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JAN 17, 2005



## CP-9 HIGH PRESSURE FITTINGS

Older versions of the Clark Pump used 3/8" NPT tapered pipe fittings in the high pressure inlet and outlet ports. These fittings used Teflon tape to seal the threads. The elbow fittings which fit into these ports must be turned to point in the desired direction during assembly or installation. This sometimes resulted in over tightening, causing cracks in the center block or valve body.

Current production Clark pumps use 3/4" UNC threads with O-ring, washer, and locknut type seal. The threads hold the fitting into the pump mechanically, but do not provide the seal. This allows the fitting to be turned in any direction without putting stress on the pump.

Install the high pressure stainless steel O-ring type compression elbows as follows:

Screw the lock nut back towards the body off the fitting as far as it will go.

Push the washer and O-ring back until they are up against the locknut. The washer may be tight and some effort may be required to move it.

Screw the fitting into the Clark Pump until the threads are fully engaged and cannot be seen, and the fitting is pointing in the desired direction, but the O-ring is not compressed.

Using two wrenches, turn the lock nut until the o-ring is compressed and the locknut is snug. Do not overtighten. After the unit is in operation, if the o-ring leaks, it can be retightened slightly.

Place the Compression nut on the hose followed by the ferrule. The ferrule should have the thick end inside the nut and the tapered end toward the end of the hose. Place the hose fully into the socket of the fitting and screw the nut on. Tighten the nut using two wrenches. A little grease on the threads will help in tightening. The compression nut should be tightened quite tight. When tightened properly the sharp end of the ferrule actually bites into the plastic hose slightly.

9/21/04

## MB-2 MEMBRANE CARE

Membrane life is affected by a large number of factors and is somewhat unpredictable. A big commercial plant running 24/7 will get 10 to 12 years out of a set of membranes. But they do all kinds of fancy chemical injections and never shut the thing off. Most cruisers are lucky to get five or six years out of one. You hear of the eight or ten year old membrane now and then. The biggest killers of membranes are lack of use, chlorine damage, and improper storage.

Don't let membranes sit around with sea water or stale fresh water in them. Biological growth will occur in the membrane. Here at the factory we frequently get back membranes for inspection that reek of hydrogen sulfide (rotten eggs). This odor is produced by anaerobic bacteria that live in an unused membrane, feeding on whatever animal or vegetable matter is trapped in it from the plankton that gets through the system. Membranes badly fouled in this way can seldom be saved. These bacteria are always present but are inhibited by the oxygen in sea water while the unit is in frequent use, by scheduled fresh water flushes, or by pickling. Keeping the prefilters clean is also important in preventing bio-fouling. If your prefilters are allowed to become a breeding ground for bacteria (get smelly), the contamination will spread throughout the system. When we cut open a failed membrane we also find mildew, another form of bio fouling, probably due to long term storage with no biocide or stale biocide.

After many hours of water making mineral deposits will form and must be dissolved away with an acid cleaner. Alkaline cleaners are used for bio-fouling. Cleaning chemicals, especially the alkaline, are not good for the membrane. Every time you clean the membrane it shortens its life. Clean only when necessary, and avoid cleaning as a "diagnostic tool".

Chlorine will destroy a membrane in minutes. It attacks the material that the membrane is made from. Always use product water or water filtered slowly through a charcoal filter for flushing and chemical treatments.

Oil simply plugs up the matrix of the membrane and clogs it up. We have brought back oil fouled membranes with Joy soap (See MB-5 Cleaning with Detergent.)

For storage we recommend using propylene glycol potable water system antifreeze if available. It can safely be left in the system for one year and will keep things from freezing in cold conditions. It is hard to find in warm climates, and takes up a lot of room on a small boat, so our SC-1 is best for tropical cruising.

Given good care a membrane will eventually just start to slowly fade away. The feed pressure may rise and/or the ppm go up. Hardly ever will they just fail overnight.

8/13/04

## MB-3 STORING WITHOUT FEED PUMP

If your feed pump fails there are a number of ways to protect the membrane until repairs can be made.

1. If you have an MPC-3000, try auto flush with the pump in place and the pressure relief open and see if the pump still works well enough in combination with the domestic water pressure to auto flush the system repairs can be made, or you can by-pass the feed pump by jumping the pump suction and discharge hoses together. If you open the pressure relief knob ½ turn the domestic water pressure should be enough to auto flush the system without the feed pump.

3. If the problem is a spun vane pump shaft you can repair it by pinning the pump shaft. See VP-1 VANE PUMP DRIVE FAILED.

4. You can temporarily put any spare water pump of the correct voltage and similar flow rate that you might have, such as a wash down pump, in place of the feed pump and pickle in the usual way described in the owner's manual.

5. You can pickle the membrane manually. To do this, disconnect the ½ inch black high pressure hose at the compression fitting on the Clark pump high pressure inlet. Disconnect the other high pressure hose at the membrane. Mix up about a third of a jar of SC-1 storage chemical in a gallon of chlorine free water and pour it into the membrane using a small funnel which will make a tight seal to the high pressure hose still connected to the membrane. The excess will run out the other end of the membrane. Then reconnect the hoses.

Be sure to open the pressure relief valve when you pickle the membrane to prevent accidentally pressurizing it while pickled the next time you start the unit.

7/24/04

## MB-5 MEMBRANE CLEANING WITH DETERGENT

If the membrane has been fouled with oil it may be possible to save it by cleaning it with dish soap such as Joy. Don't use anything that may contain bleach. You will need quite a lot of chlorine free fresh water. If using shore water run it through a charcoal filter at a rate of not more than 1.5 gallons (6 liters) per minute.

Fill a bucket with fresh water and mix in a couple squirts of the detergent. Run the system depressurized with the watermaker drawing water from the bucket and discharging overboard. When about half the water is gone from the bucket stop the unit and let the membrane soak for a few minutes. Restart and pump the remaining solution overboard. Repeat until the discharge appears clean.

After most of the oil is cleaned out you can put the brine discharge into the bucket and run the system with the soapy water circulating as you would for the other cleaning chemicals. Rinse the system with a bucket of fresh water or the fresh water flush cycle, then flush for twenty minutes using sea water. Pressurize and test.

5/12/04

## MISC-3 ACCUMULATOR PRESSURE

All Spectra Watermakers except the 700 and 1000 series are supplied with a pressure accumulator tank, p/n PL-ACC-TK, to be installed in the feed water line between the prefilters and the Clark Pump. In addition, the 300 and 400 series also have an accumulator mounted inside the fresh water flush module.

The purpose of the feed line accumulator is to reduce the spikes in the feed pressure caused by the cycling of the Clark pump. If the accumulator is not properly charged it can lead to problems with the Shurflo pump pressure cutout switches. The accumulators have an air valve on top similar to those found on car tires. This allows the internal air bladder of the accumulator to be precharged. The accumulator should be pumped up to about 65psi (4.5bar) for best results. Add air using a tire pump or air compressor. You can experiment with the exact pressure that will give the best pulsation dampening on your installation.

The purpose of the fresh water flush accumulator is to allow a steady flow of 1.5 gallons per minute of flush water through the charcoal filter. Because the feed pump on the 300 and 400 hundred series exceeds this maximum allowed flow rate, the controller turns it on and off, to reduce the overall flow rate. The accumulator gives the water flowing through the charcoal filter somewhere to go while the feed pump is cycled off. The flush water accumulator should be preloaded to 5 psi (.35bar).

9/27/04

## MPC-5 PURGE MODE BYPASS

Whenever the control power (12 or 24 volt DC) has been shut off the system will prompt you through the purge mode when it is turned back on. This is because the only time the MPC-3000 should be turned off is after the system has been pickled. Purge Mode prompts the operator to open the pressure relief and then runs seawater through the system for 20 minutes to clear away the chemicals. Normally, during periods of disuse the MPC-3000 will remain powered up so that it can do the five day flush cycles, and no storage solution will be present. If the control power has been interrupted but the system is not filled with storage solution, Purge Mode can be bypassed by tapping the two left hand buttons at the same time until the display reads PURGE MODE BYPASSED. The buttons must be pushed at exactly the same time. You can't hold one down and then push the other. From Purge Mode Bypassed you can run the system in any mode.

4/20/04

## OP-1 WINTERIZING OR PICKLING W/ ANTIFREEZE

**WARNING:** Use only propylene glycol based drinking water system antifreeze. Do not use ethylene glycol based automotive antifreeze, which is toxic.

Propylene glycol can be used instead of Spectra SC-1 storage chemical for storage in any climate up to one year following this procedure.

1. Replace the prefilters with clean ones.
2. Flush the system with fresh water until the brine discharge water is below 1000 ppm or until the brine discharge does not taste salty.
3. Set up the system for pickling according to the directions for your model.
4. Place enough antifreeze in a bucket to fill your system. This will be about two gallons for a 150 or 200 model, three gallons for a 380 or 400, and larger systems will take more.
5. Run the system **DEPRESSURIZED** with the feed pump drawing from the bucket and the brine discharging overboard until the colored antifreeze solution begins to appear at the brine discharge then switch the brine discharge into the bucket and recycle the remaining solution until the glycol and water are completely mixed, (about ten minutes). On some models you will have to shut down the unit to switch the brine discharge into the bucket.
6. The product water side of the system will not contain antifreeze and should be protected from freezing by blowing or draining it dry if necessary.
7. Turn off power to the system, leaving the pressure relief valve open ½ turn.

5/25/04

## OP-2 BAD SMELLING PRODUCT WATER

The reverse osmosis membrane is permeable by many gases including hydrogen sulfide, the gas that causes rotten eggs to smell the way they do. If there are bad odors in the feed water they will go through the membrane and the product water will be affected. Usually the source of the odor is from the decay of planktonic creatures trapped in the sea strainer and prefilters. These tiny oxygen loving creatures soon suffocate and die inside the prefilter housings when the unit is shut down. Once all the available oxygen is consumed, anaerobic bacteria begin to grow, causing the odor. If a unit being used frequently begins to make smelly water, it will be the prefilters that are the source of the problem. This occurs in a week or two in cold climates, but in less than one night in very warm waters like the Sea of Cortes or Red Sea. These bacteria can spread throughout the watermaker, and begin to grow on the membrane, causing poor water quality and high feed pressures.

Filling the system with fresh water after every use greatly slows this process, allowing the automated spectra units to operate with less frequent prefilter changes, but units operated for only an hour or so a day will probably need to have the filters changed due to odor before they are dirty enough to restrict water flow. Prefilters can be cleaned. We recommend that you have three sets in service, one in the unit, one set soaking overnight in a bucket of clean fresh or salt water and one set drying for the next use. After shutting down the unit remove the used prefilters and install the dry set. Leave the housings full of air until the next use. On non-automated systems, open the pressure relief when starting if there is a lot of air in the system until the air is cleared out through the brine overboard. The filters will get just as clean when soaked in sea water, but dry much faster if soaked in fresh. Given gentle handling, prefilters can be reused many times.

Bad smelling product water is usually caused by bad smelling feed water, but can also be caused by a fouled membrane if the membrane has been left unpickled. If the unit makes smelly but not salty water after a long idle period and the prefilters are new, the smell can be eliminated by running the unit unpressurized for an hour or so to flush the membrane.

Odors in the product water can also be eliminated by adding a charcoal filter in the product water line. Spectra offers a product water filter kit p/n KIT-FLT-CC.

More on this subject is available on our website at [www.spectrawatermakers.com](http://www.spectrawatermakers.com).

8/17/04

## OP-3 CHEMICALS 101

We use four types of chemicals: SC-1, SC-2, SC-3, and propylene glycol antifreeze

Note: Never use any chemicals with the system pressurized. Always open the pressure relief valve 1/2 turn.

Always purge a system containing chemicals for at least 20 minutes unpressurized before pressurizing and making water.

The SC-1 is for storage only. We no longer use it as a cleaning chemical. To prepare the system for storage, first do a fresh water flush until the brine discharge is below 1000ppm or does not taste salty. Mix one jar of SC-1 with 1 to 2 gallons of product or dechlorinated fresh water in a bucket and circulate UNPRESSURIZED with the fresh water in the system for 10 minutes then discard. The system should be repickled every six months in warm conditions and every eight months in cooler conditions.

The Spectra systems should be stored with Propylene Glycol if freezing could occur. This is the food grade antifreeze used to winterize R.V's, boats and cabins. This works very well for storing in warm climates and is good for one year. See OP-1 WINTERIZING OR PICKLING W/ ANTIFREEZE.

NOTE: Do not use metasodium-bisulfate, this is the standard chemical used to store most watermakers. This chemical will damage the Clark pump and void the warranty.

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

SC-2 is an alkaline cleaner used to remove light oil, grime and bio growth. It is most effective if heated to 120 deg. F On a boat this is not easy to do. If not heated, circulate for 2 hours and let set for several hours and recirculate for one hour and discard. In most cases the water quality will increase in PPM after an SC-2 cleaning. After a few hours it should recover to near the ppm it produced before the cleaning.

SC-3 is an acid cleaner used to remove mineral and scale deposits. This is used in the same way as the SC-2. In most cases this is used first and if no results go on to the SC-2. SC-3 will in most cases lower the product PPM and over all 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.

7/19/04

## OP-4 FRESH WATER FLUSH

The purpose of the fresh water flush is to replace the sea water in the watermaker with fresh water whenever the system is not operating. The Auto Flush Mode changes the fresh water every five days if the system has been idle that long. The watermaker will last longer and operate better if it is always kept filled with fresh water between uses.

Most spectra watermakers are equipped with a fresh water flush module. This module includes a 50 micron filter to filter out abrasive particles in the feed water that might damage the feed pump, a charcoal filter to remove any chlorine in the fresh water that might damage the membrane, an electrically operated valve and a check, or “one way”, valve. The electrically operated solenoid valve opens during the fresh water flush allowing the boats pressurized water system to supply water to the system. The check valve prevents the fresh water from going out backwards through the sea strainer and sea cock. The charcoal filter has a maximum flow rate of 1.5 gallons per minute (6lpm) so the feed pump is operated at a reduced speed on some models, or is cycled on and off on other models, to avoid exceeding this flow rate.

If the ship's water system is unable to provide flush water at the required flow rate, sea water will be drawn in to make up the difference. This will cause the flush water to be brackish, and ineffective in preserving the watermaker. At initial startup the fresh water flush system should be tested by taking a sample of the brine discharge water just as the flush cycle is ending. This water should not taste salty, and should read less than 1000 ppm on a digital tds meter. The flush cycle can also be tested by closing the sea cock during the flush cycle. If the MPC-3000 display gives a CK SEA STRAINER alarm this means that the fresh water supply is insufficient.

Because the pre-filters trap the plankton in the feed water they can be subject to “going anaerobic” or starting to smell like rotten eggs, as the trapped plankton decay. For this reason it is advisable to always put in clean elements if the unit is going to be left on Auto Flush Mode. In daily or regular use the fresh water flush after each shutdown will help prevent this problem, but in excessively warm or fertile waters the pre-filters will need regular attention.

7/26/04

## OP-5 CALIBRATION SOLUTIONS

Spectra Watermakers sells hand held salinity indicators (tds meters), p/n KIT-HHM, and also provides built in salinity sensors on our automated units. These meters, as well as those sold by other manufacturers, should be calibrated before use and the calibration checked occasionally. If there is ever any question about the quality of the water being produced by the water maker it is essential to have a properly calibrated meter in order to have accurate information. In order to calibrate a salinity indicator it must be placed in a solution of known salinity so that it can be adjusted to display the correct reading.

Some handheld meters have an automatic calibration feature. The meter must be placed in a solution which has 1382 parts per million total dissolved solids. When the “autocalibrate” button is pressed the meter will reset itself to read 1382 ppm. This solution is our part number EL-SLT-CBS.

Our automated watermakers with built in indicators, as well as some other handheld meters, use a calibration screw to adjust the meter. With this type of meter the sensor should be placed in an 800ppm calibration solution and the reading adjusted with a screwdriver until the display reads 800ppm. Instructions for calibrating our built in meters are in our Bulletins HS-LF-3 and HS-LF-4. Our 800ppm solution is p/n EL-SLT-CGS8.

9/15/04

## PF-1 PREFILTERS- VANE PUMP SYSTEMS

Five different filters are used on these Spectra Watermakers to make sure that no damaging foreign materials enter the system. There are four filters in the system to clean the feed water of abrasive materials while the system is in operation, and a fifth filter that prevents the entrance of chlorine during fresh water flushing.

During normal operation the feed water is filtered in two stages. First it enters a fine mesh metal sea strainer then passes through a fifty micron pleated cellulose filter. These protect the vane pump from damage due to abrasion from silt and hard shelled plankton found in the feed water. After passing through the pump the feed water enters the filter housings containing 20 and 5 micron elements. These filters remove very fine particles which could damage the Clark pump and which would shorten membrane life.

Cleaning schedules will vary widely depending on how and where the system is used. If large amounts of feed water are run through the system in a relatively short period in biologically fertile near shore waters, the prefilters will plug up, the pressure drop across the filters will rise, product production and quality will drop, and the system will sense plugged filters and give a service prefilters or check strainer alarm if so equipped. Plugged filters can be cleaned several times by soaking in a bucket, towing behind the boat at moderate speeds, or hosing them off.

When operated only an hour or two a day in inland or near shore waters, the trapped plankton will begin to decay in the filters long before the elements plug up, and the bacteria involved in the decay will cause a “rotten egg” smell in the product water. This decay will set in overnight in tropical waters, or after a week or two in high latitudes. If handled gently and changed regularly before they get too smelly, filters in this service can last through dozens of cleanings.

In crystal clear blue water conditions the filters may need to be cleaned much less frequently.

The charcoal filter used in the fresh water flush system will not plug up unless you have some incredibly dirty domestic water in your boat. About six months after installation the charcoal filter element will lose its effectiveness at removing any membrane damaging chlorine which may be present in domestic water. Charcoal filter elements must be replaced every six months if there is ANY chance that chlorine could be introduced into the flush water. Charcoal filter elements cannot be cleaned.

To ensure that filter elements fit properly and remove chlorine effectively, they should be purchased at factory authorized dealers. Our element part number is FT-FTC-XX. The last two digits indicate the micron rating, e.g. FT-FTC-05 is for a 5 micron element. Charcoal elements are FT-FTC-CC.

06/03/04

## PF-2 CHARCOAL FILTERS

The function of the charcoal filter element, p/n FT-FTC-CC, is to remove any chlorine in the fresh water flush water supply. It also removes any particulate matter. The charcoal filter we use removes 99.7% of the chlorine. Beware when buying other charcoal filters. If they don't specify the percentage of chlorine removed, don't use them. The cheap ones in most cases will only remove 60 or 70%. Also, there are aftermarket filters which are very close to, but not exactly, the same dimensions that will not seal properly in the housing. The membrane can only handle small amounts of chlorine for short periods without damage. The chlorine will damage the bonding agent in the membrane in a very short time. So if you skimp on the charcoal filter you will toast a \$450.00 membrane on the first flush. The other factor is the flow rate that the filter can handle. Because the chlorine is deactivated by a chemical reaction with the charcoal, it must remain in contact with the charcoal for sufficient period of time for the reaction to be complete. The filter we use can handle 1.5 gallons (6 litres) per minute flow, and are good for 3000 gallons (12,000 litres) at 1.5 GPM, or six months, whichever comes first. Regardless of the flow the charcoal loses its effectiveness after six months.

7/26/04

## PF-3 PREFILTERS- SHURFLO SYSTEMS

Up to four different filters are used on Spectra Watermakers using Shurflo feed pumps to make sure that no damaging foreign materials enter the system. There are 2 or 3 filters in the system to clean the feed water of abrasive materials while the system is in operation, and an additional filter to prevent the entrance of chlorine during fresh water flushing.

During normal operation the feed water is filtered in two stages. First it enters a fine mesh metal sea strainer. This protects the feed pump from damage due foreign materials and larger sea creatures. After passing through the pump the feed water enters the filter housings containing 20 and 5 micron elements. These filters remove very fine particles which could damage the Clark pump and which would shorten membrane life. Some units have only the 5 micron filter.

Cleaning schedules will vary widely depending on how and where the system is used. If large amounts of feed water are run through the system in a relatively short period in biologically fertile near shore waters, the prefilters will plug up, the pressure drop across the filters will rise, product production and quality will drop, and the system will sense plugged filters and give a service prefilters or check strainer alarm if so equipped. Plugged filters can be cleaned several times by soaking in a bucket, towing behind the boat at moderate speeds, or hosing them off.

When operated only an hour or two a day in inland or near shore waters, the trapped plankton will begin to decay in the filters long before the elements plug up, and the bacteria involved in the decay will cause a “rotten egg” smell in the product water. This decay will set in overnight in tropical waters, or after a week or two in high latitudes. If handled gently and changed regularly before they get too smelly, filters in this service can last through dozens of cleanings.

In crystal clear blue water conditions the filters may need to be cleaned much less frequently.

The charcoal filter used in the fresh water flush system will not plug up unless you have some incredibly dirty domestic water in your boat. About six months after installation the charcoal filter element will lose its effectiveness at removing any membrane damaging chlorine which may be present in domestic water. Charcoal filter elements must be replaced every six months if there is ANY chance that chlorine could be introduced into the flush water.

To ensure that filter elements fit properly and remove chlorine effectively, they should be purchased at factory authorized dealers. Our element part number is FT-FTC-XX. The last two digits indicate the micron rating, e.g. FT-FTC-05 is for a 5 micron element. Charcoal elements are FT-FTC-CC.

06/03/04

### SF-3 EXTEND SHURFLO SERVICE LIFE

The original Spectra Watermakers were designed to make 200 gallons per day and were equipped with a single Shurflo feed pump. Some of these watermakers have now been operated for over 2000 hours using the original feed pump. In response to customer demand for a watermaker that could make water faster, we began producing the Model 380C which is basically the same watermaker with two feed pumps. The 380 controls are set up to allow "RUN HIGH" and "RUN LOW" modes. In high mode both pumps run, while in low mode only one pump runs. Due to the higher operating pressures required for this increased production, the feed pumps were redesigned with the strongest internal parts available for diaphragm pumps. However, Shurflo pumps will still give a longer service life if operated at lower pressures.

Symptoms of worn pump heads include reduced production, lower than normal feed pressure, and increased salinity. The pump motors are not affected by service pressure and will last far longer than the pump heads in high pressure service.

By taking advantage of some characteristics of the system, you can help extend the life of the pump heads. When operated on one pump the system pressures are much lower than they are on two pumps. Also, pump output and system efficiency are increased when the pumps are run at the 14 Volts available when the engine is running or solar or wind are keeping the voltage up, versus 12V when running off the batteries only.

For example, if you need to make 30 gallons of water you will have to run on one pump for 4 hours or 2 pumps for 2 hours. If the solar can provide 10 amps, you can run on one pump at higher voltage for 4 hours, or two pumps at reduced voltage for 2 hours. In this case, running on one pump will give you better energy management and longer pump life. Or, when running the engine for a period long enough that the tanks will top off before you shut down, make it a practice to run the system on one pump.

One pump operation has an even greater effect on pump life in cold waters where system pressures are naturally higher than in the tropics. Another factor that shortens pump head life is high temperatures. Owner's who leave their boats in storage in very hot climates report that all the rubber diaphragm pumps on board, including the watermaker pumps, are severely affected by the intense heat inside the closed up boat.

The 12 volt Shurflo pump with motor is part no. KIT-FP-SF12, the 24 volt pumps are KIT-FP-SF24. Pump heads are the same for either voltage: p/n PL-PMP-SFPH.

02/14/05

## VP-6 FLUSHING THE FEED PUMP

Catalina, Newport, Monterey, and Watermachine model watermakers are equipped with Stainless Steel Vane Pumps that pump the feed water to the Clark Pump Pressure Intensifier. These are close tolerance pumps with precision bearings and seals. Stainless Steel is subject to a form of corrosion known as “Crevice Corrosion” which attacks the metal when it is in contact with stagnant sea water. When the watermaker is making water and sea water is flowing through the pump this form of corrosion won’t take place, but if the pump is left with sea water inside it when the water maker is turned off, the internals of the pump will be attacked. This usually shows up as a leaking seal which allows water to get to the bearings in the pump head and the motor, as well as leaking out into the boat. The “Auto Store” fresh water flush feature is designed to insure that the pump is always filled with fresh water when the unit is not operating. When the system is first installed and occasionally thereafter the flush cycle should be tested to insure that the pump is properly protected.

Because the maximum flow rate for the Charcoal Filter must not be exceeded, the watermaker is adjusted at the factory, either by cycling the feed pump on and off or by adjusting its speed, to use 1.5 gpm (6lpm.) To operate properly, the boats fresh water system must be able to deliver **1.5 gpm (6lpm) at the flush valve.** If the fresh water flow is insufficient, sea water will be drawn in to make up the difference. This will result in salt or brackish water remaining in the watermaker after the flush.

The best way to ensure that the watermaker is properly flushed is to test the water coming out through the brine discharge overboard fitting. This water should be less than 1000 ppm salinity at the end of the flush. If it is higher than 1000ppm either the flush cycle is too short or sea water is being drawn in. To find out if sea water is being drawn in close the sea cock at the beginning of the flush cycle. If the fresh water supply is inadequate the “Check Sea Strainer” alarm will sound due to a high vacuum at the feed pump suction. If the flush water supply is only slightly below the required flow the alarm may not sound, but there will be an improvement in the salinity of the overboard discharge water. If the discharge water salinity never drops below 1000 even though you have the seacock closed then the flush cycle should be reprogrammed.

Jan 17, 05