



WATER TECHNOLOGY
M A L E B L E C H N O L O G Y

Installation, Operation & Maintenance Guide for the Osmio HT+ Dental & Lab Direct Flow Reverse Osmosis System



The Osmio HT+ Reverse Osmosis System is designed to meet the needs of your Dental Practice or Laboratory.

Osmio HT+ primary uses are:

- Use in autoclave
- Use in DUWL
- Rinsing of instruments during manual cleaning
- Holding of instruments prior to decontamination
- Use in rise cycle of washer disinfectors



Installation Precautions

1. This, and any other pressurised system connected to the water mains, or pumped from a tank or gravity fed, should be protected as appropriate from leaks. It is necessary to ensure that the property where this system will be installed has controlled pressure regulation using a Pressure Reducing Valve to ensure the maximum pressure cannot go above the specified parameters. You are also advised to use a leak detector, such that if any leak is detected, the supply to the system will shut off and not cause damage due to water leaking to the property. This is especially important as water [pressure can rise on the evenings and weekends to over double what you measure in the daytime.

2., Please use clean vinyl gloves when handling the filters and touching them. This is avoid any bacterial contamination from your hands to the filters which can then multiply and cause a bad smell in the system.

1. Introduction

The Osmio HT+ Dental & Lab Direct Flow Reverse Osmosis System has been designed and built specifically for dental surgery and laboratory applications where near to 0 TDS water is required. This model replaces the Osmio DG-105 System which was a tank based reverse osmosis system. Being direct flow, the Osmio HT+ Dental & Lab Direct Flow Reverse Osmosis System does not use a tank, but instead has a larger pump and membrane so it can provide a direct flow of water. This offers massive advantages:

- No need to sanitise your tank
- Huge saving in the amount of water going to drain
- Overall less costs in bills and improved sanitary condition of the system - all leading to a much more reliable and efficient operation.

2. Product Features

Produce deionised water at a small fraction of the cost of water distillers right in your own facility.

- Ideal for autoclaves / sterilizers
- Will Remove up to 99.99% of impurities from UK mains water
- Under the counter commercial system that generates DI water
- Plug & Play parts for easy maintenance
- Total of 5 hygienically packaged filters
- Meets HTM requirements: 0-3 ppm (TDS) DI water (DI quality)
- Smart Water Technology digital controller
- Analyses water, tracks filter lifetime and optimizes performance
- Automatic flush of membrane filters for optimum water quality
- Standing model, no need to mount to wall
- Small footprint for easy installation and service
- 6 Month pre-filter change lifetime
- DI filter change lifetime when TDS changes (1-6 months)
- RO Membrane filter change lifetime when TDS changes (18-24 months)
- Full, courteous support provided by experienced professionals

Osmio HT+ is the perfect solution for Dental Practices and other facilities that require on-demand deionized water. The system comes complete tap and installation kit. HT+ is a digitally controlled reverse osmosis system with Smart Water capability that is specifically designed for dental and medical applications where deionized water is required. The system incorporates high quality filters, easy Plug & Play components and a digital controller which tracks filter lifetime as well as measure instantaneous water purity. After the reverse osmosis process, the Osmio HT+ system is equipped with a high quality mixed bed filter which purifies the water down to deionized levels. The Osmio HT+ system comes equipped with a digital controller with Smart Water capabilities. It can be set to make a sound alarm and/or cut the water flow when filter lifetime is achieved, in order to prevent limescale build-up which can damage the autoclave sterilizers. The system continuously analyses the purified water and displays the results on screen. The system will know when water is consumed and immediately flush the membrane filters afterwards to protect water quality and filter lifetime. The Smart Water System does many things in the background such as track water temperature, errors and filter lifetime in order to give the highest up-time possible while delivering the best user experience. With the push of a button or by looking at the bar graph on the display, the user will know exactly how many days are left until the next filter change. The Osmio HT+ system will also create a sound alarm when it is time to change the filters and even cut the water flow if it is surpassed significantly. -

3. Technical Specifications

Electricity 100 - 240 VAC / 50-60 Hz

Feed Water Pressure 2 Bar Min. - 6 Bar Max. Please use a pressure reducer if feed water pressure is above 6 bar.

Feed Water Temperature 4 - 40°C

Feed Water Connection 1/2" NPT

System Dimensions 48cm Height x 36cm Width x 24cm Depth

System Weight 12 KG

4. Feed Water Specifications

For the conditions below, the system will produce 60 litres of DI water per hour. Please ensure you contact Osmio Water team if your feed water does not meet these levels. Ensure that water going into the system is micro-biologically safe. If you are on a private supply, ensure there is proper UV treatment to the water before it supplies the Osmio HT+.

pH 6.5 - 8.5

Turbidity < 5 NTU

TDS < 1000 PPM

Hardness < 500 PPM CaCO₃ (50°F) (28°dH)

Chloride < 250 PPM

Free Chlorine < 0.7 PPM

Iron < 0.1 PPM

Manganese < 0.1 PPM

Silica < 0.1 PPM

Chemical Oxygen Demand < 5 PPM O₂

Total Bacteria Count < 50 CFU / mL

E. Coli < 3 CFU

5. Osmio HT+ Filters

1) 5 Micron Sediment Filter - For particles and dust to 5 micron.

- recommended change **every 6 months**

2) GAC Carbon Filter - For chlorine and chemical parameters

- recommended change **every 6 months**

3) CTO Carbon Block - All of the above + fine particles, heavy metals such as iron, manganese and other rust

- recommended change **every 6 months**

4) 400 GPD Reverse Osmosis Membrane - Dissolved solids, chemicals, micro-organisms, nano sized suspended solids, much more

- recommended change **every 12-18 months**

5) Mixed Bed Deionized Water Filter - This filter polishes off any remaining TDS left after the membrane. The Reverse Osmosis Membrane is normally reducing incoming TDS level by 94-98% so if the incoming TDS was 200ppm, the result after the RO Membrane should be at least 12ppm. The DI resin filter then polishes off the remaining TDS.

- recommended change depending on your requirements or autoclave (e.g. <4ppm or <40ppm autoclaves will make a difference how often this filter will need changing. The DI Resin filter can be upgraded to a larger size filter if the frequency of change is more than every 3 months.

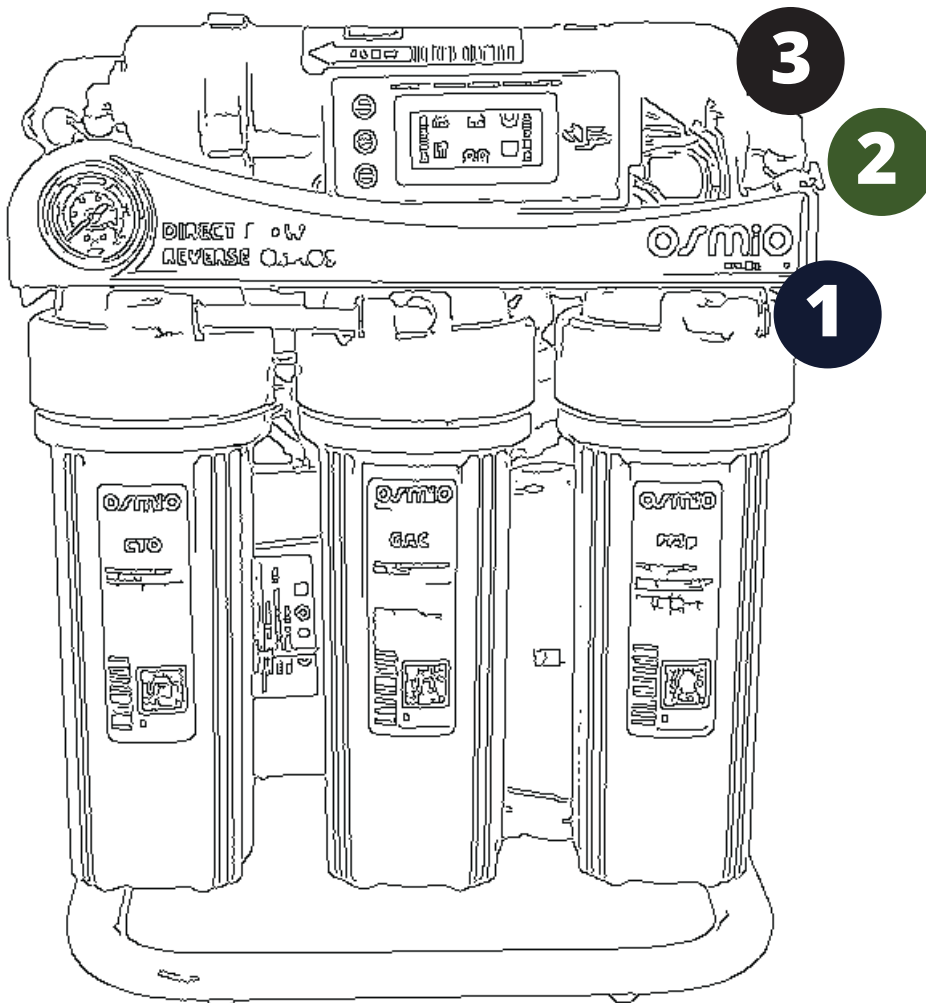
6. Connection Schematic

There are 3 connections that have to be made, and they are made using simple push fittings:

1 The Incoming water

2 To the Tap

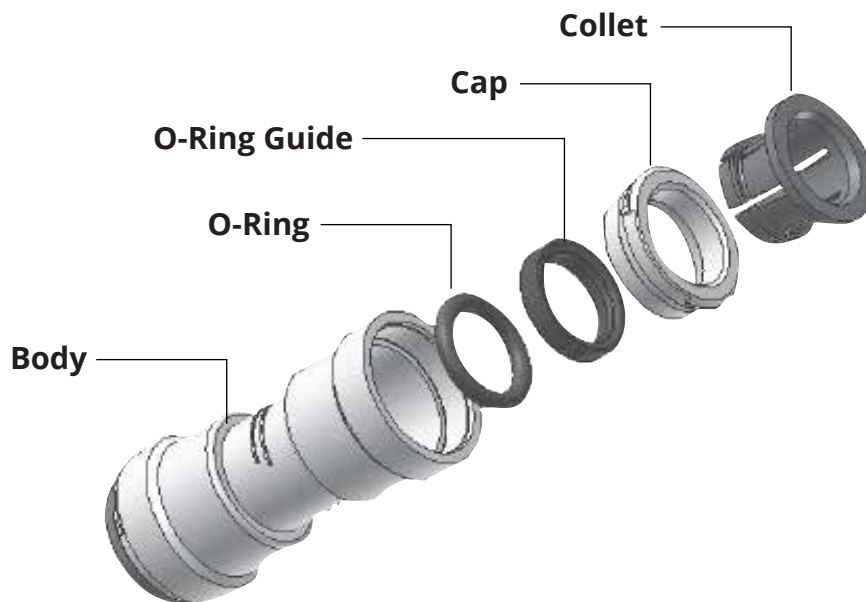
3 To the Drain (this is on the backside of the system)



How to Use Quick Connect Fittings

Quick connect fittings (push fittings) are used in a wide variety of plumbing, heating, electrical and fire suppression systems. Quick connect works by inserting the tubing into a connection mechanism that deploys fastening teeth onto the tubing surface. When opposing force is applied to the union, the teeth are forced deeper into the tubing, preventing separation of the union. The advantages of using quick connect fittings are:

- *They offer a significant time saving benefit over traditional connectors*
- *They tend to have less user failures compared to traditional connectors*
- *They require little skill or strength for their usage*
- *They do not require any tools to use and maintain them*



Exploded Diagram of a Quick Connect Fitting

All **Osmio ROHT+RO** systems take advantage of quick connect fittings. To make a connection, the tubing is simply pushed into the fitting. The unique locking system holds the tubing firmly in place without deforming it or restricting flow. Use the steps in the figure on the next page in reference to quick connect tubing connections for this system.

Step 1: It is essential that the outside diameter of the tubing being inserted into the fitting is completely free of scratch marks, dirt and any other material. Inspect the outside of the tubing carefully.

Step 2: It is also very important that the sliced edge of the tubing is cut cleanly. If the tubing needs to be cut, use a sharp knife or scissors. Make sure to remove all burrs or sharp edges before inserting the tubing into the fitting.

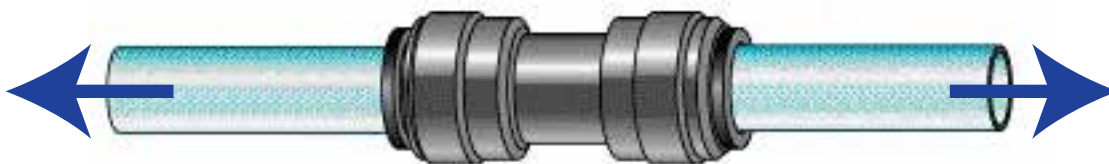
Step 3: The fitting grips the tubing before it seals. Lightly push the tubing into the fitting until the grip is felt.



Step 4: Now push the tubing into the fitting harder until the tube stop is felt. The collet has stainless steel teeth which hold the tubing in position while the O-ring provides a permanent leak proof seal.



Step 5: Pull on the tubing away from the fitting and make sure it stays firmly in place. It is good practice to test the connection with pressurized water before finishing installation.



Step 6: To disconnect the tubing from the fitting, ensure that the system is depressurized first. Push in the collet squarely against the face of the fitting. With the collet held in this position, the tubing can be removed by pulling. The fitting and tubing can be reused.



How to Use Quick Connect Fittings

7. Planning the Installation

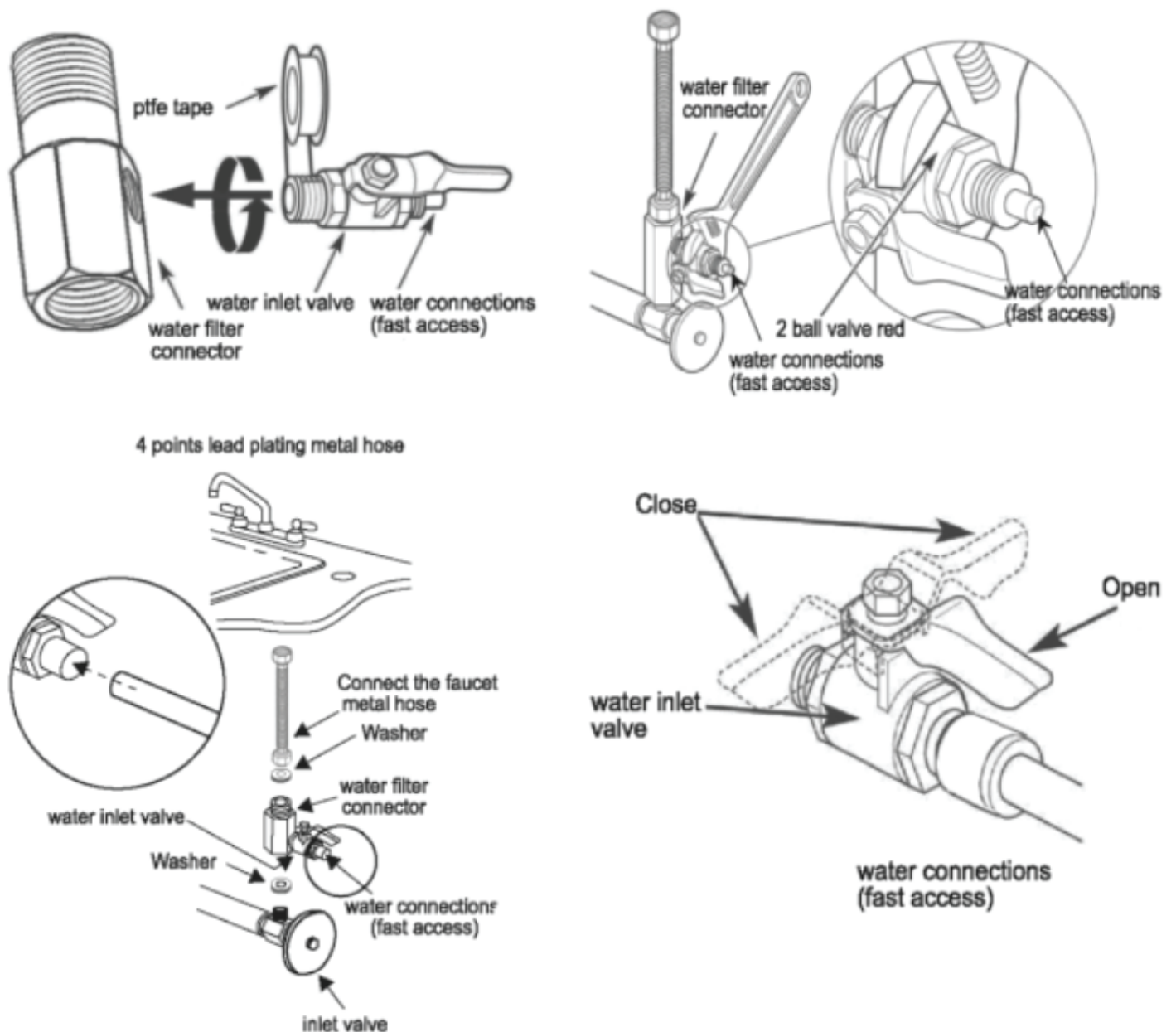
First remove the items from your box and check for any damage. Pay particular attention to the push fittings in case any are cracked or have missing collets. If there is any damage contact Osmio Water on +447852323666 and send a picture via Whatsapp showing where there is any damage.

In order to install the Osmio HT+, you will need the following tools and equipment:

- Drill & suitable drill bits for making 5mm, 7mm, 12mm holes
- Adjustable Wrench & Pipe Wrench
- Scissors
- Phillips screwdriver
- PTFE Tape

8. Installation Step 1: Feed Water Connection

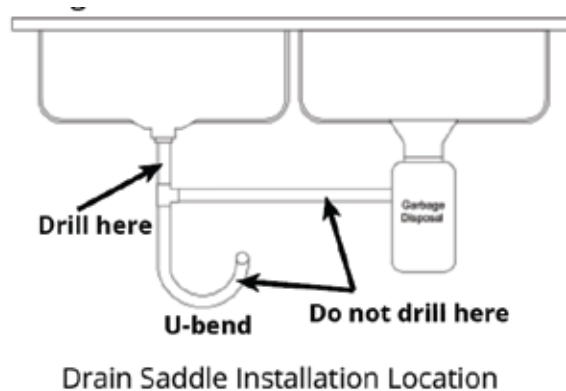
The purpose of the feed water connection is to feed the system with water to be purified by tapping the cold water supply which is usually located under the kitchen counter. It has 1/2" male and 1/2" female and a tee off. The easiest place to fit it would be where the cold hose is connected to the pipework, just remove the hose and the feed in valve goes there to tee off water to the system.



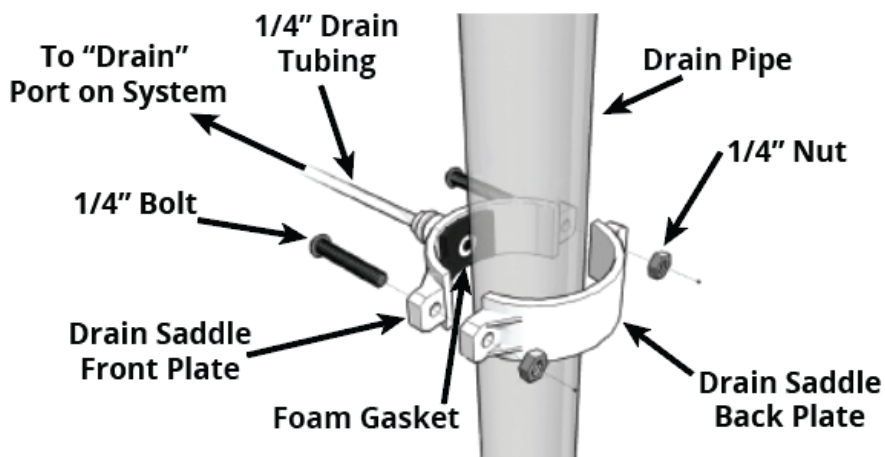
9. Installation Step 2: Drain Saddle Connection

The purpose of the drain saddle is to prevent the tubing connected to drain from popping out of place and potentially leaking where the system is installed. The drain tubing could also be put into an up-stand, or you can drill a hole in a waste pipe and silicone around it to make it seal.

Step 1: Select a location for the drain hole based on the design of the plumbing. The drain saddle should be installed above the u-bend if possible, on a vertical tail piece. Locate the drain saddle away from the garbage disposal to prevent potential contamination and system fouling. Please see figure below for a more detailed explanation. Use a 7 mm (1/4") drill bit to drill a small hole in the drain pipe for the drain to pass through. Clean the debris from the plumbing and hold before continuing.



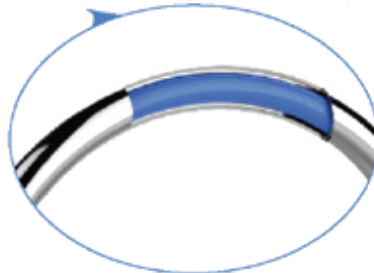
Step 2: Remove the backing from the foam gasket and stick that half of the drain saddle on the drain pipe so that the holes line up (a small drill bit or other long narrow object can be used to help align correctly). Place the other half of the drain saddle on the opposite side of the drain pipe. Clamp and loosely tighten the drain saddle using the nuts and bolts included. Use a Phillips screwdriver to tighten the drain saddle. Connect the tubing from the drain saddle quick connection to the "Drain" connection on the system.



Drain Saddle Connection Diagram

10. Installation Step 3: Installing the Tap

Your Osmio HT+ comes with a high quality chrome plated tap which we have made even easier to fit. All you need to do is drill a hole 12mm in your sink or worktop, put the tap in place and tighten it with your spanner. If you are needing to drill granite, marble or any other solid worktop, please see professional advice about how to do this if you have not done it before. Once your hole is drilled, apply the parts as shown below to the base to fix the tap in place, ending with the nut on the right. The tubing from the system is then connected using the 1/4" push fit union piece provide in your kit.



*NSF Certified and LEAD-FREE
Bacteria resistant coating inside the tap*

*Ceramic Cartridge for
years of trouble-free
service*



11. Installation Step 4: Membrane & Filters Installation

Before handling the Reverse Osmosis Membrane, it is important that you wear sanitary gloves. This is because if you touch the membrane by hand, you will immediately put bacteria which will start a new family inside your membrane housing and eventually foul your membrane. When bacteria gets into the sheets of the membrane and starts growing, it will open those sheets and the TDS will increase.



1) Remove Blue Clip



2) Remove Push Fitting



3) Unscrew Membrane Cap



Use the membrane spanner wrench provided in your kit to loosen it if you need to

4) Insert Membrane



Insert the membrane into the membrane housing. Ensure it goes into the socket at the other end of the housing inside it and the membrane is flush with the top of the housing.

5) Screw Membrane Housing Lid Back On



Insert the membrane into the membrane housing. Ensure it goes into the socket at the other end of the housing inside it and the membrane is flush with the top of the housing.

6) Insert Push Fitting & Clip



Insert the push fitting back into the membrane housing



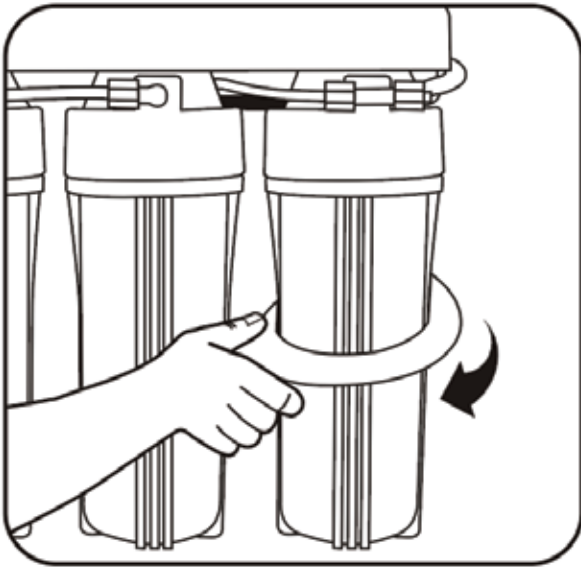
Insert the collet clip back into the push fitting

7) Install Pre Filters

The 3 pre filters are inside the bowls **(IN THEIR PACKAGING)** so you first must unscrew the bowls and remove the filters from the bowls.



Never handle the filters by hand. Always use sterile procedures and sterile gloves. Touching them by hand can immediately compromise the hygiene of the system.



To open the bowls, use the housing spanner and turn clockwise.

Remove the pre-filters and their packaging.

Place each filter back into the bowl and ensure they are centred.

By hand then re-screw back on each bowl, ensuring first that the o-ring is both seated correctly, not damaged in any way and is greased and lubricated. If the o-rings are dry this means the bowl will not easily turn and therefore it is highly likely it will leak. In this case, ensure you grease the o-ring and each time you do a filter change.

12. System Start Up and Operation

Once all of the connections are made from the previous sections we can now take the following commissioning steps.

- 1) Make sure that the installed tap is in the on position (faucet lever perpendicular to faucet body). This will allow for pressure to not build up in the system during start-up and also we want to drain out the first few litres of production.
- 2) **SLOWLY** turn on the incoming water at the feed in valve by turning the red lever to point in the line to the pipe (this turns the water on).
- 3) Plug in the system power cord into an electrical socket. This will start the system boot up process. The system will sound a series of beeps and the lights on the front of the system will activate.
- 4) After the beeps, the system will commence by first a “flush” process which can be observed from the on-board digital panel. In this process the membrane sheets are washed by high flow water that goes directly to the drain line. This process will last up to 90 seconds and the system will next enter the “pump” cycle which also can be observed from the digital panel. In this process the system will start producing water which can be seen running from the faucet tap.
- 5) Run the water from the tap for 5 minutes. During this time the TDS value on the digital panel should be controlled. Make sure that it is inside of the 0 - 40 PPM range before turning off the faucet.
- 6) Once the faucet is turned off, the system will remain in the “pump” cycle until it is fully pressurized. Once this is done, it may be followed by a short “flush” cycle of 5-10 seconds to make sure any residuals left on the membrane sheet surface is flushed to drain. Next, the system will go into “Tank Full” mode where it is in stand-by waiting to produce water. The LED lights are automatically turned off in the “Tank Full” mode. Additionally the TDS reading is not active and will display “000 PPM” on the screen (TDS is only measured actively during Flush and Pump cycles).

12. Digital Controller

The board is equipped with three key buttons:

- 1) Select Button
- 2) Clear Button
- 3) Flush Button





The key functions are as follows:

1. Filter Selection Button function: This is for setting the filter lifetime and is used on installation and non filter changes. Use this button to select the Filter Lifetime (F1) or press again to select the RO Membrane Lifetime (F2)
2. Filter Clear Button function: When pressing the selection key to select the filter cartridge or membrane, then press this CLEAR button and then the selected membrane or filter lifetime will be reset with full bars showing.
3. Flush Button: Pressing this button will put the Osmio HT+ into the manual flushing state, which will rinse the membrane for 30 seconds. Whilst this happens, the LED screen "FLUSH" symbol will flash.

Symbol Key

SOURCE: If the system has a shortage of water, the **SOURCE** light will flash and a buzzer will alarm.

CHECK: This will come on if the system goes into the maintenance state, **CHECK** mark will flash indicating a problem with the system.

PURIFY: This will light when the system is actually producing water.

F1: This is the indicator of filters life (not including the membrane - F2). As the bar drops to the bottom this indicates the filters must be changed. Preset to 6 months.

F2: This is the indicator of MEMBRANE Filter life. As the bar drops to the bottom this indicates the filters must be changed. Preset to 2 years (24 months)

FULL: flushing;

When **PURIFY** and **FULL** are both showing, this then shows the TDS* value of pure water (*range 0~99ppm)

Wiring Key

No.	Wire Colour	Wiring
1	Yellow	Low-pressure switch
2	Blue	High-pressure switch
3	Blue	High-pressure switch
4	Red	Flush valve
5	Green	Pump
6	Black	Solenoid valve
7	Yellow	Low-pressure switch
8	Green	Pump
9	Black	Solenoid valve
10	Red	Flush valve
11	White	24Vdc
12	Pink	24Vdc

Digital Controller Specification

Power	<1.2W(Max)
Operating temperature	-20°C - +70°C
Operating Humidity	5%-85%
Operating voltage	DC24V
Load Current	3A
Load voltage	24VDC
Size	135x65x32mm

13. Filter Changes & Sanitisation Process

The system will require periodic filter changes and sanitisation. This must only be conducted by an Osmio Certified Professional.

Contact your dealer for more information for how to book a filter change and sanitisation service.

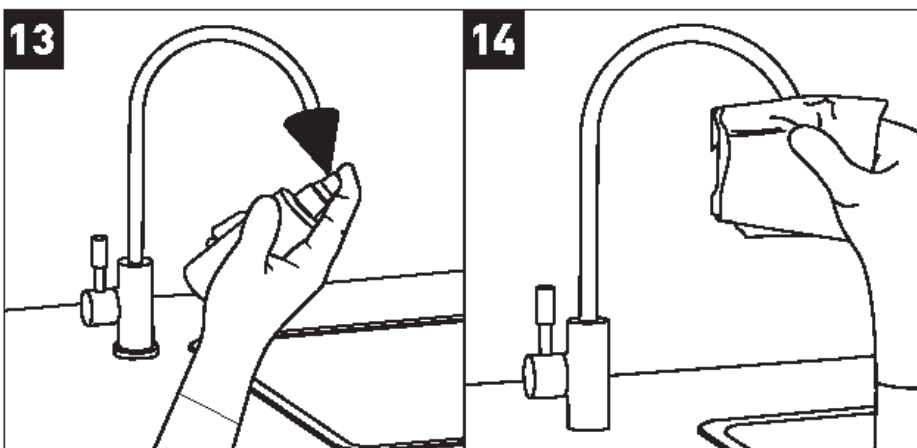
It is vitally important for HTM & CQC decontamination room guidance, that the maintenance of your machine only be carried out by trained professionals.

Sanitisation Process



HTM 01-05 and CQC must be implemented in your working regime and this includes sanitising your reverse osmosis system. We suggest this is carried out by a Osmio trained and certified professional.

1. Shut off main incoming water valve at the feed in red (red lever turn it to right angle to pipe).
2. Dispense water from the tap and leave tap open.
3. Remove stage 1-3 filters, from filter housing
4. Remove membrane, from membrane housing. If old then discard, if midterm then simply place the membrane in a sanitary bag until you are ready to put it back in.
5. Remove DI Resin Filter
6. Reinstall all the filter and membrane housings without filters and membrane (remember to pour about 6-8 ounces of chlorine / hydrogen peroxide in stage 1 housing)
7. Reattach all connections
8. Turn back on main valve.
9. Let system run until some water comes out the tap. Then close the tap.
10. Let it now sit for 10 minutes and then turn on the tap to flush.
11. Do this at least twice until the smell of chlorine / hydrogen peroxide is diluted.
12. Shut off main valve again, install all new filters and membrane.
13. Spray the tap spout with your sanitising solution.
14. Wipe the tap spout with a sanitary wipe or clean tissue.



Pay special attention to keeping the tap regularly clean, as most RO systems will first get contaminated from this point.

15. Turn on main valve and flush for 5 minutes.
16. Your sanitisation is now complete. Next log your work on the Service Log and book in the calendar the next sanitisation / filter change.

Problem	Cause	Solution
Leak between fitting and installed part	Fitting not installed correctly	Remove the fitting, apply teflon tape if necessary and install again
Leak between fitting and tubing	Tubing not inserted correctly	Remove and reinstall the tubing
	O-ring inside fitting damaged	Replace fitting
Drain saddle leak	Drain saddle not installed properly	Reinstall the drain saddle per Section 4.5 on page 17
Pre-filter / Membrane housing leak	O-ring seal is misaligned	Check that the o-ring is properly aligned in the o-ring groove
	O-ring is damaged	Replace the o-ring
	Housing not properly tightened	Tighten the housing with the included housing wrench
Water flows too slow from the faucet	Water supply pressure is too low	Non-pumped systems require min. 3 bar feed water pressure to operate while pumped systems require min. 2.5 bar pressure to operate. Check your supply pressure. If necessary, install a booster pump at the water main.
	Pre-filter or membrane filters are clogged	Replace the filters
	Tubing is kinked	Make sure no tubings to and from the system are kinked
	The flow from the system is meant to be 0.5 litres per minute upwards	Try doing some deep abdominal breathing and be patient and relax.
System is operating noisy	Sounds like whistle - air is stuck in the shut-off valve	The air will go away with continued operation
	Water supply pressure is too high	Check the inlet feed water pressure, If necessary install a pressure reducer
The system is always on (water continuously flows to drain)	Water supply pressure is too low	Check your supply pressure. If necessary, install a booster pump at the water main.
	Pre-filter or membrane filters are clogged	Replace the filters
	Missing or misplaced flow restrictor	Check for the location of the flow restrictor
	Shut-off valve failure	Replace the shut-off valve
	Check valve failure	Replace the check valve
"Cloudy" or "Milky" purified water. After a few seconds becomes clear again.	During first time start-up air pressure is trapped in the system	This is normal and will pass in 3-4 days
	If happens after weeks or months of operation, feed water is supplied intermittently with air	This is also normal and can be minimized by running the system for 15-20 minutes every few weeks
Purified water has bad taste or smell	Filters are at end-of-life	Replace the filters
	Contamination in the system	Sanitize the system

