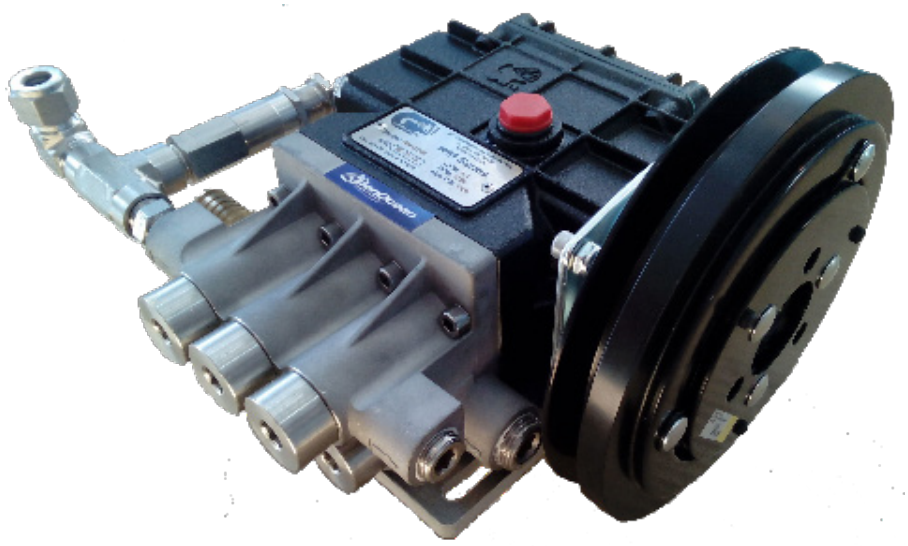
OpenOcean water.

Open Ocean Modular Water • Quencher Series

QUENCHER
Engine Drive

User Manual and Installation Guide



September 2026

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OpenOcean water.

1. Welcome

Thank you for purchasing an Open Ocean watermaker. Your Quencher Engine Drive system has been designed, built and tested in New Zealand, and most spare parts can be sourced worldwide.

Please read this guide in full before you begin installation. If anything is unclear, or you have feedback that could help us build a better product, contact us any time — details are on the back cover.

2. Components

Your Engine Drive System is made up of the following.

- Membranes — 1, 2 or 3
- Boost pump
- High pressure pump / motor
- High pressure hose (5 m)
- Seawater filter, 5 micron
- Seawater filter, 20 micron (option)
- Spare 5 micron filter
- Charcoal filter
- Operating panel
- Sample/test valve
- Sodium metabisulphite (for pickling)
- Operation & installation manual
- Quick start instructions (laminated)
- Auto flush (option)
- Offshore spares kit (option)

3. System Overview

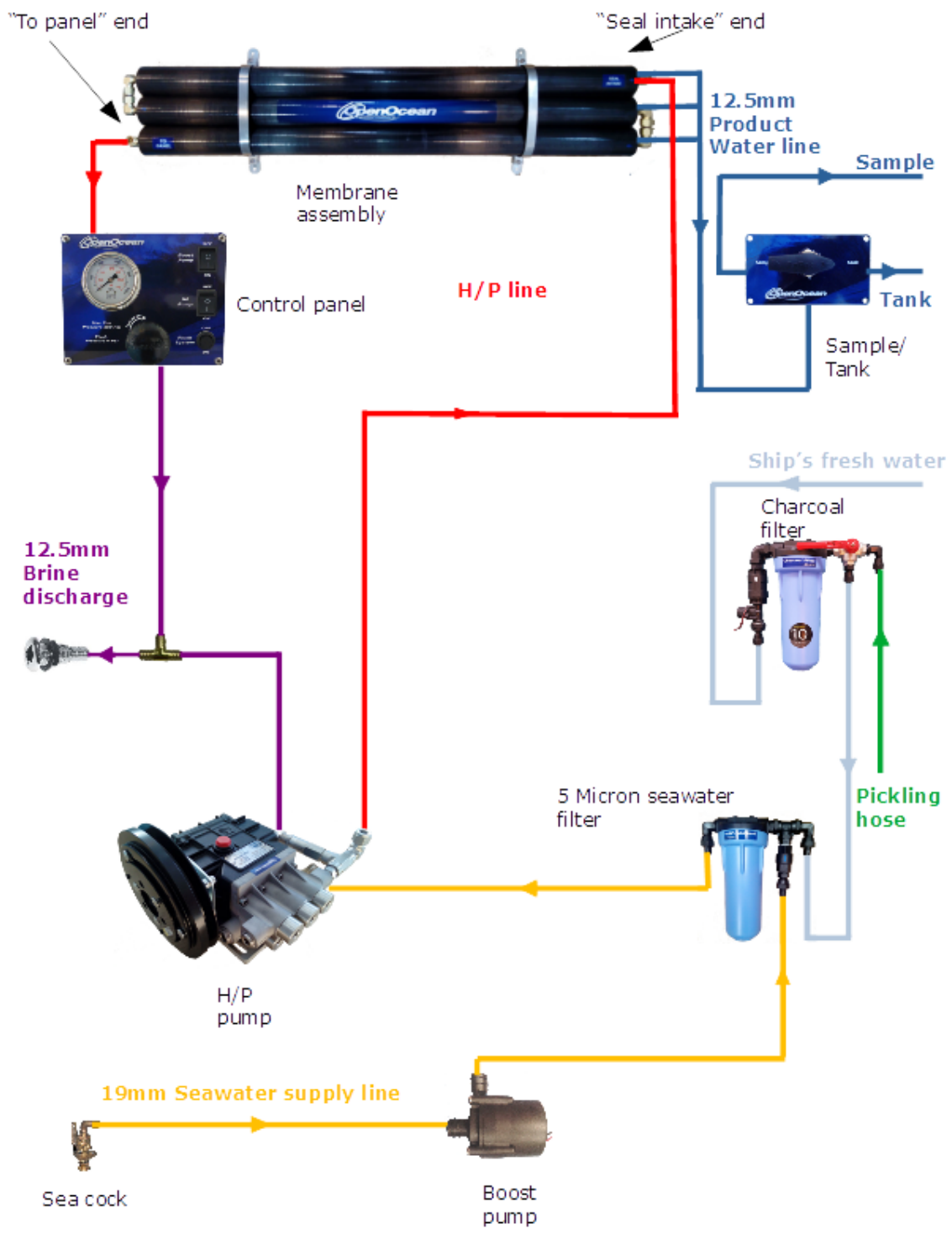
Seawater is drawn in through the boost pump and seawater filter, then pressurised by the high pressure pump and forced through the membrane assembly. The membrane separates the feed into two streams: purified product water, which is routed to the sample/tank valve, and concentrated brine, which is discharged overboard. The diagram below shows how the major components connect.

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5. Component Schematic



KEY

Red	High pressure lines
Yellow	Sea water
Purple	Brine discharge
Light blue	Ship's fresh water
Blue	Product water
Green	Pickling Hose

6. Before You Begin

Read this installation guide all the way through before starting work. Plan the location of every component first — several parts need regular access for cleaning and servicing, and the high and low pressure lines are easier to route if the full layout is mapped out in advance.

REGISTERED ELECTRICIAN

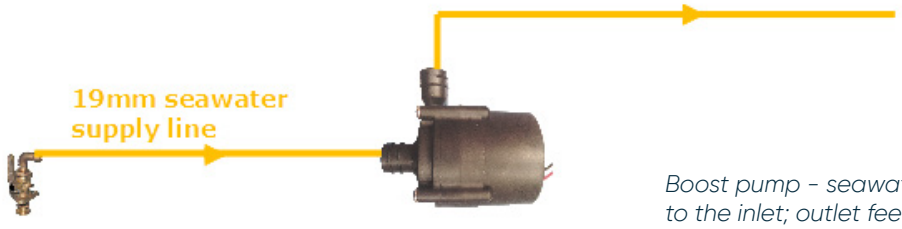
Open Ocean Ltd strongly recommends that a registered electrician carry out all wiring, and that all work complies with your local electrical rules and regulations.

7. Component Installation

Please read the installation guide all the way through before starting your installation

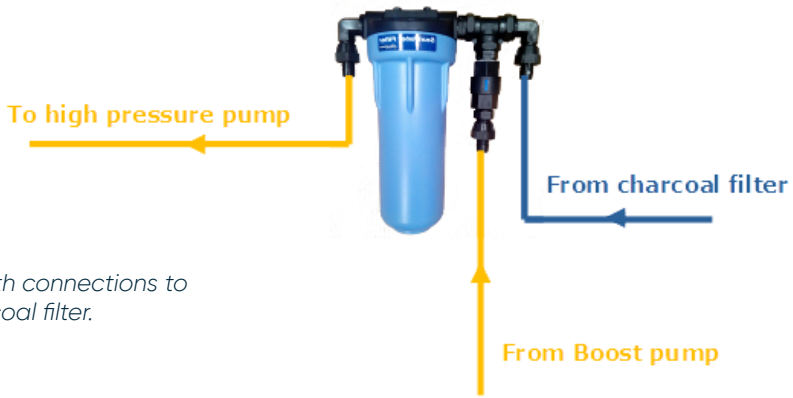
7.1 Boost Pump & Seawater Filter

- Mount the boost pump below the waterline, with its outlet facing up. The thru-hull can share an intake with other equipment, but never with the engine's raw-water intake or with another positive-displacement pump. Position the thru-hull so that air cannot be drawn into the system while underway.



Boost pump - seawater supply line connects to the inlet; outlet feeds the seawater filter.

- Install the seawater filter housing somewhere convenient and accessible, such as a cockpit locker — bear in mind the area will get wet whenever the filter is changed. Leave at least 50 mm of clearance below the housing so the filter element can be removed, and plan for frequent access.



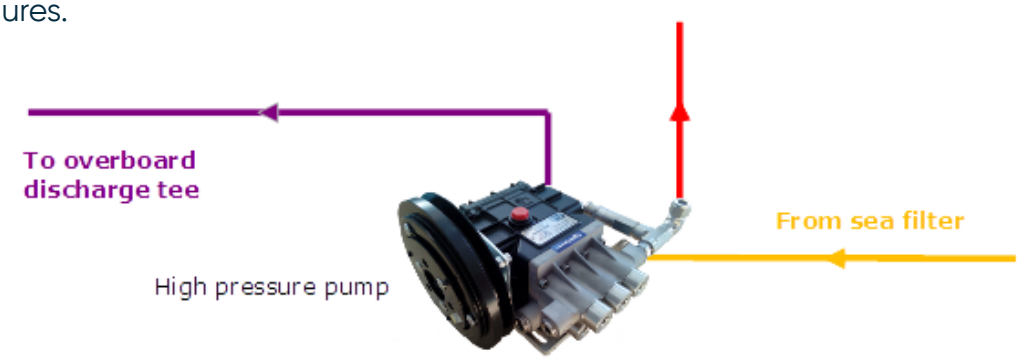
5 micron seawater filter, with connections to the boost pump and charcoal filter.

Component Installation Continued...

Please read the installation guide all the way through before starting your installation

7.2 High Pressure Pump & Membrane Assembly

- The high pressure pump mounts directly on the engine, using either the optional base slide plate or the optional pivot plate. Full dimensions, mounting hole spacing and the pulley/engine-speed reference table are in section 9, Engine Drive Pump – Facts & Figures.



High pressure (H/P) pump – seawater in from the filters, high pressure line out to the membranes, discharge to the overboard tee.

- The membrane element is sealed inside its housing by end caps at both ends, with a small amount of pickling solution inside to keep it moist. Install and commission your watermaker as soon as possible after unpacking it.

FRAGILE END-CAP FITTINGS
Do not knock the end-cap fittings while installing the membrane housing – impact damage here is easy to cause and can be costly to fix.

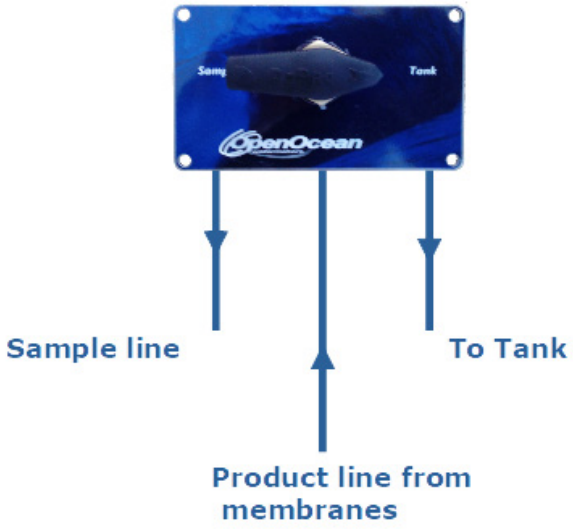
- The housing is normally mounted horizontally. If it must be mounted vertically, orient it with flow running upward – the 'to panel' end up – and leave at least 50 mm clearance at each end for hoses and fittings. The end marked 'seal intake' connects to the high pressure pump. Secure the housing using the stainless steel mounting brackets provided.



Membrane housing assembly – 'seal intake' end (right) connects to the H/P pump; 'to panel' end (left) sends high pressure water to the control panel.

7.3 Sample/Tank Valve & Control Panel

- Mount the sample/tank valve near the sink or another test point for product water. Flush-mount it by cutting a 110mm x 55mm opening with an 8mm corner radius, or surface-mount it with the optional Open Ocean standoff kit.



Sample/tank valve — product line in from the membranes, out to Sample or Tank.

- The control panel can be flush-mounted — cut a 180mm x 145mm opening with an 8mm corner radius — or surface-mounted using the optional Open Ocean standoff. Choose a location that's easy to reach both underway and at anchor.



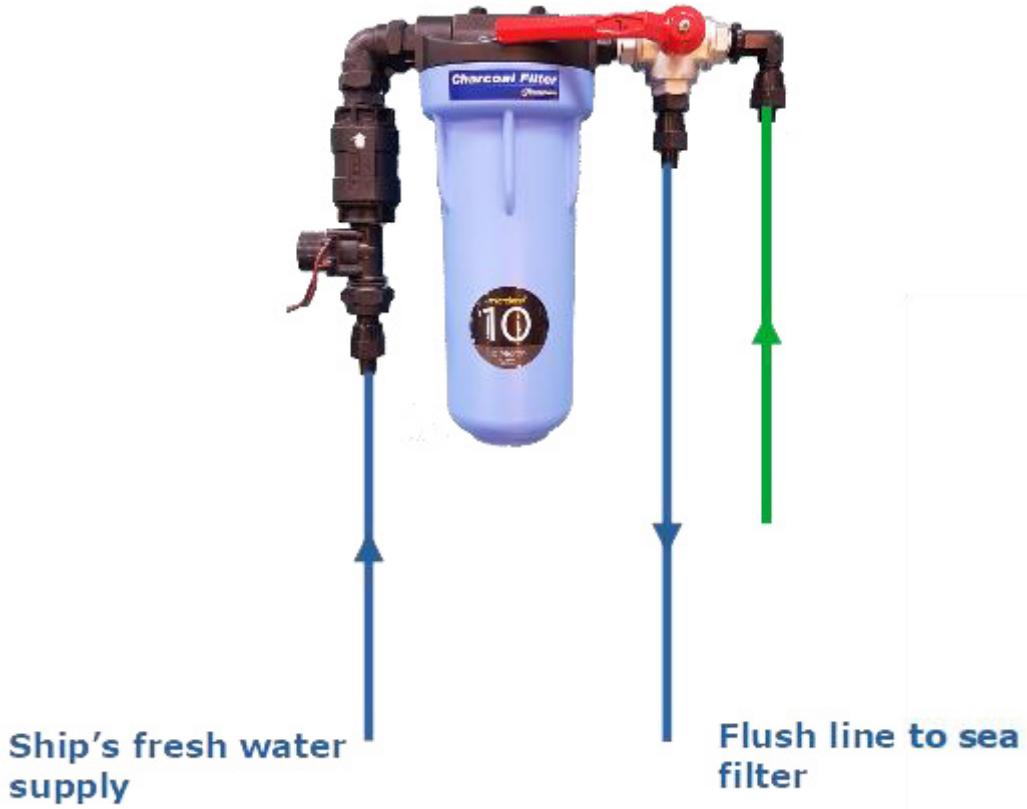
Control panel — H/P from the membranes (left); low-pressure discharge to the overboard tee (right).

Component Installation Continued...

Please read the installation guide all the way through before starting your installation

7.4 Charcoal Filter & Pickling Line

- Install the charcoal filter somewhere convenient and accessible, leaving at least 50mm of clearance below it for filter removal. Replace the charcoal filter cartridge every six months.
- Run a 12.5mm reinforced potable water hose from the boat's pressurised cold water system to the charcoal filter solenoid valve. For a semi-automatic flush, wire the solenoid valve back to the control panel's flush switch (section 7.8). For a fully automatic flush system, follow the wiring diagram in section 7.8.
- The right-hand hose barb on the charcoal filter's selection valve is the pickling side – when pickling the system, connect a length of hose here and run it to a bucket of pickling solution.



Charcoal filter and pickling valve.

SELECTOR HANDLE POSITION
The red selector handle is vertical for pickling and horizontal for normal watermaking.

7.5 Low Pressure Lines

Sea water supply — 19mm reinforced potable water hose

- Run a line from the seacock to the boost pump.
- Run a line from the boost pump outlet to the non-return valve on the seawater filter.
- Run a line from the seawater filter outlet to the high pressure pump inlet.

Product water line — 12.5mm reinforced potable water hose

NO SHUT-OFF VLAVES
Do not fit shut-off valves anywhere in the product water line.

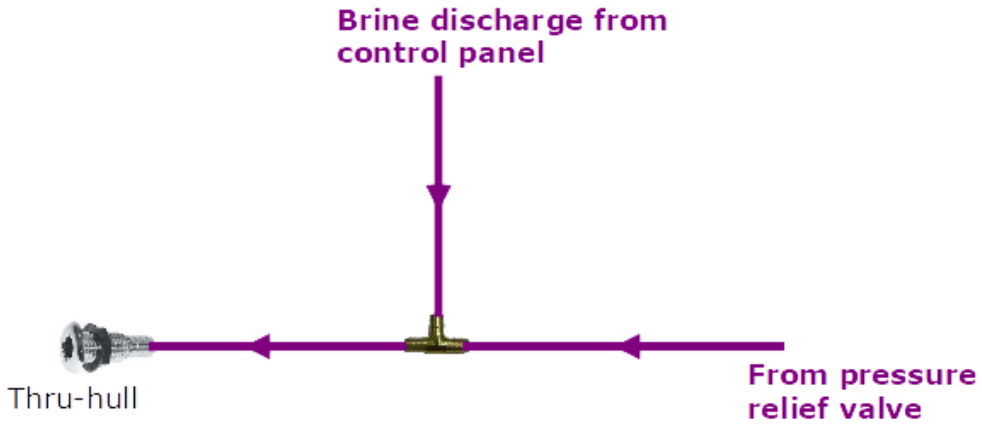
- Run a line from the product water outlet on the membrane housing end cap to the inlet at the back of the sample/tank valve.
- Run a line from the sample fitting to the sample point — typically a dedicated, free-flowing spout at the galley sink with no shut-off valve.
- Run a line from the tank fitting on the sample/tank valve to the freshwater tank.

NEVER LEAVE THE VALVE MID-POSITION
The sample/tank valve must always be set fully to 'Sample' or fully to 'Tank' — never left in between.

7.6 Overboard Discharge

Discharge lines use 12.5mm reinforced water hose.

- Run a line from the pressure relief valve on the high pressure pump to a tee fitting.
- Run a line from the discharge fitting on the control panel to the tee fitting.
- Run a line from the tee fitting to an overboard thru-hull.



Overboard discharge — brine from the control panel and the pressure relief valve join at a tee fitting before the thru-hull (see the component layout diagram in section 2).

- Use a 12.5mm thru-hull above the waterline, positioned somewhere easy to see for troubleshooting. Plumbing into an existing discharge thru-hull is also an option.

Component Installation Continued...

Please read the installation guide all the way through before starting your installation

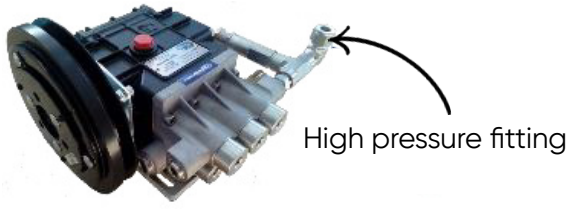
7.7 High Pressure Lines

- The high pressure line is a high pressure tube inside a 16mm anti-chafe hose. Secure it firmly along its entire length with saddles to prevent vibration and harmonics, and always clean the tube after cutting to keep particles out.
- There are two high pressure lines to run: from the high pressure pump to the membrane housing ('seal intake' end), and from the membrane housing ('to panel' end) to the control panel.
- The membrane housing's high pressure fittings have plastic plugs fitted temporarily to contain the pickling solution – open each fitting and carefully remove the plug before connecting the lines.
- The high pressure body fittings on the membrane housing end caps rotate through 360° and will feel loose – this is normal. Hand-tighten the body fitting several turns until you feel slight resistance, then back it off to the position you need.

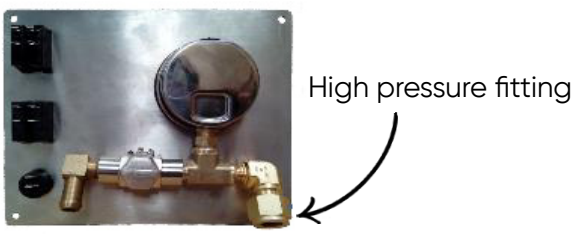
NEVER USE A SPANNER ON THE END CAP
Never tighten the fitting into the end cap with a spanner – hand-tight only.

Assembling each of the four high pressure fittings:

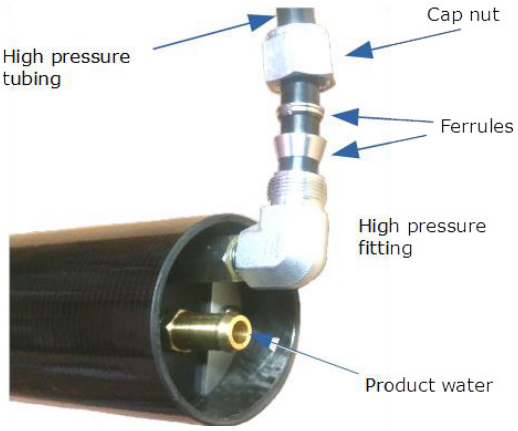
1. Slide the cap nut onto the tubing.
2. Slide the small ferrule onto the tubing, wide cone facing the nut.
3. Slide the large ferrule onto the tubing, wide cone facing the nut.
4. Slide both ferrules up to the nut.
5. Insert the tubing into the connector on the fitting body.
6. Pull the cap nut down until its threads meet the threads on the fitting body.
7. Tighten the cap nut hand-tight, then mark a flat on the nut as a reference point.
8. Using two spanners – (one on the nut and one on the fitting body).
   Tighten exactly one full turn from the marked position. Do not over-tighten.



High pressure fitting on the H/P pump.



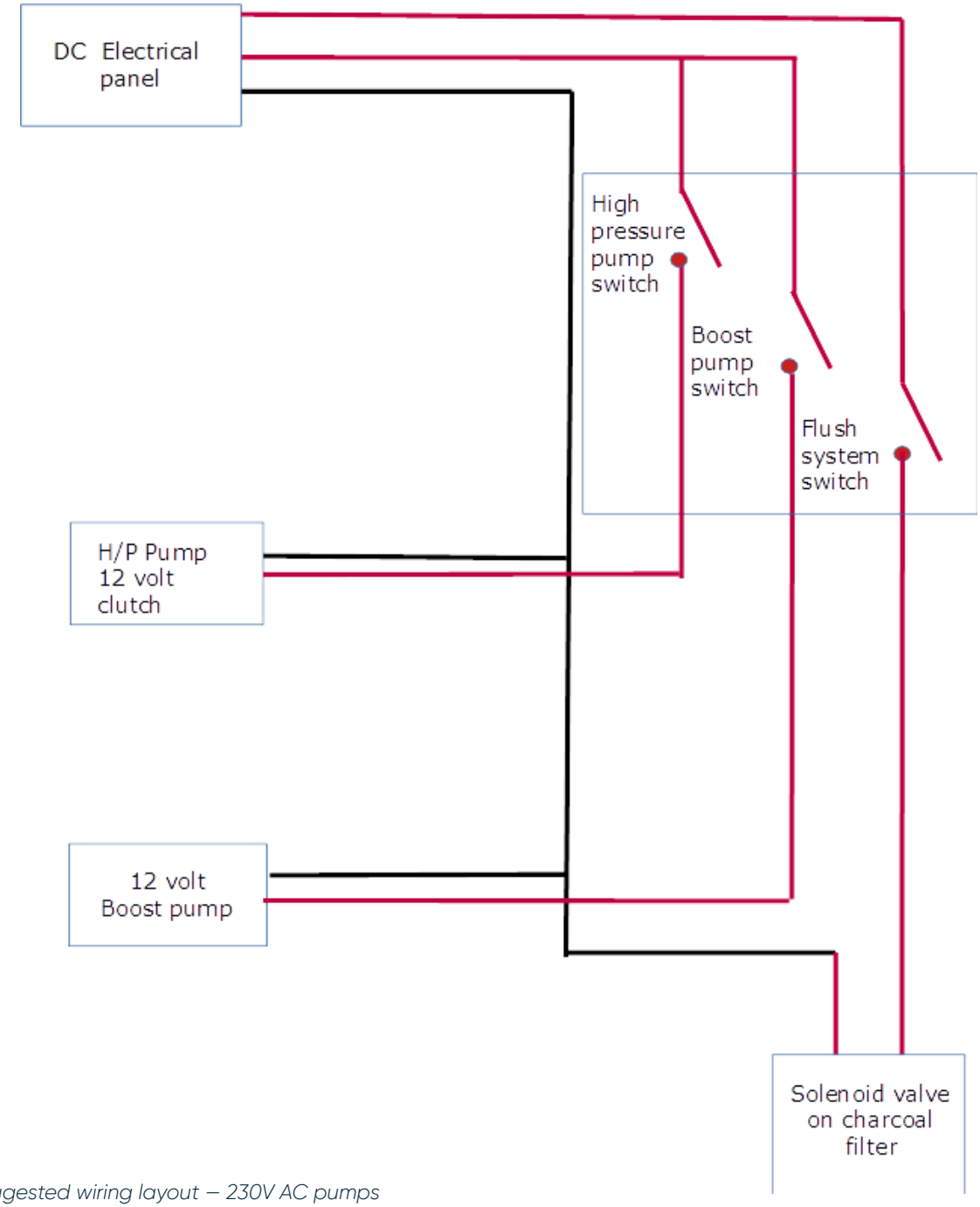
High pressure fitting on the control panel.



High pressure fitting assembly at the membrane housing.

7.8 Electrical Wiring

- The high pressure pump uses a 12 volt DC clutch, switched from the control panel alongside the boost pump and flush system.



Suggested wiring layout — 230V AC pumps switched via relays from the DC control panel.

Registered Electrician

All wiring must comply with your local electrical rules and regulations. Open Ocean Ltd strongly recommends using a registered electrician to wire your watermaker.

Component Installation Continued...

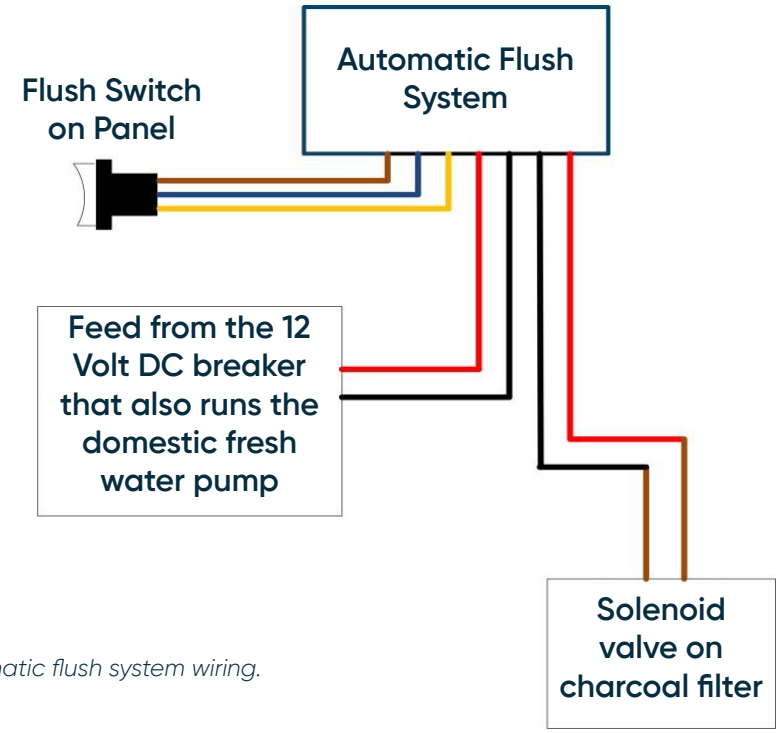
Please read the installation guide all the way through before starting your installation

7.9 Optional Automatic Flush System

- The solenoid valve on the charcoal filter is controlled by the automatic flush module, wired to a three-position flush switch:

Switch Position	What it does
Up (momentary)	Springs back to centre and starts a single flush cycle.
Centre (off)	The flush system is off.
Down (on)	The automatic flush module flushes the system once a week.

- Wire the automatic flush module to share a circuit with the fresh water pump – this circuit must stay on for the module to operate.



Optional automatic flush system wiring.

8. Operation

8.1 Start Up

Before you start

- The 5 micron filter is installed in the seawater filter housing.
- The pickling valve is in the horizontal position.
- The pressure regulating valve is in the no-pressure setting – turned fully anticlockwise.
- The sample/tank valve is turned to 'Sample'.

NEVER LEAVE THE VALVE MID-POSITION
The sample/tank valve must always be set fully to 'Sample' or fully to 'Tank'.

Startup sequence

1. Turn on the boost pump and wait 30 seconds.
2. Turn on the high pressure pump. Check for a steady stream of water from the overboard discharge, then wait two minutes to let any remaining air clear from the system and membrane.
3. Slowly turn the pressure regulating valve clockwise while watching the gauge. Bring the pressure up to 700 psi, then pause to let the system stabilise. If the pressure fluctuates, there is likely air in the system — back the pressure off and let it purge through the discharge.
4. Increase the pressure to 800 psi.
5. Allow at least 60 seconds before testing product water quality at the sample outlet.
6. Turn the sample/tank valve to 'Tank', then monitor the system, checking periodically that pressure holds steady at 800 psi.

MAXIMUM PRESSURE
Never allow system pressure to exceed 850 psi.

REDUCED SALINITY WATER
Decrease the pressure when operating in water of reduced salinity, and make sure product water output doesn't exceed the specified rate. Running the membrane outside its limits will severely shorten its life.

8.2 Shut Down

1. Turn the sample/tank valve to 'Sample'.
2. Turn the pressure regulating valve fully anticlockwise. Product water at the sample outlet will stop flowing, and the valve is now ready for next time.
3. Switch off the high pressure pump.
4. Switch off the boost pump.
5. Unscrew the seawater filter housing and remove the filter element. Clean it in fresh water, then fit a clean or new element, refill the housing with water, and hand-tighten it back into place. It's standard practice to keep two filter elements in rotation — one in use, one drying in the sun to sterilise it.
6. Turn on the flush system and run it for two minutes (or one cycle on an automatic flush system) until all seawater has purged overboard. The boat's freshwater pump will run during this process.

FLUSH EVERY TIME
Flush the system after every use. If you won't be using the watermaker for more than 10 days, pickle it or run another flush cycle — see section 9.2.

9. Maintenance

9.1 Maintenance Schedule

Activity	Frequency	Notes
Clean Seawater Filter	After every use	Unscrew the housing, remove and clean the filter in fresh water. Refit, fill with water, and hand-tighten. Keep two elements in rotation, alternating at every clean.
Flush Watermaker	After every use, or every 10 days if not in use	Skipping this will considerably shorten the life of the components and voids the warranty.
Pickle Watermaker	If it will sit unflushed for more than 10 days	See section 9.2.
Check Oil Level	Regularly	Oil should sit halfway up the sight glass on the end of the pump.
Change Oil	Every 200 hours of use	Drain via the plug on the bottom of the pump; refill to halfway up the sight glass with SAE30 non-detergent oil.
Inspect High Pressure Tubing	Every six months	Check for leaks.
Replace Charcoal Filter	Every six months	Fit a new filter cartridge.

PROTECT THE MEMBRANE FROM FREEZING

The membrane must never be allowed to freeze. In freezing conditions, remove it and store it somewhere warm.

9.2 Pickling the System

If you'll be leaving the watermaker unflushed for more than 10 days, pickle the system first. Pickling is always done with no pressure applied.

1. Open the pressure regulating valve fully (turn it fully counter-clockwise).
2. Turn the pickling valve on the saltwater filter to the vertical position.
3. In a large bucket, mix a solution of 10 litres of non-chlorinated water with 100 grams of sodium metabisulphite to create a 1% solution.
4. Place the pickling hose in the bucket.
5. Start the high pressure pump and watch as it draws in the pickling solution. Shut the system down just before the bucket runs dry — never let the high pressure pump run dry.
6. Turn the pickling valve back to the horizontal position.
7. Store the watermaker with the pickling solution retained in the membrane. Before you next use the system, flush it thoroughly (see section 5.2, step 6) to clear the solution from the lines before making water.



Note: Red Handle
-Vertical for Pickling
-Horizontal for making water

Pickling valve and pickling line.

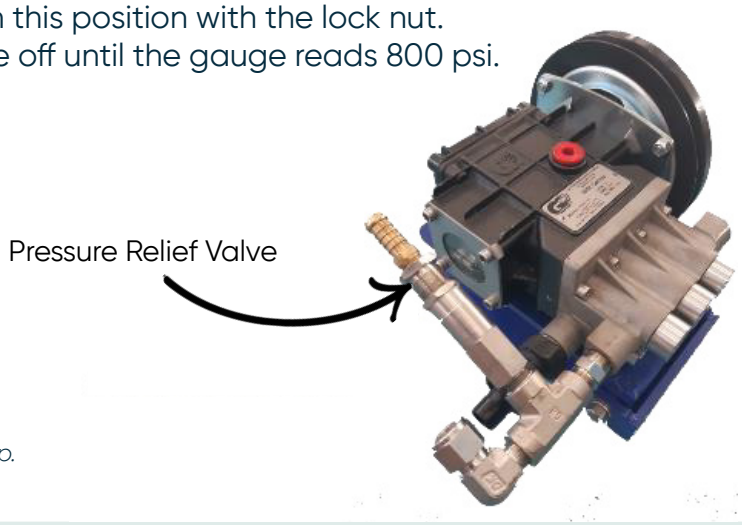
9.3 Setting the Pressure Relief Valve

- The pressure relief valve guards against an over-pressure situation damaging your watermaker. It's located on the high pressure pump.

FACTORY-SET
Open Ocean Ltd sets the pressure relief valve before your system ships. This section is for reference only.

After a few months of use, the spring in the pressure relief valve can weaken. If it does, reset it as follows:

1. Loosen the lock nut located on the pressure relief valve.
2. Turn the barrel anticlockwise until you feel very little pressure on the spring, while keeping the threads engaged.
3. Start the watermaker as per the operating instructions. Slowly turn the pressure control valve all the way in (clockwise) while watching the gauge on the operating panel — it must not rise above 500 psi. If it does, turn the pressure relief valve on the high pressure pump anticlockwise.
4. Slowly turn the pressure relief valve clockwise while watching the gauge, until the pressure reaches 1050 psi.
5. Lock the pressure relief valve in this position with the lock nut.
6. Back the pressure control valve off until the gauge reads 800 psi.



Pressure relief valve, on the high pressure pump.

9.4 Replacing the Membrane Element

Seawater reverse osmosis membranes typically last 4–8 years, depending on usage, water quality, environmental extremes, and exposure to chlorine and other chemicals. Open Ocean uses standard 40" x 2.5" membrane elements, available from Open Ocean or from membrane suppliers worldwide.

You'll need: a large Phillips screwdriver, a mallet or hammer, a short stick, a long stick (such as a broom handle), two adjustable spanners, Teflon thread tape, food-grade silicone grease, and an extra pair of hands.

Removing the old element

1. Remove the high pressure lines from the membrane housing assembly — undo the cap nuts and pull the tubes from the fittings.
2. Remove the product water hose from its fitting.
3. Remove the membrane housing assembly from its mounting and lay it horizontally on your work area.
4. Remove the stainless steel (S/S) keepers from the 'to panel' end cap.
5. Hold a hose to the high pressure fitting on the 'seal intake' end cap. Turn on the hose and use your fingers to block the holes in both end caps — this pushes the 'to panel' end cap out. Set it aside.
6. Pull the element out of the membrane housing.
7. Remove the S/S keepers from the 'seal intake' end cap.
8. Insert the stick into the housing and tap out the 'seal intake' end cap.

Installing the new element

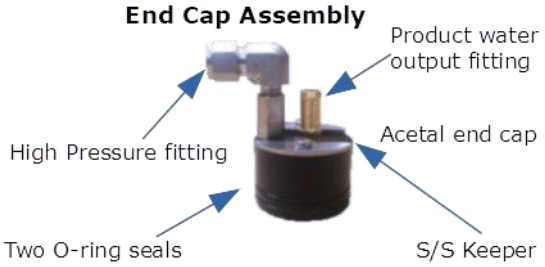
1. Unwrap the new membrane element and apply a thin smear of silicone grease to the O-ring seal. Stand the housing on a folded towel with the 'to panel' end down.
2. Insert the element into the housing with the O-ring seal facing up. When the O-ring is about 250mm from the top of the housing, let go — it should drop so the O-ring seal sits past the keeper slot. Confirm the O-ring is well seated, and centre the element in the tube.
3. Remove all fittings from both end caps and apply a thin smear of silicone grease to the O-rings, inside and out, on each end cap.
4. Orient the end caps with the high pressure ports toward the decals and parallel to each other. Tap them in with the mallet, stopping just past the keeper slots.
5. Reinstall the keepers.
6. Remove old thread tape from the product water fitting and the plug, wrap with fresh tape, and reinstall. Do not over-tighten.
7. Apply a thin smear of silicone grease to the high pressure fittings' O-rings. Hand-tighten the body fitting several turns until you feel resistance, then back off to the desired position. Never tighten the fitting into the end cap with a spanner.
8. Remount the membrane housing assembly and reconnect the high pressure tubes and product water hose.

COMMISSIONING A NEW MEMBRANE ELEMENT

Run seawater through the system for 10 minutes with the pressure off. Then bring the system up to pressure and run for 15 minutes, discarding the sample water.



Membrane element, with O-ring seal.



End cap assembly – high pressure fitting, O-ring seals, product water outlet and S/S keeper.

10. Troubleshooting

Problem	Possible Cause	Remedy
Boost pump isn't pumping water	No power to the pump	Check that fuses and circuit breakers are on and in good order.
	Air in the feed hose	Check for an airlock; disconnect the hose at the seawater filter and check water flow.
	Pump is blocked	Check the impeller is free of debris.
High pressure pump won't run	No power to the pump	Check that fuses and circuit breakers are on and in good order.
Both pumps run but no water flows	Seawater filter is dirty or blocked	Remove and clean the filter, or replace it.
	Pickling valve is in the wrong position	For normal operation, the pickling valve must be horizontal.
System won't come up to pressure	Air in the system	Open the pressure control valve fully (anticlockwise) and let the air purge through.
	Pressure relief valve spring has weakened	Reset the valve. See section 9.3.
Pressure fluctuates	Air in the system	Open the pressure control valve fully (anticlockwise) and let the air purge through.
	Seawater filter is dirty	Remove and clean the filter.
Product water is high in salinity	Membrane is in poor condition	Replace the membrane. See section 9.4.

11. Warranty

Open Ocean Group Ltd — Limited Warranty

Five-year warranty on the pressure housing and end caps.

Open Ocean Ltd warrants this product to the original purchaser for twelve (12) months from the date of shipment. Open Ocean Ltd's liability under this warranty is limited, at its option, to repair or replacement of the watermaker. Under no circumstances is Open Ocean Ltd liable for consequential damages arising from, or connected with, the system's failure to perform as described. This limited warranty replaces all other express or implied warranties, including warranties of merchantability and fitness for a particular purpose.

If a defect, malfunction, or failure occurs during the warranty period, Open Ocean Group Ltd will repair or replace, at its option, the product or component that on examination proves defective or not up to factory specification. To obtain warranty service, return the defective product or part to Open Ocean Group Ltd's service centre. The purchaser is responsible for transportation and labour costs incurred in removing and returning the product.

This limited warranty does not extend to any component that has been subjected to misuse, neglect, accident, improper customer installation, or use contrary to Open Ocean Group Ltd's instructions. It does not extend to components on which the serial number has been removed, defaced, or altered.

Open Ocean Group Ltd reserves the right to make changes or improvements to its products during subsequent production, without any obligation to install such changes or improvements on equipment already manufactured.

The implied warranties that the law imposes on the sale of this product are expressly limited in duration to the period stated above. Open Ocean Group Ltd is not liable for damages, consequential or otherwise, resulting from the use or operation of this product or from breach of this limited warranty.

Not Covered By This Warranty

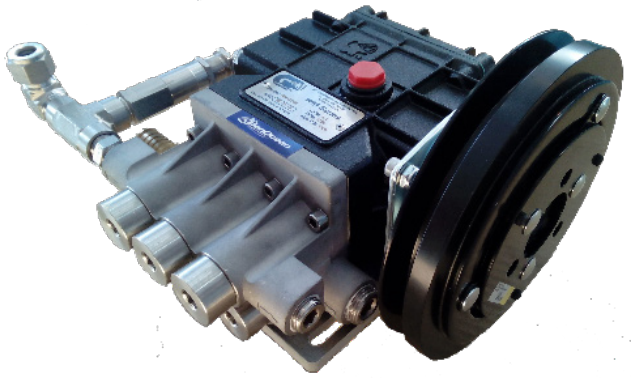
This limited warranty does not cover normal, recurring user maintenance items:

Pre-filter cartridges	Gauge instrument calibration
Pump valve assemblies	Pump crankcase oil
Pump seals	Pump packing

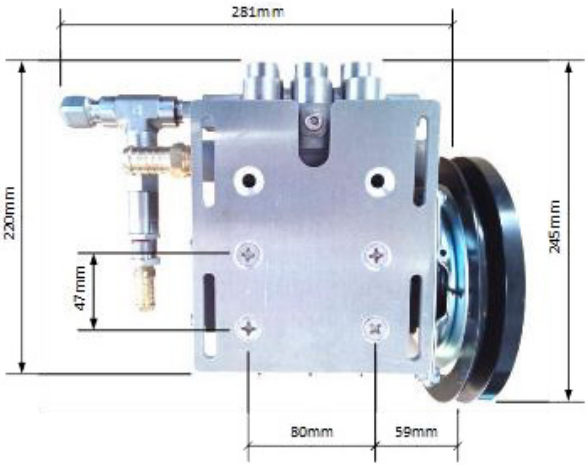
The Open Ocean Ltd membrane element is not guaranteed against iron fouling (rust), chemical attack, oil, extreme temperatures (above 45°C or below 0°C), drying out, or extreme pressure (over 1200 psi).

12. Facts and Figures

When you're considering an Engine Drive watermaker, the first thing you'll want to know is: can I fit it?



Engine Drive high pressure pump.



Dimensional view from the bottom of the pump, with the optional base plate fitted.

- Can be driven in either direction — clockwise or anti-clockwise.
- Pump weighs 11 kg.
- The pulley is 7" in diameter.
- Total width including pulley is 245mm; pump body only is 220mm.
- The mounting sockets take 8mm machine screws.
- The mounting holes are 80mm and 47mm apart.
- Forward mounting holes are 59mm back from the centre of the drive belt.
- The crankshaft is centred between the mounting holes, and 51mm above the base of the pump body.
- Centre of drive belt to back fitting is 281mm. This can be reduced to 225mm by adding a couple of street elbows in the fitting assemblies.



Example of pump with street elbows in the fittings assembly.

Pulley & engine speed reference

PUMP PULLEY DIAMETER	PUMP PULLEY CIRCUMFRENCE	CRANKSHAFT PULLEY DIAMETER	CRANKSHAFT PULLEY CIRCUMFRENCE	ENGINE SPEED RANGE
7"	22"	5"	15.7"	1950 to 2450 RPM
7"	22"	6"	18.8"	1550 to 2050 RPM
7"	22"	7"	22"	1250 to 1750 RPM
7"	22"	8"	25.13"	1030 to 1530 RPM

Thank you for choosing Open Ocean

We would love to hear your questions, comments or suggestions — your feedback helps us build the best watermakers in the world.

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