



OF70A

70 LPH FULLY AUTOMATIC DC WATERMAKER

INSTALLATION AND OPERATION MANUAL

INTRODUCTION

Congratulations on purchasing an Oceanflo watermaker. All units are fully bench-tested and delivered with pride. Your watermaker will provide you with clean and safe drinking water for many years to come.

To ensure trouble-free performance, please follow the simple instructions in this owners' guide. By understanding the function, importance, and normal operation of each part in the system, the operator can readily diagnose problems when they first develop. Such problems are easily corrected and require minor adjustments. If left unattended, a minor problem in one component may affect the rest of the system and can lead to your unit needing repair.

If you have any questions regarding the installation, operation, or maintenance of your watermaker, please contact your dealer.



CONTENTS

Page 4:	Technical Specifications
Page 5:	Power Requirements
Page 6:	Standard System Components
Page 7:	Installation Instructions
Page 11:	Electrical Installation
Page 13:	Commissioning
Page 14:	Operating Instructions
Page 15:	Control Panel Indication Lights
Page 16:	Emergency Operation Overrides
Page 17:	Maintenance Timetable
Page 18:	Troubleshooting Guide
Page 19:	System Parameter Adjustments
Page 19:	Optional Tank Fill Shutoff
Page 20:	Filter Guidelines
Page 21:	System Storage Procedure
Page 22:	General Comments
Page 23:	Warranty



SPECIFICATIONS

Reverse Osmosis performance varies with feed water temperature, voltage and salinity.

Rated performance is tested at 26C / 80F water temperature and 33g NaCl/ltr.

Rated Performance	70 LPH @ 13 V DC
RO Membrane Type	Standard size high rejection TFC Polyamide / Thin Film Composite / Spiral Wound, single pass reverse osmosis element
Product Water Quality	Minimum 500 ppm TDS
Feed Water Salinity Range	< 50,000 ppm TDS
Chlorine Tolerance	1000 ppm hours @ 0.1 ppm
Feed Water Pressure	3 psi to 60 psi
Operating Pressure	600 to 950 psi
Feed Water Temperature Range	min. 50F / 10C max 113F / 45C

POWER REQUIREMENTS

	12V DC	24 V DC
Operating Amps Approx.	20A	10A
Circuit Breaker	30A	15A



STANDARD SYSTEM COMPONENTS

1. High-efficiency self-pressure regulating pump and motor
2. Dual Carbon fiber pressure vessels with dual membranes
3. 5 and 20 micron sea water pre-filter housing assembly
4. Control panel with salinity control, automated fresh water flush
5. High output brushless mag drive boost pump
6. Remote control panel
7. Fresh water flush with carbon filter and solenoid valve assembly
8. Product water carbon filter assembly

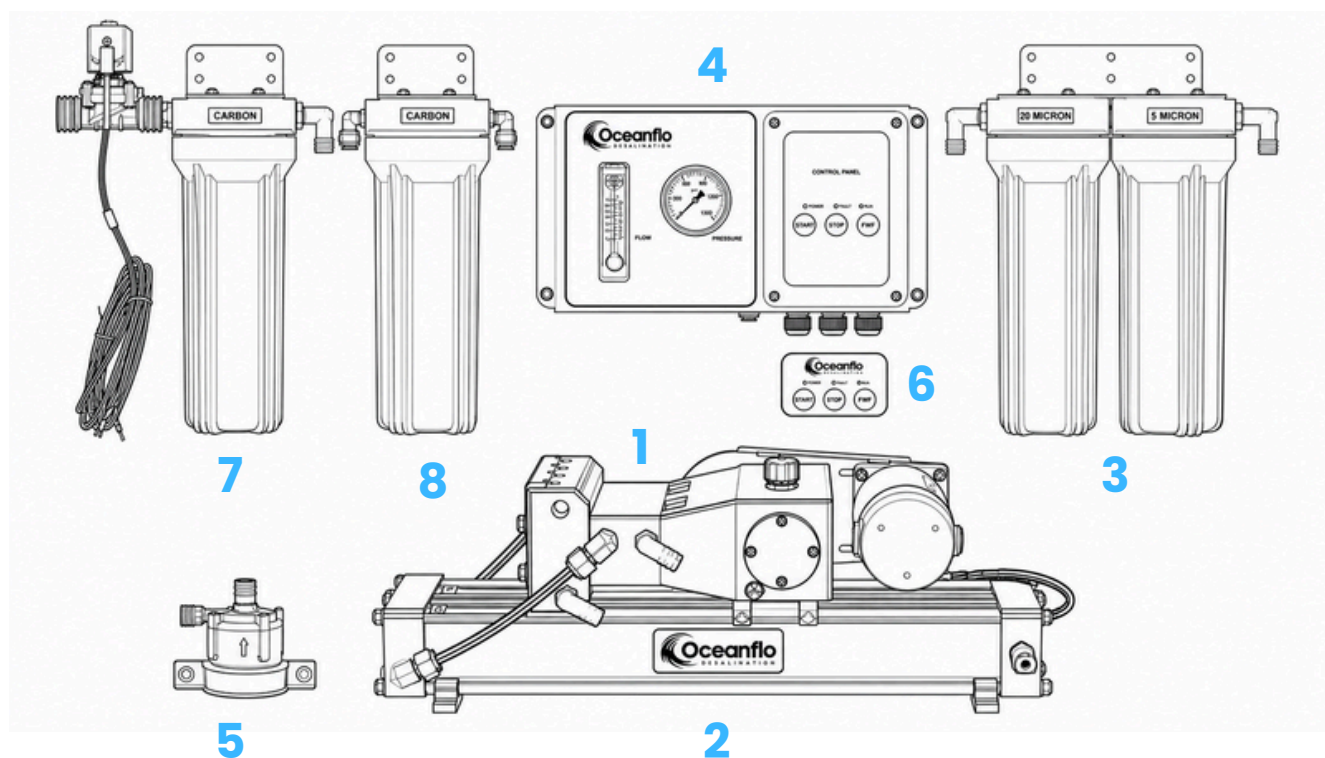


Image Not to Scale

INSTALLATION INSTRUCTIONS

Install plumbing according to the following diagrams, following the notes below.

Standard hoses and fittings have not been provided as they will differ depending on each boats requirements.

PUMP AND MOTOR ASSEMBLY

Always mount the Pump and Motor Assembly on a flat surface. It is advisable to have the pump in a well ventilated area that does not get too hot in order to extend motor life.

Note: It is normal for the motor to reach temperatures of up to 70 degrees celsius

PRE - FILTERS

Install the Pre-Filter Assembly in an accesible area away from equipment to avoid water damage during filter changes (see maintenance table for filter change frequency).

SALTWATER SUPPLY LINES

16mm Pressure Flex (Not Supplied).

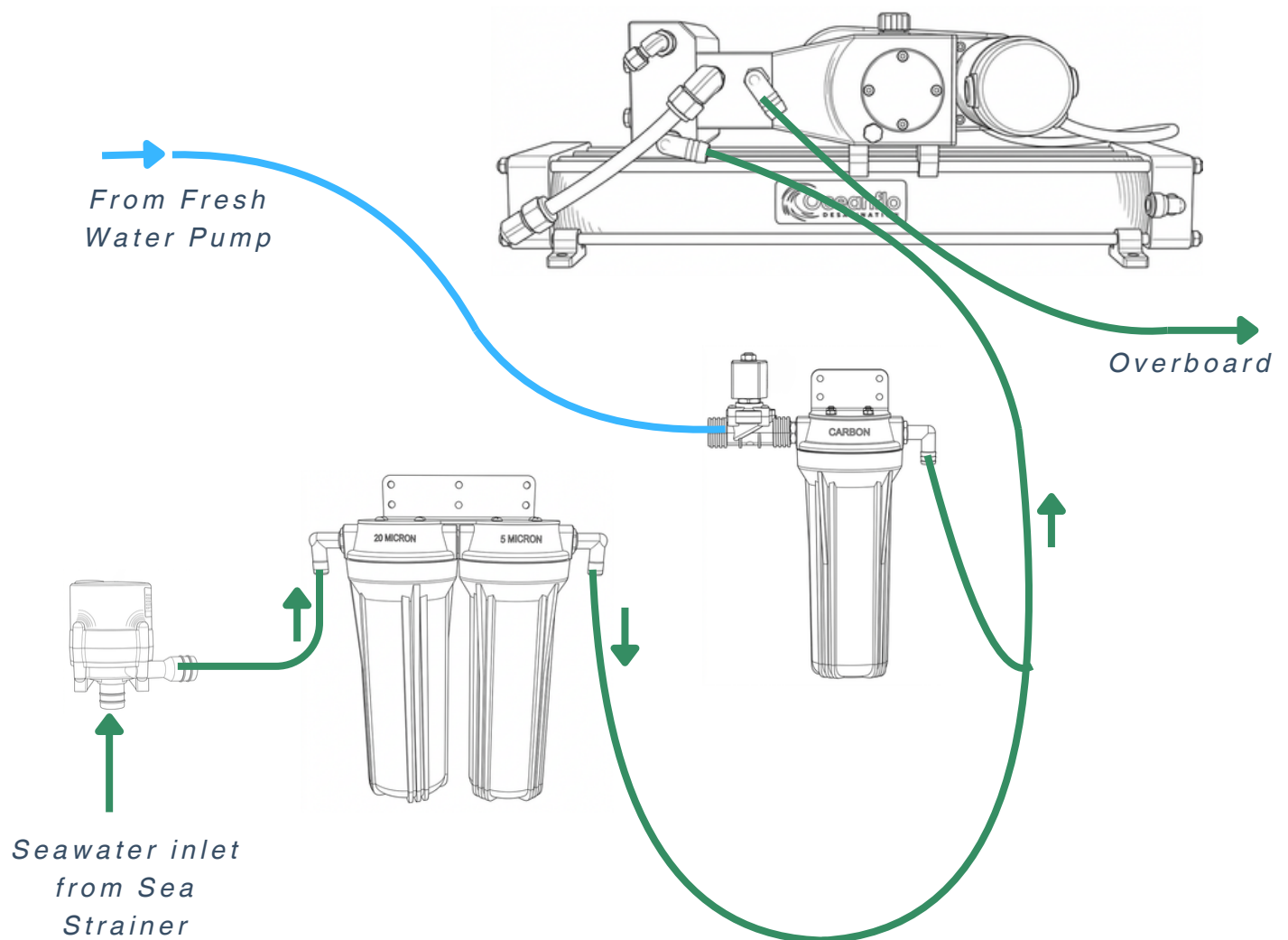
Minimize 90 degree bends to improve flow and reduce pressure loss at the pump.

THRU-HULL AND STRAINER (NOT SUPPLIED)

The designated intake thru-hull fitting of the boat should be positioned in an area that remains submerged under normal operating conditions. A strainer scoop thru-hull fitting, installed with the opening facing forward, can be beneficial as it typically generates a small amount of pressure while the boat is in motion. Drilling a small hole in the back of the scoop will facilitate the escape of air when underway. It is crucial not to place the thru-hull fitting directly in front of a speedometer pickup. Additionally, it is advisable to avoid positioning the intake thru-hull fitting immediately aft of the output from the holding tank, head, or galley sink overboard discharge.

STEP 1

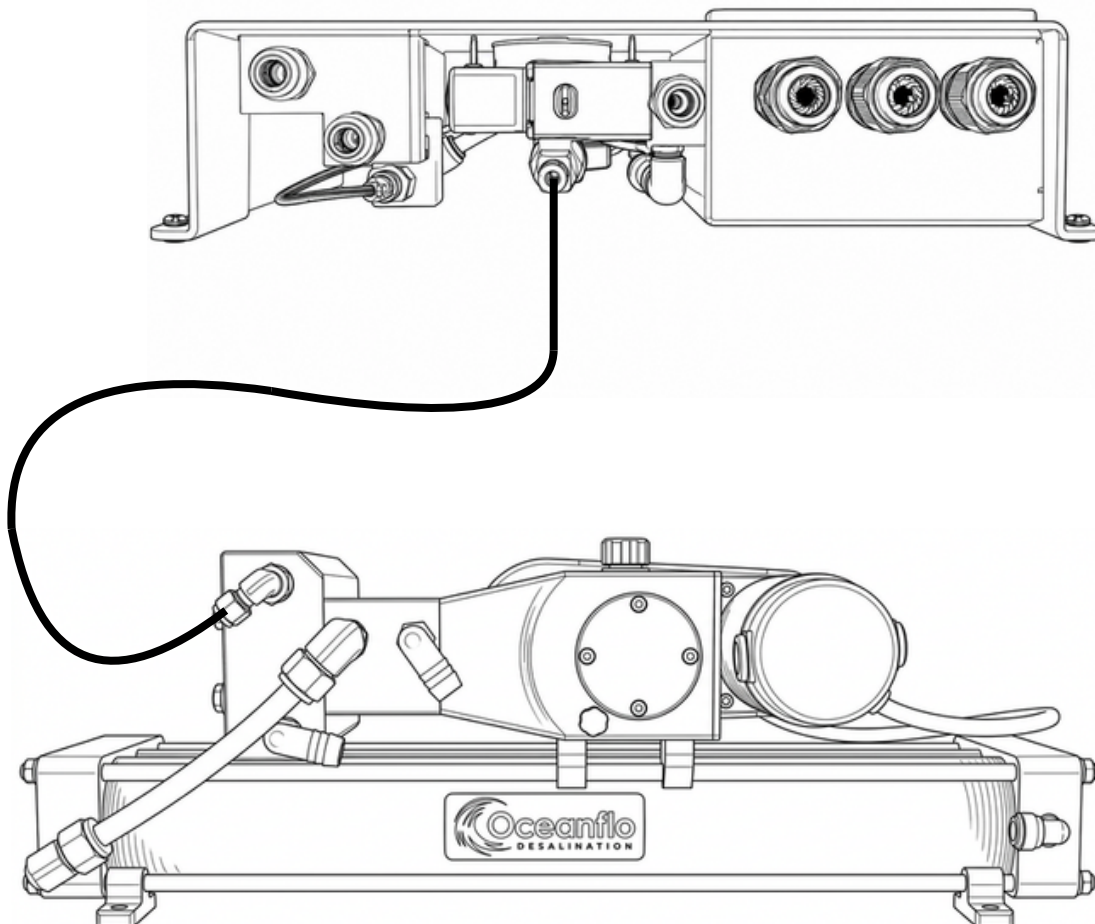
- Plumb the salt water lines per diagram below
- Connections can be taken from either side of the pump
- Use 5/8" or 16mm Pressure Flex



STEP 2

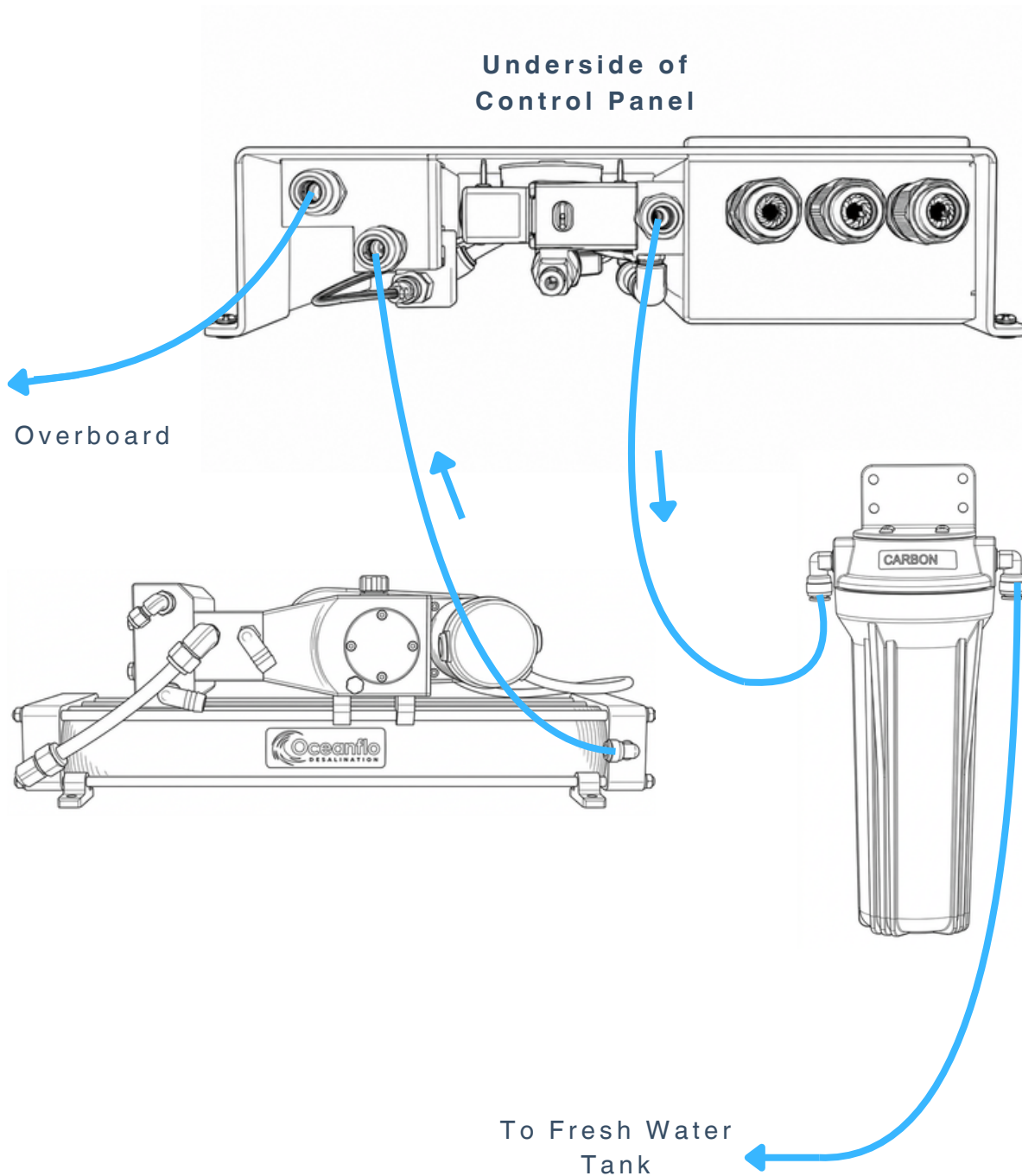
- Install high pressure line per diagram below
 - **Note:** it is critical compression olive is fully crushed for line to stay reliably attached and leak free under pressure.
 - Push black line all the way into fitting and tighten nut to compress olive, validate by pulling line hard, ensuring it cannot be removed.
- 1/4" black high pressure line connects HP Gauge on Control Panel, to HP Pump outlet on Pump and Motor Assembly.

Underside of
Control Panel



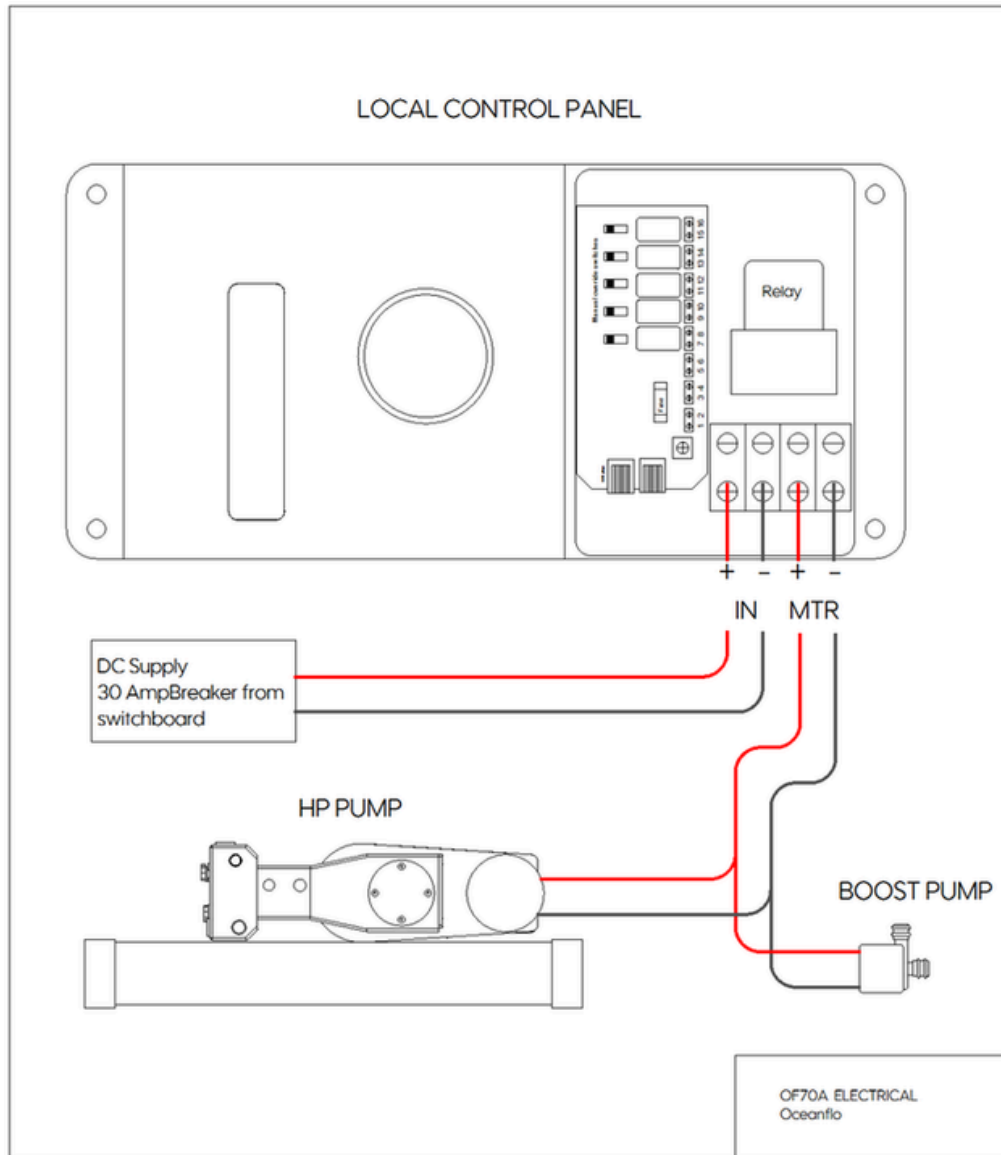
STEP 3

- Install the 3/8" clear tube per diagram below



ELECTRICAL INSTALLATION

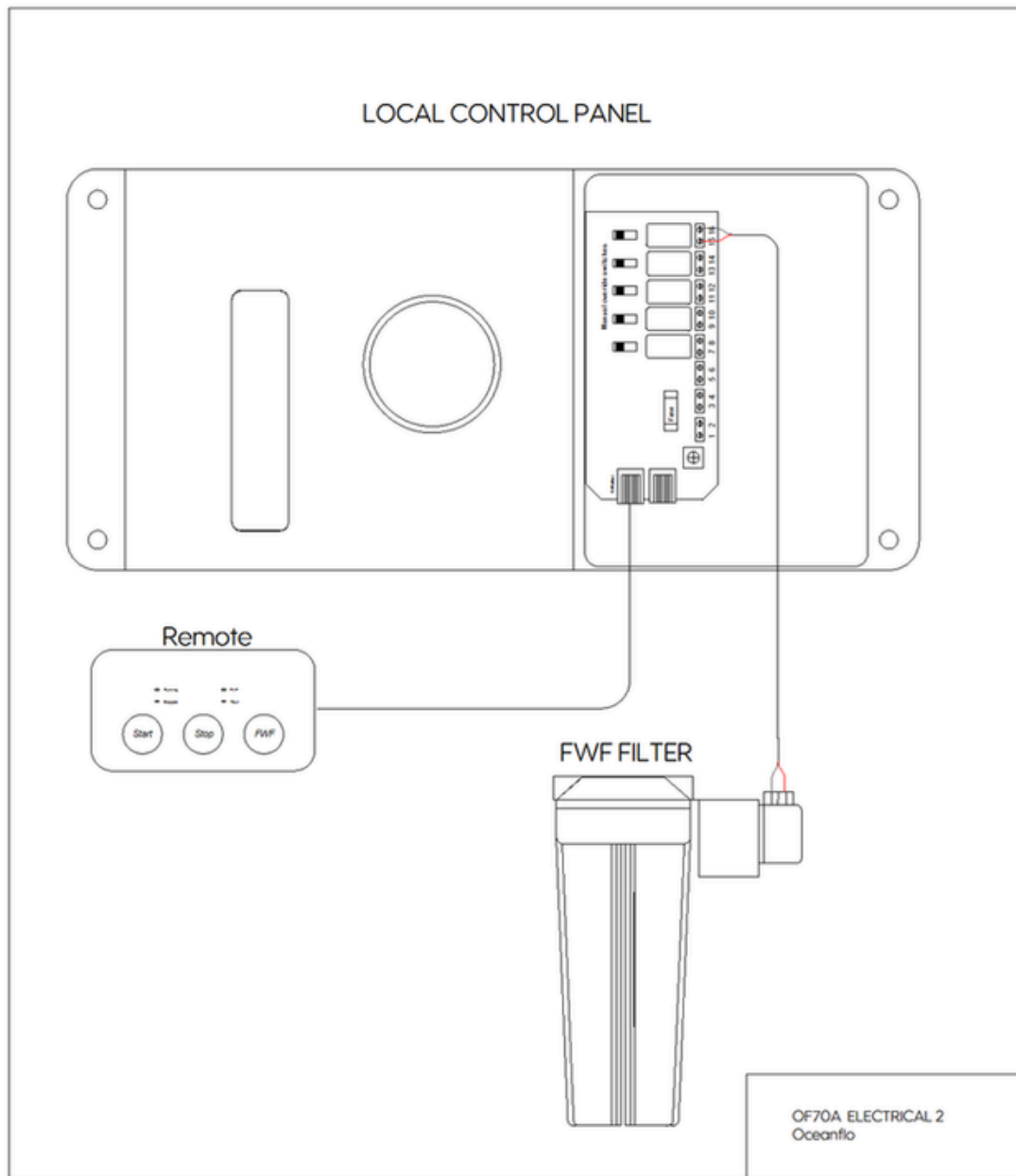
Wire Control Panel, HP Pump and Boost Pump per diagram below



Minimum Power Supply Cable Wire Size @ 12V DC - Use ½ for 24V DC

Length of Run (M)	3	5	6	8	10	12	14
Wire Size (AWG)	10	10	8	6	6	6	4
Wire Size (mm2)	6	6	10	16	16	16	25

ELECTRICAL INSTALLATION



NOTE:

Remote panel uses a standard network cable with RJ45 Plugs.

Ensure you do not use a crossover cable.

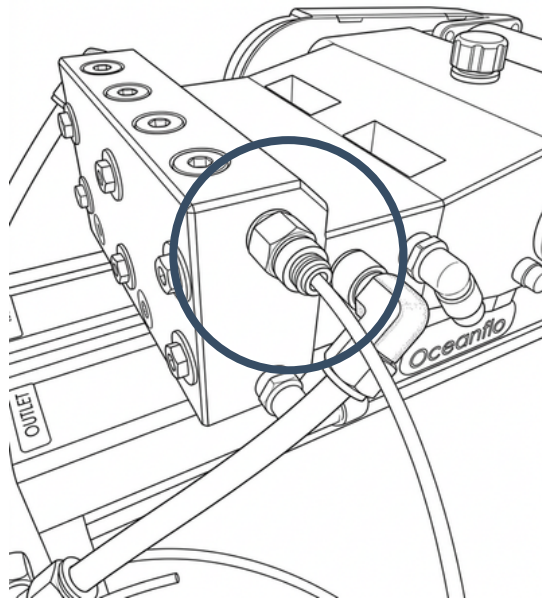
Freshwater Flush is connected to terminals 15,16 on circuit board.
Minimum cable size is 18AWG or 0.75mm².

COMMISSIONING

Before operating Watermaker for the first time, storage chemical in membranes must be flushed out. This must be done under low pressure with **non-chlorinated water**.

Note: Oceanflo may have supplied your membranes flushed - confirm with your supplier and if so - skip this process

1. Disconnect and remove high-pressure fitting (black 6mm HP line) from side of pump
2. Install decompression fitting per diagram below



3. Run 1/8" line from decompression fitting into a bucket
4. Press and hold "**START**" button for 4 seconds to start pump, while bypassing low product water switch
5. Run this way for **10 minutes** to fully flush storage chemical from membranes
6. Remove decompression fitting and reinstall black 6mm HP line
7. Again, press and hold "**START**" button for 4 seconds, restarting pump to build pressure. No water will divert to tank
8. Run for **10 minutes** to remove any remaining storage chemical from product water side of membrane
9. Press "**STOP**" button - flush is complete

Notes: Discard first 10 minutes of product water after flushing storage chemical from membranes.

Decompression fitting will be reused when storing the membranes on your watermaker.

OPERATION

Start-Up

1. Ensure **intake valve** and **overboard valve** are **open**
2. For first time operation, refer to steps in **commissioning** guide above
3. Press **“START”** button
 - a. Refer to diagram below for explanation of **LED indicators**
4. Press **“STOP”** button when desired volume of fresh water has been produced
5. If unit will not be used again for **more than 3 days**, run **Fresh Water Flush** sequence as detailed below

Fresh Water Flush

Fresh water flush is recommended if you plan to not use your watermaker for more than 3 days - it is not necessary if the unit is being run regularly. To function correctly, your vessels fresh water pump must be on.

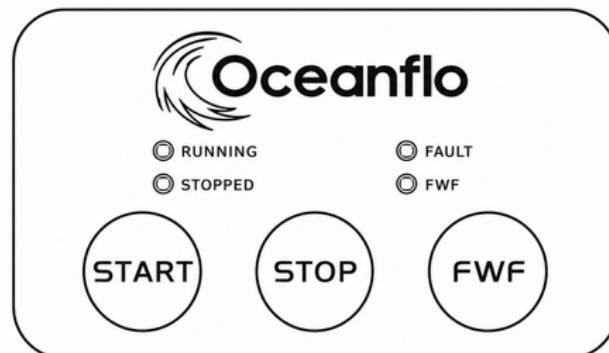
1. Press **“FWF”** button - a solid blue light will turn on
2. Once the flush procedure is complete, it will return to the automatic 7 day cycle indicated by a flashing blue LED

Pre Filter Back Flush

Optional back flush functionality can be used to hit your pre filters with a blast of clean water from your fresh water supply, to help extend their lifespan.

Note: *this functionality requires the system fresh water flush to be plumbed exactly as detailed in this manual.*

1. Ensure your machine is stopped
2. Press and hold the **“FWF”** button for 3 seconds
3. Solenoid valve will open and flush the filters with clean water



INDICATION LIGHTS

RUNNING - Green Light

- Flashing when product water is above set-point (flashing faster the closer it gets to the set point)
- Solid Green Light when product water is below set-point and ready to send to tank

FWF/TANK - Blue Light

- When operating - solid blue light indicates product water is being diverted to tank
- When flushing - solid blue light indicates flushing in progress
- Flashing Blue Light indicates 7 day automatic flush active

FAULT - Red Light

- Flashing Red Light indicates not enough product water being produced - after 10 seconds, watermaker will stop
- Solid Red Light - High-Pressure fault - Watermaker will stop

STOPPED - Red Light

- Solid Red Light when Watermaker stopped by user or fault

Possible Causes:

- Pressure has reached exceeded High Pressure cut out
 - As soon as this happens unit will stop and present a solid red fault light
 - Most likely cause is fouled membranes, requiring replacement
- No product water flow detected
 - Fault light will flash for 12 seconds before stopping
 - Likely caused by Blocked Pre Filters, or a lock from air entering the system

EMERGENCY OPERATION OPTIONS

Salinity Probe Override:

- While running - press and hold “**FWF**” button for 4 seconds
 - Product water will be manually diverted to tank, overriding the salinity check
 - Green “running” light will continue to flash if ppm is outside set point

Manual Mode:

Low product water flow switch and salinity probe override

- Press and hold the “**START**” button for 4 seconds
 - Overrides the Low Flow product water switch
- Press and hold the “**FWF**” button for 4 seconds
 - Operated diversion valve to send water to tank



Operation via Dip Switches on Circuit Board:
CAUTION ALL SAFETY FEATURES DISABLED!



Fresh Water Flush Solenoid Valve

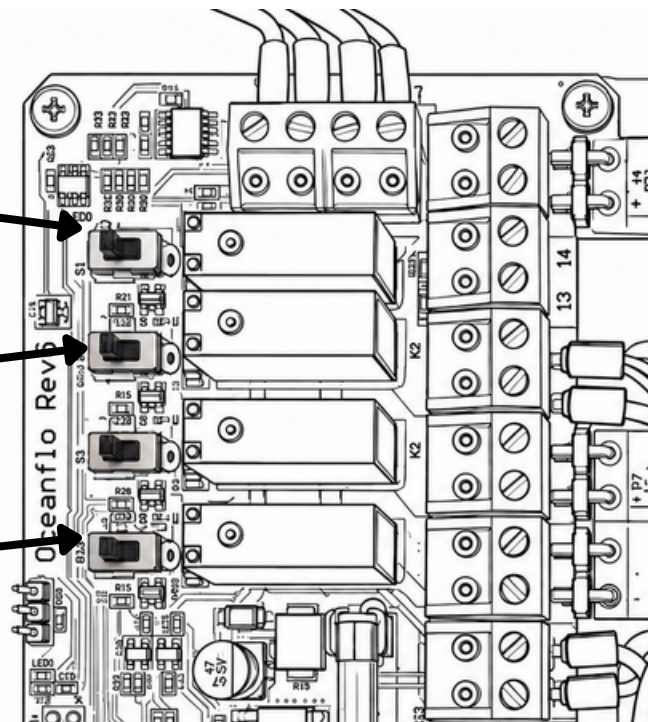
Switching will Open Valve

Diversion Valve

Switching **ON** will divert
Product Water OVERBOARD

HP Pump Power

Provides power to DC motor,
HP Pump and Boost Pump
will operate



MAINTENANCE TIMETABLE

Timetable is an estimate, adjust based on usage frequency, intake water quality, seawater exposure and total running time.

If your watermaker is behaving in any way unusual, it is worth starting the investigation at the sea water supply. Seastrainers will foul quickly in some marine environments.

Sea water pre-filters should be understood as a consumable item, in the worst environments they may need replacement after even a single operation.

Component	Maintenance Required	Time Interval
Sea Strainer	Inspect, clean screen and housing	Every 20-30 hours of operation or when fouled
Seawater Pre Filters	Replace or clean elements	When pump fails to build pressure or is noisy in operation Inspect every 20-30 hours of operation
Carbon Filters	Replace elements	6 months
High Pressure Pump	Replace crank case oil	After first 50 hours, then again every 500 hours Use ISO68 weight hydraulic oil 0.6L, 15-20mm from top of crank case
High Pressure Pump	Change HP Seals	When pump fails to build pressure
DC Motor Brushes	Inspect annually	Replace when half of brush remains
RO Membranes	Flush with non-chlorinated water	Weekly

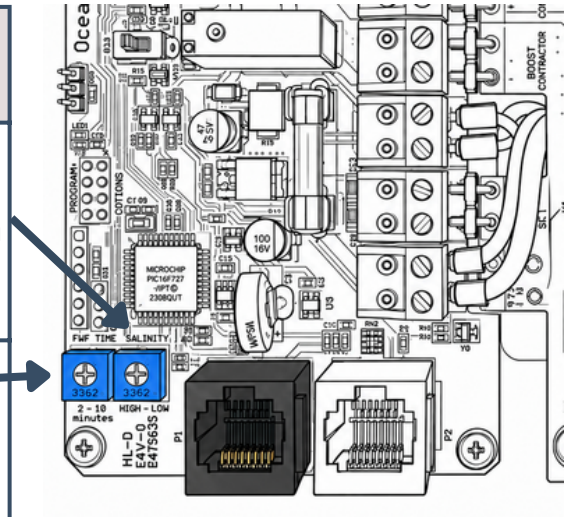
TROUBLESHOOTING GUIDE

Problem	Cause	Solution
Inability to build pressure	• Air in the system • Blocked Pre Filters or Sea Strainer • Seals and pump failure • Jammed Non-Return Valves in HP Pump	• Allow time to prime • Replace or clean filters • Clear Sea Strainer • Replace pump seals • Remove, inspect and reinstall 8 Non Return Valves
Product water output below specification	• Low Voltage • Blocked Pre Filters • Worn pump Seals • Obstructed / Fouled Non Return Valves	• Charge Batteries • Replace or clean filters • Replace High Pressure Seals • Remove, inspect and reinstall 8 Non Return Valves
High Product Water Salinity	• Membrane has reached end of life • High sea water temperature	• Replace Membranes • This is normal
High Operating Pressure	• Membrane fouling • Worn Piston Seals • Very Cold Seawater	• Replace membranes • Replace Piston Seals • This is normal

SYSTEM ADJUSTMENTS

Adjust these potentiometers with a small screwdriver to change the system setpoint for their respective variable.

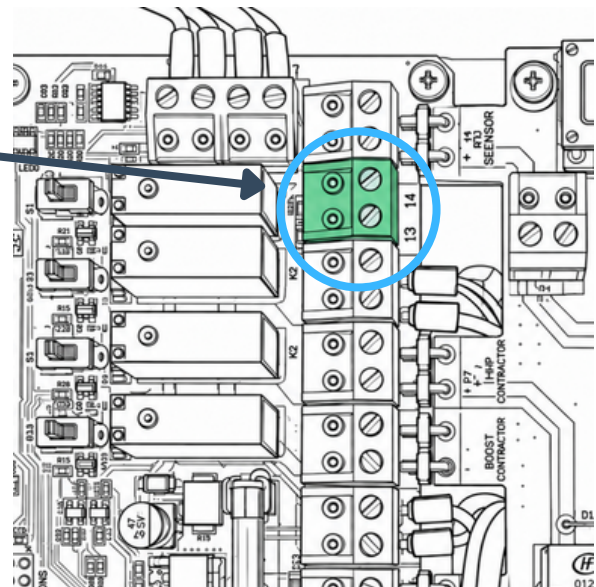
Variable	MIN	MAX
Salinity Level CW - lower setpoint CCW - increase setpoint	200 ppm	800 ppm
Fresh Water Flush Time CW - increase flush time CCW - reduce flush time	30 sec	180 sec



OPTIONAL TANK FILL SHUT OFF

Connect tank fill switch to Pins 13,14.

- Open Circuit = below fill target (tank will continue to fill)
- Closed Circuit = Tank Full (Watermaker will Shutdown)



FILTERS

Seawater intake filters need to be understood as consumable components. The lifespan depends widely depending on the quality of the source water. In the worst case in dirty water such as harbours or some marinas, a filter element may only survive a single operation.

Oceanflo recommends inspecting every 20 hours of operation.

SEA WATER INTAKE FILTER (BLUE) - 5 Micron

5 Micron Pleated Sediment Filter: **10" Long, 2.5" OD**

To be changed when pump fails to build pressure or is excessively noisy

SEA WATER INTAKE FILTER (BLUE) - 20 Micron

20 Micron Pleated Sediment Filter: **10" Long, 2.5" OD**

To be changed when pump fails to build pressure or is excessively noisy

FRESH WATER FLUSH AND PRODUCT WATER FILTER - Carbon

5 Micron Carbon Block Filter: **10" Long, 2.5" OD**

To be changed every 6 months



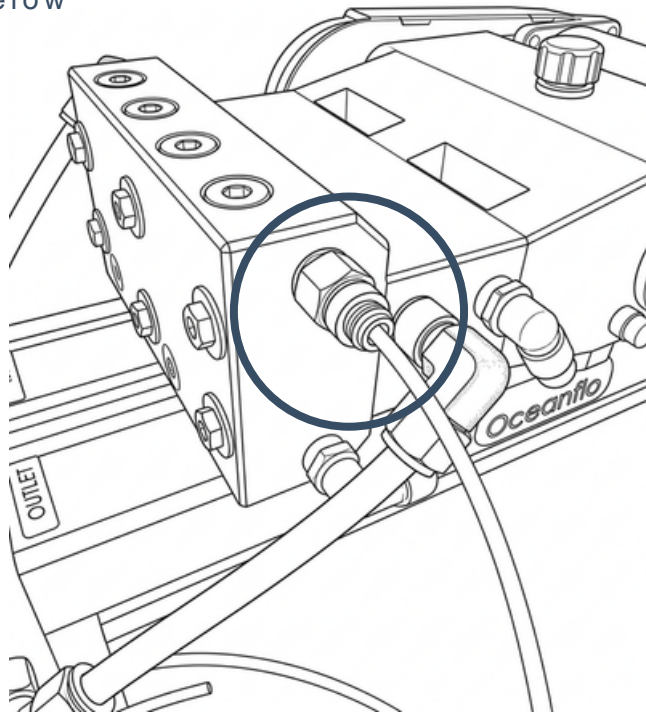
5μ Pleated 20μ Pleated 5μ Carbon

SYSTEM STORAGE

If Watermaker will not be used for an extended period (3 months or more) membranes must be preserved with storage chemical (Food Grade Propylene Glycol - PPG).

Follow procedure below under low pressure with non-chlorinated water.

1. Isolate Seawater intake
2. Perform **2 or more** fresh water flush cycles to remove all seawater from system
3. Remove High Pressure Gauge line and install Decompression fitting per image below



4. Mix **3L** of nonchlorinated water and **3L** of PPG in a bucket
5. Place intake, Brine outlet and Decompression hose fitting into the bucket
6. Press "**START**" for **4 seconds**, run for **1 minute** circulating the PPG and achieving approximately 35% PPG concentration for optimum membrane storage conditions
7. To reinstate: follow commissioning process ensuring all filters are replaced

NOTE: UNDER NO CIRCUMSTANCES SHOULD SODIUM METABISULPHITE ENTER THE PUMP TO PREVENT IRREVERSIBLE DAMAGE TO PUMP INTERNALS. USE ONLY FOOD GRADE Propylene Glycol with no Ethyl Alcohol.

GENERAL COMMENTS

EFFECTS OF VOLTAGE:

Increasing Voltage causes the pump to increase in speed, drawing more current and producing more water.

Decreasing voltage causes the pump to reduce in speed, drawing less current and producing less water.

70 LPH output is calculated at 13 VDC

EFFECTS OF WATER TEMPERATURE:

Higher water temperatures result in reduced pressure and a minor reduction in water quality.

Colder water temperatures result in increased pressure and minor improvement in water quality.

Please contact Oceanflo if you intend to operate your watermaker below 10 degrees celcius.

EFFECTS OF SEAWATER SALINITY:

Higher seawater salinity results in higher operating pressure and higher current draw. In areas with reduced salinity such as brackish water near rivers, lower pressure and reduced current draw can be expected.

SEAWATER INTAKE:

The unit should not be used where the seawater intake can pull in a large amount of air. **For example, heeling when under sail leading to the intake lifting out of water.**

This will cause poor water quality and potential damage to the pump, the unit should have an uninterrupted supply of seawater when in use.

STORAGE CHEMICALS:

Under no circumstances should **SODIUM METABISULPHITE** enter the system. It will lead to irreversible damage to the pump internals. Always use food grade Propylene Glycol (PPG) at 33% or greater concentration.

WARRANTY

Oceanflo Desalination Limited ("Oceanflo") warrants the Oceanflo Watermaker against defects in materials and workmanship for a period of one (1) year from the date of shipment, subject to the terms and conditions below.

Oceanflo's liability under this warranty is limited, at Oceanflo's sole option, to the repair or replacement of the Oceanflo Watermaker, product, or defective component. To the maximum extent permitted by law, Oceanflo shall not be liable for any indirect, special, incidental, or consequential loss or damage arising from, or connected with, failure of the system to perform.

This limited warranty is in lieu of all other warranties, whether express or implied, including warranties of merchantability and fitness for a particular purpose, except to the extent that any such warranty or consumer right cannot lawfully be excluded or limited.

If a defect, malfunction, or failure occurs during the warranty period, Oceanflo may, at its sole option, repair or replace the product or component where, following examination by Oceanflo, it is found to be defective or not in accordance with factory specifications.

To obtain warranty service, the defective product or part must be returned to an Oceanflo service centre. The purchaser is responsible for all transportation, removal, refitting, and labour costs associated with returning the product or part, unless otherwise agreed by Oceanflo in writing. A return authorisation must be obtained from Oceanflo before any product, part, or component is returned.

Warranty support may be provided internationally; however, all warranty service is administered by Oceanflo from New Zealand and is subject to New Zealand law. Any replacement parts, repair services, technical assistance, or other warranty support supplied outside New Zealand are provided under Oceanflo's New Zealand warranty obligations.

This warranty does not extend to any product or component that has been subjected to misuse, neglect, accident, improper installation, unauthorised modification or repair, inadequate maintenance, or use contrary to Oceanflo's instructions.

This warranty does not apply where a serial number has been removed, altered, defaced, or made illegible.

Oceanflo reserves the right to make changes or improvements to its products in subsequent production without any obligation to make those changes or improvements to previously manufactured equipment.

Governing Law and Jurisdiction

All sales, warranties, support services, and liabilities relating to Oceanflo products are governed by the laws of New Zealand. To the extent permitted by applicable law, any dispute arising out of or in connection with the product, its sale, this warranty, or warranty support shall be submitted to the exclusive jurisdiction of the courts of New Zealand.

The purchaser is responsible for ensuring that the product complies with all laws, standards, certification requirements, and operational requirements applicable in any country outside New Zealand. Oceanflo does not accept liability under foreign law or foreign jurisdiction, except where such liability cannot lawfully be excluded.

Maintenance Exclusion

This limited warranty does not apply to normal, routine, or recurring user maintenance as described in Oceanflo's applicable product manuals and maintenance instructions.

EFFICIENT, QUIET, RELIABLE

Innovative DC Watermakers - Designed and Made in New Zealand



Contact:

info@oceanflo.co.nz