

OWNER'S MANUAL

DB SERIES

Manual Control, Modular Installation



SK WATERMAKERS

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WARNINGS

1. SK Watermakers recommends installation by a qualified marine dealer or technician.
2. The desalination process operates under high pressure and serious damage or bodily harm could occur if not properly installed. Immediately shut down the system if leaks occur.
3. Please read this manual in its entirety before installing or operating your system.
4. Your system was tested at the factory under simulated seawater conditions as well as pressure tested to ensure integrity against leaks. During transportation there is potential for fittings and components to shift and possibly create leaks. Be sure to check the system thoroughly during the initial start-up, and make appropriate adjustments.
5. Do not allow the pumps to run dry.
6. Turbid water and oily water will shorten the life of the system. Operate in clean water where possible and keep pre-filter cartridges clean.

PACKING LIST

Included with system:

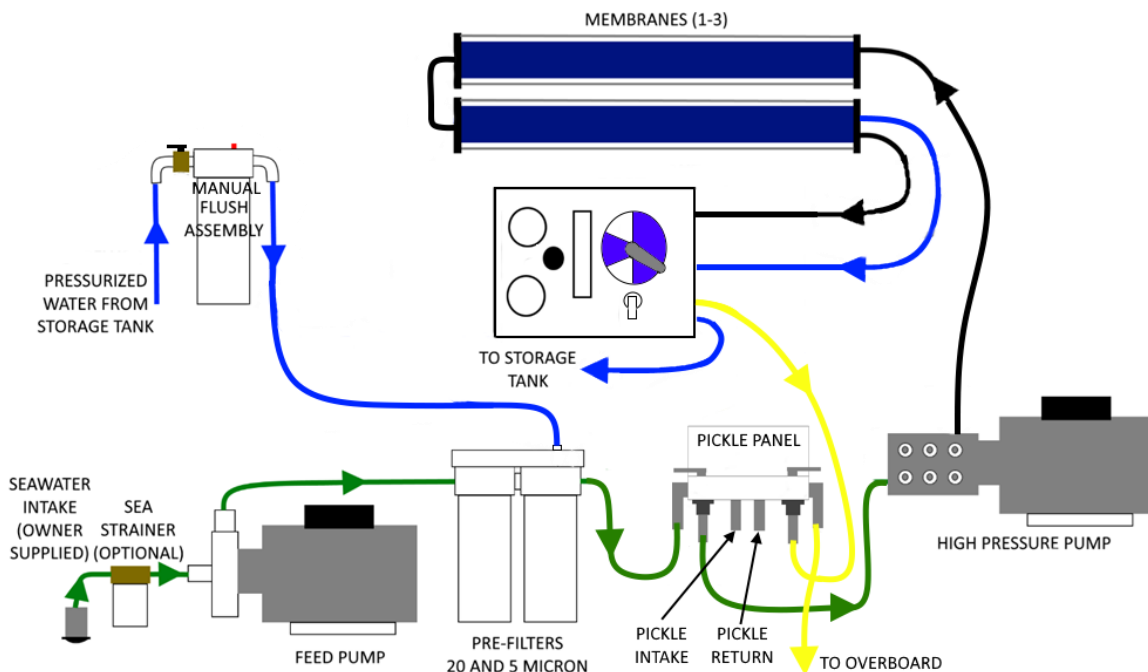
- DB Series control panel
- High Pressure pump assembly
- Membrane rack
- Feed Pump
- Pre-filter assembly
- Pickle Panel
- Flush assembly
- Filter wrench
- (2) 6 foot high pressure hoses
- Manual

Not included with system:

- Thru-hull/Seacock
- Strainer
- Electrical wiring
- Breakers/switches
- 3/8" braided hose or poly tubing
- 1/2" braided hose
- 3/4" braided hose
- Fasteners

INSTALLATION

1. Find a suitable location for the installation of modular components. Locate the pieces in an area with sufficient room to make electrical and water connections.
2. Mount the DB series panel to a solid vertical location.
3. Secure the high pressure pump assembly to a solid, level surface using the rubber anti-vibration mounts.
4. Find a location for the feed pump. The feed pump needs to be securely mounted low in the vessel, near the thru-hull and below the waterline. The feed pump is required to move seawater from the thru-hull to the pre-filters and pickle panel, and on to the unit. Locate the feed pump in the closest reasonable position between the thru-hull and the unit, with the least amount of bends in the plumbing. Bends and length contribute to head loss and effects the efficiency of the pump.
5. Find a location for the membrane rack. The membrane rack should be within 6 feet of the high pressure pump and DB series panel as (2) 6 foot high pressure hoses are supplied with the unit. Longer or customer hoses can be purchased from SK Watermakers. The membrane rack may be mounted vertically or horizontally, whichever works best for your installation and ease of maintaining the membranes.
6. Find a location for the pre-filter assembly. Refer to flow diagram below for general hydraulic schematic. Locate and securely mount the pre-filter assembly in a convenient location for cartridge removal and replacement. Leave enough room to use the filter wrench to remove the sumps and cartridges.
7. Locate the flush assembly in a location where pressurized clean water is available. The flush assembly uses fresh water produced by the unit and stored in the storage tank. When the unit is shut down after normal operation, manually open the valve on the flush assembly for 5 minutes to flush the unit with clean water. The flush system uses a carbon block cartridge to remove any chlorine that may have been added to the storage tank. Chlorine and other disinfectants will damage the membranes.
8. Connect all of the pieces as shown on the flow diagram below.



WATER CONNECTIONS

1. This watermaker requires 3/4" reinforced hose for the incoming water. This should be used for your connections from the thru hull to the strainer, then to the feed pump and on to the pre-filter on the side of the watermaker. It is recommended the feed pump be as close to the watermaker as possible.
2. Use 3/4" reinforced hose for the concentrate water going from the watermaker to waste or overboard.
3. Use 3/8" reinforced hose or poly tubing for the permeate water going from the watermaker to your holding tank.
4. Use 3/8" poly tubing for your fresh water coming from a pressurized source to the carbon block filter on the side of the watermaker for flushing.

CRANKCASE PRESSURE

Replace the RED transport crankcase plug with the VENTED crankcase plug. Failure to do so can cause crankcase seals to fail.

SETTING HIGH PRESSURE RELIEF VALVE

The system has a pressure relief valve for protection against over-pressurization during operation. This valve is set at 850 psi during the factory test procedure. Occasionally, there may be a need to adjust the valve. Follow these steps to adjust the valve:

1. Using a 1" open end wrench, loosen the lock nut completely
2. With the system operating, tighten or loosen the spring-loaded adjustment nut (using the 1" open end wrench or a 1" deep socket) while watching the high pressure gauge and adjusting the control valve until you find the point at 850 psi that the high pressure blows off to waste.
3. Lock the spring-loaded adjustment nut in place by tightening the lock nut against it.

OPERATING INSTRUCTIONS

1. Before starting the unit, back off (counter-clockwise to the left) the pressure control valve on the DB Series control panel.
2. Start the feed pump (owner supplied switch).
3. Ensure a minimum 5 psi pressure on the low pressure gauge. If minimum 5 psi pressure cannot be maintained, check the feed pump, pre-filters, hoses, thru-hull seacock, etc. for blockages.
4. Start the high pressure pump (owner supplied).
 - a. The high pressure pump will circulate water through the system.
 - b. After a few moments, SLOWLY increase pressure to the system by turning the pressure control valve clock-wise on the DB Series control panel. Increase to about 650-700 psi.
 - i. This pressure will force seawater to permeate the membranes and produce fresh water.
 - ii. Use a handheld TDS meter (available from SK Watermakers). You can divert high TDS water via the sample port on the front of the DB Series control panel.

NOTES: seawater is normally around 34,000 ppm TDS, drinking water is normally around 150 ppm TDS, you want the water to be below 500 ppm TDS for consumption, which is the acceptable upper limit of TDS.

- c. When TDS is below 500 ppm, move the sample port selector lever to tank and fresh water will flow to the storage tank.
- i. The system has a high pressure protection feature. There is a pressure relief valve that will blow off (to waste) if high pressure should exceed 850 psi.
- NOTES: normal operating pressure will be 700 – 800 psi, you want to adjust your pressure to make the specified production rate, measured by the PRODUCT WATER flow meter.

Model	PRODUCT WATER flow meter should read
600 GPD	25 GPH
1000 GPD	42 GPH
1500 GPD	62 GPH

5. On initial start-up, or start-up after pickling or cleaning, dump the first 15 minutes of fresh water production.
6. Shut down – when ready to shut the system down, turn off your high pressure pump first, followed by the feed pump.
7. Manually activate the flush system by opening the valve on the flush filter housing for 5 minutes. The flush system uses produced fresh water to flush the system. The supply of stored fresh water needs to be pressurized.
8. Recommended flush, pickling, and clean timetables:

Timeframe	Action
Less than one week	No action needed
One week or more	Manually operate the flush system for 5 minutes.
Shut down for extended periods	Pickle the system with Sodium Metabisulfate
Production quality or quantity not optimal	Clean membranes with membrane cleaners <ol style="list-style-type: none"> 1. Alkaline cleaner first for organics 2. Acid cleaner second for scale
Cleaners and sodium metabisulfite are available at skwatermakers.net	

MAINTENANCE

1. Filter cartridges - visually inspect your pre-filter cartridges on a regular basis. If they are dirty or feed pressure has dropped, they may need to be cleaned or changed.
2. Pump oil – change the first time after 50 hours of use. Subsequently, change the oil every 500 hours.
3. Membranes – if production drops off or TDS rises to or above 500 ppm TDS, the membranes may need to be replaced. Try cleaning first using alkaline and acid cleaners but if that doesn't work, replace your membranes.

NOTES: out at sea, seawater is typically fairly clean – just salty, with proper maintenance the membranes should be good for 3 – 5 years. Using the watermaker in silty water such as harbor or shallow water will shorten membrane life dramatically.

DO's and DON'Ts

DO:

1. Lower control valve pressure before stopping and starting
2. Operate the system at lower pressure in brackish water (stay within GPH rating on chart above)

DON'T:

1. Operate the watermaker in oily or silty water.
2. Let the membranes dry out or freeze.
3. Share the thru-hull with other devices.
4. Operate under low or varying voltages.

WARRANTY

1. SK Watermakers warrants machine workmanship and parts for one year from the original date of shipment, with the exclusion of the membranes – there is no warranty on membranes.
2. All systems are pressure tested under simulated seawater conditions at the factory before shipping and test results will be provided if requested.
3. All shipments must be inspected within 7 days of receipt and SK Watermakers needs to be notified as soon as possible of any shipping issues.
4. All shipments are FOB Jacksonville Florida, USA, and it is Customer's responsibility to file any claims with freight companies. SK Watermakers will assist in such claims to the best of our ability.
5. Any warranty claim for workmanship or parts must be approved in advance by SK Watermakers before any disposition is determined.
6. Customer is responsible to return any part that may be eligible for warranty reimbursement or replacement.
7. All replacement product is invoiced and payment collected at time of shipment.
8. Upon receipt and inspection of returned item(s), Customers account will be credited if item is deemed defective.
9. There are no other expressed or implied warranties.
10. SK Watermakers does not pay for repair services without authorization. In cases where Customer is authorized to provide labor to diagnose, repair and/or replace defective components on SK Watermakers behalf, prior authorization to perform such work is required.