

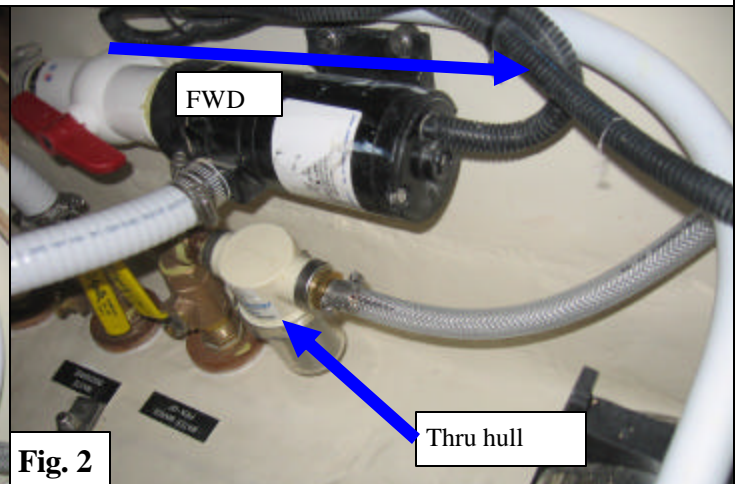
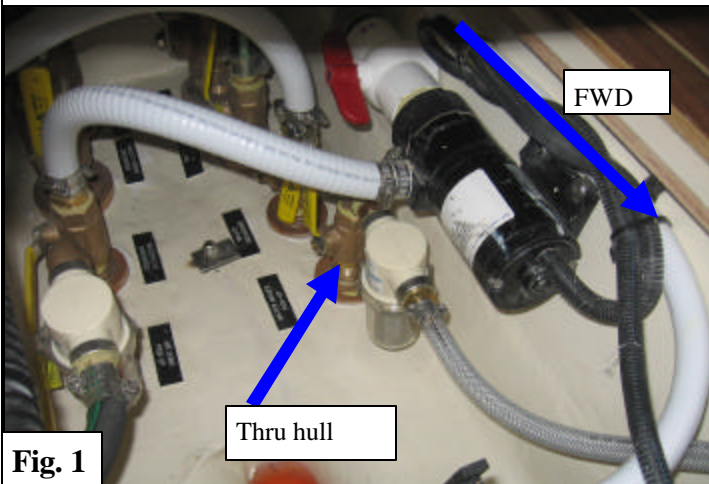
45CC Water Maker Installation

Note:

1. **DISCONNECT ALL ELECTRICAL POWER, TURN OFF MAIN SWITCH BEFORE PROCEEDING ANY INSTALLATION.**
2. **ALWAYS USE OWNER'S MANUAL VENDER THAT VENDER SUPPLIED WITH THIS INSTALLATION PROCEDURE.**

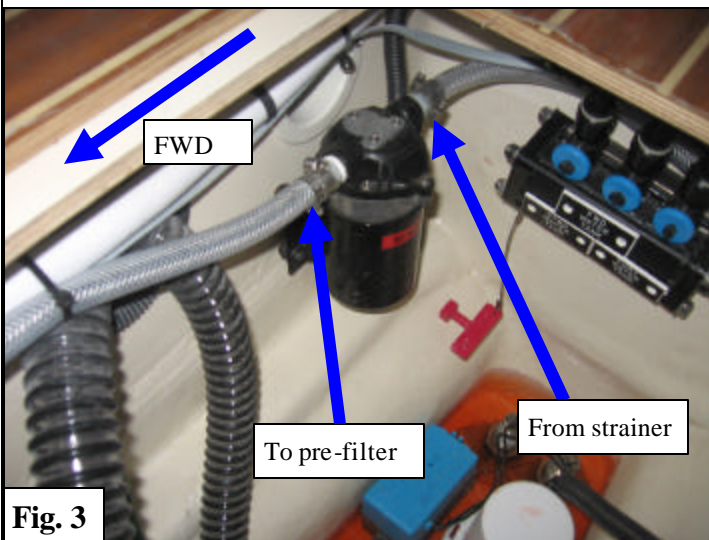
Bilge Thru-Hull :

1. Install water maker inlet thru hull in main bilge discharge location, locate the thru hull 3-1/2" forward of port side fwd thru hull fitting.
2. Make sure the inlet scoop facing forward and apply Marine sealant 5200 caulking around the to seal the thru hull. And ball valve should be facing inboard and the handle pointing upward when valve opens.
3. Install strainer after the thru hull installation is complete.
4. Make sure to use pipe thread sealant for hoses to fittings connection, 2 hose clamps are required for each connection. (See figure 1 & 2)



Booster Pump :

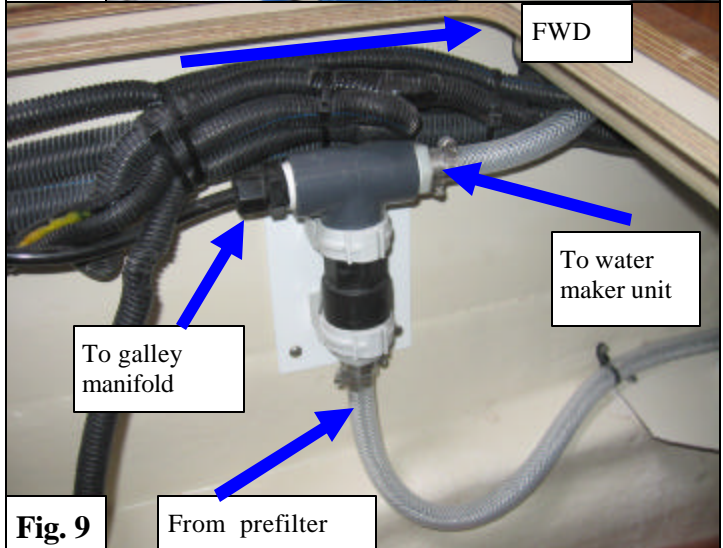
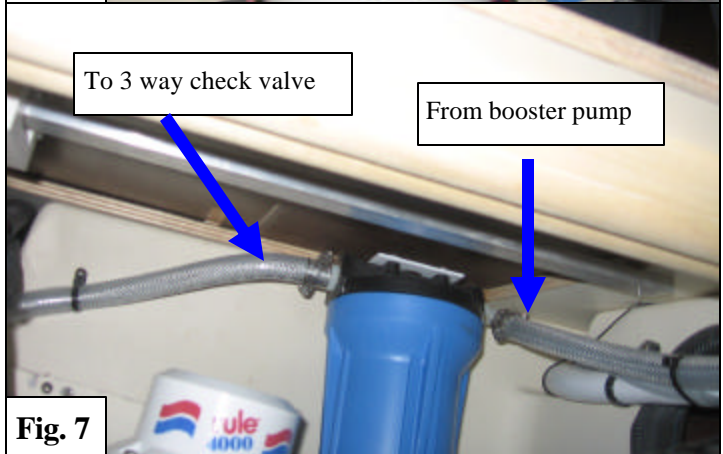
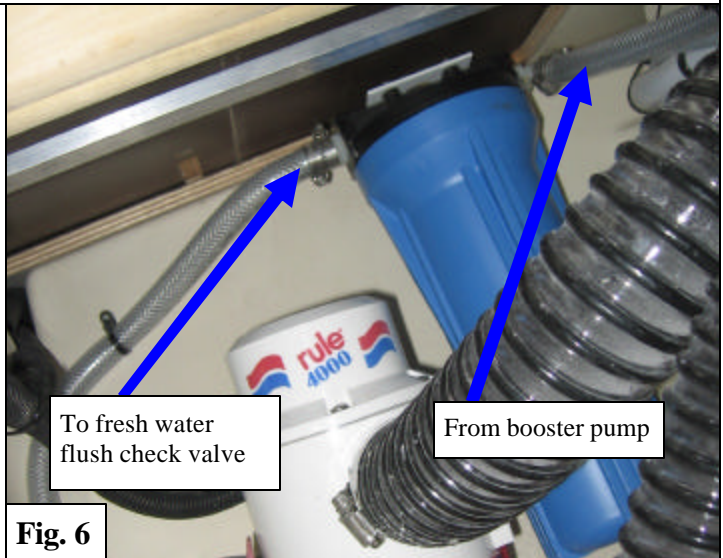
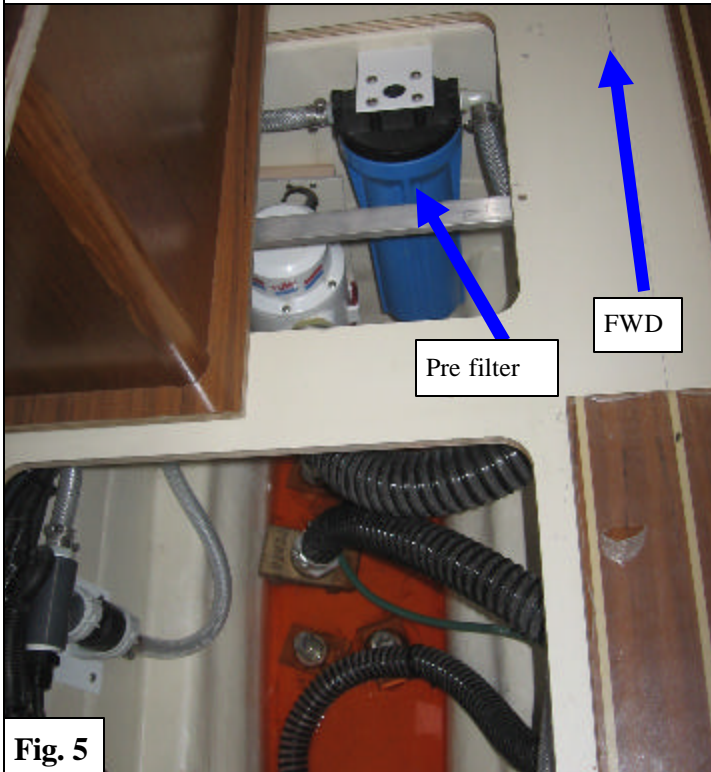
1. Install the booster pump in the main bilge compartment by fresh water tank manifold, mount and secure the pump to stringer using designated fasteners.
2. Connect the hose that is from strainer to booster pump inlet fitting then secure the hose to fitting using 2 designated hose clamps. (See figure 3 & 4)



45CC Water Maker Installation

Feed Water Prefilter:

1. Install the pre-filter (blue) in the main bilge compartment by high water bilge pump, mount and secure the pump to stringer using designated fasteners (comes with water maker).
2. Connect the hose that is from booster pump outlet fitting to prefilter inlet fitting, secure the hose to fitting using 2 designated hose clamps. (See figure 5, 6, 7, 8 & 9. See attached reference documents.



45CC Water Maker Installation

Fresh Water Flush, Check Valve:

1. Install the 3 way check valve (fresh water) in the main bilge compartment aft to high water bilge pump, mount and secure the 3 way valve to stringer using designated fasteners (comes with water maker).
2. Connect the hose that is from pre-filter outlet fitting to bottom inlet fitting of the valve.
3. Connect hose to the upper fwd end fitting of the valve and run the hose to port side main cabin bunk fwd compartment (water maker unit will be installed in this compartment).
4. Connect black plastic tubing to the aft fitting of the valve then run the tubing to PH neutralizer filter that locates in galley water pump compartment.
5. Mount and install the PH neutralizer filter nest to fresh water pump then run and install tubing to galley manifold for further installation. (See Figure 9-1 & 9-2)
6. secure the tubing to galley manifold (See figure 10 & 11). Also see attached reference documents.



Fig. 9-1

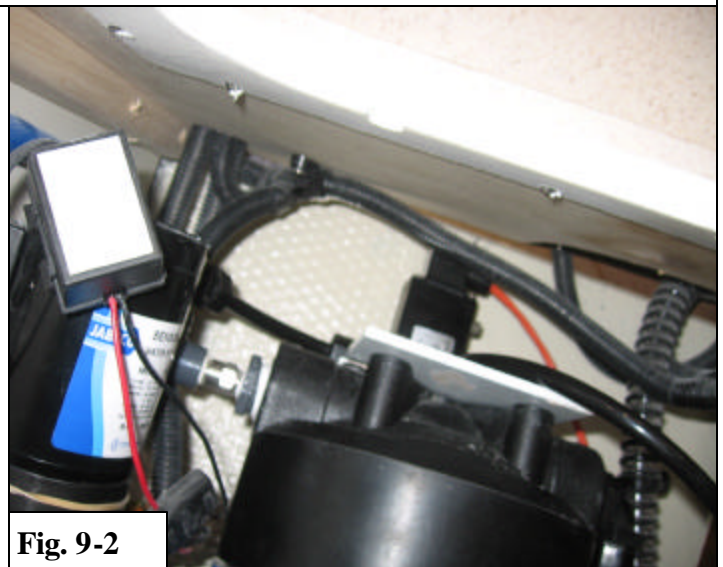


Fig. 9-2

Tubing to Galley Manifold:

1. Install black tubing to 90° then install brass nipple for 15mm blue tubing then install 15mm regular elbow then install the assembly to galley manifold lower left fitting.(See figure 10 & 11).
2. Make sure all connection will not lea.

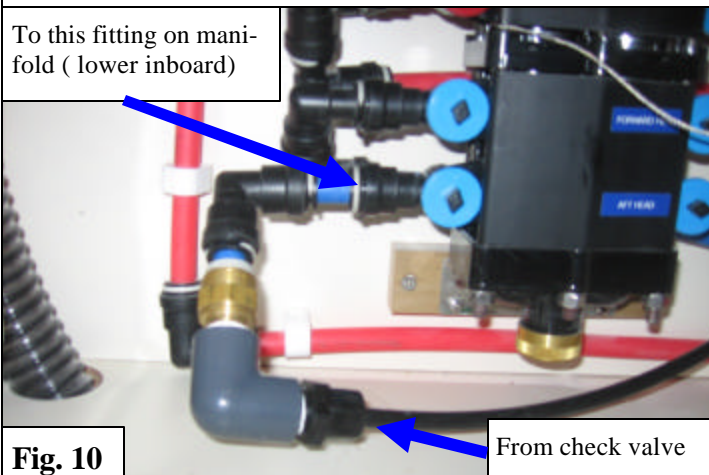


Fig. 10

From check valve



Fig. 11

45CC Water Maker Installation

Water Maker Unit:

1. Mount and secure the water maker unit inside the main cabin bunk fwd compartment (the control panel facing afterward).
2. Install the main filter with the inlet fitting at tank side, install and secure the hoses that connect to the R.O Membrane Element.
3. Ensure to conduit all electric wire during installation. See attached reference documents for more details.

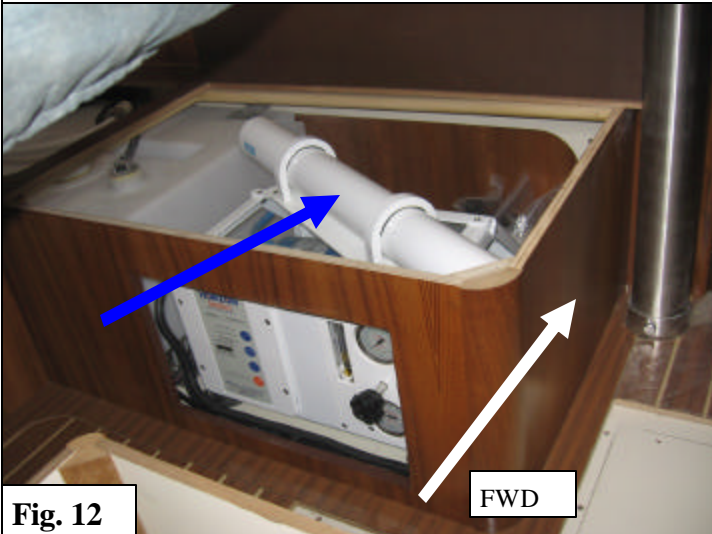


Fig. 12

FWD

Install the RO Membrane element like in the shown picture



Fig. 12

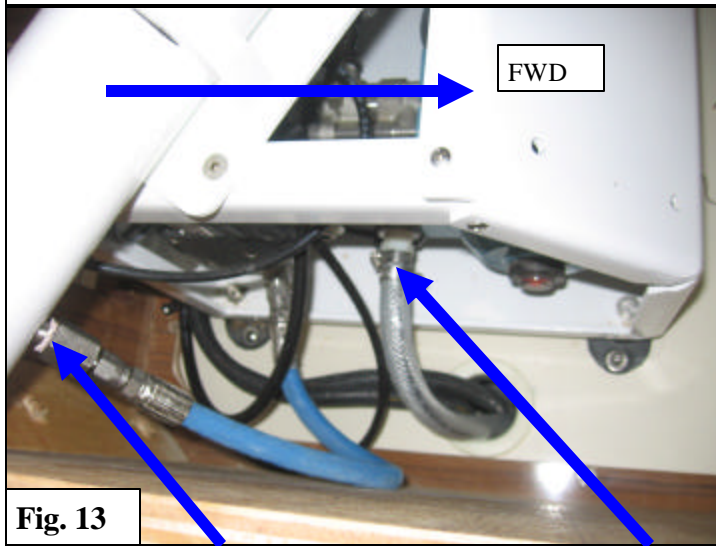


Fig. 13

FWD

Filter outlet fitting

From 3 way check valve

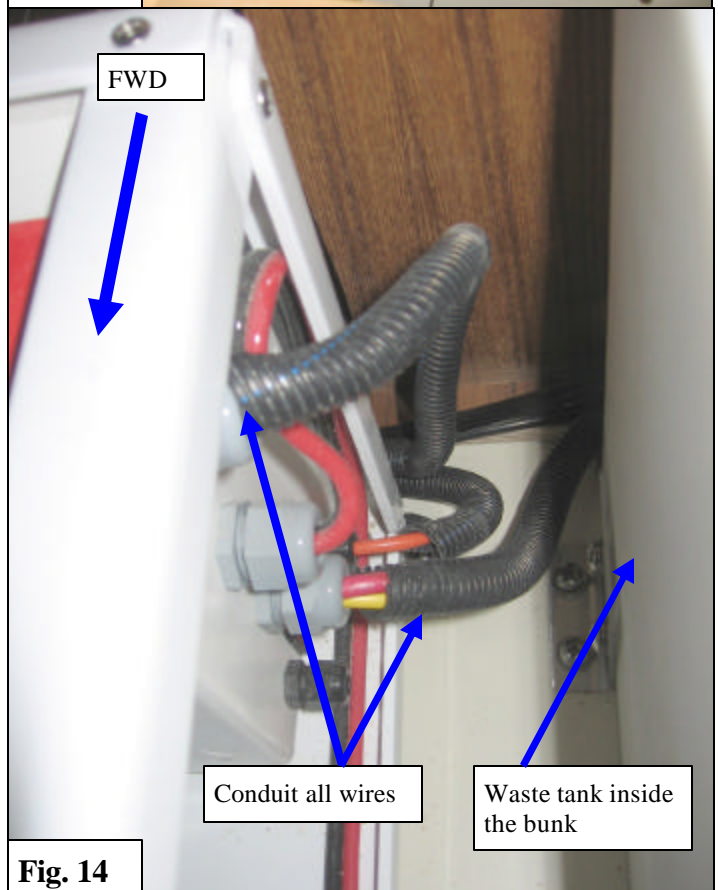


Fig. 14

FWD

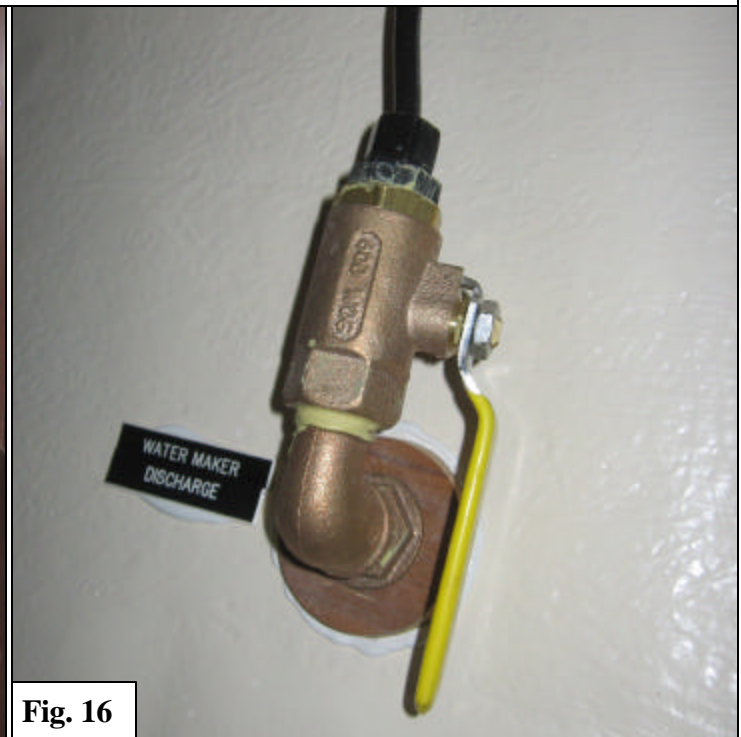
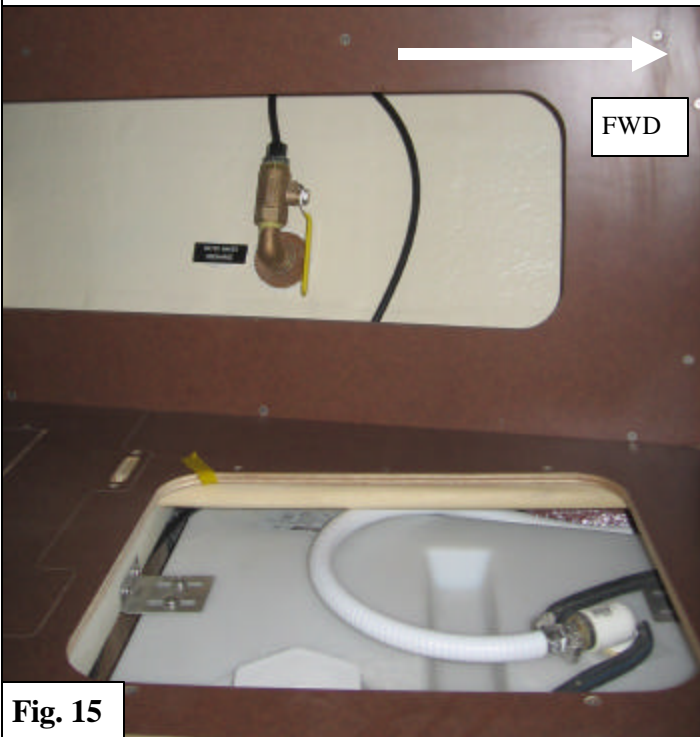
Conduit all wires

Waste tank inside the bunk

45CC Water Maker Installation

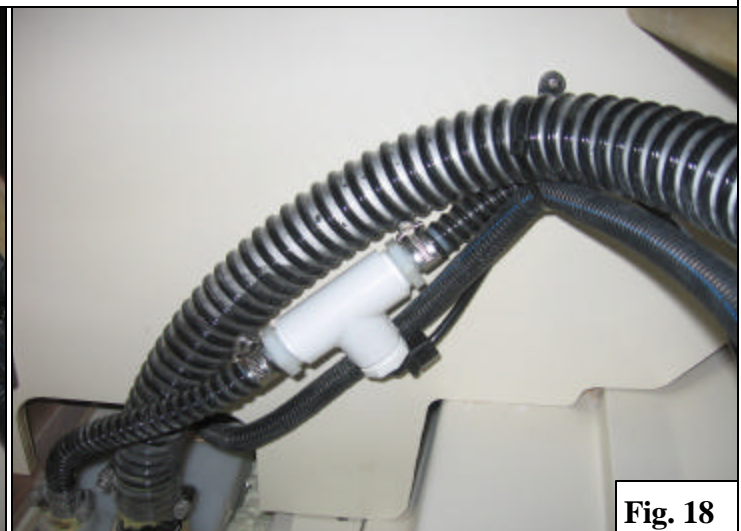
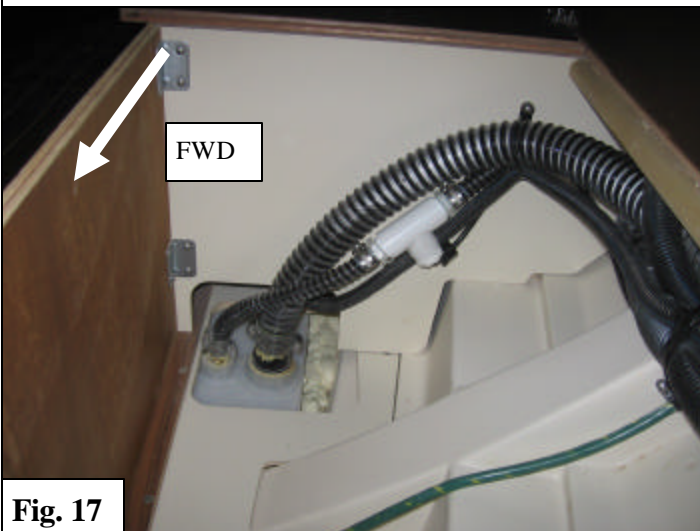
Thru Hull Discharge Fitting:

1. Install water maker discharge thru hull fitting on port side sheer that is behind the bunk back rest. And label the thru hull.
2. Using marine sealant 5200 white to seal this thru hull fitting and install the ball valve facing forward, handle pointing downward when opens.
3. Run the discharge tubing (black) from the 3-Way Product Water Diversion Valve, Electric Solenoid Actuated (in water maker unit). (see figure 15 & 16), also see attached documents in the following pages



Fresh Water Storage:

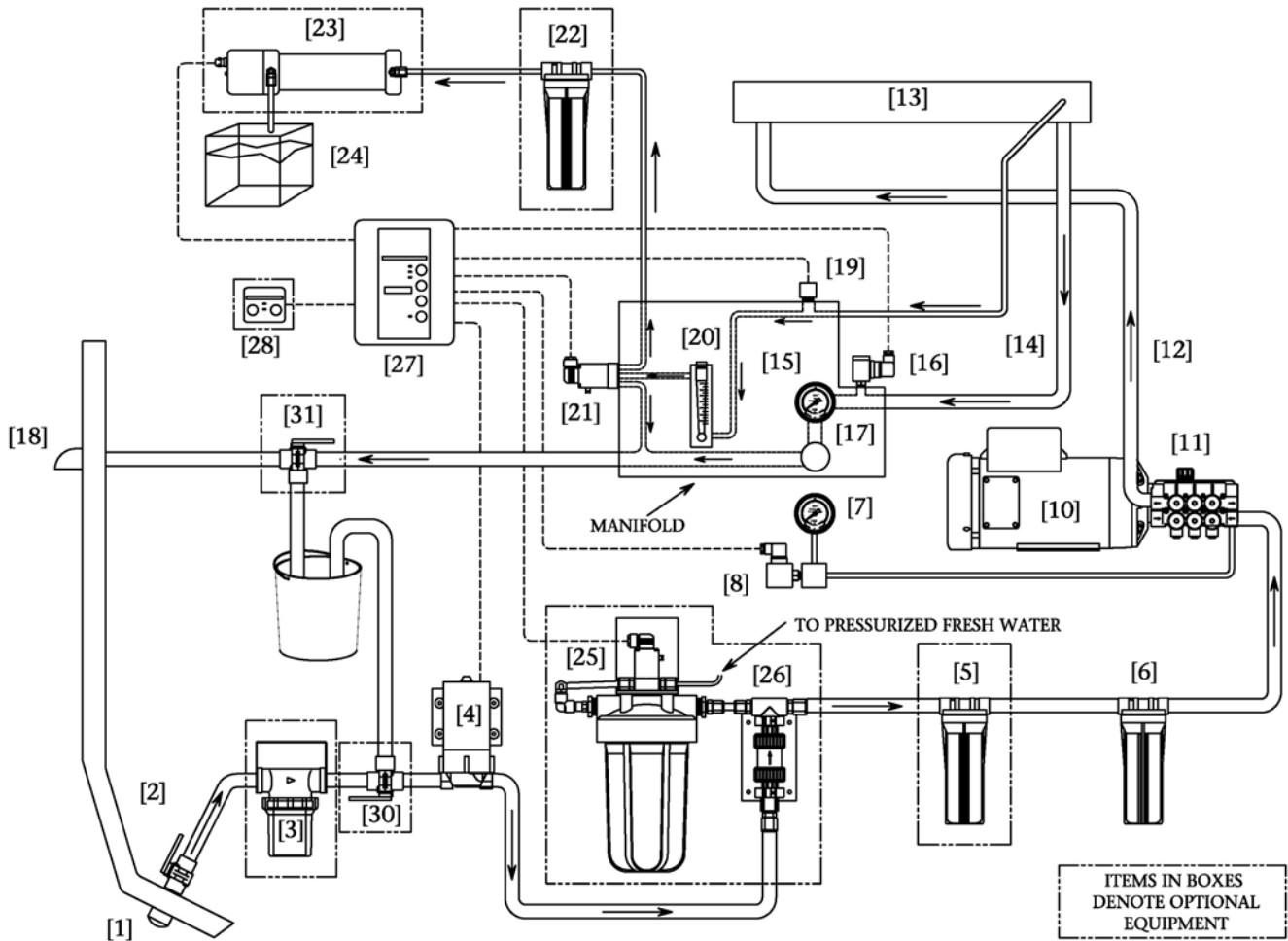
1. The fresh water will be stored in the main cabin port side water tank. Run the tubing (**high pressure hose from the Ultra Violet Sterilizer**) inside the bunk by chainplate stringer location (water tan fill hose location) then install designated Tee fitting with adapters to water tank vent hose. Tie wrapping the tubing after installation complete. (see figure 17 & 18)



Seafari 170 and Seafari 350 P&ID
(Piping & Interconnect Diagram)

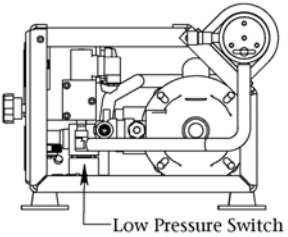
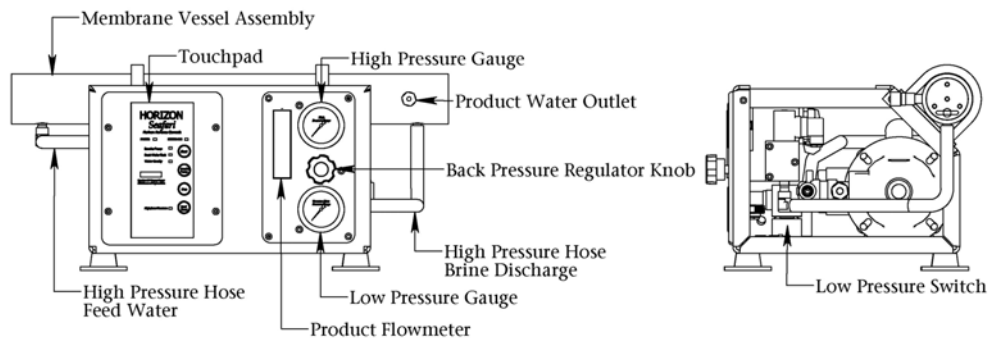
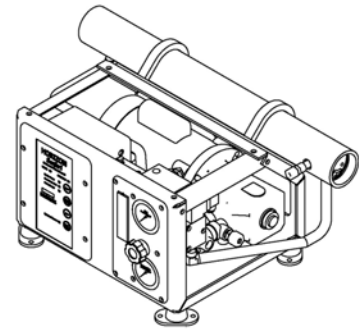
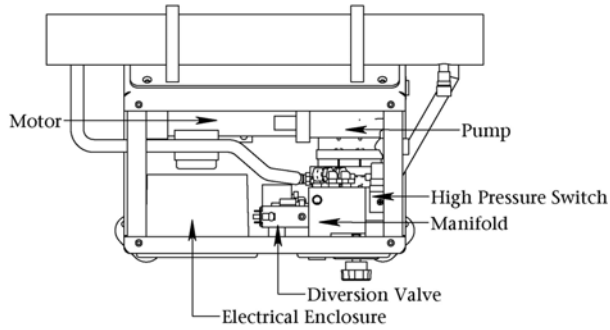
SEAFARI 170/350 U.S. GPD

Reverse Osmosis Desalination System

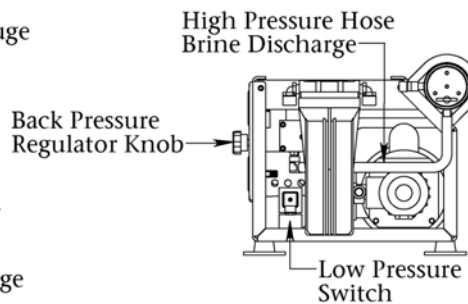
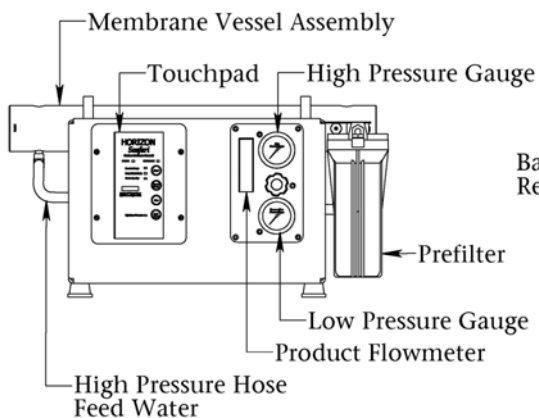
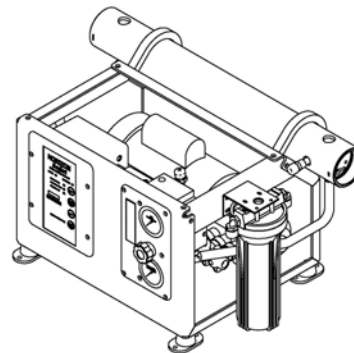
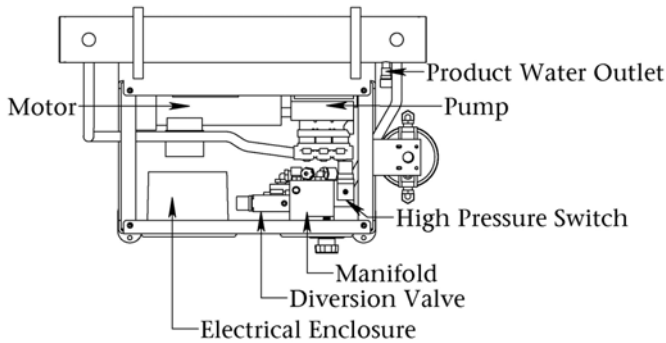


COMPONENT
LOCATIONS:

SEAFARI 170 COMPONENTS



SEAFARI 350 COMPONENTS



A. PREFILTRATION SUBSYSTEM:

This section of the system filters and delivers the feed water into the system. The raw feed water is filtered to remove suspended solids larger than 5 Micron size (5/1,000,000 of a meter). The pre-filtration protects the Reverse Osmosis Membrane Element from premature fouling.

1. **Inlet Thru Hull Fitting with Forward Facing Scoop** ** is the point at which the feed water enters the system. It is important that the installer utilizes a forward facing scoop so that the system receives a positive flow of water as the boat is under way.

CAUTION: A flat inlet thru-hull fitting will cause a vacuum as the boat is under way, and this will cause loss of feed water flow and cavitation of the feed water pump and high pressure pump resulting in continual system shut down due to low feed water flow and pressure. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Horizon Reverse Osmosis warranty.

CAUTION: If the thru-hull fitting is placed in a position on the underside of the hull that allows air to continually enter the thru-hull fitting, this will cause the system to continually shut down due to loss of feed water. The resulting failure of the system to remain in operation is attributed to improper installation, is the liability of the installer, and is not covered by the Horizon Reverse Osmosis warranty.

2. **Sea Cock Valve** ** is used in a ship installation for safety reasons to close the feed water line during repair, maintenance, and disuse of the system.
3. **Sea Strainer** *** has a clear bowl with nylon body filter housing or optional bronze body containing a cleanable monel fine mesh filter screen. The Sea Strainer filters out large particulate matter and suspended particles that would otherwise prematurely foul the cartridge Prefilter Element.
4. **Booster Pump** supplies a positive pressure to the Pre-filters and through to the High Pressure Pump. The Booster Pump has a

performance curve of 70 Ft Head (30 PSI) at 1.0 GPM. The resulting pressure at the High Pressure Pump depends on the final installation configuration.

5. **Plankton Filter** *** This optional filter assembly contains a cleanable ultra fine monel mesh screen. The mesh screen removes suspended solids or biological growth such as plankton. It also provides longer life to the Pre-filter Elements and in turn provides lower system maintenance costs.
6. **Pre-Filter** This filter removes suspended solids 5 Microns and larger to protect the Reverse Osmosis Membrane from fouling.

CAUTION: Do not use third party prefilter elements, use only Horizon Reverse Osmosis prefilter elements. Third party prefilter elements do not properly fit and the seams fall apart. They also allow by-pass resulting in premature fouling of the R.O. Membrane Element.

CAUTION: Do not use "string wound" or "fiber" prefilter elements. These types of elements are designed for the Photographic Film Developing Industry. When used in sea water, they will plug up rapidly in 1/10th or less the time. This will cause frequent shut downs of the system and very frequent changing which will result in very high cost of maintenance.

7. **Low Pressure Gauge** displays the Inlet Pressure to the High Pressure Pump. The gauge assists the operator in diagnosing the Sea Strainer, Booster Pump, Plankton Filter Element, and Pre Filter Element condition.
8. **Low Pressure Switch** shuts the system off automatically when a plugged filter element or other condition causes a low flow situation. This protects the High Pressure Pump, the R.O. Membrane Element, and the Booster Pump from damage.

B. PRESSURIZATION SUBSYSTEM:

Proper pressure and proper flow across the Membrane Element are two basic requirements of Reverse Osmosis. Refer to Chapter 8 for Salinity and Temperature adjustments.

9. **Future Reference**

10. **High Pressure Pump Motor** is directly coupled to the High Pressure Pump.
11. **High Pressure Pump** is a marine quality, positive displacement, ceramic plunger pump with a 316 stainless steel manifold.
12. **High Pressure Hose**, HP Pump Outlet to MVA Inlet, transfers pressurized sea water from the High Pressure Pump to the inlet of the R.O. Membrane Element.
13. **R.O. Membrane Element & Vessel.** The Membrane Element allows potable water molecules to pass through while rejecting the salt ions. Only a small percentage of the Seawater Feed becomes fresh Product Water. The remainder carries the rejected salt ions out of the R.O. Membrane Element in a concentrated brine stream.

C. BRINE DISCHARGE SUBSYSTEM:

This section of the system carries the Brine Discharge exiting from the R.O. Membrane Element.

14. **High Pressure Hose**, MVA Outlet to inlet of manifold, transfers pressurized Brine Discharge Water from the Membrane Vessel Assembly to the Control Manifold Assembly.
15. **High Pressure Gauge** displays the R.O. Membrane Vessel outlet pressure.
16. **High Pressure Switch** automatically turns the system off in case of over-pressurization during operation.
17. **Back Pressure Regulator** By turning the valve adjustment handle clockwise and counterclockwise, pressure is increased and decreased accordingly. This increases and decreases the production of the R.O. Membrane Element.
18. **Thru Hull Discharge Fitting** ** should be installed above water level for discharge of the Brine Discharge Water from the system.

D. PRODUCT WATER SUBSYSTEM:

This section of the system gives a visual indication of the clarity, quantity, and quality of the product water. Post Filtration is the final step in Product Water quality control. The Post Filtration Subsystem is designed to limit unpleasant odor and taste, as well as sterilize biological matter, which may have passed through the R.O. Membrane Element.

19. **Temperature Compensated Salinity Probe** electronically determines whether the salinity content of the Product Water is acceptable. This Salinity Probe is temperature compensated and provides an accurate measurement of Product Water quality.
20. **Flow Meter, Product Water** measures the rate of Product Water flow, in gallons and liters per hour. It measures from the R.O. Membrane Element toward the Product Water Post Filtration Components.
21. **3-Way Product Water Diversion Valve, Electric Solenoid Actuated**, the Controller energizes this valve to the "Potable" position when the system produces water which meets the low salinity requirement. If the Product Water being produced is "Un-potable", high in salinity, then no signal is sent to the valve, and it thus remains in the normal open position. The "fail safe" normal open position diverts the un-potable Product Water to discharge.
22. **Charcoal Filter** *** is designed to remove foul odors from the Product Water. Sulfurous odor (rotten eggs) is caused when decaying biological matter in the feed water section. Fresh water flushing of the system helps to minimize this.
23. **Ultra Violet Sterilizer***** destroys at least 99.9% of any virus, bacteria, and other micro-organisms which may pass through the R.O. Membrane Element. The U.V. sterilizer is recommended if the Product Water Storage Tank is not otherwise treated by means such as chlorination.
24. **Potable Water Storage Tank**** may be any container suitable for storing Potable Water, i.e. existing water storage tank.

25. **pH Neutralizer Filter***** The product water from the system will be slightly acidic. The pH Neutralizer Filter neutralizes the pH of the product water.

E. FRESH WATER FLUSH SUBSYSTEM:

Consists of supplied valves and required tank or container for the cleaning, rinsing, or storage of the R.O. System.

26. **Fresh Water Flush System***** (including charcoal filter and solenoid valve) automatically flushes the system with fresh water. This process is automatic at each shut down of the system and repeats automatically every 7 days. Fresh Water Flushing replaces the seawater in the system with less corrosive fresh water, and this also reduces the biological decay as well as biological growth that naturally occur if the feed water (sea water) is not flushed from the system with fresh water.

27. **Fresh Water Flush Check Valve Assembly ***** included with the Fresh Water Flush Optional Assembly, isolates the Fresh Water Flush system which prevents seawater from flowing in the reverse direction through the Charcoal Filter.

28. **Future Reference**

29. **Inlet Rinse Clean Valve ***** (optional) used in conjunction with the Discharge Rinse Clean Valve [31] simplifies the storage and cleaning procedures by allowing the operator to turn a valve rather than disconnect a hose. Also used for a manual fresh water flush if the Automatic Fresh Water Flush System [25] is not installed.

30. **Discharge Rinse Clean Valve ***** (optional) used in conjunction with the Inlet Rinse Clean Valve [30] simplifies the storage and cleaning procedures by allowing the operator to turn a valve rather than disconnect a hose.

F. ELECTRONIC SUBSYSTEM:

This subsystem measures water quality, controls the direction of Product Water flow, Starts and Stops the pumps, and contains the central electrical connection point of the system. It also ensures only potable Product Water passes into the Product Water Storage Tank.

31. **Salinity Controller** The controller monitors the salt content of the product water and signals the 3-Way Product Diversion Valve when Potable Water is being produced. The 3-Way Product Diversion Valve, Motors, Remote Control and U.V. Sterilizer are each governed by this controller. This enclosure houses the high-voltage components of the system. It serves as the connection point for all the electrical systems such as the motors, switches, valves, and the controller.

32. **Remote Controller ***** (optional) allows for remote monitoring and/or controlling of the system.

G. ADDITIONAL EQUIPMENT:

Soft Start*** The soft start, used only in AC (Alternating Current) Single Phase systems reduces the initial startup amperes required to start the motor and in turn allows a smaller sized KW generator to start the system.