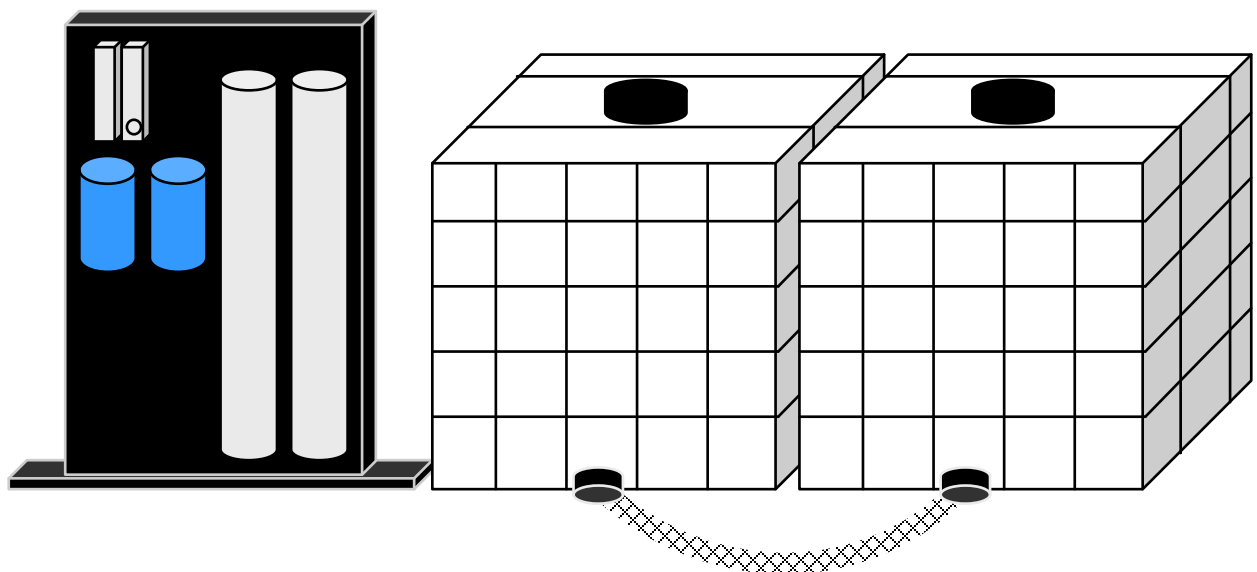




# BULKFLOW 2000



## OPERATION & MAINTENANCE MANUAL

# INDEX

- 3 Welcome
- 4 General Advice
- 5 Installation
- 6 Operation/Water Flow Gauges  
Maintenance/Operation

## **Routine Maintenance**

- 7 TDS Meter
- 8 Filter Housings
- 9-10 Resin Vessel
- 11 Membrane Replacement
  
- 12 Troubleshooting Guide

# WELCOME

Congratulations on purchasing one of the finest pure water generators available.

This **BF2000** machine has been designed by engineers, with reliability, build-quality, robustness and ease of use paramount in their considerations.

Like all engineered equipment, maintenance is an integral part of ensuring continuity in design performance and will guarantee tireless production of top-quality pure water for many years to come.

We would recommend that you to take the time to read this manual to fully appreciate that, with just a few simple routine operations, you can protect your investment, whilst minimising any potential downtime.

This manual will give you an overview of the system, the location of significant fittings and controls, and a quick guide to get you up-and-running.

Then a more detailed explanation of the settings and routine maintenance, along with troubleshooting and longer-term maintenance.

The Brodex BF2000 RO machine utilises pre-filtration, Reverse Osmosis Filtration and Mixed Bed Resin filtration to produce Pure Water in the most economical fashion.

We are confident you will be extremely pleased with your new system.

## Overview of System

You will have been given a rundown of your system and all its components, along with a guide to basic maintenance, short-term and long-term (covered in later sections of this manual).

But it's a lot to take in in one day, so be sure to familiarize yourself with your machine and all the attachments and fittings by close reference to this manual.

# GENERAL ADVICE

Remember to check the pressure of your mains water supply – typically about 50PSI – as this can seriously affect the performance of your system.

The nature of RO membranes is that they perform better and better the higher the feedwater pressure – right up to 150psi. Unfortunately, the low and inconsistent pressure delivered to our homes by the water board is very far from achieving this, often below 60 psi and sometimes as low as 30.

When this becomes significant it may be necessary to consider adding a booster pump.

Quite simply, the higher the water pressure, the purer the water (and that's by a considerable amount).

Many advantages include greater production rate (considerably quicker fill-time for your machine), the less blockages caused by scale deposits and more efficient flushing procedure, hence prolonging the life of your expensive membranes.

In practical terms RO Systems work quite satisfactorily where your mains pressure is 50psi or more, and the lifetime of membranes is generally acceptable to the average user. Even so, you might like to consider the Booster Pump as a long-term investment given the obvious benefits listed above.

But, where you are in the 30-40psi region, or lower, a Booster pump is an essential addition to your system and will soon pay for itself. Please call us for more information.

## **Dangers to System**

**FREEZING** : this system has been designed to be exceptionally resistant to frost damage, but, as you would expect from any system filled with water, allowing it to freeze can cause expensive damage.

We suggest you take every possible precaution to protect your investment.

## **MEMBRANE FLUSHING – PLEASE SEE REGULAR FLUSHING ADVICE.**

**HOW PRESSURE BLOCKS MEMBRANES AND USES EXCESS RESIN** – Low mains water pressure of around 30-40psi results in premature scale build-up on the membrane surfaces.

This blocks the pores and reduces flow-rate of product, and also dramatically increases the TDS of the product water which consumes a lot more resin, ultimately costing you far more than necessary.

# INSTALLATION

## Installation of the **BF2000**

The equipment is composed of the following components;

1. Powder-coated steel panel with controls.
2. IBC (1000 Litre tank) or more, e.g BF2000 has 2 x IBC Tanks
3. A "Blue Torpedo" DI resin Vessel, in position on the back of the free-standing control panel

### **Step. No 1**

Position the tank where required on level ground and position the steel control panel close to the tanks.

### **CAUTION - HEAVY ITEM - TWO MAN LIFT!**

Be aware that you will need to locate close to a water supply and Drain point.

### **Step. No 2**

Take your premises water supply and convert to a ½ inch hose supply, e.g. Tricoflex, with enough length to reach the water tank.

### **Step. No 3**

There are 2 fittings on the tank, Water In and Drain

### **Step. No 4**

Locate the premises drains and obtain a ½ inch hose (see step 1 ) and run the hose to the drain fitting on system.

### **Step. No 5**

Plug in the 240Volt submersible pump lead to a fused 13amp mains socket and the installation is now complete.

# OPERATION

## Step. No 1

Turn on the water supply.

## Step. No 2

Close (i.e screw in) clockwise the 'adjusting' valve situated on the steel panel face. Do this until the level of water to drain is no less than 2.0 lpm.

## Step. No 3

Pure water will now be produced and sent to the holding tank and Concentrate waste water will be sent to drain.

## Step. No 4

The holding tank will shut off the production when full.

## Step. No 5

To extract the product from holding tanks, switch on the delivery pump from the switched plug socket on the wall. The delivery pump will continue to operate until the BF2000 holding tank is empty and should then be switched off at the mains socket.

## Panel Gauges

These gauges enable the user to obtain an accurate numerical value for the amount of water that is converted into the product i.e into the tank and i sent down the drain, i.e - waste.

The product gauge does not have any type of adjustment and merely shows the quantity of pure water being produced. The other gauge has a control valve at the base which will control the amount of water which passes to drain.

As this valve is adjusted this will in turn, adjust the amount of pure water produced into the tank.

Whilst this can be adjusted to increase (clockwise) or decrease (anti- clockwise) the product quantities, we reccomend that it is adjusted to allow a minimum of 2 litres per minute (1.5 lpm) to flow to drain.

*\*This is the minimum amount of water required to maintain healthy membranes.\**

If the drain rate is increased this will reduce the product rate dramatically and, if the drain rate is decreased, the product rate will indeed increase. But it is essential that a good quantity of water (2.0 lpm ) is passing over the surface of the membrane to drain, otherwise the membrane will become blocked with calcium deposits.

*\*If no water is allowed to drain at all, product will still enter the tank, but the membranes will be irreparably damaged within several tank fills.\**

## FLUSHING ALERT!

Again, we would stress the importance of regular flushing as detailed on page 07. This helps to clean away unwanted deposits on the membrane surface and dramatically extends the membrane lifetime.

# MAINTENANCE

The ongoing maintenance of the system comprises of 3 main areas;

1. Pre-Filters
2. Membranes

## **Pre-Filters**

To be changed according to usage but as a guide we recommend every 3/4 months.

## **Resin**

To be changed when TDS readings dictate. Typically after 30,000L

## **FLUSHING ALERT!**

### **VITAL : REGULAR ADDITIONAL MEMBRANE FLUSHING**

We cannot overstress the importance of flushing your reverse osmosis membrane ...at least weekly, preferably every day, by opening up fully for at least an hour, the drain ad-justing valve on the front panel.

This reduces the amount of calcium scale build up and prolongs the life of the membranes.

Also, in areas of the country where the water is particularly hard with calcium salts, the life of a membrane will be dramatically increased if the machine is fed with artificially sof-tened water.

## **Taking a TDS Reading**

Total Dissolved Solids (TDS) are the total amount of mobile charged ions, including minerals salts or metals dissolved in a given volume of water. It is expressed in parts per million (ppm) or milligrams per litre (mg/L). Our industry tends to work in ppm. Specific instructions will have been included with your meter, but generally it will be as follows:

Remove the protective cap, turn the meter on and immerse the sensor into the water to be measured - usually no more than 2", as the whole unit may not be waterproof! Lightly stir the meter to dislodge any air bubbles. Wait about 10 seconds, until the display has stabilized, then read your ppm from the LCD screen. Some models may have a "hold" button to enable you remove the unit from the water and still read the display.

As a general guide, mains water in soft water areas will usually be in excess of 50ppm, and in hard water areas in excess of 300ppm,

While Pure (deionised) Water will be 0-2ppm

And sodium chloride used to calibrate TDS meters is 342ppm

It is advisable to use the TDS meter to measure the ppm readings at three points:

- Incoming mains
- RO water directly from the membrane
- Water delivered from the manifold

This will help you diagnose problems before they arise and cure them when they do occur.

# MAINTENANCE

## **3G Intelligent Filter Housings 10" Particle and Carbon Pre-filters**

Pre-filtration is essential to protect to Reverse Osmosis membranes from damage caused by suspended and some dissolved solids present in ordinary tap water.

The most cost effective way is to use 10" disposable cartridge filters to remove any suspended solids that would block the membrane.

These filters should be changed regularly, as filling times will be dramatically reduced and running costs of the machine can rise, which is due to poorer quality RO water product water.

We recommend replacement every 3-6 months, but be aware that, if you see brown coloured town's main water in your area, due possibly to local water authority repairs, the filters can block very quickly. However they are cheap to replace and ensure the health of your membrane which is the most expensive single filter component on your machine.

Pre-filter maintenance is an insurance policy on your machine, please remember to log dates in your owners' manual when you change them. Replacement is straightforward, please follow steps below.

### **Replacement**

- Ensure any booster pumps are turned off and that the machine is de-pressurised. Put a bucket under the housing to catch any water spillage.
- Using your housing spanner supplied with your machine, locate onto the moulded ribs of the housing and turn anti-clockwise from housing body.

**PLEASE NOTE:** Viewed from above the direction is clockwise to loosen. Watch closely for a rubber " O " ring which must be refitted to prevent leaks.

- The filter housing bowl will detach from the black gauge body.
- Remove the old 10" filter and discard.
- Replace with the new filter and discard.
- Replace with a new filter ensuring that all packaging is removed.
- Refit bowl hand-tight, ensuring "O" ring is still in correct position.
- Once the filter is replaced, pressurise the machine and bleed air from the top of the housing by depressing the red toggle button on top of housing body.
- Once clear water bleeds out of the red recess, the filter is now back on line protecting the membranes.



# MAINTENANCE

## DI Resin Vessel filling

The resin that needs to be changed regularly is found in the blue resin vessel (Torpedo). With time and use, this resin will become exhausted and will need replenishing with fresh resin.

This is available from Brodex in convenient 25 litre sacks. Please follow the instructions carefully to ensure that your machine will produce good quality purified water, as verified by using your water purity testing TDS meter.

### SAFETY NOTICE

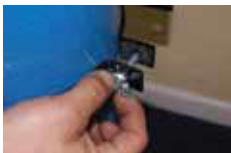
Ensure that the vessel is de-pressurised before removing any connecting pipe work. This can be achieved by simply connecting an open outlet hose to the machine pure water outlet on the machine or on the associated security manifold. Wear approved eye safety equipment.

### Instructions.



Disconnect the inlet and outlet pipes from the vessel body— IN and OUT are clearly marked.

Simply take care to note which side is which and duplicate this when reconnecting.



Undo the nuts on the circular bracket.



Unscrew (in an anticlockwise direction) the head assembly which will then release from the vessel body. Take care not to lose the black "O" ring which may fall away. Withdraw the cap assembly taking care not to damage the riser tube and end distributor.



The riser tube can be slowly lifted out whilst shaking the blue vessel and you must inspect this tube to ensure that the white plastic distributors at the top and bottom are intact and undamaged.



Again at this time ensure that the black rubber "O" ring is safe.



Taking the riser tube and distributor as-sembly, gently pull the rise tube out of the vessel head. There are 2 rubber "O" rings located within the female recess that accommodates the riser tube. Ensure on re-assembly that the riser tube is pushed gently but firmly home into the head assembly. This will ensure a water tight seal and prevent "tracking" of hard water to service flow.



# MAINTENANCE

- Cover the end of the tube with some sticky tape to ensure that resin does not pass down the tube whilst filing.
- Empty the old resin out of the vessel and place into a plastic bag and throw away with domestic waste. The resin is non hazardous to the touch and can be handled safely. Rinse the vessel out with a hose to remove any remaining old resin.
- Place the taped up riser tube inside the bottle. Once the riser tube is centrally positioned into the empty vessel, start to fill the vessel with mixed bed resin.
- A cut down funnel is a useful tool to assist filling.
- Fill the vessel up to the shoulder position, as indicated. Shake the container frequently to ensure a good settlement and compaction of resin. Do not overfill and ensure that the riser tube remains central during the procedure.
- Apply a smear of petroleum jelly (i.e. Vaseline) to the rubber "O" ring on the vessel head assembly. This will assist in a good watertight seal. If the "O" ring is damaged, replace accordingly.
- Remove the sticky tape from the top of the riser tube and slide on the head assembly as far as it will go. Now slowly screw on the head in a clockwise direction, ensuring that you do not cross-thread until it is tight to the hand. Make sure that the top of the vessel and the shoulder of the head are sandwiching the rubber "O" ring.
- Reconnect the bottle to the machine; ensure that the inlet port goes into the left hand side port on the machine.
- **Do take care to reconnect your "IN" and "OUT" as noted at disassembly.**

# MAINTENANCE

## Long-term Maintenance Replacing Reverse Osmosis Membranes – 40 & 20 inch



- Remove the 40 inch or 20 inch Membrane Housing from the machine by disconnecting the hoses using a 19mm spanner. Then remove the whole cylinder from its two Cobra clamps by undoing the alan bolts on each. Position housing on bench and pay attention to the end of the housing with a single pipe inlet and a grey plastic plug. Undo the clamp which holds the end cap in place using two 14mm spanners, as shown, right.
- This clamp takes the form of two C pieces, held together by a pair of bolts. Loosen one, but leave in position, and remove the other entirely, as shown.
- The black end cap has a recess which the clamp fitted into. Place the tip of a broad blade screwdriver in this recess and, using a hammer, gently tap to ease it out of the steel tube.
- Once a reasonable gap has opened up, insert the screwdriver in this, and twist to open further, taking care not to damage the rubber "O" ring which is now exposed.



- Once the cap is removed, the white membrane can be seen. Take care to retain the rubber "O" ring and, if damaged, replace.
- Grasp the central spigot with a pair of pliers and pull gently, turning membrane as necessary and withdraw the membrane fully from the housing.
- Fit new membrane in reverse order of the above. Smear the central spigot on both ends with silicone gel or vaseline.

### Note: insert new membrane in direction of flow arrow

- Ensure "O" ring is in good condition and correctly positioned, as you reinsert black endcap.
- Refit pair of "C" clamps, ensuring outer lip grips the recess in the plastic end cap and the other fits over the stainless steel lip at the end of the membrane housing. Tighten bolts equally, so that a similar gap is on either side of the cap. Replace housing on machine and reconnect hoses.



# MAINTENANCE

## TROUBLESHOOTING

<b>SYMPTOM</b>	<b>CAUSE</b>	<b>REMEDY</b>
High TDS reading from tank	Resin Exhausted	Check TDS of membrane water from torpedo feed to tank, if good, replace resin in torpedo accordingly.
High TDS in membrane water	<ol style="list-style-type: none"> <li>1. Low mains water pressure</li> <li>2. Leak inside tank (raw water contamination)</li> </ol>	<ol style="list-style-type: none"> <li>1. Flush/Replace membranes</li> <li>2. Install mains booster pump (40PSI Ideal Minimum)</li> <li>3. Check for leaks &amp; repair fittings accordingly.</li> </ol>
Slow Filling	<ol style="list-style-type: none"> <li>1. Blocked Pre-Filters</li> <li>2. Blocked membrane</li> </ol>	<ol style="list-style-type: none"> <li>1. Change filters</li> <li>2. Change membranes</li> </ol>
Tank Overflows	Faulty Ball Valve	Replace ball valve