



COMPLETE FILTRATION SYSTEMS



SYSTEM 10,000 MARINE USER GUIDE

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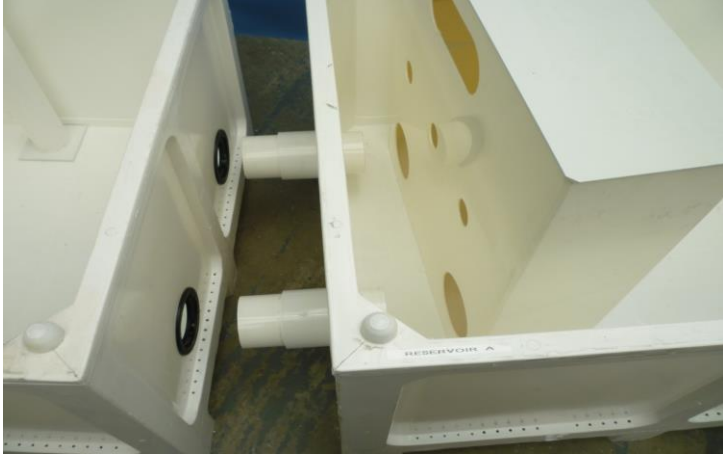
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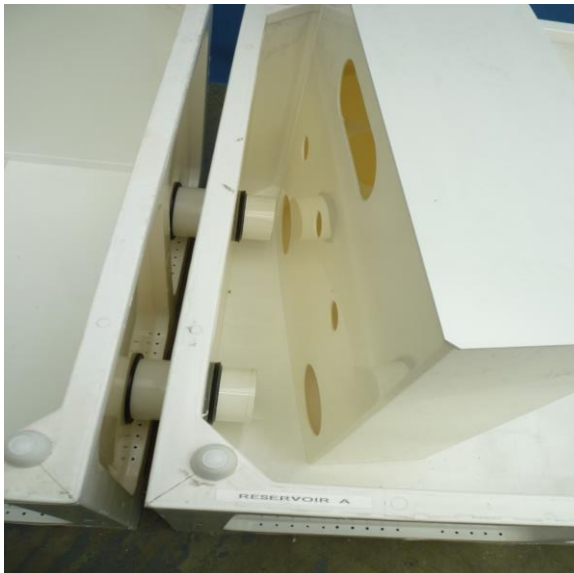
Website: www.biosystems-tmc.co.uk

A. Installation Instructions

1. First remove all the components from the reservoirs and remove all the protective packaging.



2. You've got two reservoirs labelled up reservoir A and reservoir B, which need to be linked together. In each of the reservoirs there are 2 x 115mm holes which have been pre drilled. You'll have 4 x 4" rigid tank connectors which have been paired up and linked using a 4" socket. Use these to join the reservoirs together and on the inside of the reservoir put some silicon sealant onto the back of the nut before screwing it onto the tank connector, and screw it tightly to the face of the reservoir.



3. Then push the reservoirs together, making sure the pipes go through the middle of the flexible tank connectors and that the flexible tank connector has completely sealed against the 4" pipe and the reservoir wall. Then in reservoir A the bag filter

which has 2 x 159mm holes drilled in it needs to be sited. The 4" pipes go through these holes which will in turn position the bag filter.

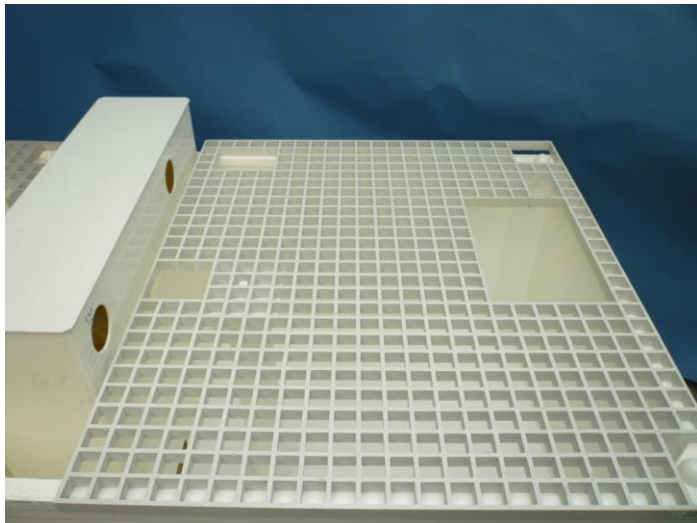


4. The other bag filter needs to be positioned in reservoir B and will be in the same position as the bag filter in reservoir A. A support stanchion needs to be positioned in each of the reservoirs to add support to the grid which sits on the reservoirs. The above picture shows where it needs to be sited in reservoir B. And the picture below shows where it needs to be in reservoir A.





5. When the support stanchions have been put into the reservoirs, the support grids need to be put into position. Above shows reservoir B with the grid in position, and shows the correct location on the cut out sections. Below show's reservoir A with the grid in position and again the correct location of the cut out sections. **If you've got the standard PSW5500P then you'll have a full support grid and the Protein Skimmer will stand next to the reservoir and not inside.**





6. Above shows the two reservoirs linked together, with the bag filters in position and the supports grids in their correct orientation.



7. Above shows the two reservoirs with the filtration components in position. The AV75 is to run the protein skimmer and will be positioned on reservoir B. The AV150 is to run the biological filtration on reservoir A.



8. Once all the components are in position the pipe work can be fixed into place. All the joints are labelled alphabetically A to A, B to B etc (Please note that when you're attaching the pipe work to the protein skimmer, it'll be easier if you put the venturi into the skimmer body first). Above and below are pictures from either side on the protein skimmer showing all the pipe work attached.





9. When attaching the pipe work on reservoir A, it's better to connect the three towers together as shown above. This will fix everything into position for you.
10. It's better to sit the UV on the floor to the rear of the system, rather than on the back of the system it's self. This will allow you easier access into the reservoir it's self and it'll be easier to do maintenance to the UV.



11. Once complete the system will look like the picture below.



B. Operating Instructions

1. Before commissioning the system, we'd recommend running the system without livestock and using a saltwater mix containing at least 100kg of PVD (pure vacuum dried) salt for at least 24hrs. This will help to cure all the plastic surfaces and remove any traces of oils used in the manufacturing of the plastic components, filter media and plumbing. It's also beneficial to increase the temperature of the water to approximately 25C to aid the dissolving and efficiency of the salt. If you're curing any of the adjoining plumbing to your aquariums, please ensure that the UV is bypassed to prevent deposition on the quartz sleeves.
2. Before starting any pumps, fill the pump strainer basket with water until its level with the inlet of the pump and ONLY hand tighten the lid. Also make all socket unions and double union balls valves are hand tight as well.

IMPORTANT: Read the following operating instructions carefully before switching on any pumps. Do not switch on the UV steriliser.

3. Close all valves with the exception of the following which should be fully open:

Ball Valve No.1: Valve on the system bypass to the reservoir.

Ball Valve No.2 & 3: Valves to the Trickle Bio Towers.

Ball Valve No.4 Valve to bypass the Trickle Bio Towers.

Ball Valve No.5 Inlet to the Protein Skimmer.

Ball Valve No.6 Valve to control the flow going to the venturi.

Ball Valve No.9 Protein Skimmer outlet.

4. Start the filtration pump on reservoir A, allowing it to prime and clear air from the line. All water should pass through the fully opened bypass (ball valve No.1), returning directly to the reservoir.
5. Slowly adjust ball valve no.1 to allow the rest of the system to fill. Avoid filling the system too quickly and overflowing any of the filtration components.
6. Check all joints and unions for leaks, and remove any plastic swarf floating in the reservoir. Place the four filter bags supplied in the location rings in the bag filter box.
7. Start the filtration pump on reservoir B, allow the air to clear from the pipe and let the protein skimmer body to fill. Slightly close valve 9 at this point to raise the water level in the skimmer body, so allowing this to cure.

8. Repeat step 6 at this point and remove any swarf in the reservoir and place the four filter bags supplied into the location rings in the bag filter box.
9. Drain the water from the system and system elements, flushing again with freshwater and run the system until all the components are fully rinsed to remove any residual salt. Empty again, and refill with clean freshwater and adding Tropic Marin Salt to the correct density (allow approximately 25kg of Tropic Marin for the volume of water in the reservoir).
10. Thoroughly rinse/wash the sand for the fluid sand tower (FST) before use.
11. With the system turned off, siphon out 50% of the water in the fluid sand tower (FST) prior to adding the sand media. Remove the clear vent pipe on top of the fluidised sand tower. Use a funnel (not supplied) to carefully add the sand. When all the sand media is added, replace the vent pipe, ensuring it's clear of sand. The fluid sand tower (FST) can be split at the flange in the centre of the unit, so the acrylic section can be detached. This is an alternative method of adding the sand. The acrylic section is fragile and should be handled with extreme care.

IMPORTANT: Repeat steps 2-4 and then proceed as follows.

12. Very slowly adjust ball valve no.1 until the sand media in the fluid sand tower (FST) is fluidised so the sand level reaches the flange, where the unit can be split.

IMPORTANT: Do not adjust any valves completely or too quickly or the sand media maybe fluidised to the point of overflowing through the clear vent pipe. Large amounts of rising trapped air may also cause the sand to overflow if this start up procedure isn't carried out carefully.

13. Once the water flow through the fluidised sand filter is stabilised, adjust valves 2 and 3 above the trickle bio towers (TBT's) so you've got water coming out of the spray bars. You may need to adjust/close valve 4 slightly so water is diverted to these valves.

14. One rotation a second is sufficient, but maybe further reduced to give a suitable dry/wet exposure of the 1" bio rings, depending on the application and filtration requirements. When adjusting valves 2, 3 and 4 be care full not to adjust these valves too quickly in case the fluid sand tower (FST) overflows.

IMPORTANT: The arms of the spray bars are not glued to allow the customer to adjust the angle of the spray bar to further control the speed of rotation for a given flow of water.

15. Turn on the supply pump for the protein skimmer (PSW), making sure valves 5, 6 and 9 are fully open. Once the pumps primed and the skimmer is starting to fill slowly adjust valve 5, so water is being forced through the venturi. The venturi when operating correctly will infuse the whole body of the protein skimmer (PSW) with a dense, even cloud of fine bubbles. It may take several hours before the whole system is cleared of air trapped during start up and this will initially disrupt the correct operation of the venturi. This is normal.
16. If the internal saltwater foam column washer is connected via an automatic timer valve (an optional extra), then ball valve No. 7 should be left open. However, if this is not the case then the ball valve No. 7 should be closed and used to manually wash the foam column as required.
17. If an ozone generator is to be installed on the system, then this will be to be connected to the stainless steel fitting located next to valve No. 8 via some Teflon tube.
18. It is necessary to set the correct operating water level in the protein skimmer. This is achieved by slowly and gradually closing outlet ball valve No. 9 until the water level in the protein skimmer (not the foam level) is within a few centimetres of the top flange of the main body, where the main body meets the tapering cone. The water level should not rise significantly within the tapering foam cone or the final vertical column.
19. If the foam is too dry, it may settle at the top of the foam tower and risk refluxing its contents back into the main body of the water. If the foam is too wet there could be unacceptable losses of water from the system that is costly if artificial seawater is being used.
20. Further adjustments maybe necessary to fine tune the flow of water to the main filter elements and this should be done by using valves 1, 2, 3, 4, 5, 6, and 9. Once satisfied the operation and running of the filtration system, the supply pump to your aquaria via the UV can be switched on. The UV should be switched on when there is water flowing through the unit.
21. It is recommended that any alterations and modifications made to the system in the normal day to day running be made in the morning. This is because back pressures and flow rates can take several hours to equalise and these need to be monitored periodically throughout the day.

IMPORTANT: The system 10,000 like any other biological filtration unit requires a maturation period (to allow colonisation of the appropriate levels of nitrifying bacteria) before it can be used on a fully stocked system.

22. The length of the maturation period will vary from 4-12 weeks depending on the initial stocking levels, water temperature, feed rates and other criteria. Throughout this period, ammonia and nitrite should be monitored daily to assess the progress of the maturation process. Further stocking should only be considered once the system is fully matured.
23. When the reservoir levels are low due to maintenance or high sales, ensure the pumps are not allowed to draw air. It is strongly recommended that the systems be fitted with water level switches to ensure that the pumps can't draw air. Do not allow bubbles from the return water to be drawn into the pump inlet.

CAUTION: All of these will cause embolism that will kill Livestock.

24. All items supplied with the system are covered by warranties under Tropical Marine Centre's standard terms and conditions. However Tropical Marine Centre LTD cannot be held responsible for any subsequent damage or the loss of livestock caused by the failure of the system component.

C. Maintenance Instructions

Recommended regular maintenance tasks for the SYSTEM 10,000

Daily Maintenance

- Check overall system and livestock health for early signs of problems
- Check bag filters for blockages and wash as necessary.
- Check protein skimmer cup and operate internal and external wash kits as necessary
- Check rotation of bio-tower spray-bars
- Check sand bed fluidisation level and adjust accordingly
- Check REDOX if applicable

Weekly Maintenance

- Carry out regular water tests with particular reference to pH, ammonia and nitrite when the system is maturing
- Perform partial water change (generally around 10 %)
- Check water salinity/density
- Change bag filters. If new bags are used, rinse in freshwater before installation
- Check and manually clean protein skimmer cup as necessary.
- Carry out a visual check on pump strainer baskets and intake strainers

Monthly Maintenance

- Inspect pump, UV steriliser and filter seals to ensure there is no build up of salt due to minor seepage, especially on pumps.
- Check consistency of protein skimmer foam and adjust as per set up instructions.
- Due to the abrasive nature of the fluidised sand bed filter media, the bowl may need to be replaced periodically and should be inspected for any signs of wear. Replacement bowls are available from TMC (product code FSB/VFCA4G8).

Biannual Maintenance

- Change ultra violet lamps using TMC 55 Watt UV lamps (product code 6056)

- Clean quartz sleeves (product code 5277) on UV steriliser and replace o-rings (product code 5281)
- Inspect bio media for mulm build up and clean/replace as necessary
- Check and clean clear pump lids

The system has been designed with as much flexibility as possible. Modifications and expansions are usually very easy to achieve. Please consult Tropical Marine Centre directly with any queries.

Optimal Values for Water Quality Parameters

Parameter	Acceptable	Optimal	Caution
Specific Gravity (at 25 °C or 77 °F)	1.020 – 1.027	1.022 – 1.025	< 1.020 > 1.027
Conductivity	43 – 60 mS/cm	45 – 55 mS/cm	< 43 mS/cm > 60 mS/cm
REDOX Potential	150 – 450 mV	250 – 350 mV	< 150 mV < 450 mV
pH Value	7.8 – 8.4	8.1 – 8.4	< 7.8 > 8.6
Alkalinity/Carbonate Hardness	5 – 18 dKH	7 – 16 dKH	< 5 dKH > 18 dKH
Phosphate (PO ₄ ³⁻)	< 0.15 mg/l	< 0.05 mg/l	> 0.15 mg/l
Ammonium/Ammonia Total Conc (NH ₄ ⁺ /NH ₃)	< 0.05 mg/l	< 0.01 mg/l	> 0.05 mg/l
Nitrite (NO ₂ ⁻)	0.02 mg/l	0 mg/l	> 0.02 mg/l
Nitrate (NO ₃ ⁻)	1 – 20 mg/l	2 – 10 mg/l	< 1 mg/l > 20 mg/l
Calcium (Ca ²⁺)	300 – 450 mg/l	400 – 420 mg/l	< 300 mg/l
Magnesium (Mg ²⁺)	1,000 – 1,600 mg/l	1,200 – 1,350 mg/l	< 1,000 mg/l > 1,600 mg/l

D. Commercial Ultraviolet Water Steriliser

Instructions For Installation And Use

All Tropical Marine Centre Commercial Ultraviolet Water Sterilisers using 55-watt lamps are supplied with two-inch solvent weld unions for easy connection to existing plumbing. We advise that a two-inch bypass system is incorporated into the installation of the UV unit to simplify future servicing and maintenance.

The unit is supplied with two-inch solvent-weld socket unions for connection to imperial and US plumbing fittings. Where metric plumbing fittings are to be used an inch to metric adapter can be supplied (2" × 63mm Solvent-Weld Metric Socket Adaptor, part number 7545)

IMPORTANT SAFETY INFORMATION:

- All units must be mounted with the lamps in a horizontal position. Never mount the unit with the lamps in a vertical position. Incorrect mounting and positioning will result in malfunction and permanent damage to the unit.
- **Never** look directly at an illuminated UV lamp.
- Do not operate the unit when disconnected from the water supply or allow the unit to run dry
- Always isolate the unit from mains electricity and turn off the water supply prior to carrying out maintenance.
- Always disconnect from mains supply before putting your hands into the water.
- Electricity should be supplied through a Residual Current Device (RCD) with a rated residual operating current not exceeding 30mA.
- The unit must be earthed. Do not use a fuse larger than 3 amps.
- Rating: UK and European models 220 – 240 v 50 Hz. Class 1, IP64.
- Rating: USA models 120 v 60 Hz. Class 1 IP64.

The unit must not be submerged in water

- The unit must be fully frost protected or taken inside during the winter months.
- Do not install it above or immediately alongside exposed water, to prevent the unit falling into it.

Connection To Electrical Supply

If in doubt, consult a qualified electrician.

CAUTION: Installation must comply with the relevant local wiring guidelines and legislation. Please consult a qualified electrician.

CAUTION: Always disconnect the UV steriliser from the mains electricity supply before putting your hands into the water.

CAUTION: Power must be supplied through a Residual Current Device (RCD) with a rated residual operating current no exceeding 30 mA.

CAUTION: Power is supplied to the UV lamps via electronic ballasts. The unit should not be installed in any electrical circuit with equipment that may produce an inductive load. This includes equipment such as conventional fluorescent luminaires, floodlights and water pumps. Inductive loads can generate high-energy surges that permanently damage the electronic ballast.

Suitable electrical cable should be used to wire the pumps, UV steriliser and any additional electrical equipment supplied with the unit. All electrical equipment is provided for connection to single-phase supply, unless specified otherwise. If in doubt, consult a qualified electrician.

A switch with 3 mm contact separation must be provided in the fixed wiring to provide disconnection from the electricity supply.

INTERNAL FUSE REPLACEMENT: Always isolate from mains supply before undertaking any maintenance. Only use a suitably rated fuse.

E. Ultraviolet Water Steriliser Maintenance Procedure

IMPORTANT SAFETY INFORMATION:

Please Read Carefully

- **Never** look directly at an illuminated UV lamp.
- Always isolate the unit from mains electricity and turn off the water supply prior to carrying out maintenance.
- If the quartz sleeve is accidentally cracked it must be replaced prior to reconnection to either the electrical or water supplies. If you do not have a replacement quartz sleeve, remove the broken sleeve and use the blue blanking plugs provided with the unit to close off the ends of the affected tube.

HALF-YEARLY MAINTENANCE

All maintenance should only be undertaken by trained and competent staff.

The UV lamps should be changed at 4000-hour intervals (approximately six month) to achieve a high UV efficiency. Should the lamps only be changed at 8000 hours intervals (approximately annually) there is a 15 % depreciation in UV efficiency over one year.

PROCEDURE:

1. Isolate the ultraviolet steriliser from the electrical supply at the control panel.
2. Isolate the ultraviolet steriliser from the water supply by closing any supply valves or opening any installed bypass.
3. Drain the water from the unit by opening the drainage tap (orange bib tap) located on the bottom support bar of the unit. Wall mounted units are not fitted with a drainage tap.
4. Carefully remove the numbered black lamp end cap from the lamp. Repeat this procedure at the opposite end of the same lamp assembly.
5. Carefully slide out each used UV lamp ensuring that no pressure is applied to the quartz sleeve.
6. Unscrew the compression fitting at either end of the lamp assembly.
7. Remove the o-ring at either end of the quartz sleeve assembly.

NOTE: If water pours out of the unit at this stage then the unit has either not been isolated from the system or not drained prior to commencing the maintenance procedure.

8. Remove the o-rings and discard them. O-rings should be replaced at each service interval.
9. After removing the o-ring, carefully slide out the quartz sleeve. Clean the quartz sleeve by washing in warm soapy water. Rinse it thoroughly in fresh water, then dry, and polish it using a paper towel.

NOTE: If the quartz sleeve has calcified with lime scale deposits from the water it should be cleaned with a proprietary plastic kettle descaling solution, following the manufacturer's recommendations. Plastic gloves and eye protection should be worn for this process. The quartz sleeve should be rinsed in fresh water, dried and polished with a paper towel.

10. To reassemble the unit reverse the above procedure by carefully sliding the quartz sleeves back into the plastic housing and locating it correctly. Slide new o-rings over either end of the quartz sleeve and locate them into the o-ring recess on the main casing.
11. Ensure the female threads on the compression fitting and the male threads on the main plastic body are clean. Wipe a little silicon grease or Vaseline (NOT silicon sealant) onto these threads. As these threads are only serviced twice a year, this lubrication will help prevent them binding. Replace and firmly hand tighten the compression fittings.

NOTE: The compression fitting must be adequately tightened onto the o-ring and quartz sleeve or the unit will

leak water when reconnected to the main system.

12. Once all the quartz sleeves, o-rings and compression fittings have been reassembled, the drainage tap at the base of the unit must be closed and any utility valves be reopened. Check each assembly to ensure there are no water leaks. If water is leaking from any of the assemblies then the unit must be drained down again following the procedure above. At the points where water is leaking, check the quartz sleeves for damaged and check that the o-rings are correctly positioned. Make certain that the compression fittings are fully tightened.

13. Assuming there are no water leaks, slide the new UV lamp into the quartz sleeve and replace the lamp ends. Each end cap has a unique number that refers to each lamp. It is critical that the correct lamp end cap is fitted to the appropriate lamp.
14. Always ensure that water is circulating through the UV steriliser before the lamps are turned back on.
15. Once all the lamps have been connected, the UV steriliser unit should be turned back on at the control panel. Check each lamp to verify that it is working. Only view the lamp through the plastic locknut compression fitting. **Never** look directly at an exposed UV lamp.

IMPORTANT:

The plastic body of this unit has been manufactured from polymers specifically stabilised to protect them from the effects of germicidal UVC light emitted from the lamp. Despite the UV protection, the unit will be eroded over time by a combination of the UVC and water flow. As a matter of course, inspect the unit whenever a lamp change is carried out. Make sure that the unit does not show signs of excessive deterioration. Replacement parts are available from Tropical Marine Centre.