. It will not dissolve completely, which is normal, and any particles will be caught by the filter.
5. Connect the intake service hose to the service port on feed pump module A and lead the hose into the solution in the bucket. Turn the yellow service valve to SERVICE. The system will now draw the solution from the bucket and return it via the brine discharge service hose.
6. Turn on a feed pump and circulate the storage chemical through the system for approximately 10 minutes, alternating feed pumps. Turn off the feed pumps.

Clean Up:

Remove the brine discharge service hose, and replace the brine discharge hose leading to the thru-hull. Turn the yellow service valve back to RUN, and remove the intake service hose. Close the seacock, drain and clean the sea strainer and pre-filter. Reassemble dry with a new filter.

Your system is now protected for the next six months.

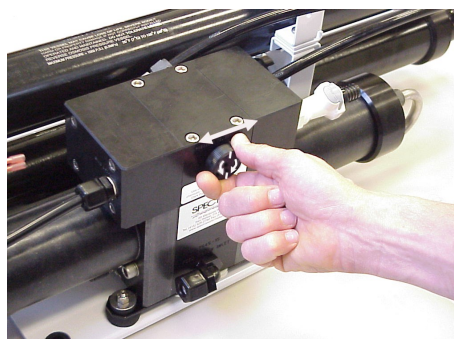
Feed Pump Module Valves in **flush position**:



Flush Valve
OPEN

Service Valve
OFF

Opening the pressure relief valve On Clark Pump 1/2 turn:



Valves in **service position**:



Flush Valve
CLOSED

Service Hose
ATTACHED

Service Valve to
SERVICE

Connecting brine discharge hose:

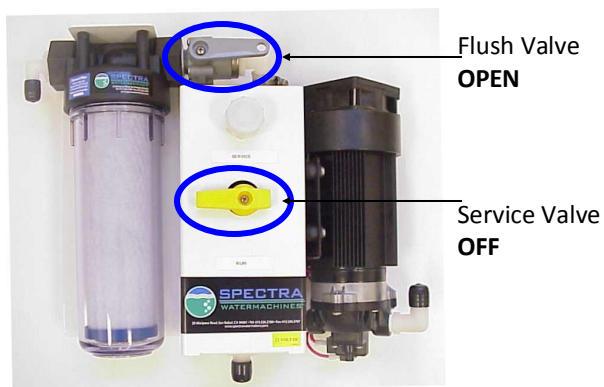


Winterizing with Propylene Glycol

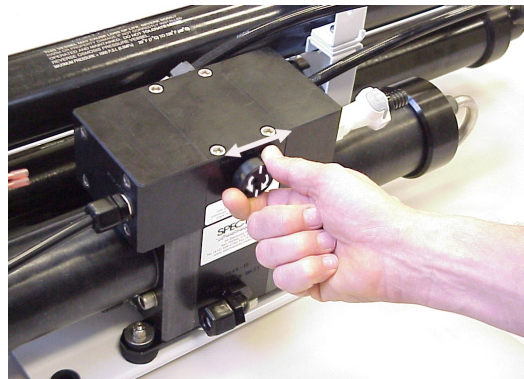
1. Fresh water flush the watermaker (page 28). Turn off the feed pumps. Close the grey flush valve (located on feed pump module A).
2. Connect the inlet service hose to the service intake on feed pump module A, and lead it into a bucket. Turn the yellow service valve to the SERVICE position.
3. Connect the brine discharge service hose to the quick disconnect on the side of the Clark Pump and lead it into a second container.
4. Pour 1 gallon (4L) of propylene glycol of appropriate concentration (see pages 34-35) into the bucket with the intake service hose.
5. **Make sure that the pressure relief valve on the Clark Pump is OPEN a 1/2 turn, OR THE MEMBRANE WILL BE DAMAGED.**
6. Turn on one of the feed pumps until about a gallon of water has flowed from the brine discharge, or propylene glycol appears. Propylene glycol will look slightly different, and feel more slippery, than water. Stop the pump. Add more antifreeze to the intake bucket if necessary.
7. Lead the brine discharge service hose into the bucket of propylene glycol. The system will now draw propylene glycol from the bucket and return it via the brine discharge hose.
8. Circulate the antifreeze in this manner for about 10 minutes, alternating feed pumps.
9. Stop the feed pumps. Reconnect the brine discharge hose that leads to thru-hull. Run the feed pump until the bucket is empty.
10. Close the seawater intake. Turn yellow service valve to OFF. Drain the seawater strainer and the hose leading to the feed pump modules. Disconnect the product tubing from the membrane housing and blow residual water out of the tubing. Empty the charcoal filter housing and flush water lines.

Your watermaker is now protected from biological growth and freezing for one year.

Feed Pump Module Valves in
flush position:



Opening the pressure relief valve on
Clark Pump 1/2 turn:



Valves in **service position:**



Connecting brine discharge hose:



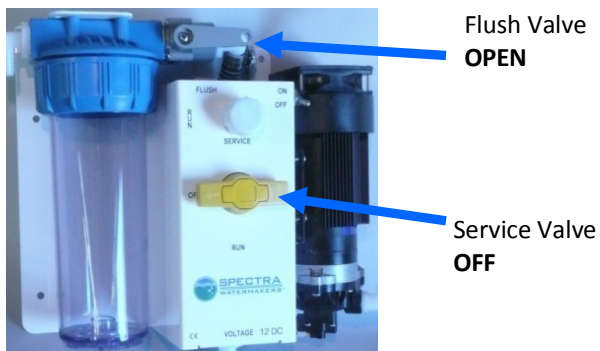
Membrane Cleaning Procedures

Note: Procedures are the same for the SC-2 and SC-3 cleaners

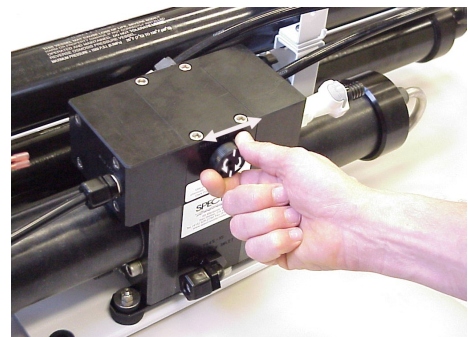
A Spectra cleaning compound (SC-2 or SC-3) must be mixed with fresh water at a ratio of 1 container of compound to 3 gallons (12L) of unchlorinated fresh water. **An average of two gallons (8 liters) of water is already present inside a Cape Horn Xtreme system**, and this water must be figured into the mixture. Warm water is ideal for cleaning membranes: Use a large stainless steel pot to heat the solution to 120° (49°C). You might have to periodically stop and reheat the solution.

1. Perform a fresh water flush (page 28). Stop the feed pumps and close the grey flush valve.
2. Connect the inlet service hose to the service intake on the feed pump module A. Connect the brine discharge service hose to the quick disconnect on the Clark Pump. Lead the hoses into a bucket. Open the grey flush valve and run feed pump A until you have one gallon (4 liters) of water in the bucket.
3. Turn off the feed pump and close the grey fresh water flush valve.
4. Turn the yellow service valve on feed pump module A to SERVICE.
5. **Make sure the pressure relief valve on the Clark Pump is OPEN 1/2 a turn (system is un-pressurized) OR THE MEMBRANE WILL BE DAMAGED.**
6. Mix the cleaning chemical with the water in the bucket.
7. Start feed pump A and circulate the chemical through the system for 45 minutes, if the solution is warm. Let the solution sit in the unit overnight if the cleaning solution is cold.
8. Stop the pump, replace the brine discharge hose, and run the pump until the bucket is empty. Stop the feed pump and turn the yellow service valve to RUN. Follow the instructions for a New System Startup (pages 25-26). **KEEP PRESSURE RELIEF VALVE OPEN** to flush out the cleaning chemicals.

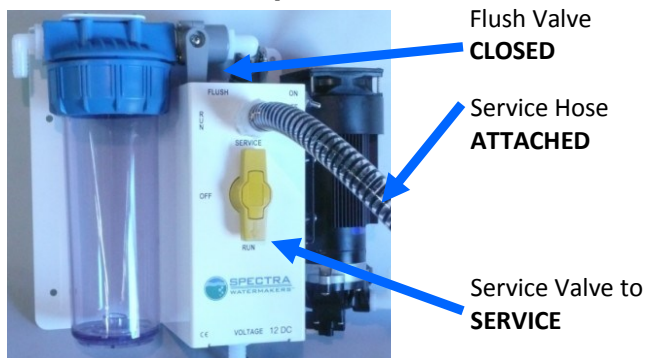
Feed Pump Module Valves in **flush position**:



Opening the pressure relief valve



Valves in **service position**:



Connecting brine discharge hose:

