Permanent Installation Manual

With No Control Panel

H2O on the Go ®

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Installing a H2O on the Go® watermaker into a boat.

Our systems can be supplied as parts so that it can be installed in a boat, below are some considerations when contemplating this type of installation.

Please keep in mind that when installing a system in a boat some of the problems that you may encounter are leaking connections, installing three-way valves incorrectly and connecting hoses incorrectly, all may cause permanent damage to your system.

This guide provides diagrams and considerations for installing in a boat but as every installation is quite different, a self-install will require a level of mechanical knowledge and initiative.

Shopping list

The below items will be needed to carry out this install. You may have purchased some or all f this equipment from us or if replacing a machine, you may already have this equipment in place.

1. Primary pump and fittings for hose on inlet and discharge.
2. Appropriate non-kinking hose. (length will vary depending on your positioning of system on your boat) for inlet and discharge lines.
3. Hose and connections to go between primary pump and primary filter
4. 3 x plastic or stainless steel 316 three-way valves
5. 6 plastic or stainless steel 316 hose barbs (match steel with steel and plastic with plastic when possible) and hose clamps.
6. If you do not want to swap the primary sediment filter for a carbon block filter when carrying out a flush, a separate filter can be placed on the freshwater line before the three-way valve.
7. For extended trips, you will need motor oil (any 30 or 40 weight Non-Detergent pump oil) spare sediment filters and carbon filters. Sodium Metabisulfite for sterlising/pickling. Citric Acid for maintenance schedule (only if you need to carry out maintenance at sea, see operation and Maintenance manual for more information.

Plumbing.

Water Coming in to System

There are 3 water sources needed to operate the water maker.

1. The feed water, in the case of a boat this is the ocean or the river water.
2. Fresh water from a water tank to carry out fresh water flush.
3. From a 20 litre bucket to sanitise or pickle the system.

Using a two three way valves is the easiest way to achieve these connections. The valves should be placed between the pump and the source feed water as shown below.

As shown diagram at the end of this manual one three-way valve is placed on the incoming line and allows for a small submersible pump to be placed in a bucket of sanitisng/pickling solution.

NOTE: You may also install this three-way valve prior to the primary pump so that you can use the primary pump to suck the sterilizing solution into the system, but you must have a self-priming pump to do this. Inline/submersible pumps are not self-priming, the recommended Jabsco pump is self-priming.

The second valve is placed on the incoming line to allow the water source to be changed from seawater to fresh water.

NOTE: This installation assumes that you have installed a primary pump to a seacock with a strainer and that you will be using your onboard fresh water pressure pump for your fresh flush. i.e. when you open change the three-way valve to fresh water the onboard pressure pump will pump water through the system.

Water Coming Out of The System

There are four water outlets to consider. Two are on the production/fresh water line and two are lines going to waste.

On the production/fresh line the two destinations are as follows.

1. To the water tank during water production.

2. To test/waste on production line. When you start the system you always send the water to waste/test first. Once the system is stable and you have tested the water you them send the water to the fresh tank. Once again the best way to achieve this is using a three-way valve to direct the water to the appropriate destination.

   The test waste line may be plumbed into waste and an inline TDS tester placed on this line, or it could be plumbed to a tap at a sink, or it may be just a hose that is going overboard when system is in use. This will totally depend on your installation, but you will need to have access to this water for testing prior to sending to fresh tank.

On the waste line, there are two sources coming from the system and going to waste (back to ocean or river)

1. Waste from the membrane. This is normal waste created during normal operation.

2. Waste from pressure relief valve. This is waste created in an over pressure situation, this does not occur in normal running and indicates, the that too much pressure has been applied to the system or the relief valve needs adjusting (please refer to the Operation & Maintenance manual for further information)

Both waste lines can be permanently plumbed to go to waste.

Water Booster Pump.

Our portable systems come with a 12v submersible pump to ensure plenty of water is available to the high-pressure pump. This may or may not be appropriate for a boat install. If not, we suggest a booster pump be put in place. Depending on your system the size of the pump required will vary. Please discuss this with us but normally we recommend a Jabsco Commercial Water Puppy suitable for continuous use. (please see specs at the end of this manual for further information on this pump)
NOTE: A Jabsco pump is not included with your system but can be supplied upon request as an extra.

If you already have a pump installed please check it against these Jabsco specs below to see if it is suitable, generally on demand pressure pumps are not suitable for this system, they tend to turn off and on during operation and are rarely rated for continuous use so will overheat and turn off allowing the system to then run dry.

Pickling Pump

A small submersible may be required for carrying out sanitizing/pickling for this a rule bilge 500-1000 (depending on your system) gallon per hour pump will suffice.
NOTE: a submersible pump is supplied with the system unless you have requested to have it removed.

Installation Notes

When selection a mounting location, consider parts that will require periodic access, such as pre-filters and changing the high-pressure pump lubrication.

ensure adequate fuses are used for electrical connections and that all electrical connections are carried out by a qualified electrician.

Both high pressure and low pressure lines should be routed in such a way that does not leave them exposed to possible chaffing or with tight radius bends that could cause the lines to kink.

Do not use any pipe dopes or sealing thread paste compounds in the installation as they may enter and block the membrane.

The RO membrane can have its life shortened by exposure to high temperatures. So, select a mounting location where they will not be exposed to ambient temperatures more than 48 degrees Celsius during operation and 60 degrees Celsius when not in operation.

The 12v motor can be mounted in any position except with the pump on top of the motor (in case of seal failure). The 240v motor/pump assembly can only be mounted horizontally so that the pump breather cap is faced to the sky. Ensure all motor/pump assemblies are mounted in a position that can properly support the

unit's weight.

Membrane pressure vessels can be mounted in any location that can be reached by the high-pressure hose coming from the pump. They may be mounted in any orientation.

When installing the gauge, flow meter and inline TDS meters (optional) keep in mind that you will need to access these repeatedly during water making.

Fittings

You will find several different fittings on your system, some are stainless and some are plastic.

Pump Fittings

Both our 12v and 240v system pumps are National Pipe Taper Fuel (NPTF) fittings. We match these fittings with standard National Pipe Taper (NPT) fittings.

Why don't we match them with NPTF fittings? Because when two NPTF fittings are threaded together part of the sealing process is the crushing of the threads, this is to ensure a solid seal in fuel type situations.

We do not want to crush the threads of the pumps because the fittings may need to be removed in the future to carry our repairs. NPTF matched fittings destroy both threads.

Using NPTF female (on all pumps) and NPT male fittings together means that the NPT male fittings do not screw all the way in to the NPTF female fittings and appear to be sticking out further than they should, this is normal and the fittings are secure regardless of this appearance.
These fitting may be already installed on your pump, we use Loctiite 577 on these fittings.

NOTE: Never use Loctite 577 on plastic fittings, it will erode the fittings.

The 240v systems pumps have the following fittings
Inlets: 1/2" NPTF Female (low pressure)
Discharge 3/8" NPTF Female (high pressure)

The 12v system pumps have the following fittings
Inlets (low pressure) and discharge (high pressure) are all 1/4" NPTF Female

An adapter 3/8" NPT male to 1/4" BSP female is used on the discharge of the 240v system pump.

NOTE: If you use NPTF male fittings with either pump the fittings cannot be successfully removed and replaced, please always use NPT male fittings.

Primary Filters

Primary filter has 1/2” threaded BSP male fittings. When carrying out a fresh water flush you will need to swap the sediment filter for a carbon filter, alternatively you can install a second filter on the fresh line before the three-way valve.

Membrane/s

Membranes have two 1/4” BSP female outlets on each end, only 3 of these 4 outlets will be in use one will remain plugged.

Flow Meter

Flow meter has 1/2” BSP fittings in these fittings are 1/2” BSP threaded male to 1/4” push to fit plastic fittings.

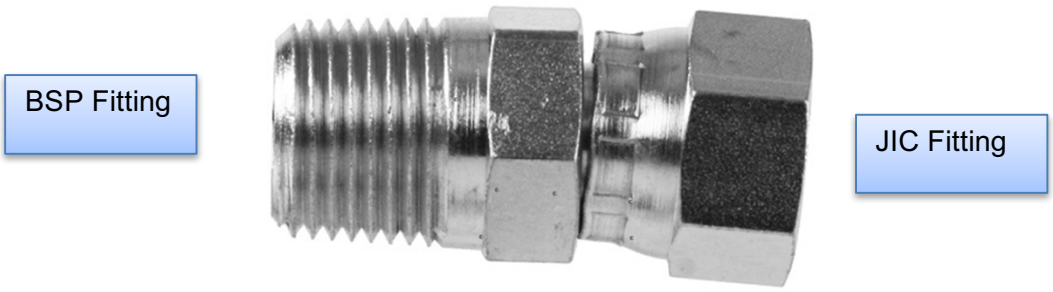
High Pressure Hoses

All High-pressure hoses will have either a 1/4” BSP male fittings, or 1/4” JIC female swivel fittings.

NOTE: JIC swivel fittings must be matched with JIC nipple fittings, please do not use any tape on JIC fittings, JIC fitting must be done up all the way tightly to create a seal, using tape prevents this from happening. If a JIC fitting is leaking it is not done up tightly enough.

Below are photos of a JIC male nipple and female swivel, please note the curved end of the nipple as opposed to a normal BSP nipple

Note with the female JIC fitting below that if the female fitting is not screwed completely on water will leak from the base of the swivel.



BSP fittings generally have a washer and will not require any thread seal tape to seal, plastic fittings may require thread seal tape to get a watertight seal.

New membranes may initially weep near the plates; this will stop after a few uses. We use glycerin when seating the end plates to ensure the o rings do not get crimped, this causes some continued movement in plates until the glycerin is completely washed away after a few uses.

Once installation is complete please test the pressure relief valve is set correctly, refer to the Operation & Maintenance manual for information on testing the pressure relief valve.

Fully test all water directions on three-way valves prior to turning on the high-pressure pump, label the valves to prevent future mistakes.

Plastic fittings are generally done up hand tight plus just a tiny bit more. Applying to much pressure to plastic fittings may break them, sometimes removing and reinstalling with fresh tape seals problematic connections.

Always install all metal fittings on membranes before plastic fittings so that the plastic fittings are not unadvertised broken.

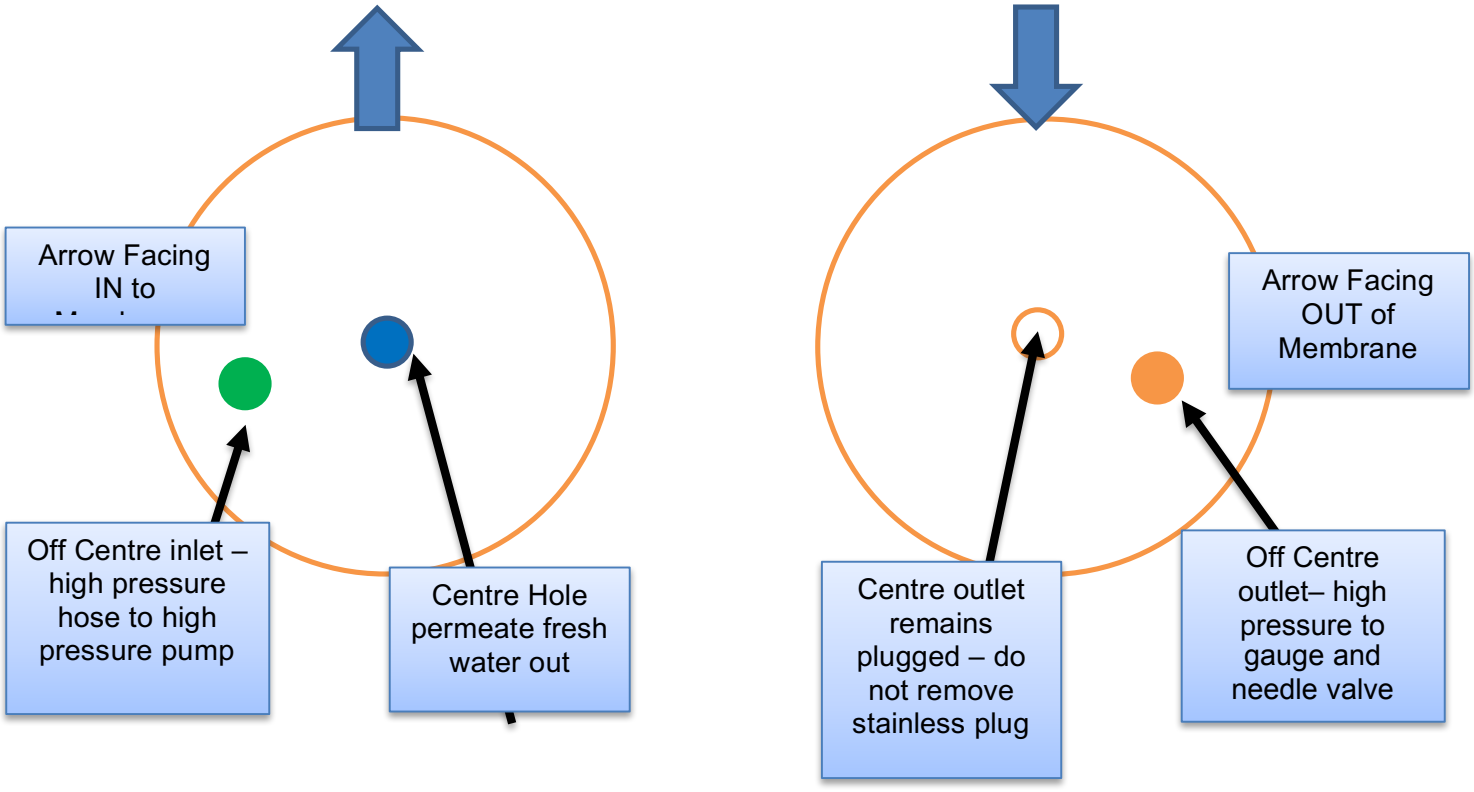
When installing stainless fittings on membranes ends the membrane end plates may begin to move, if so brace the end plates with a screw driver so that you can get a tight connection on fittings.

Membrane Installation

Membranes must be installed in the correct sequence and direction. Your membranes are clearly marked with a membrane number, arrows and colour coded dots. The membranes also have a H2O on the Go sticker on them these should be both facing the same direction.

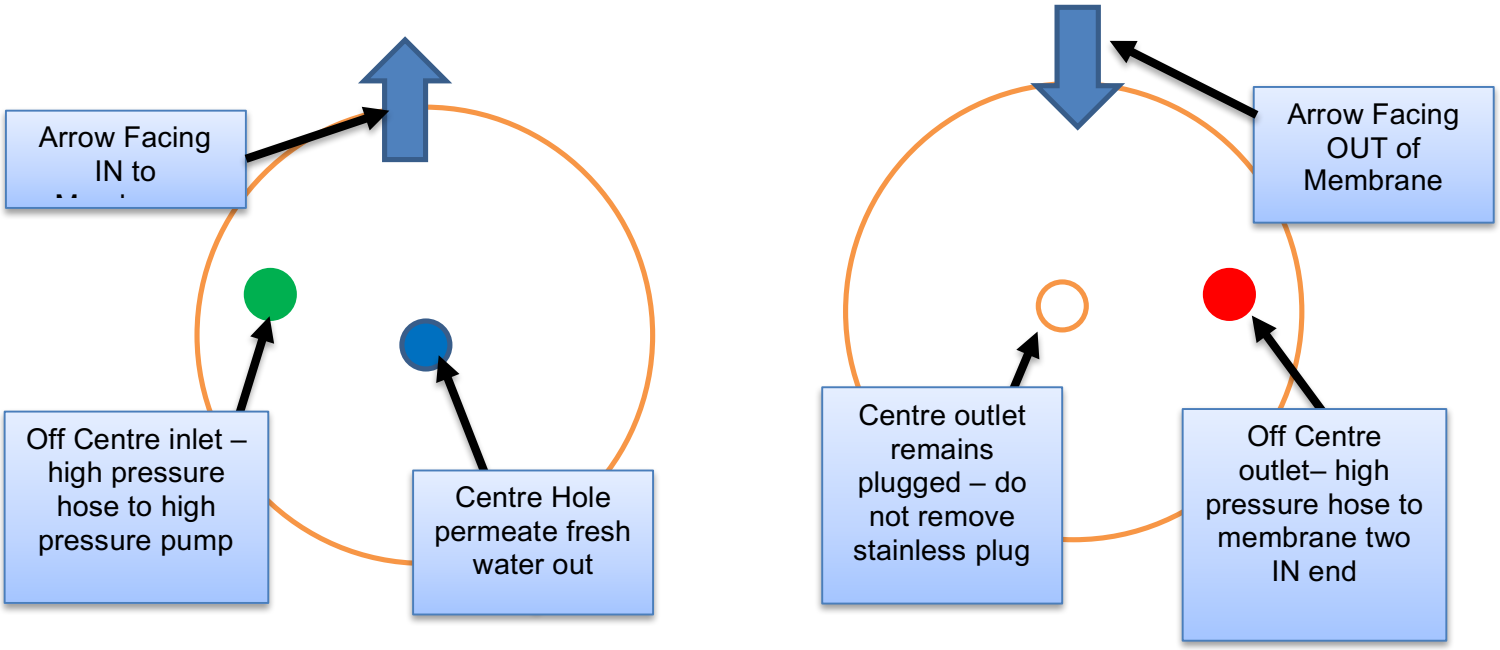
As the membranes are already commissioned and immersed in sanitising solution the membrane vessels are completely sealed. Brass plugs are used in areas where plugs are removed and replaced with other fittings, marine grade stainless steel is used in areas that remain plugged. If you remove a stainless plug, you are installing your system incorrectly.

Membrane Installation on a Single Membrane System

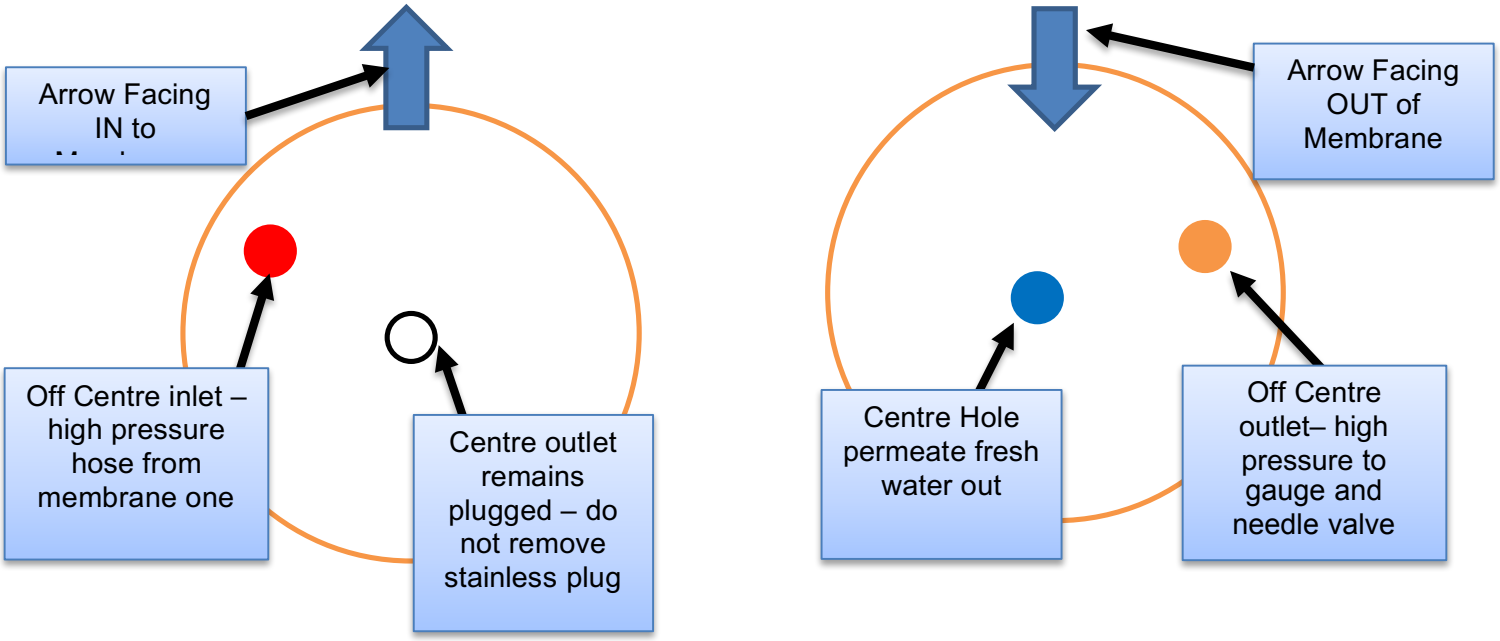


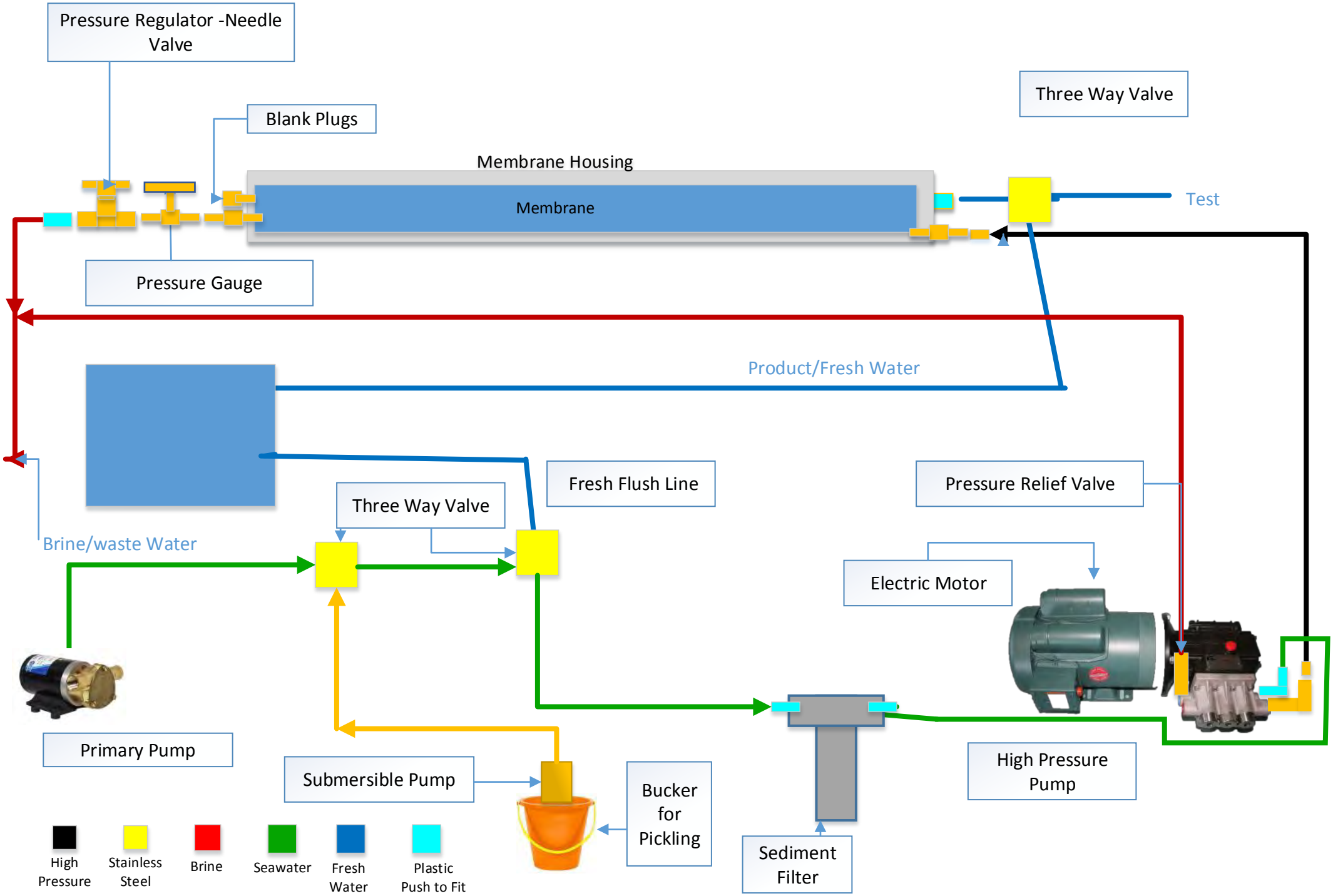
Membrane Installation with double membranes

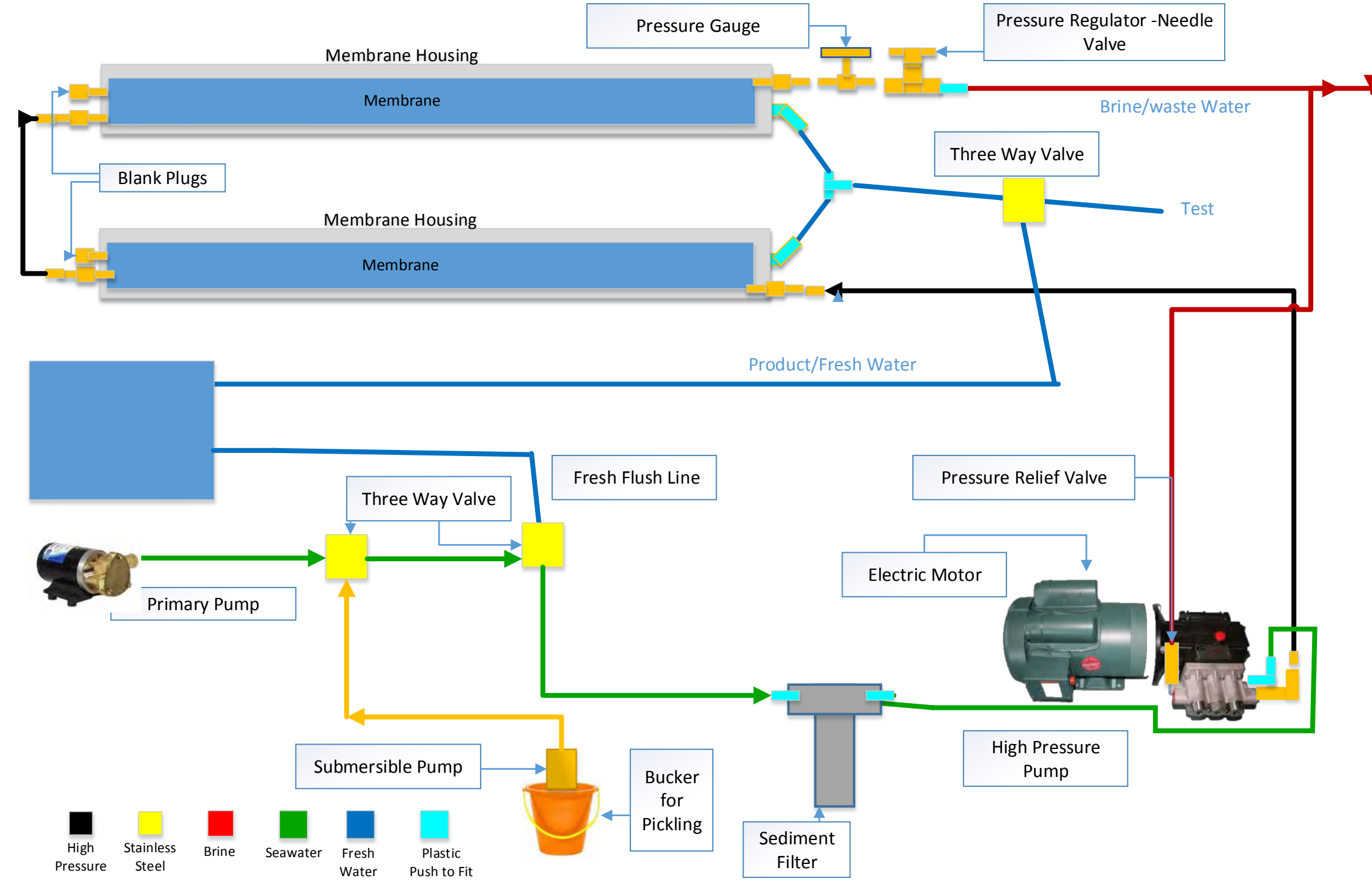
Membrane one – this membrane is the first membrane in line and connects to the high-pressure pump.



Membrane two – this membrane is the second membrane in line and connects to the first membrane on the in one end and to the pressure gauge on the panel.




Pressure Regulator -Needle Valve
Blank Plugs
Three Way Valve
Membrane Housing
Membrane
Test
Pressure Gauge
Product/Fresh Water
Fresh Flush Line
Pressure Relief Valve
Three Way Valve
Brine/waste Water
Electric Motor
Primary Pump
Submersible Pump
High Pressure Pump
Bucker for Pickling
Sediment Filter
High Pressure
Stainless Steel
Brine
Seawater
Fresh Water
Plastic Push to Fit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Seawater
Fresh Water
Plastic Push to Fit

COMMERCIAL DUTY WATER PUPPY

MODELS:
23680-4003 12V DC
23680-4103 24V DC

CE

FEATURES:

Continuous rated, medium duty pumps for bilge and general purpose use.

- ISO 8846 MARINE (Ignition protection).
- ISO 8849 MARINE (Bilge pump standard).
- Small bilge debris present no problem to these bronze bodied, flexible impeller pumps.
- Simple design means fewer wearing parts.
- 32 lpm (6.5 UK gpm) output @ 3m (10ft) head.
- Self priming to 1.2m (4 ft).

WATER PUPPY PERFORMANCE

Approximate performance for new pump, running water at 20°C with fully charged battery

TOTAL HEAD		WATER PUPPY	
m	ft	lpm	UK gpm
2	7	35	7.7
3	10	32	7
4	13	30	6.6
6	20	25	5.5

WARNING: If the fuse fails repeatedly do not fit a heavier fuse or bridge the fuse terminals with silver paper or metal wire. Failure to observe this instruction may result in a fire hazard due to overheating of cables.

WARNING: Do not use any Jabsco pump for petrol, petroleum products or any products with a flash point below 37°C (98°F), explosion or death may occur.

INSTALLATION INSTRUCTIONS:

Jabsco Water Puppy can be mounted on any flat surface. Fit the pump in a dry, well ventilated position where there is full access for service. If installed in a vertical position the motor must be above the pump head. Use the rubber grommets provided to minimise vibration, do not overtighten the mounting screws.

Secure 25mm (1") id hose either direct to the discharge ports or to ½" BSP male threaded fittings using stainless steel hose clamps. Use spiral reinforced hose (with a smooth internal bore) that will not collapse under suction, or rigid or semi rigid pipework systems. The pipework must be compatible with the liquid being pumped. Pipe runs should be kept as straight and short as possible, avoiding rising and dipping over obstructions. Fit a strainer on the inlet hose to prevent larger debris from entering the pump.

WIRING INSTRUCTIONS

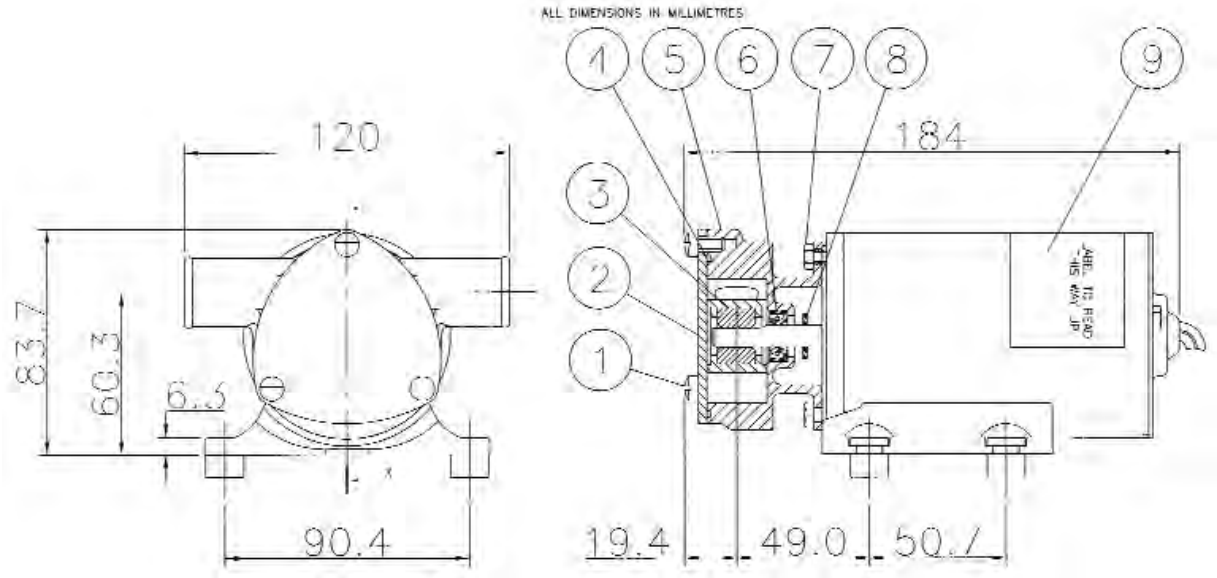
Make all electrical connections in dry locations, connections in humid environments should be sealed to prevent corrosion. Protect the circuit with a correctly rated fuse or circuit breaker in the orange positive (+) lead as close as possible to the power source. Connect the black motor wire to the negative (-) battery terminal. Inadequate voltage at the motor terminals when the pump is running (not less than 10% below rated voltage at full load) due to partially discharged batteries or insufficient cable size may result in blowing fuses, failure to start or poor pump performance.

WARNING: All marine pumps discharging overboard must be installed with the overboard discharge well above both static and heeled waterlines.

ELECTRICAL WIRING INFORMATION					
MODEL NO.	VOLTAGE	MAXIMUM AMP DRAW	MAXIMUM FUSE SIZE	MINIMUM WIRE SIZE	MAXIMUM LENGTH BETWEEN (+) & (-) BATTERY TERMINALS
23680-4003	12 volt	13 amp	15 amp	30 / 0.25mm (1.5mm²)	4.5m (15ft) *
23680-4103	24 volt	6 amp	10 amp	32 / 0.2mm (1.0mm²)	4.5m (15ft) *

* For longer installations, fit thicker cables

DIMENSIONAL DRAWING & PARTS LIST



WEIGHT: Water Puppy - 3.0kg (6.6lb)

WATER PUPPY PART LIST			
KEY	DESCRIPTION	QUANTITY	PART NO.
1	End Cover Screw *	3	SP1004-09
2	End Cover	1	9328-0200
3	Impeller *	1	6303-0003
4	O-ring *	1	X5251-049
5	Body	1	23064-2100
6	Seal *	1	SP2701-52
7	Screw (pump to motor)	2	X3001-147F
8	Slinger	1	6342
9	Motor 12V	1	74001-2652B
	Motor 24V	1	74001-2653B
Service Kit (Contains Items Marked *)			SK224

xylem
Let's Solve Water

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