

Plumbing Assembly Instructions

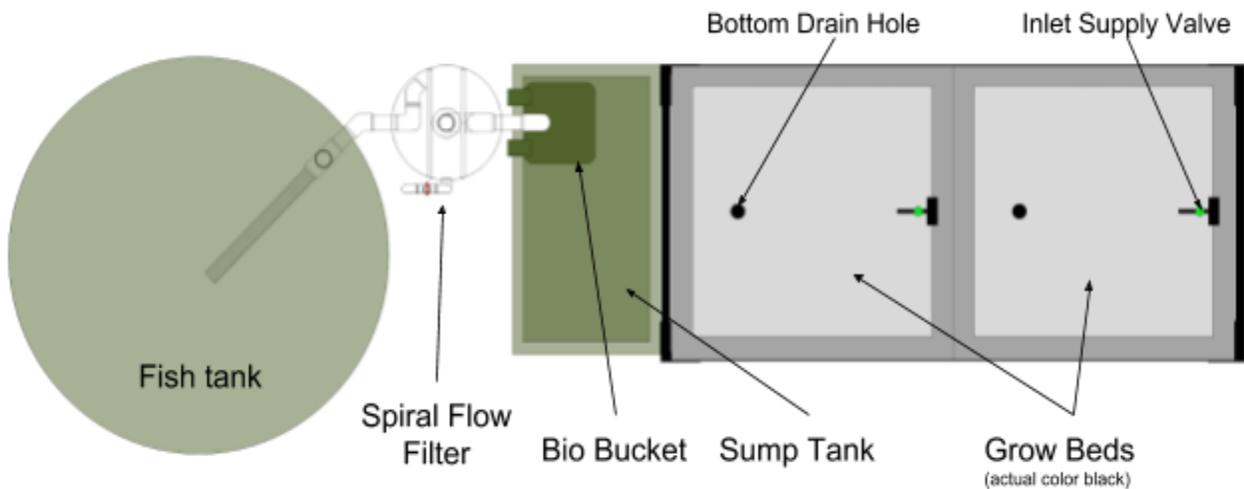
Before beginning the plumbing assembly, it's important to locate your completed grow bed frame where you want it and to also layout the main components like the fish tank, swirl filter and sump so you can visualize the orientation and ensure everything fits properly in the space.

Unless we have designated a custom layout for your system, the plumbing pipe lengths are precut so it's important to maintain the proper spacing between the fish tank, spiral flow filter, sump tank and grow bed frame when installing the system. The standard layout for the system is pictured below. Only two grow beds are shown here but your system may have more.

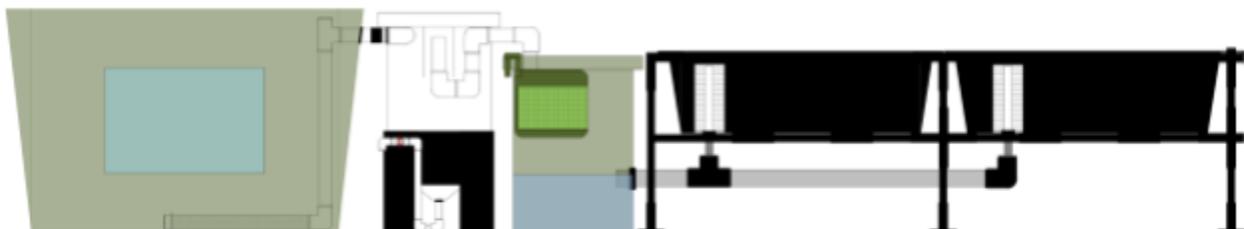
Each grow bed has a pre drilled bottom drain hole and a hole in the center sidewall for the inlet supply valve assembly. The grow beds should be oriented as shown in the top down view below. The sump tank needs to be centered along the end wall of the grow bed frame.

**The number of grow beds in your system may not match the illustrations shown below. However the plumbing steps and nomenclature are the same regardless of how many beds you have.

Aquabundance Modular Top Down View



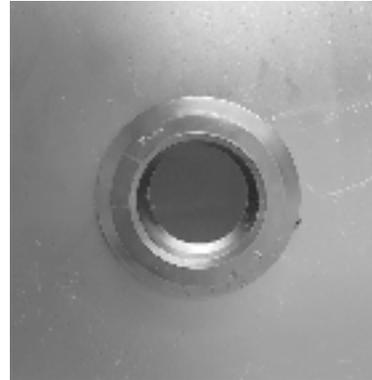
Aquabundance Modular Front Elevation View



Step 1:

Insert 2" Uniseal into hole in sump tank

- Install from **outside** of tank, so flange of uniseal is on exterior
- Place sump tank centered at the end of the grow bed frame closest to fish tank with the uniseal side facing the grow bed frame



Parts Needed:

Sump Tank



2" Uniseal



Step 2:

Thread Quick Loc connector onto pump

- This pump fitting is in a bag in the pump box
- Place pump in sump tank

Parts Needed:

Pump



Quick Loc Connector



Step 3:

Install the Inlet Valve Assembly Supply onto each grow bed

- Insert 1/2" Bulkhead (inlet valve assembly) into the pre-drilled supply hole in the **side** of each grow bed. Ensure that the rubber gasket is placed **inside** the grow bed.
- Thread the nut on the outside of the bulkhead. Be sure to hand tighten only, a wrench can damage the bulkhead. (Threads are reversed)



Interior view of grow bed

Parts Needed:

Grow Beds (all)



Inlet Valve Assembly (all)



Exterior view of grow bed

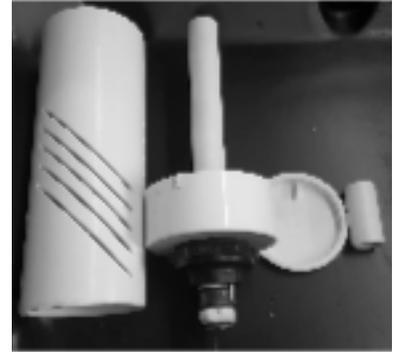
Step 4A:

Prepare Media Bed Drain Assembly for installation in each media bed

- Remove media guard from bottom cap, and remove the top lid (use a flathead screwdriver to lightly pry off)

Parts Needed:

Media Guard Drain Assembly (Disassembled, right)



Step 4B:

Remove nut from bulkhead fitting. Keep the rubber gasket in place on bottom side of cap



Step 4C:

Lower assembly from previous step into the hole in the bottom of the grow bed.

- Make sure the gasket is seated between the grow bed and white cap.
- Screw on bulkhead nut on the underside of grow bed. Hand tighten firmly. (A wrench is not required)



Step 4D:

Install the media guard inside the cap

- Be sure that the media guard is pressed firmly into the cap
- Install the lid on the top of the media guard

The media guard assembly comes with 2 standpipes. Use the taller standpipe when you first start your system for a higher water level. Swap it out for the short standpipe for a lower water level once you have mature plants with deep roots



Step 5 (for Deep Water Culture beds only):

5A: Install the bulkhead fittings from Drain Assembly for DWC Beds the same way you did in step 4.

5B: Install 10 3/4" standpipe into the slip fitting in DWC drain assembly

- Make sure that standpipe is fully seated in slip fitting in drain bulkhead
- There are no media guards used for DWC drain

Parts Needed:

Drain Assembly for DWC Beds



Step 6:

Place the raft boards into each of the DWC grow beds.

- Each DWC bed takes 2 raft boards
- Raft boards sit on the inside lip of the grow beds, and cover over the inlet valve assembly

Parts Needed:

DWC Raft Boards



Step 7:

Lower assembled grow beds into grow bed frame

- Grow bed side with inlet valve assembly should be on the right side of grow bed frame



Step 8:

Assemble and install the Solids Lift Overflow (SLO)

The Fish Tank Solids Lift Overflow (SLO) allows for fish waste removal from the bottom of your tank.

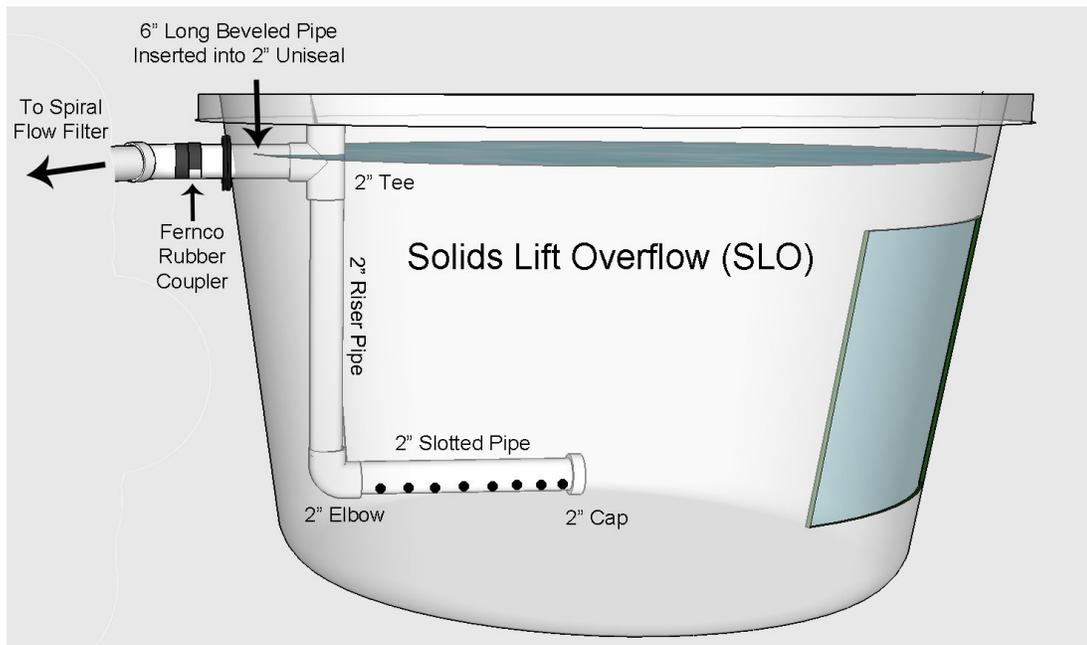
Step 8A: Insert 2" Uniseal in the pre-drilled hole in the fish tank. Insert 2" Beveled pipe (6") into the uniseal bulkhead *using the method described in Appendix A at the end of the plumbing section of this manual.*

Step 8B: Insert 2" Tee into 22.5" riser pipe. Insert a 2" Elbow on the other end.

Step 8C: Insert pipe with holes into Elbow with a 2" cap on the other end.

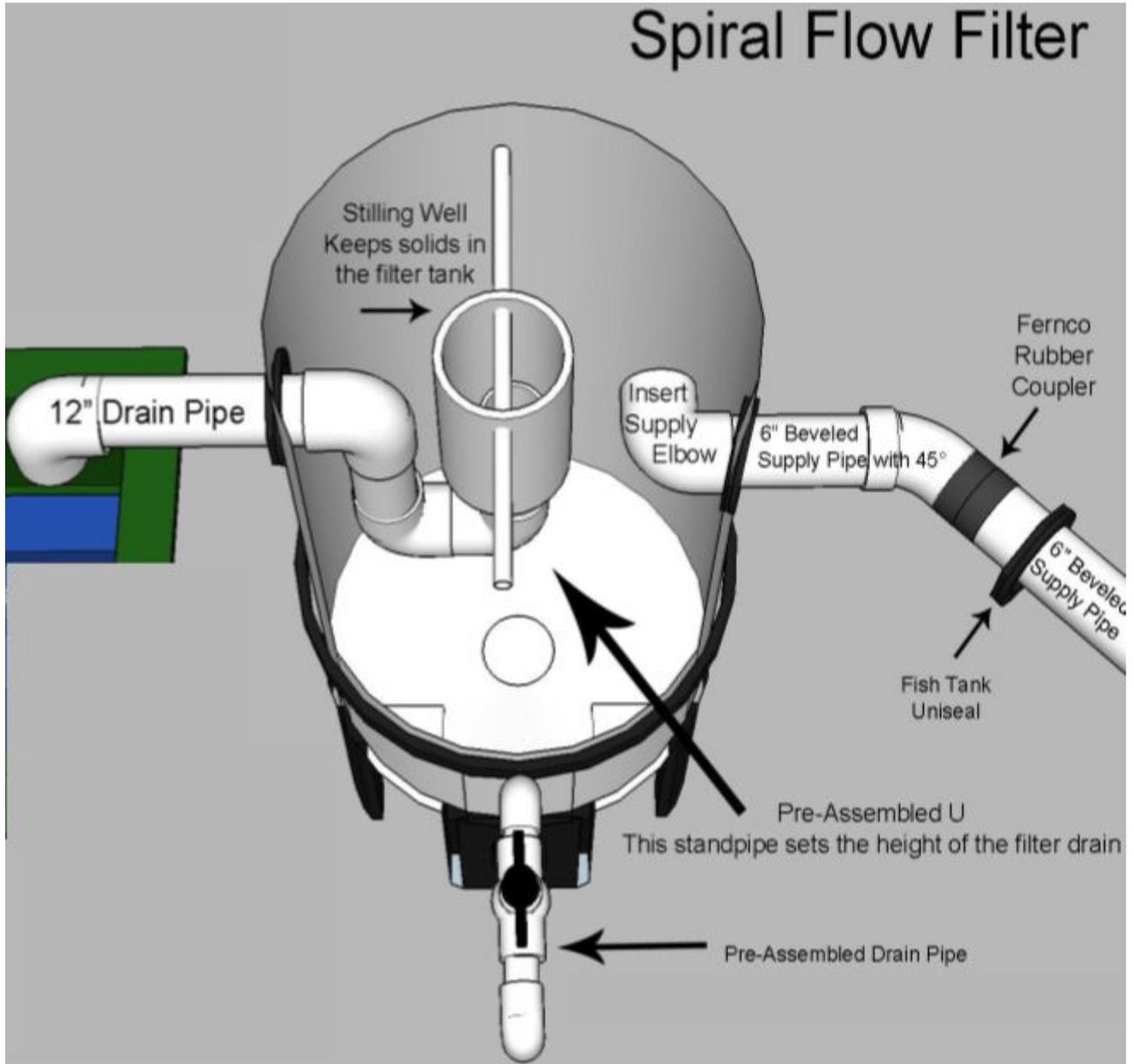
Step 8D: Insert this SLO into the beveled end of the pipe entering the fish tank. This part should sit on the bottom of the fish tank to remove fish waste from the bottom of the tank.

Step 8E: Place the fish tank next to the Spiral Flow Filter. Use the Fernco Rubber Coupler and a flathead screwdriver to connect the overflow from the fish tank to the inflow from the filter (see step 10).

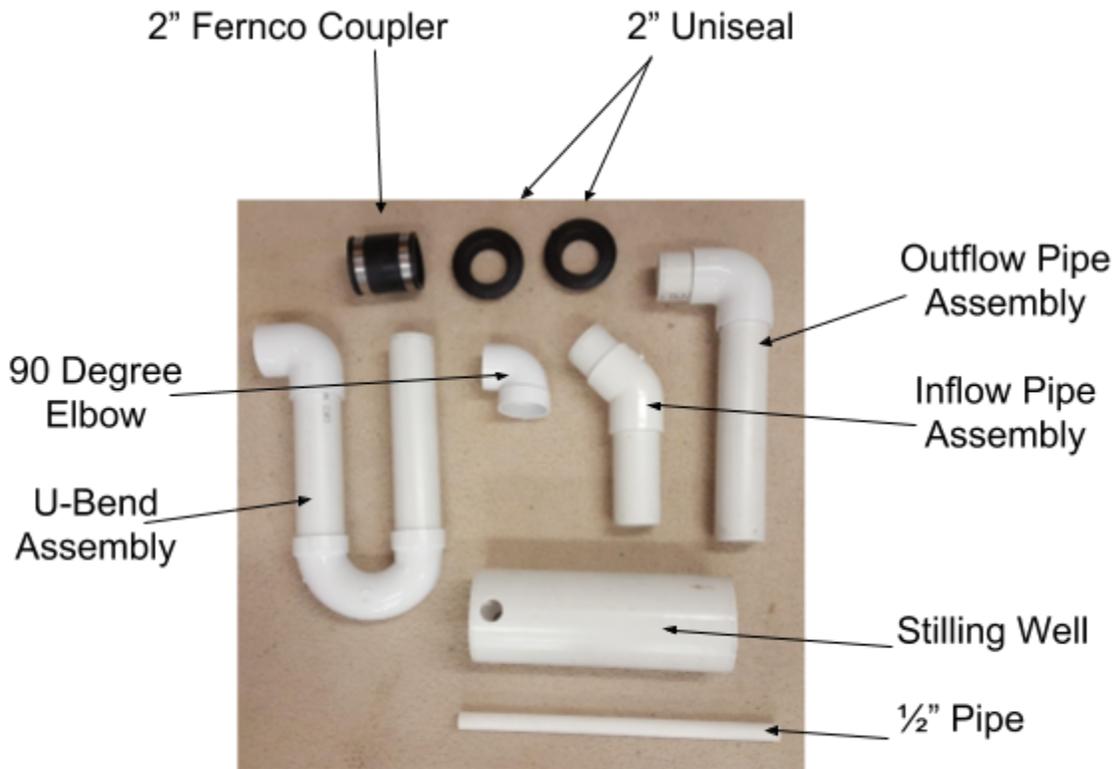


Step 9:
Assemble the Spiral Flow Filter (SFF)

SFF Instruction steps on next page



Spiral Flow Filter Plumbing Components:



Step 9A:

Position the Spiral Flow Filter (SFF) between the fish tank and sump tank



Step 9B:

Install a 2" uniseal on side of SFF closest to fish tank.

- Then, insert beveled end of inflow pipe assembly through uniseal
- See appendix A for uniseal installation instructions
- **Note:** Pipe should be inserted through uniseal no more than 1"

Parts Needed:

2" Uniseal Inflow Pipe Assembly



Step 9C:

Install 90 degree elbow onto inflow assembly pipe inside SFF tank

- Make sure that the elbow is angled for circular flow around the tank



Step 9D:

Install second 2" uniseal on opposite side of SFF

- Then, pass beveled end of outflow pipe assembly through uniseal
- Pipe should not be inserted more than 1 1/2" inside the SFF, and the other end of outflow should be in the sump tank

Parts Needed:

Outflow Pipe Assembly

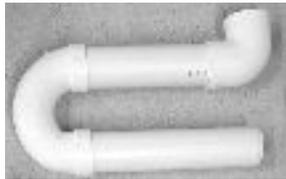


Step 9E:

Insert U-Bend assembly onto outflow pipe inside SFF

Parts Needed:

U-Bend assembly

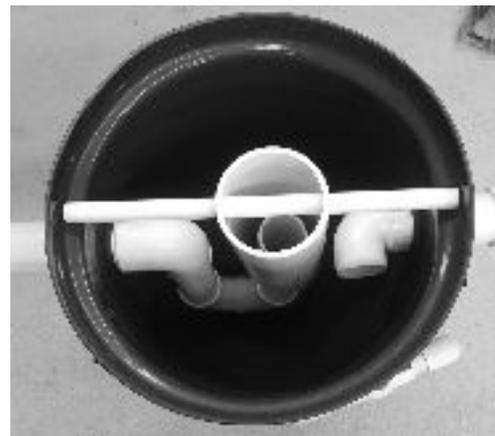


Step 9F:

Insert ½” pipe through holes in Stilling Well and position in SFF over the outflow standpipe

Parts Needed:

½” pipe and Stilling Well



Step 9G:

Place green vented lid over SFF

- Close ball valve on pivoting solids drain



Step 9H:

Using the 2" Fernco Coupler, connect SFF inflow pipe to Solids Lift Overflow on fish tank

Parts Needed:

2" Fernco Coupler



Step 10:

Attach the pump section of the Distribution Backbone to the pump in the sump tank.

- Barbed "T" fitting should be towards the rear side of your sump

Parts Needed: Distribution backbone



Barbed "T" fitting

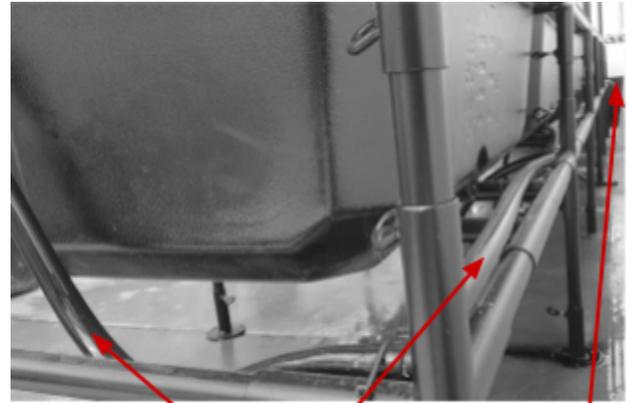
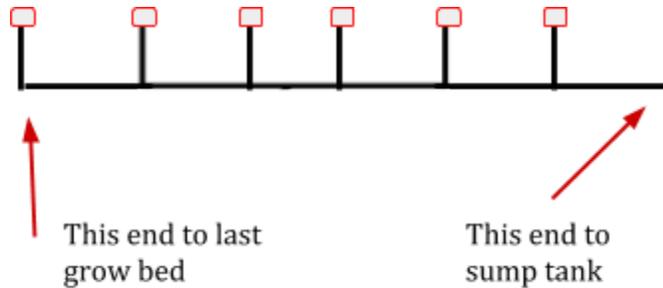


Step 11:

Lay out the the grow bed section of the Distribution Backbone (DB) along the rear side of the grow bed frame

- You can tell which end of the DB connects with the last grow bed based on the location of the 90° elbow in the DB (See picture)

Parts Needed: Distribution backbone



Distribution Backbone

Sump tank

** The number of outlets on the distribution backbone you receive will correspond to the number of grow beds in your system.

Step 12:

12A: Feed the sump tank end of the Distribution Backbone (DB) into the upper hole on the side of the sump tank

- This hole is the one adjacent to the grow beds

12B: Install the 3/4" bulkhead fitting in the fish tank. Then, screw the white threaded elbow into the interior side of the fish tank, and the Quick Loc connector to the outside, and attach DB (see picture)

Parts Needed:

Fish tank supply fittings



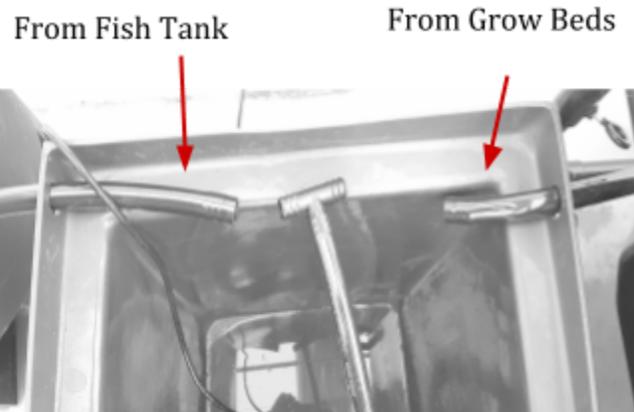
Inside fish tank

Outside Fish Tank

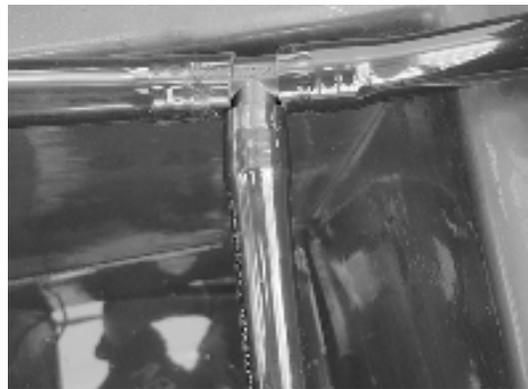
12C: Feed the fish tank section of the DB through the upper hole on the opposite side of the sump tank

Parts Needed:

Distribution Backbone (Fish tank section)



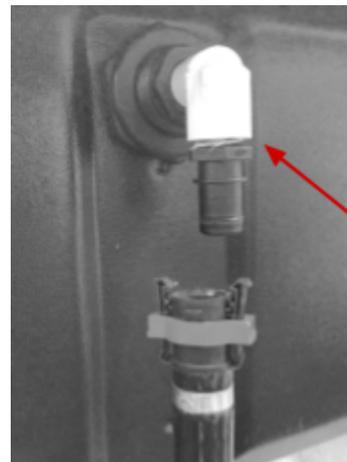
12D: Push DB sections from fish tank and grow beds together on the “T” coming from the DB section in the fish tank



Step 13:

13A: Install the threaded elbow and quick lock connector on the outside of each grow bed on Inlet Valve Assembly

- Screw in the threaded elbow to the bulkhead fitting on the outside of the bed. Hand tighten only and leave the female threaded end facing downward.
- Screw in the ½” quick lock connector into the female threaded end of the elbow.



Assembled Threaded elbow with Quick Loc connector

13B: Connect the Quick loc socket end from the distribution backbone in step 10 to the male end of the quick lock connector

- The distribution backbone connects to each Inlet Valve Assembly on the right sides of each grow bed. Push the red lock fitting up until it clicks



Distribution Backbone attached to Quick Loc socket

13C: Using several zip ties, secure the distribution backbone to the grow bed frame of the system

- Be careful not to over tighten and restrict flow to grow beds

Parts Required:

Threaded elbow,



Quick loc connector



Step 14:

14A: Install the hanging filter bucket on the back side of sump tank

- Plastic hooks on bucket will go around the distribution backbone and over the edge of the sump tank

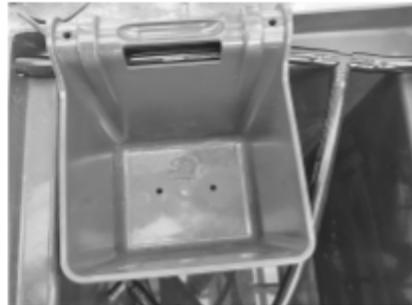
14B: Place the Strainer Bag with Filter Media into the hanging filter bucket

Parts Required:

Hanging Filter Bucket

Strainer Bag with Filter Media

To Fish Tank To Grow Beds



Step 15:

Position the outlet and 90° elbow of Spiral Flow Filter so that water will flow into the strainer bag with filter media



Step 16:

Insert the 14.5” long black drainpipe through the uniseal on the sump tank *Using the method described in Appendix A.*

- Pipe should be pushed in about 2” into sump tank

Parts Needed:

Black drain pipe (14.5”)



View from exterior of sump



View from interior of sump

Step 17:

Thread the bushing onto the threaded nipple on the underside (exterior) of each grow bed drain assembly

If threads are not taped with teflon tape you will need to do this. Wrap teflon (plumbers tape) around the threads 2 to 3 times to prevent leaks

Parts Needed:

Bushings



Step 18:

18A: Insert Fernco T black rubber drain pipes onto bushings on each grow bed drain (except last one) and tighten with a flathead screwdriver.

- On bed closest to sump tank, attach drain pipe inserted into sump tank into the Fernco T and tighten
- All bends (sweeps) in Fernco T fittings should be angling towards sump tank



18B: Insert Fernco 90 black rubber drain pipe onto bushing on last bed in run (furthest from fish tank)

Parts Needed:



Step 19:

Insert 2" Black Drain Pipes into Ferncos between each grow bed drain and tighten with a flathead screwdriver

- You should alternate between the longer and shorter pipes to accommodate the distance changes between the beds. The longer pipes span the beds that have an extra spacing with the CMS pipes. These are the poles with the open head fitting on top and the extra support bar on the bottom.

Parts Needed:

Drain Pipe



Step 20:

Set air pump near GFI protected outlet, and run air lines from each outlet of pump to each of the 4 small holes on the rim of the fish tank, then attach large air stones



- Ideally, air pump should be placed on a shelf or table above water level of fish tank to prevent back-siphoning in a power failure
- Cut four lengths of airline tubing so the tubing can reach the airstone inside the tank all the way back to the aerator. You will likely have different lengths of tubing.
- Make sure air stones are sitting on bottom of fish tank

Parts Needed: Air Pump Air Line Medium Air Stones



Step 21: (For systems with DWC Beds)

Place second air pump near GFI protected outlet, and run one air line to the center of each grow bed. Attach medium air stones to lines.



- Ideally, air pump should be placed on shelf or table above water level of fish tank to prevent back-siphoning in a power failure
- If you have an odd number of DWC beds, one of your beds will have two air stones in it.

Parts Needed: Air Pump Air Line Medium Air Stones



Air Stones/Pump Tips

- Once all the airstones are placed in the tank you can zip tie any excess tubing to the tank frame to help secure airlines to try to keep all the lines under the grow bed, behind the fish tank and out of sight.
- Turn on the air pump. There is a flow control dial on the top of the air pump that can be used to increase or decrease air to the air stones. The airstones should be giving off thousands of tiny air bubbles once the system is filled with water. The small air bubbles provide a lot of surface area for air contact with the water. Over time airstones can get gummed up with algae, feed and biofloc decreasing their performance. Clean the air stones by dipping in clean water and using a green scrubbie.

ADDING GROW MEDIA

Step 1: Wash the Grow Media

Parts/Tools Required: Grow Media, hose and sprayer, screwdriver or crate (preferred method).



Light Weight Expanded Clay Aggregate (LECA) has a thin layer of red clay dust that will cloud your water and can clog your pump and plumbing. It will settle out eventually but you should rinse the media prior to filling the grow beds.

There are two approaches to washing the media. This should be done outside in a place where you can allow the red-clay water to drain. Use care as the clay can stain.

Bag Washing Method (less effective)

Make many small holes all around the base of the bag by puncturing with a screwdriver to allow for drainage. Shake the bag to let the dust fall out.

Cut open the top of the bag. Using your hose and sprayer, start rinsing the media. Move and shake the bag periodically until the water, draining from the bottom runs clear. Media will not be completely clean, just cleaner than it was.



Crate Washing Method (best method)

Use a plastic crate with mesh bottom so dust and water can drain out. Openings should be less than 1/4" to prevent media from falling through. You may need to line the container with a mesh screen if the openings are too large. *Make sure the crate is clean prior to washing media so that it doesn't introduce an undesirable contaminant into your aquaponic system.*

Empty the bag of media into the crate. Shake the crate to let the dust fall out. Spray the media thoroughly, rolling it around with your hands. Wash until the water runs clear and the media is all wet.



Step 2: Fill the Grow Beds with Media

Once your media has been rinsed you can begin filling the grow beds. Each growbed will take five and half 40 liter bags of media.

YOU MUST KEEP THE MEDIA GUARD HELD IN PLACE.

If the media guard gets dislodged when you are filling the beds, then media will pour inside and will difficult to remove. Place a heavy object on the media guard or have someone hold the media guard down to prevent it from dislodging.



Level out the top layer of media with your hand while keeping the media guard firmly seated against the bottom of the grow bed. Keep weight on the media guard when filling the growbeds will water as the LECA media will initially float until it becomes saturated.

Congratulations!

You have successfully installed your very own AquaBundance System.

Please refer to the System Startup Section to get your system filled and cycled!



Appendix A – Installing and inserting a pipe through a Uniseal

Uniseals are a great way to provide a watertight seal for a pipe that needs to penetrate through a tank. These instructions are here to support you in the installation process. Our Aquabundance tanks have come pre-drilled for your convenience. Our plumbing pipes come beveled for easy installation.

- Insert a Uniseal bulkhead into the pre-drilled hole on the tank with the tapered side of the uniseal on the outside of the tank.
- Apply dish soap to the beveled end of pipe and to the inside of the tapered uniseal.
- Gently rock the pipe up and down as you push it into the Uniseal.
- Getting the pipe through the uniseal can be challenging and requires some pressure while rocking it back and forth. You may also need someone to support the tank as you are pressing the pipe into the uniseal.
- Once it is in the tank and at the desired depth, be sure to wipe off excess soap with a clean dry cloth before filling with water.

