



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 (page 39) of your owner's manual.

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 2 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 54.

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 fifty percent dilution with residual water. "Minus 200" formulations are pure propylene glycol.

Introduction to Spectra Chemicals continued...

Complete microbial 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 55.

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 56.

Cleaners

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

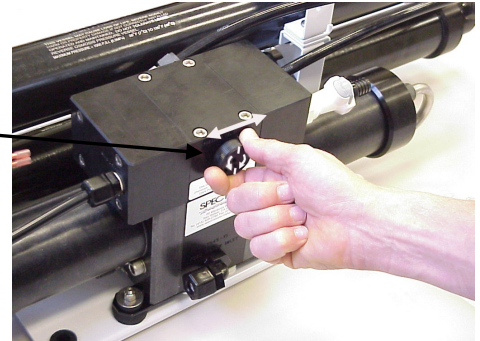
SC-2 is an alkaline cleaner used to remove light oil, grime and biological growth. It is most effective if heated to 120 deg. F (49 deg. C), which is difficult on a boat. In most cases the water quality will increase in PPM (salinity) after an SC-2 cleaning. After a few hours it should recover to near 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 **Membrane Cleaning Procedure** on page 56.

Storage Procedure

1. Close the intake seacock.
2. Push **Auto Store** to fresh water flush the system. Press Stop to cancel the flush interval timer, then push **Auto Store** again, to flush the system a second time.
3. Remove the quick disconnect fitting from the brine discharge outlet of the Clark Pump, per photo below, and replace it with the quick disconnect brine discharge service hose. Lead the brine service hose into the bucket.
4. Push the **Auto Store** button and run the feed pump until you have one gallon of fresh water in the bucket from the brine discharge service hose, then press **Stop**.
5. Mix 1 container of SC-1 storage compound with the water in the bucket.
6. Remove the hose from the “to strainer” pigtail on the feed pump module and install the inlet service hose from the service kit, per photos below. Lead this hose into the 5 gallon (20 liter) bucket as well.
7. **Make sure the pressure relief valve on the Clark Pump is OPEN (un-pressurized) by turning 1/2 turn counterclockwise**
8. Turn on the feed pump by moving the manual control switch on the MPC 5000 control box to SERVICE SYSTEM. The solution will be drawn from the bucket with the service hose, and returned to the bucket from the brine discharge service hose. Circulate the storage chemical in the system for approximately 10 minutes. Stop the feed pump by moving the switch back to the RUN AUTO position.



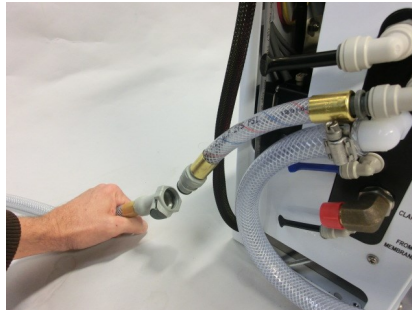
Clean Up

Remove the brine discharge service hose from the Clark Pump, and replace the brine discharge hose that leads to the thru-hull. You may now pump the bucket dry by moving the manual control switch on the MPC Control Box back to SERVICE SYSTEM. Stop the feed pump by moving the switch back to RUN AUTO.

Remove the inlet service hose and reattach the hose from the sea strainer to the “to strainer” pigtail. Drain and clean the strainer and any filters in the system. Reassemble dry. Leave the pressure relief valve open, since the next time you run the system you will need to purge the storage chemicals with the system unpressurized. Turn off the power to the system.



Connecting brine discharge service hose



Removing hose to sea strainer from the “to strainer” pigtail.

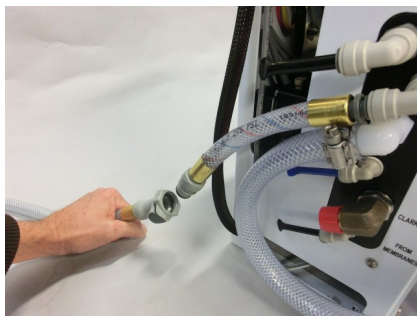
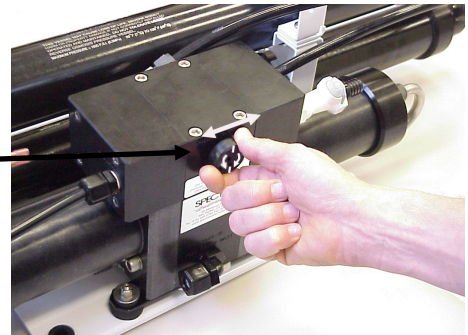


Attaching intake service hose to the hose connecting to the sea strainer.

Winterizing with Propylene Glycol

See description of propylene glycol formulations, and purging from system, on pages 52-53.

1. Close the intake seacock.
 2. Push **Auto Store** to fresh water flush the system. Press **Stop** to cancel the flush interval timer, then push **Auto Store** again, to flush the system a second time.
 3. Remove the hose from the “to strainer” pigtail, install the inlet service hose from the service kit, and lead the hose to the bottom of a bucket. Connect the brine service hose, and run it into a second container.
 4. Pour 1 gallon (4 liters) of propylene glycol of appropriate concentration (see pages 52-53) into the bucket with the intake service hose.
 5. **Make sure the pressure relief valve on the Clark Pump is OPEN 1/2 turn (un-pressurized).**
 6. Run the feed pump by switching the manual switch on the MPC control box to SERVICE SYSTEM until about a gallon of water has flowed from the brine discharge service hose, or antifreeze appears. Propylene glycol will look slightly different, and feel more slippery, than water. Stop the pump by moving the switch back to RUN AUTO. Add more propylene glycol to the intake bucket if necessary.
 7. Lead the brine discharge service hose into the intake bucket of propylene glycol. Move the switch back to SERVICE SYSTEM. The service hose will now draw propylene glycol solution from the bucket, and the brine discharge service hose will return it. Run the feed pump and circulate the propylene glycol for 10 minutes.
 8. Stop the feed pump. Drain the seawater strainer, the hose leading to the boost pump module, and the hose between the boost pump module and the feed pump module. 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. Leave the pressure relief valve open, since the next time you run the system you will need to purge the system unpressurized.
- Your watermaker is now protected from biological growth and freezing for one year.



Removing hose to sea strainer from the “to strainer” pigtail.



Attaching intake service hose to hose to sea strainer.

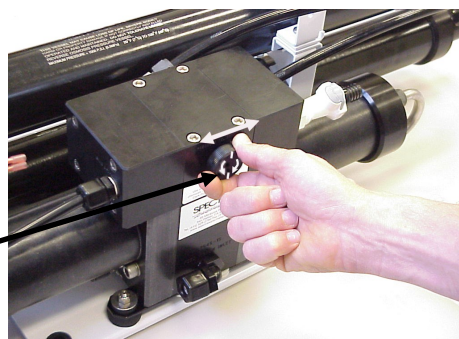


Connecting brine discharge service hose

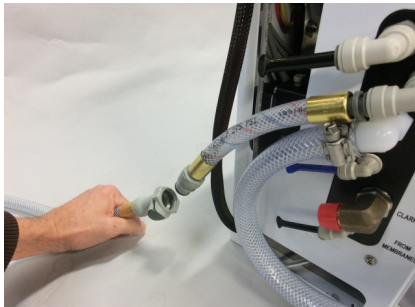
Membrane Cleaning Procedures

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 water. An average of two gallons (8L) of water is already present inside a Newport 400 MkII system, so this water must be figured into the mixture. A Newport 400 MkII system requires one container of compound per cleaning.

1. Close the intake seacock.
2. Push **Auto Store** to fresh water flush the system. Press Stop to cancel the flush interval timer, then push **AutoStore** again, to flush the system a second time.
3. Remove the quick disconnect fitting from the brine discharge outlet of the Clark Pump, and replace it with the quick disconnect brine discharge service hose. Lead it into a 5 gallon (20 liter) bucket. Push the **Auto Store** button and run the feed pump until one gallon of fresh water runs into the bucket from the brine discharge service hose. Press **Stop**.
4. Remove the hose from the “to strainer” pigtail and install the inlet service hose from the service kit. Lead both hoses into the bucket.
5. **Make sure that the pressure relief valve on the Clark Pump is open (un-pressurized).**
6. Mix the cleaning chemical in the bucket. If possible, heat the solution to 120 F (49 C).
7. Move manual switch on the MPC control box to SERVICE SYSTEM. The intake service hose will draw solution from the bucket and the brine discharge service hose will return it. Circulate the solution through the system in this manner for 45 minutes. Stop the pump and let it sit overnight if the solution is cold.
8. Replace the brine discharge overboard hose and run the pump until the bucket is empty by moving the manual switch to SERVICE SYSTEM. Return the switch to RUN AUTO. Follow the New System Startup procedures to flush the chemicals out of the system (**DO NOT CLOSE the pressure relief valve!**)
9. The system may now be restarted, flushed, or stored.



Connecting brine discharge service hose



Removing hose to sea strainer from the “to strainer” pigtail.



Attaching intake service hose to the hose connecting to the sea strainer.