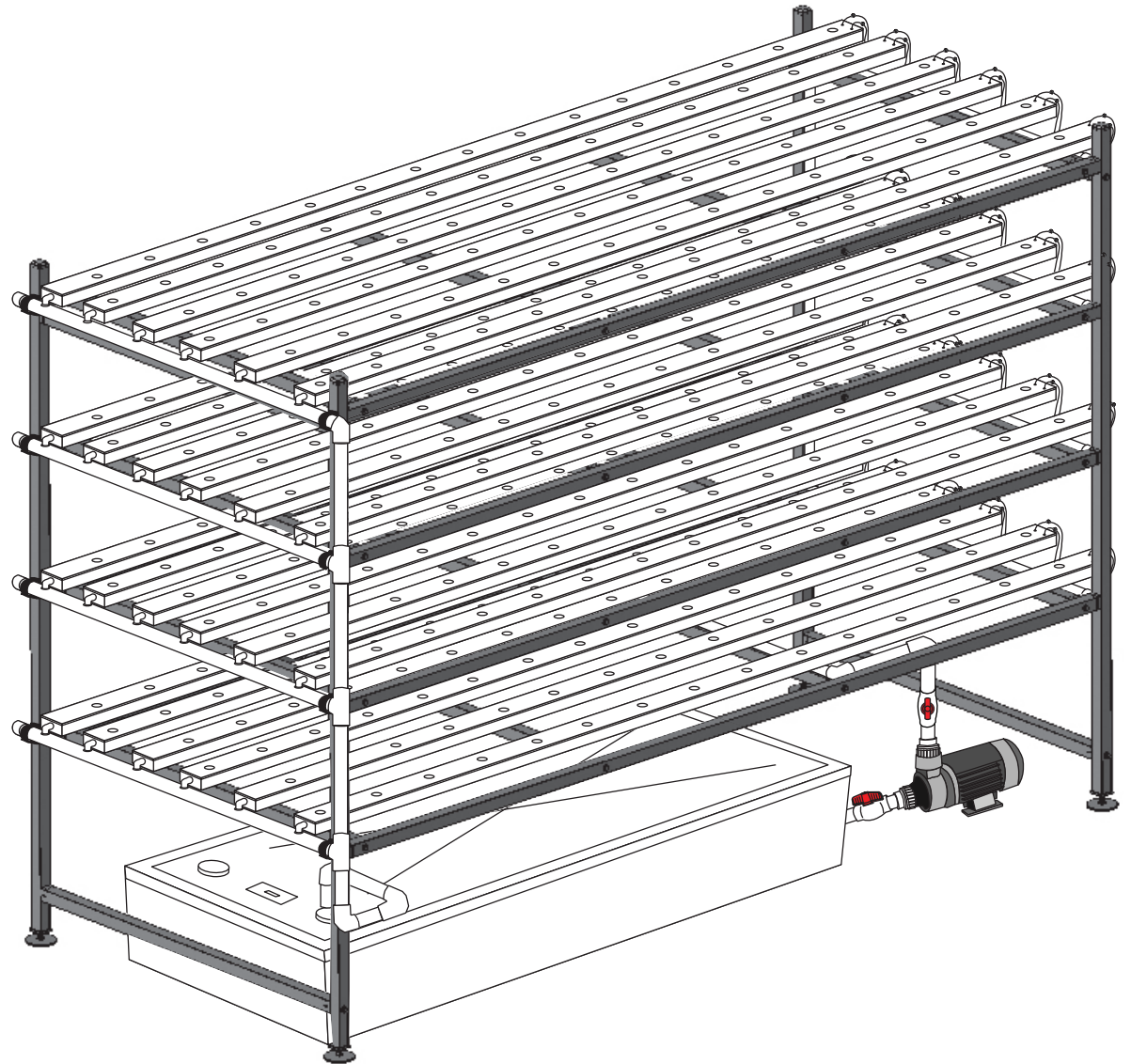




HydroCycle Vertical NFT Lettuce & Herb Systems



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WARNING: Cancer and Reproductive Toxicity - P65Warnings.ca.gov

Revision date: 05.19.23

STK#	DIMENSIONS
11291950	51" W x 80" H x 118" L*

*Dimensions have been rounded and are approximate.
Dimensions are of the frame only; they do not include
adjustable feet or pvc plumbing and fixtures.

Important Information

READ THIS DOCUMENT BEFORE YOU BEGIN

Thank you for purchasing the vertical hydroponic system. When properly assembled and maintained, this product will provide years of reliable service. These instructions include helpful hints and important information needed to safely assemble and properly maintain the system. Please read these instructions **before** you begin. If you have any questions during the assembly, contact Customer Service at 1.800.245.9881 for assistance.

SAFETY PRECAUTIONS

- Wear eye protection.
- Wear gloves when handling metal pipes.
- Use a portable GFCI (Ground Fault Circuit Interrupter) when working with power tools and cords.

REQUIRED TOOLS

The following list identifies the main tools needed to assemble the hydroponic system. Additional tools and supports may be needed.

- Level (4'- recommended)
- Wrench set to set adjustable feet
- Ratchet with 1/2" socket to assemble frame
- 3/16" hex (Allen) wrench
- 5/16" drill bit
- Small hammer and gloves
- Cutting tool to cut pvc tubing
- Adjustable pliers
- Magnetic nut setter (5/16" x 2-9/16")
- 1-3/8", 2-1/4" and 2-1/2" hole saw bits
- Adjustable supports or saw horses for channel assembly.



ASSEMBLY PROCEDURE

Following the instructions as presented will help ensure the proper assembly of your hydroponic system. The steps outlining the assembly process are as follows:

1. Verify that all parts are included in the shipment. Notify customer service for questions or concerns.
2. Read these instructions and all additional documentation included with the shipment **before** you begin.
3. Gather the tools and assistants.
4. For best results, assemble the components in the order they are presented in these instructions.
5. Read the care and maintenance information.

UNPACK AND IDENTIFY PARTS

The following steps will ensure that you have all the necessary parts **before** you begin assembly.

1. Unpack the contents of the shipment and place where you can easily inventory the parts. Refer to the Bill of Materials/Spec Sheets.
2. Verify that all parts listed on the Bill of Materials/Spec Sheets are present. If anything is missing or you have questions, consult the Pictorial Parts Guide and all diagrams for clarification, or contact Customer Service.

NOTE: At this time, you do not need to open the plastic bags containing smaller parts such as fasteners or washers (if equipped).

CARE AND MAINTENANCE

Proper care and maintenance of your hydroponic system is important. Check the following items periodically to properly maintain your hydroponic system.

- Check connections and all fasteners to verify that they remain tight.
- Do not climb or stand on the frame or channels at anytime.
- Verify that the supply lines and related fittings are clean and functioning properly.
- Replace all worn or damaged parts and fittings promptly.
- Repair all leaks immediately.
- If system is moved, inspect all parts and connections before reassembling and use.
- For replacement or missing parts, call 1.800.245.9881 for assistance.

QUICK START GUIDE

For a quick overview of this product, its components, and connection details consult the Quick Start Guide at the back of these instructions.



WARNING: All electrical wiring to be completed by a qualified electrician and according to recognized local building codes..

Important Information

PICTORIAL GUIDE

The following graphics and photos will help identify the different parts of the hydroponic system. (Some parts may not be shown.) To prevent mixing of fittings, select only those that are needed for each procedure. **Keep all fittings in the shipping bags until they are needed.**



FALB34B



112838
Tek Screws



FAME51B



FAG338B



111047



112770



115820
Grommets



110077



112772



106808 3/4" Hanger
112539 2" Hanger



WR1095
Tape



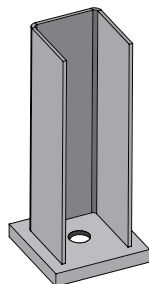
110091 Clear Vinyl Tubing



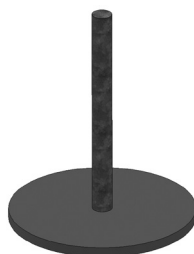
Porthole Cover



112509 CA4000
Instant Adhesive



112477



113030S01



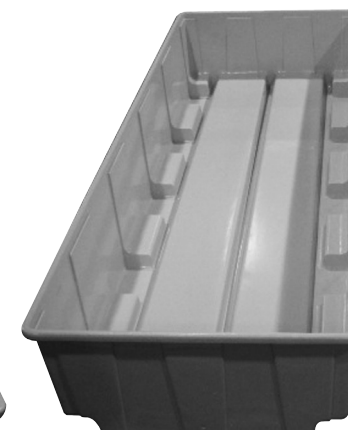
110725
Air Pump



113536
Pump



Reservoir Cover



115 Gallon Reservoir

Important Information

PICTORIAL GUIDE (continued)



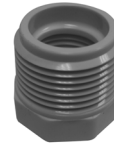
WF1386



111303



WF8582



WF2392



WF3310 & WF3316



WF2153



WF3410



WF1576



111302



WF1530

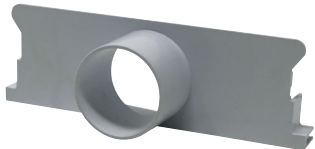


WF6990
PVC Cement
and
113372 Purple
Primer

PVC PRIMER & PVC CEMENT

Follow all directions printed on pvc primer and cement containers. **Purple color of primer does not fade!** Use caution during application to reduce spills and over application at joints.

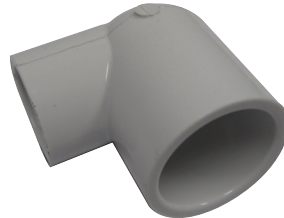
Prime all joints before assembly.



117079 (24)
End Cap w/ Outlet



117078 (24)
End Cap No Outlet



WF6682



WF6717



WF2160



WF1320



111046



WF1023

Assemble Frame

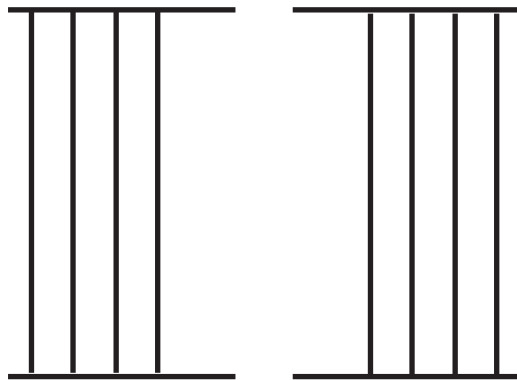
1

ASSEMBLE SIDE FRAMES

Assemble frame on a flat, level surface for best results.

Complete these steps:

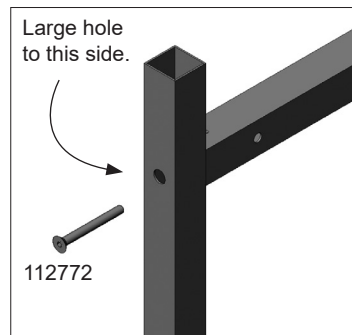
1. Review the frame diagram at the right (and at the back of this guide) and gather two (2) corner tubes and four (4) longer, side frame tubes to construct one side frame assembly.
2. Position the two (2) corner tubes so holes match up. The hole closest to the top end of each corner pipe is used to attach the upper side tube. Lower tier is approximately 23" from the end or bottom of the pipe. See diagram.
3. Take four (4) of the longer, side tubes and connect these to the corner tubes using the 112772 flat head bolts to assemble the first side frame.
4. With assistance, set the assembly aside and repeat the steps to assemble the remaining side frame.
5. Once both identical side frames are assembled, position these opposite each other. See diagram below.



Top view showing two assembled side frames.

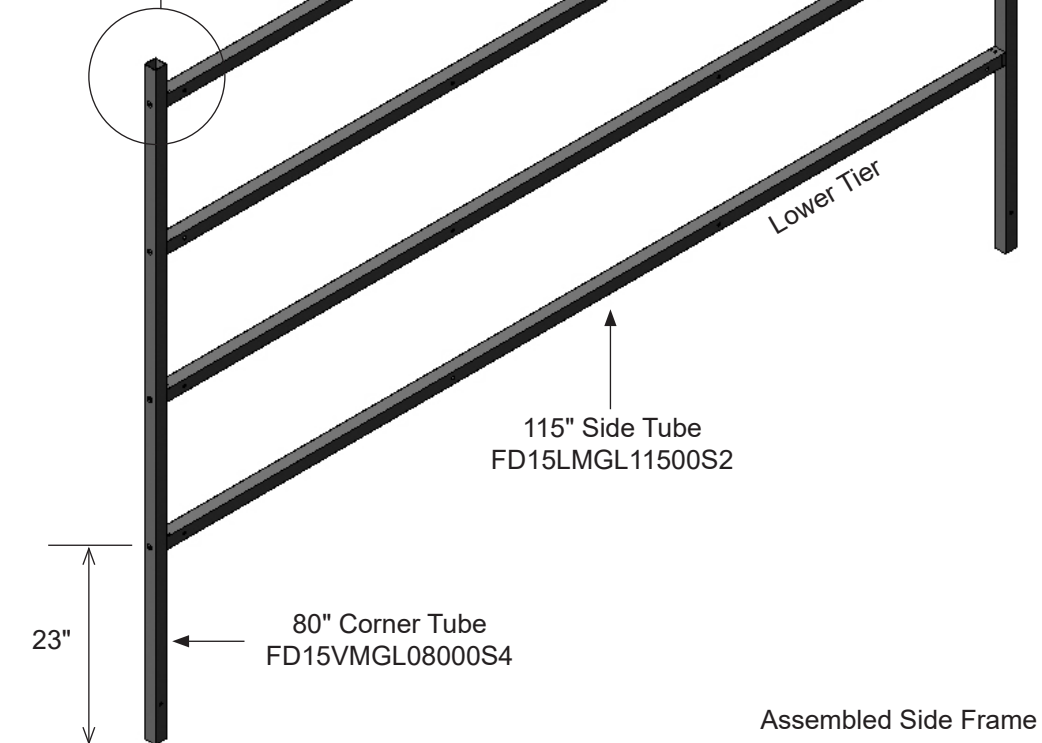
6. Continue by installing the adjustable feet – Procedure 2.

ATTENTION: The vertical tubes include holes of two different diameters. Install the larger hole to the outside to allow the flat head bolt to sit flush with the tube surface when installed.



Large hole to this side.

112772



Assemble Frame

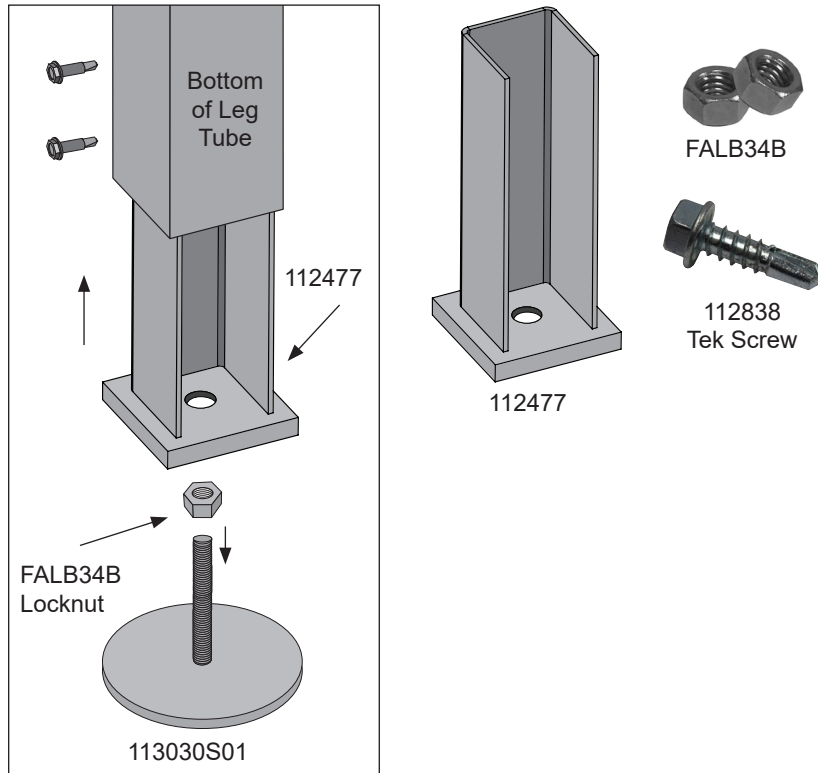
1

ASSEMBLE FRAME—INSTALL ADJUSTABLE FEET

Assemble frame on a flat, level surface for best results.

Complete these steps:

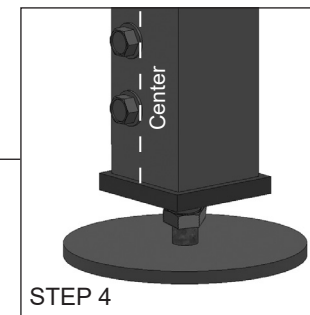
1. Add one FALB34B nut to the threaded stud of each 113030S01 foot and attach one foot to each 112477 insert.



2. Slide one 112477 insert assembly into the bottom of each 80" vertical leg tube. Tap gently with a small hammer if needed to seat.
3. Secure each insert to each tube using two (2) 112838 Tek screws. **Install screws through leg tube and wall of the 112477 insert. Install screws to the left or right of the centerline of the leg tube to prevent hitting the threaded shaft of the adjustable foot.**
4. Adjust the 113030S01 foot so that it is seated against the threaded plate of the insert and nut. See diagram.
5. Continue with the main frame assembly – Procedure 3.



Side Frame Assembly with Adjustable Feet



Assemble Frame

1

ASSEMBLE FRAME—continued

Assemble frame on a flat, level surface for best results. Assistants are required to complete the frame assembly.

Complete these steps to assemble the main frame.

1. With assistance, stand the two side frames as shown (Fig. 1).
2. Select four (4) of the remaining frame tubes (FD15CMGL04800S1) and place two of these at each end of the side frames.



FAG338B



FAME51B

FIG. 1

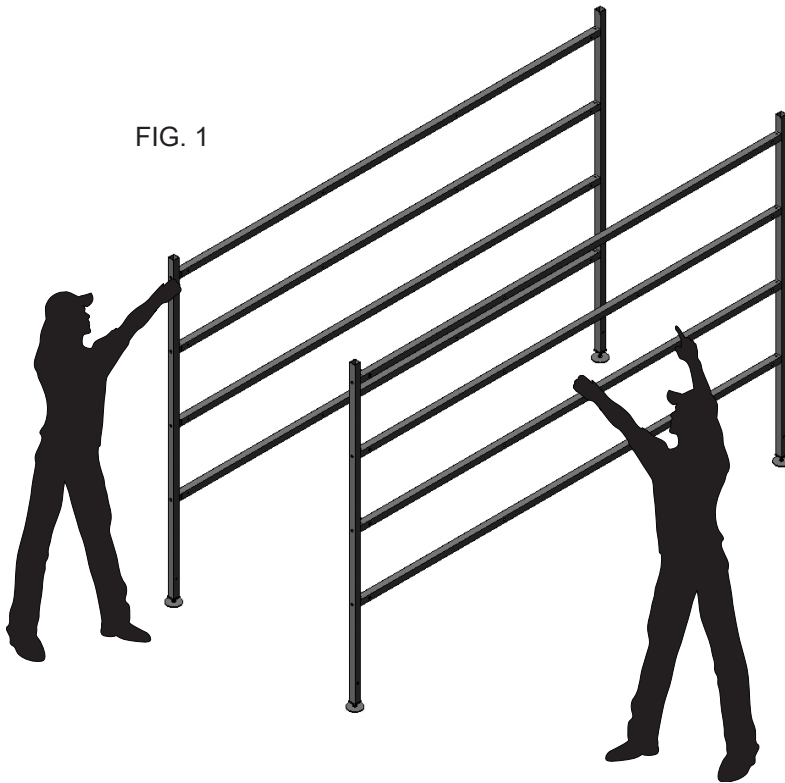
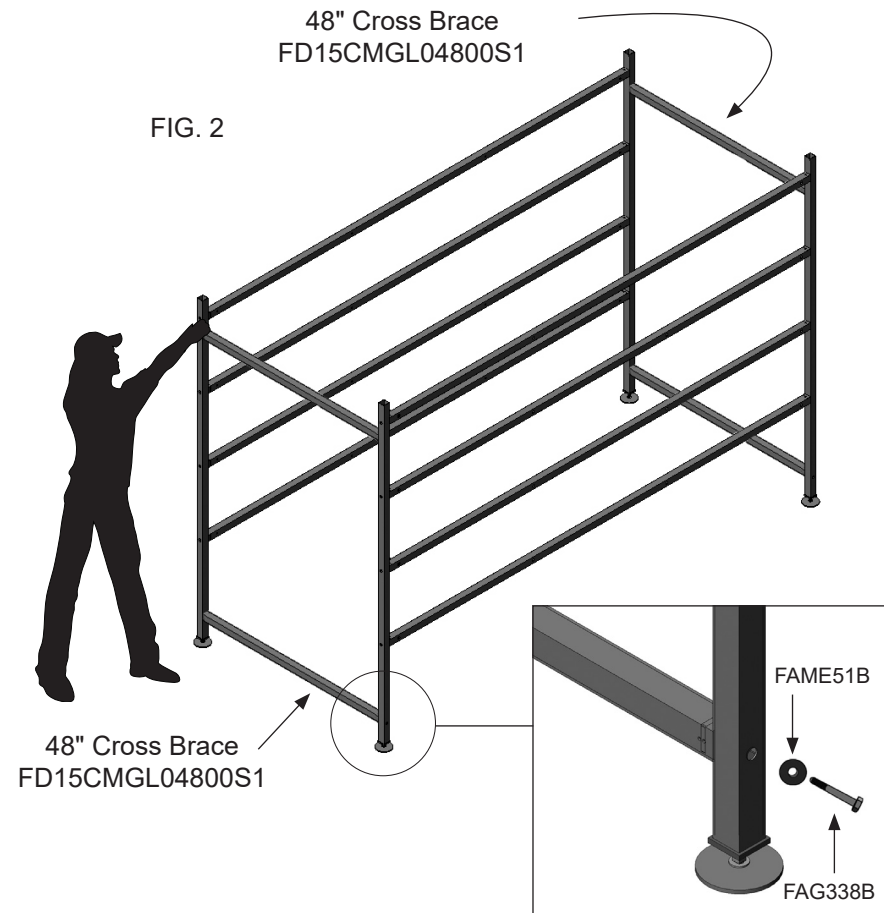


FIG. 2



3. Using the FAG338B (5/16" x 3") hex head bolts and FAME51B flat washers, attach cross braces between side frame tubes (Fig. 2) at each end.

Assemble Frame

1

ASSEMBLE FRAME—continued

- Continue by installing all remaining cross braces between the side tubes at each level using the hex head bolts and flat washers.
- Complete the frame assembly by installing the 112770 finishing plugs. **Check all fasteners to ensure they are all tight.**
- Continue with the next procedure.



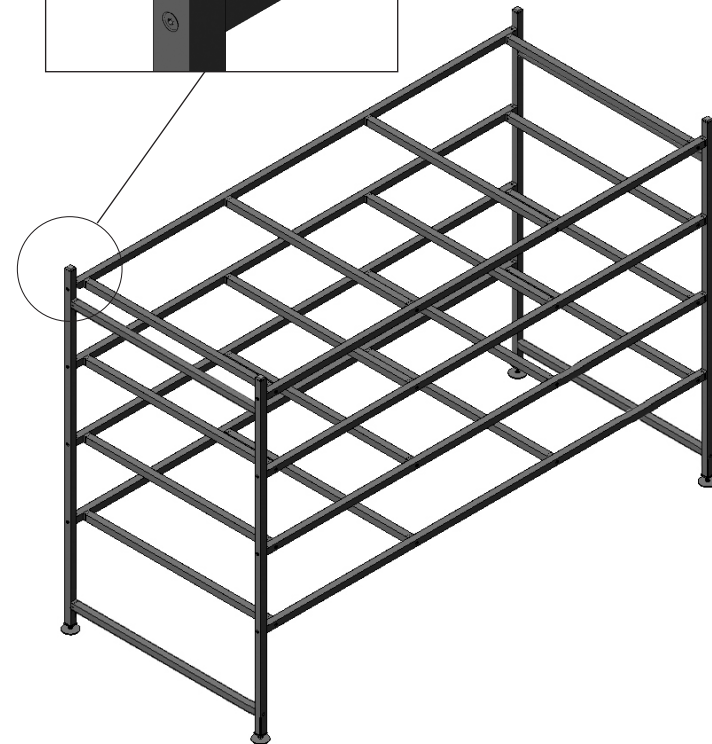
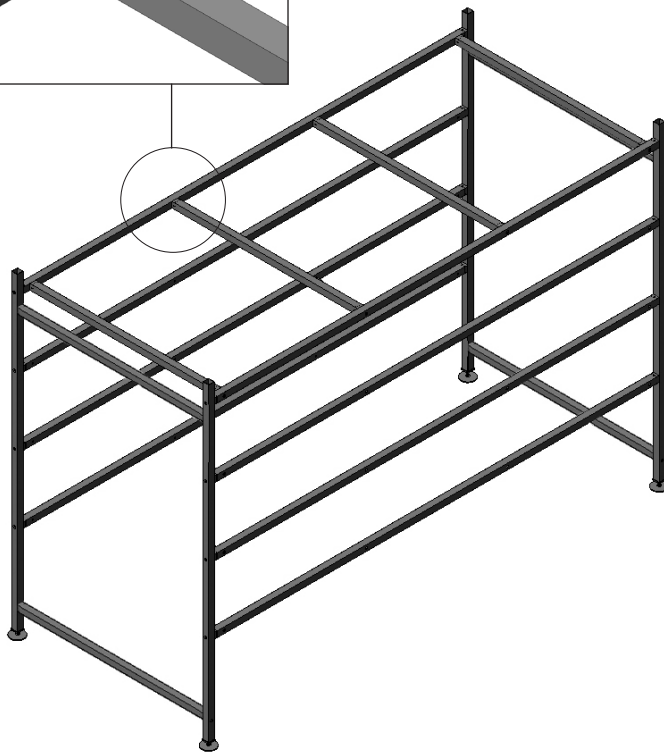
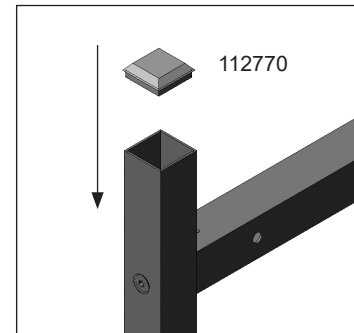
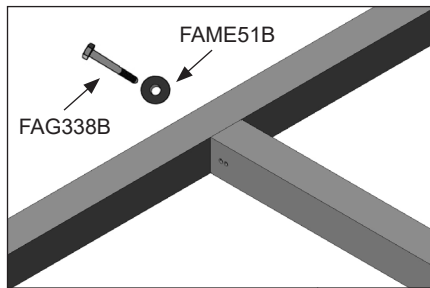
FAG338B



FAME51B



112770



Assemble 10' Channels


2

ASSEMBLE 117077L120 CHANNELS (10')

1. Place one 10' channel (117077L120) on a bench or saw horses.
2. Using the 112509 adhesive, attach a plain end cap (no outlet-117078) to one end and a end cap with an outlet (117079) to the other end. Coat the ends of the channel with adhesive *before* you install the end caps.
3. Repeat the process for all channels. Set channels aside to allow the adhesive to dry.
4. Next, attach a 90° elbow (WF6682) to each 117079 end cap as shown. Apply pvc primer and pvc cement to end cap outlet and inside of fitting. Slide fitting onto outlet. Install fitting as shown with open end pointing down in the 6:00 o'clock position.

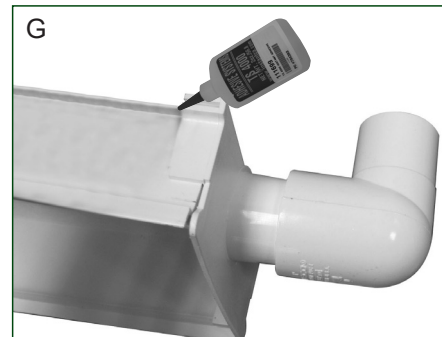
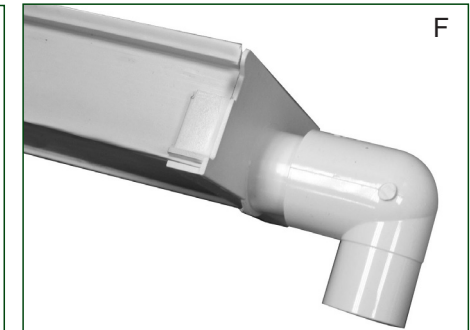
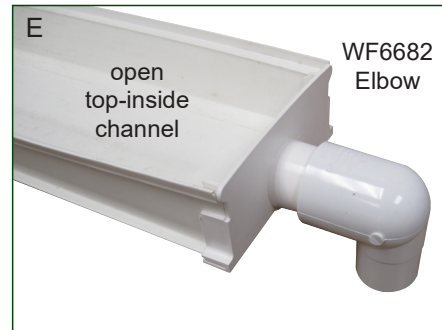
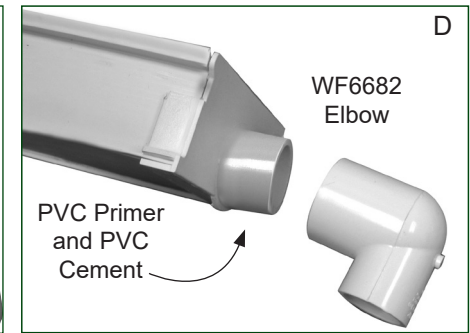
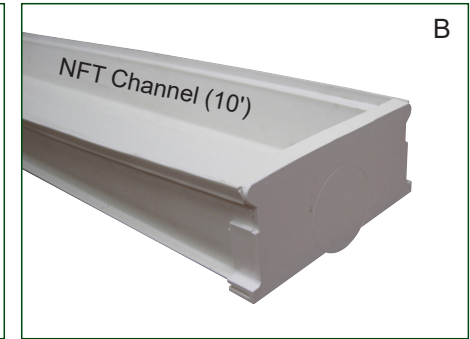
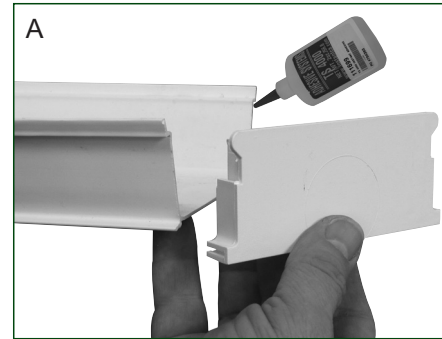
ATTENTION: Verify that you are using the WF6682 elbows that do not have threads. **Do not use the WF6692 elbow.**

5. Once all end caps and drain elbows are in place, carefully flip all channels over so the bottom is facing up and the open top is down.
6. Apply the 112509 adhesive along the edges to secure end caps to each 10' channel. Photos show an end cap with an outlet. Secure the plain end caps in the same manner.

 Apply pvc primer and pvc cement in a well-ventilated area. Read container information for additional precautions.

NOTE: Be sure to coat all edges and seams of the end caps to prevent leaks.

7. Allow the adhesive to dry before moving the channels or testing the system.
8. Continue by installing the 2" hangers.



Install 2" Pipe Hangers

3

INSTALL 2" DRAIN MANIFOLD HANGERS



112838
Tek Screw

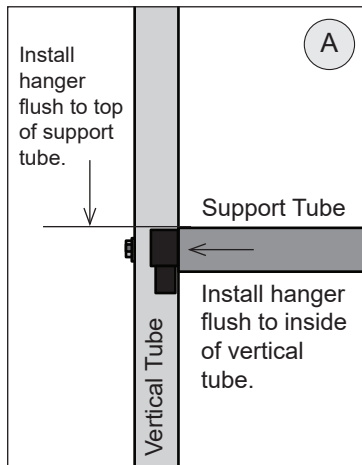


112539 2" Hanger

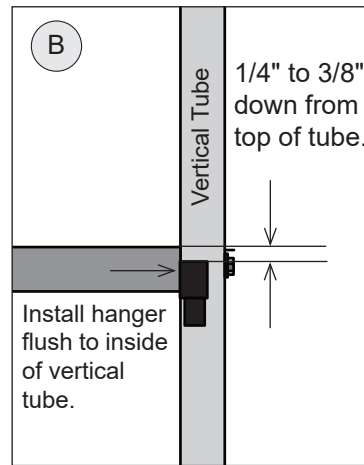
Complete these steps.

1. Determine which direction you want the drain manifold to slope toward and attach the high end pipe hanger first. See A.

NOTE: Attach 112539 hanger flush with the top edge of the channel support tube and flush with the inside edge vertical frame tube. Secure hangers to the frame using 112838 Tek screws and the nut setter.

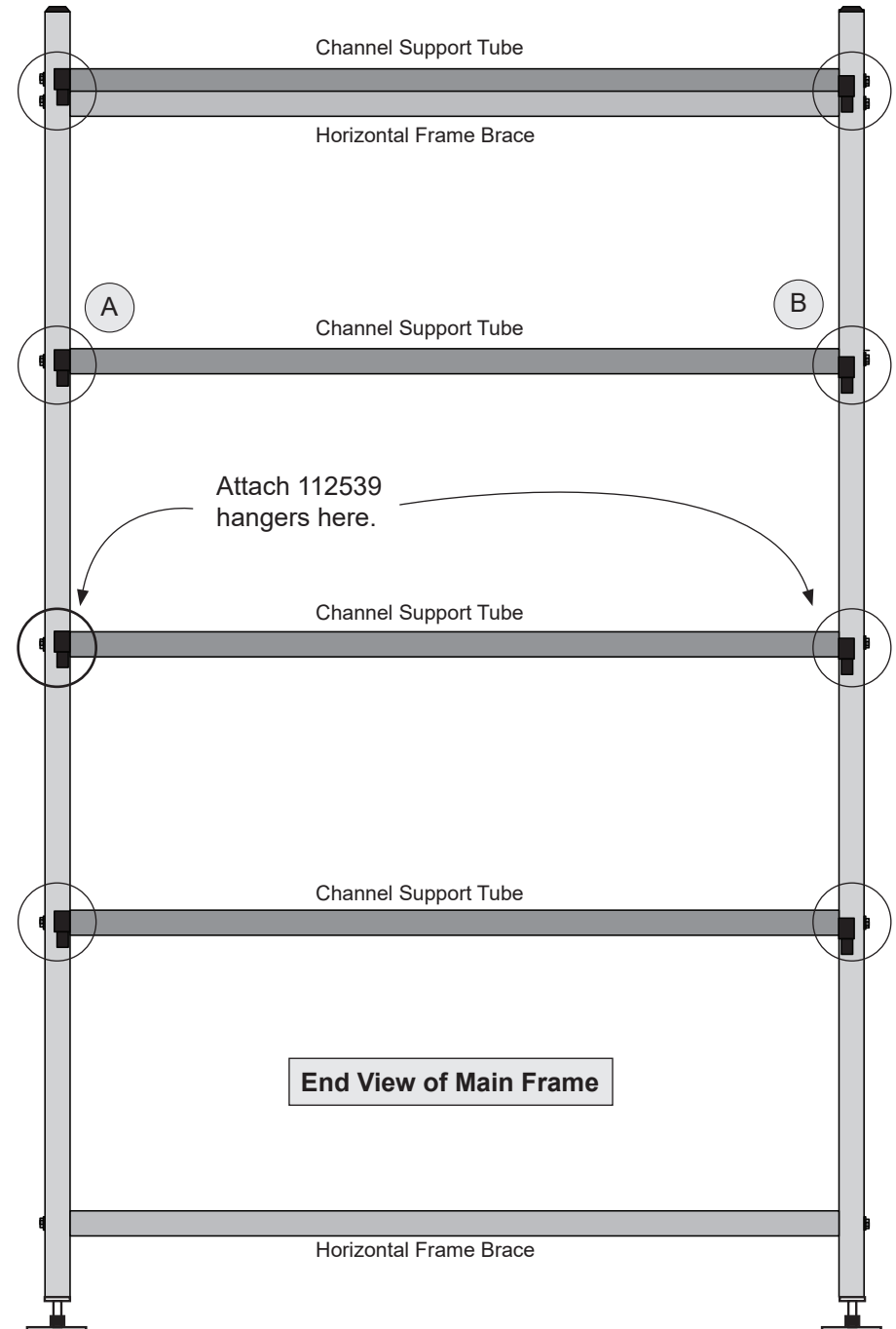
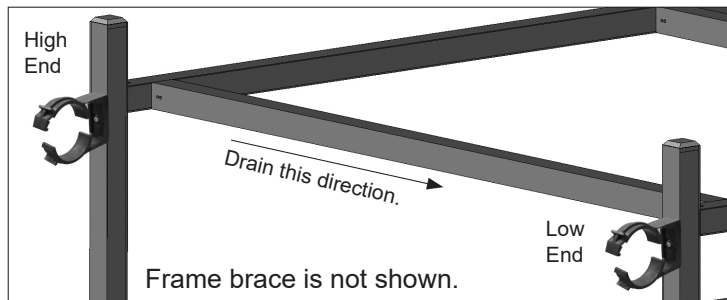


High End of Drain Manifold



Low End of Drain Manifold

2. Move to the low end and attach hangers 1/4" down from the top edge of the support tube and flush to the inside of the vertical frame tube. See B.
3. Repeat for all remaining 2" drain hangers.



Assemble and Attach 2" PVC Drain Manifold

4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD

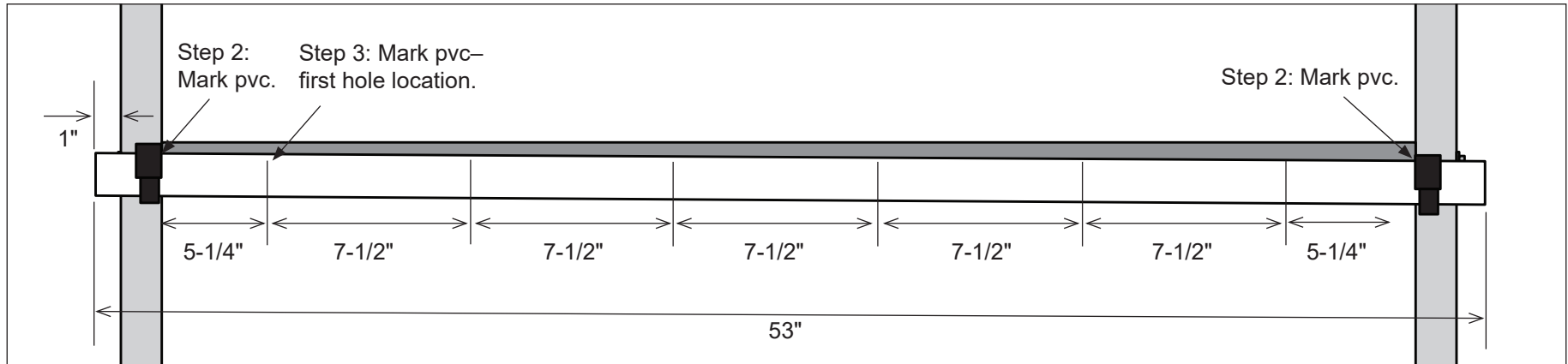
ATTENTION: During the assembly of the 2" drain manifold, dry fit all pvc tubing and fittings *before* applying the pvc adhesive.

Complete these steps:

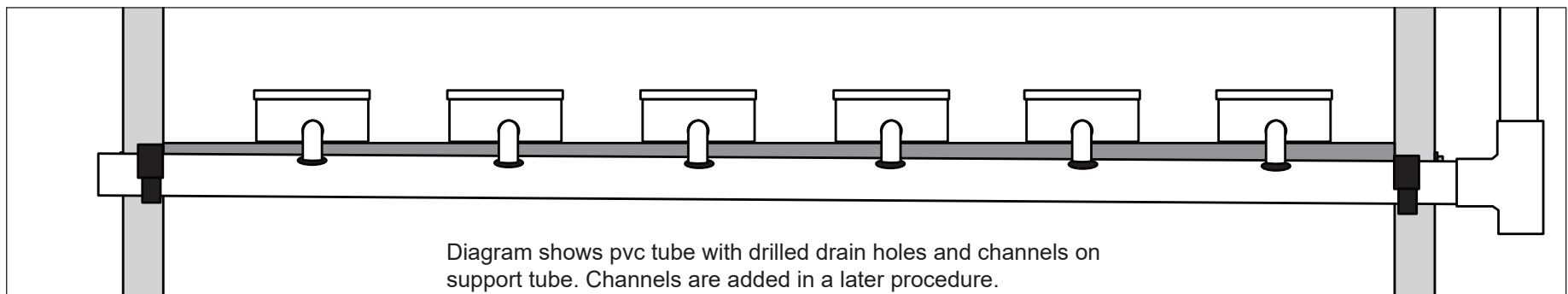
1. Cut one piece of 2" pvc pipe to 53" and snap it into the hangers at one level of the frame.

ATTENTION: Center the pvc pipe so 1" extends past the outer edge of the vertical frame tube at each end.

2. Rotate the pipe in the hangers so the printing on the pvc is centered on top. (Printing is used to maintain alignment when drilling holes.) Mark the inside edge of each hanger on the pvc pipe as shown. Marks are used to realign pipe with the hangers after drilling.
3. At one end of the pipe, measure 5-1/4" *in from the hanger* and mark. This is the position of the first drain hole.
4. From the mark in Step 3, measure and mark the on-center locations for the drain elbows of all channels. See diagram for on-center dimension.



ATTENTION: Check hole positions *before* the next step! There should be six (6) hole positions marked on the tube when finished. Holes should be evenly spaced and equal distance from each end of the pvc tube. Measure and remark if holes are not marked correctly.



Assemble and Attach 2" PVC Drain Manifold

4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD—continued

- After confirming hole positions, use a 1-3/8" hole saw bit to drill the six (6) holes in the 2" tube. Example shows using a step bit to drill the holes. Keep all holes aligned during this step. Use the printing on the pipe if possible.

NOTE: Pvc pipe can remain clamped in the hangers, or it can be removed and drilled off the rack. If you leave it clamped to the rack, block the center of the pipe or have an assistant hold it to prevent damage to the pipe hangers. For best results, drill pvc in a drill press if possible.

To release the pvc pipe from the clamps, press the pipe into the hanger and use a small screw driver to release the hanger jaws. Hangers will release easily. Be careful not to damage the locking teeth of the hanger jaws.

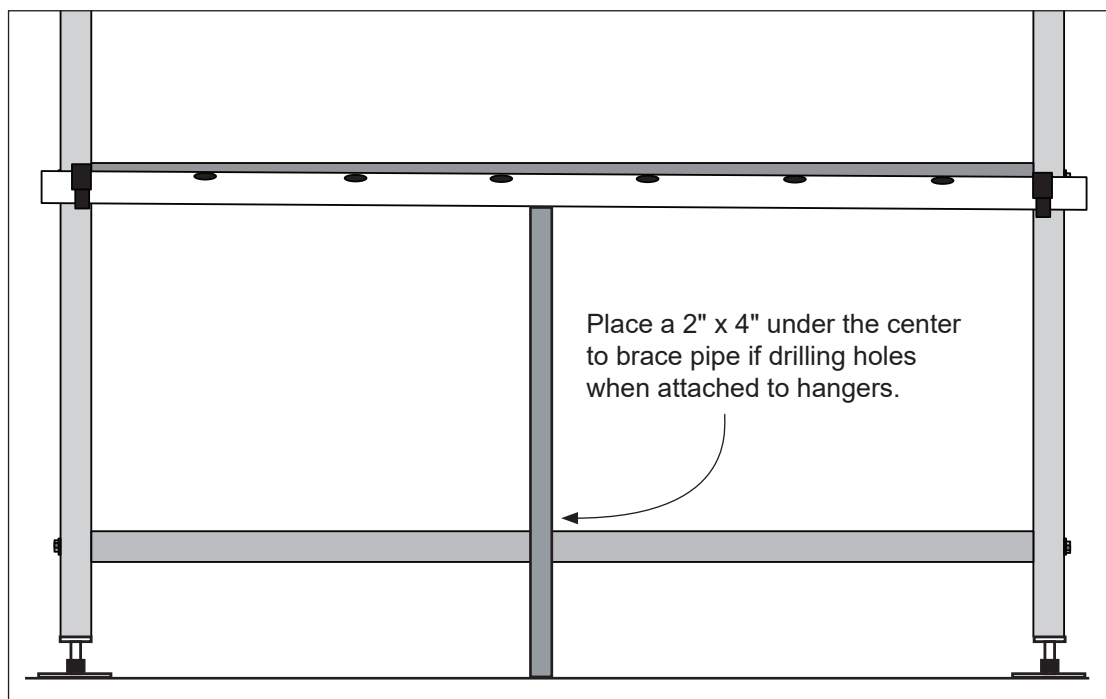


Photo shows using a step bit to drill holes in the pvc pipe.



Photo shows using a hole saw bit to drill holes in pvc pipe.

- After drilling the pipe, remove all pvc debris and clean inside the tube. If pipe was drilled on the rack, remove it from the lower level and install at the upper level after cleaning. Use the lower level hangers to hold and drill the pipe. Diagram below shows top view of pvc pipe after drilling drain holes.



- Repeat these steps to prepare, drill, and clean the remain three (3) horizontal 2" pvc drain pipes.

Assemble and Attach 2" PVC Drain Manifold

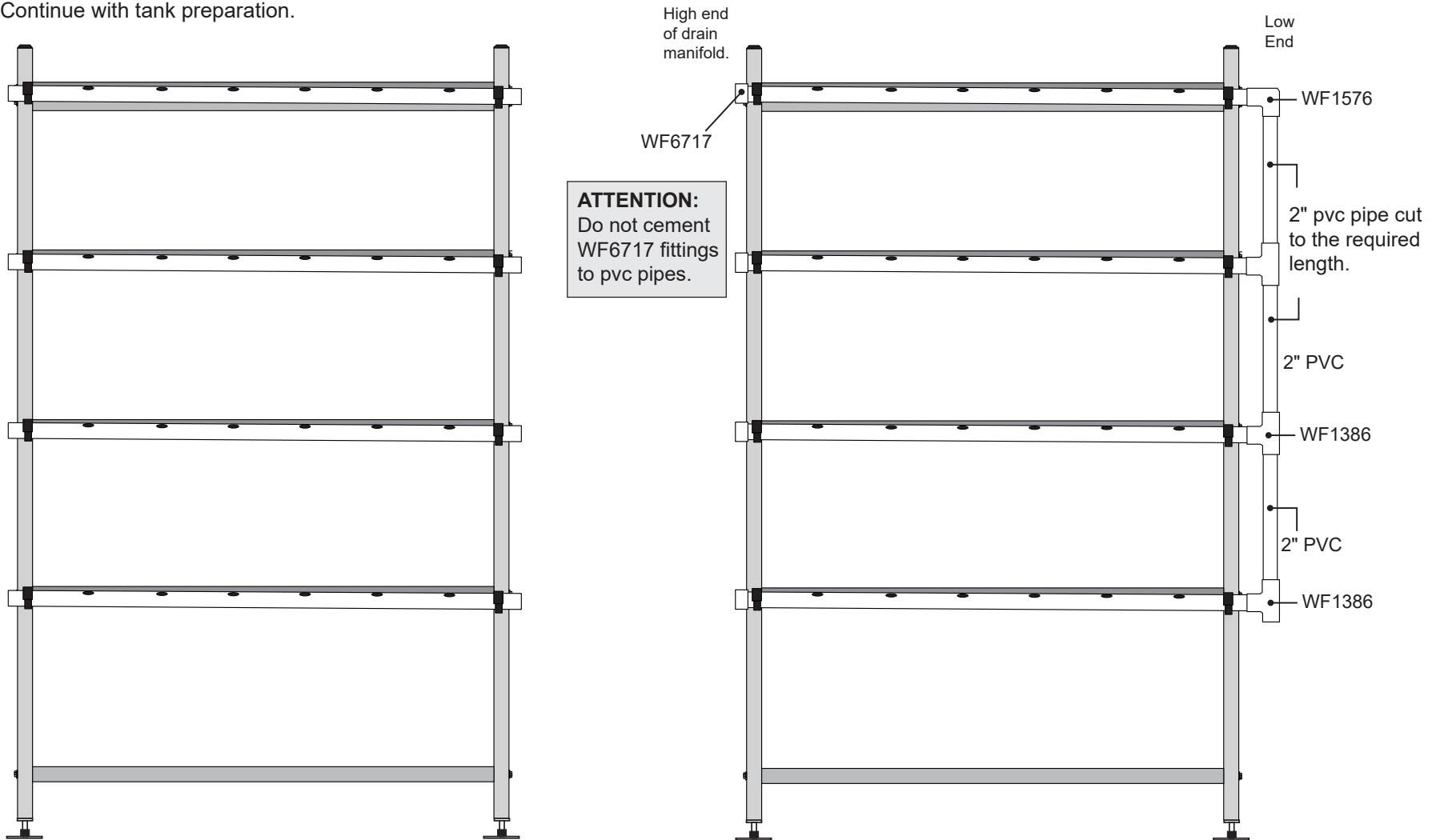
4

ASSEMBLE AND ATTACH 2" PVC DRAIN MANIFOLD—continued

- Attach all prepared pvc tubes to the frame. Align marks made in Step 2 with the installed hangers. See left diagram below.
- Assemble remainder of main drain manifold as shown in right diagram below. Dry fit all components before you permanently secure with pvc primer and pvc cement. Apply primer and cement to each component and assemble. Allow cement to set.

ATTENTION: Do not cement the WF6717 slip caps to horizontal tubes. Caps are removed to periodically clean drain manifold as needed.

- Continue with tank preparation.



Reservoir and Lid Preparation

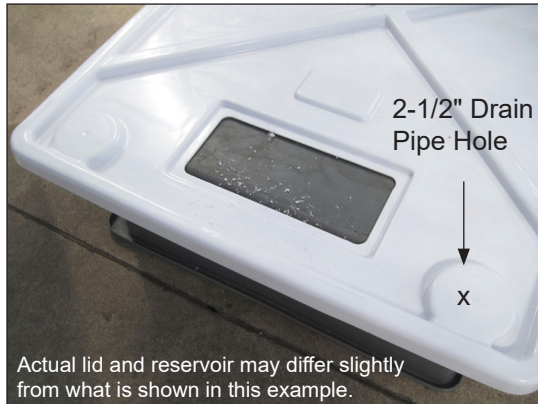
5

DRILL RESERVOIR AND LID AND INSTALL FITTINGS

Required tools: Drill, 5/16" drill bit, 2-1/4" and 2-1/2" hole saw bits

ATTENTION: Actual reservoir and lid may differ from the model used in the photos. Procedures are similar.

1. Identify corner you want to drill the drain hole in reservoir lid. (When reservoir is in position under frame, this is the corner closest to drain manifold.) Drill drain hole **using a 2-1/2" hole saw**. Do not drill cover over the reservoir. Debris can damage the pump and clog the filter once system is operating.
2. Next, using a 5/16" drill bit, drill hole through the lid for the air pump tubes. See photo below.



STEP 1: X marks hole location based on reservoir design and position. *Drill one 2-1/2" drain hole in corner.*



Move cover off reservoir. Place on support to drill the 2-1/2" drain hole.



Photo shows sample reservoir with drain hole in lid. Actual lid and reservoir may differ.



STEP 2: Drill holes for air pump tubes using a 5/16" drill bit. Drill cover off reservoir.

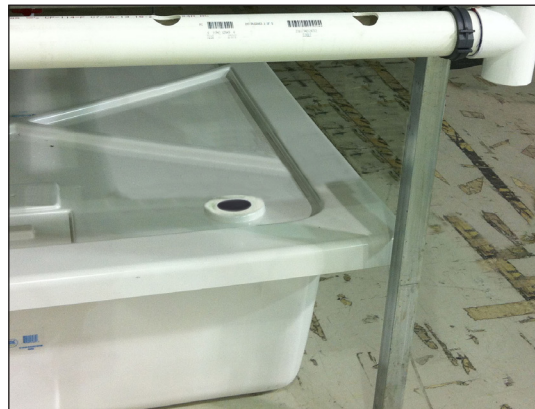


Photo show drain hole in reservoir lid.

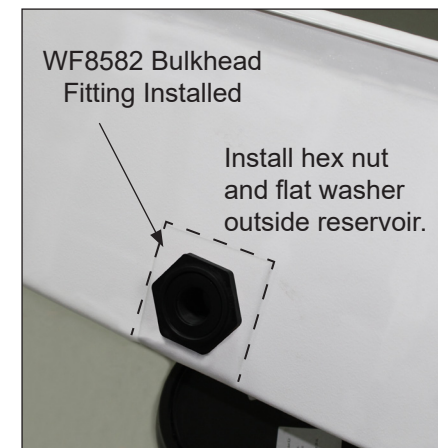
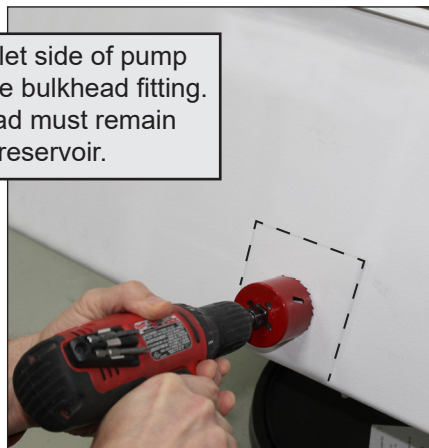
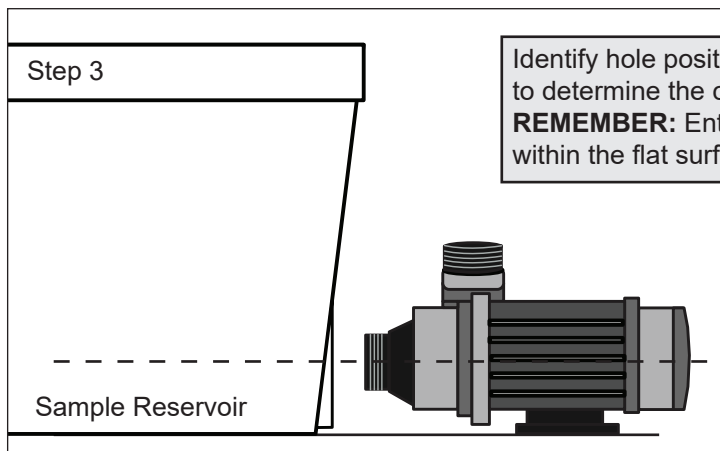
Reservoir and Lid Preparation

5

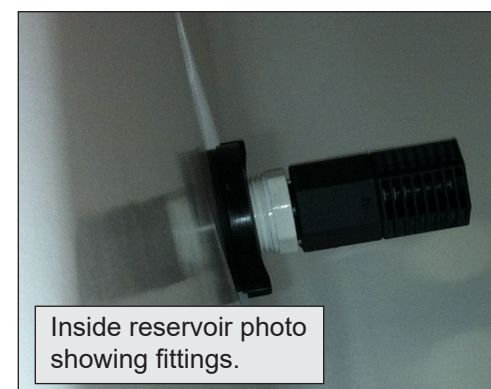
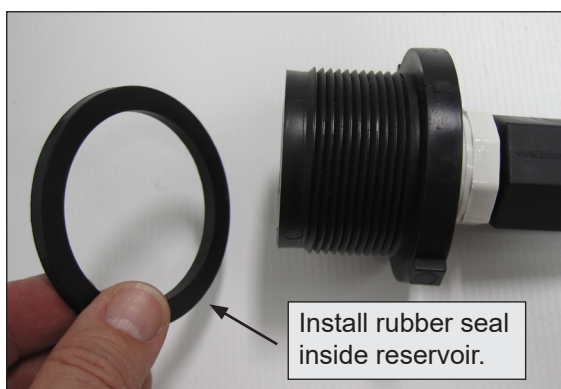
DRILL RESERVOIR AND LID AND INSTALL FITTINGS—continued

3. Finally, take the reservoir and drill the bulkhead fitting hole using a **2-1/4" hole saw bit**. Review photos and diagrams for position.

ATTENTION: Use the pump to determine the hole position on the reservoir. Set the pump and reservoir on the same level surface and align the inlet port of the pump with the spot on the reservoir where the bulkhead fitting will be installed. Mark the location. Adjust as needed to ensure the entire bulkhead fitting is against the flat surface of the reservoir. Dashed line outlines area for bulkhead fitting.



4. Attach the WF2392 bushing, 111302 extension, and 111303 screen to the threaded body of the bulkhead fitting. Hand tighten until snug.



5. Attach the bulkhead assembly to the reservoir. Hex nut and thin flat washer are outside the reservoir. Tighten until snug using large adjustable pliers.
6. Continue with the next procedure.

Channel Preparation: Lids

5

DRILL TUBE HOLES IN LIDS AND INSTALL LIDS

Lids are designed with off-set holes for improved plant growth. During installation, alternate lids as shown. Before snapping lids onto the channels, drill the nutrient tube holes at one end of each lid.

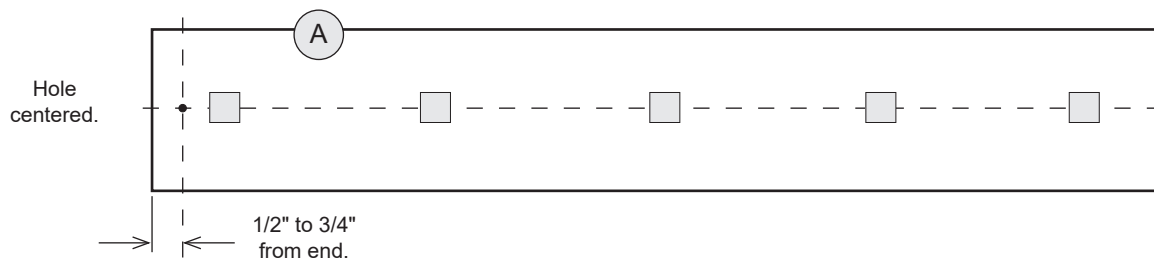
Complete these steps to drill holes for the nutrient tubes:

1. Take twelve (12) channel lids and arrange so all the plant holes and ends of the lids align. Take the remaining channel lids and repeat this step. Keep the two piles separate.

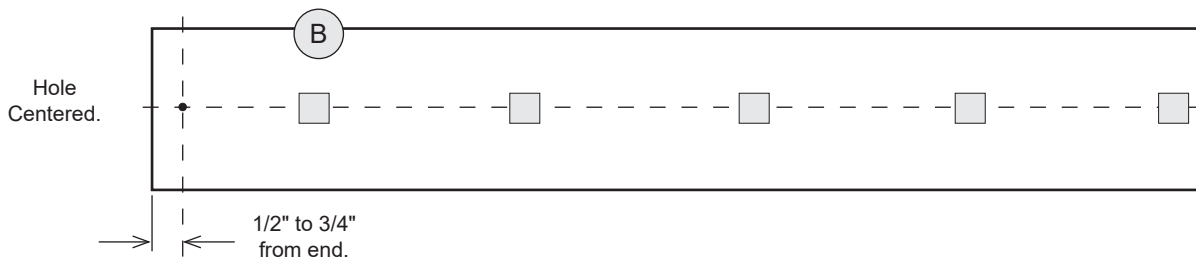
ATTENTION: For the first pile of lids, drill the nutrient tube holes where the first plant hole is closest to the end of the lid. See A in the photo.

For the remaining lids, drill the nutrient tube holes where the first plant hole is farthest from the end of the lid. See B in the photo.

2. Once the lids are separated, move to pile A and drill one (1) 5/16" hole in each lid where plant hole is closest to the end. See the diagram that follows. Keep lids in the same group when completed.



3. Move to pile B and drill one (1) 5/16" hole in each lid where plant hole is farthest from the end. See the diagram that follows. Keep lids in the same group when completed.



ATTENTION: When sliding the lids onto the channels, position the nutrient holes opposite the drain end/elbow of the channel.

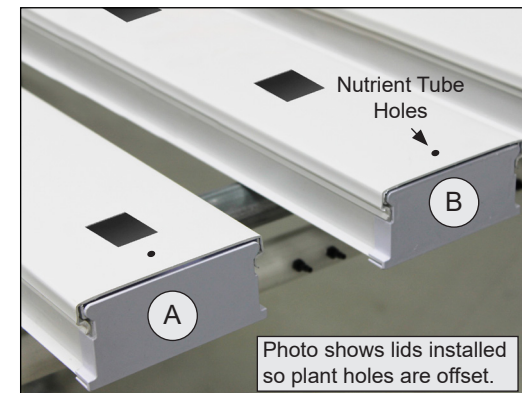
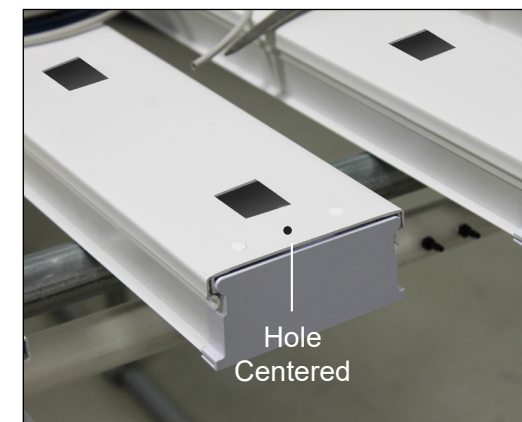


Photo shows lids installed so plant holes are offset.



ATTENTION: Drill holes away from open channels to prevent debris from dropping into the channels.

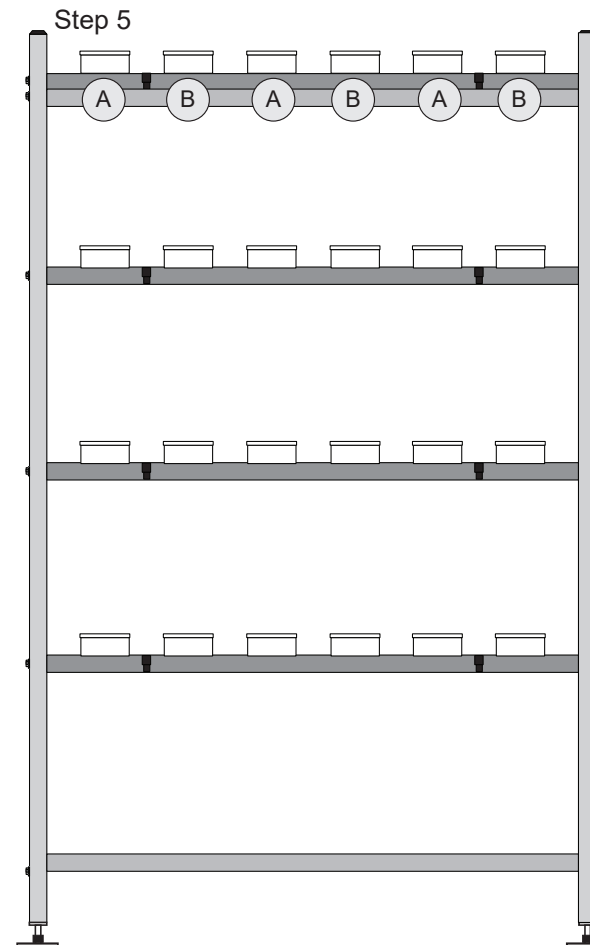
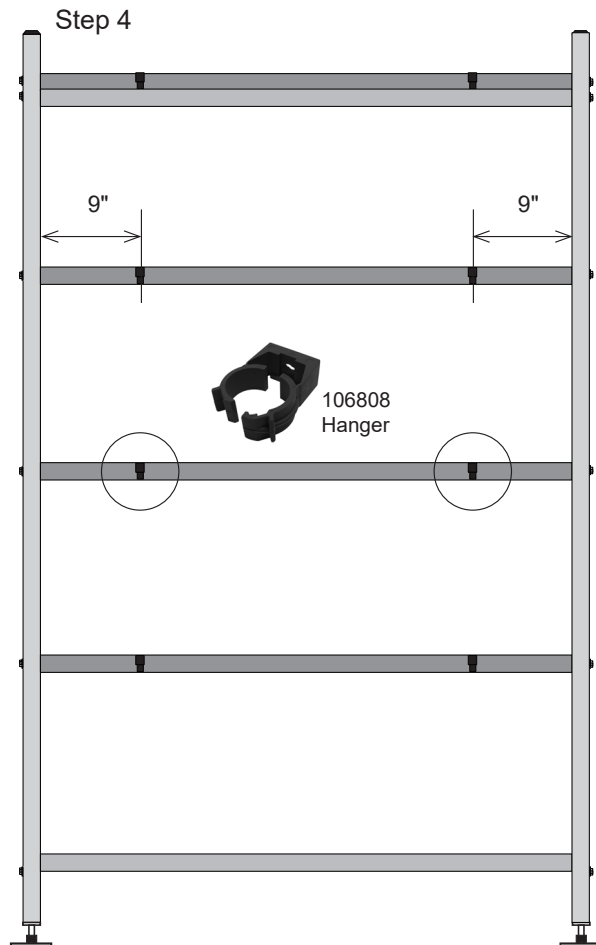
Channel Preparation: Lids

5

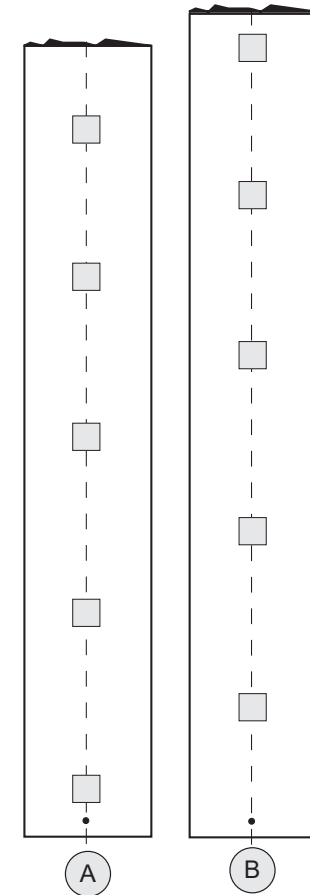
DRILL TUBE HOLES IN LIDS AND INSTALL LIDS—continued



4. Move to the supply manifold end of the frame opposite the drain manifold and attach one 106808 hanger in each position shown below using the 106808 Tek screws and 5/16" x 2-9/16" magnetic nut setter. Do not overtighten!
5. Next, add a lid to each channel and arrange on the assembled frame as shown. Wipe the shavings from each lid (top side and underside) before sliding the lid onto the channel. **Position all nutrient tube holes opposite the drain elbow of the channel.**



Top View of Channels



6. Continue with the assembly and installation of the nutrient supply manifold.

Assemble and Install Nutrient Supply Manifolds

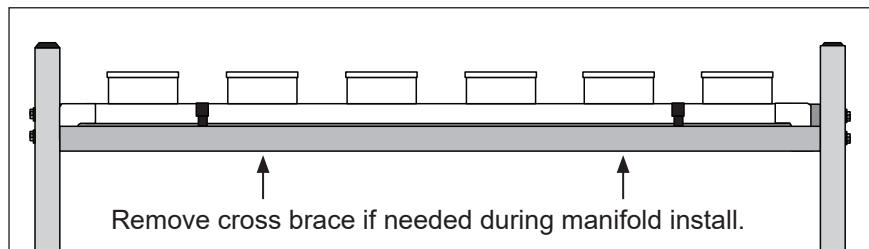
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS— CONTINUED

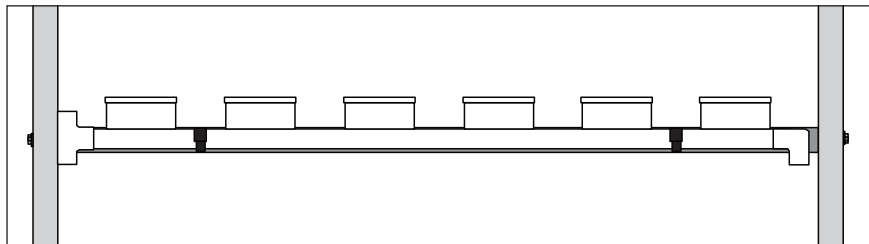
Complete these steps:

1. Gather the parts and construct one (1) upper manifold pipe and three (3) lower manifold pipes. **Dry fit all parts. Do not cement at this time.**

ATTENTION: Cut the 3/4" pvc pipe short enough to allow approximately 1/2" clearance at each end when fittings are installed.

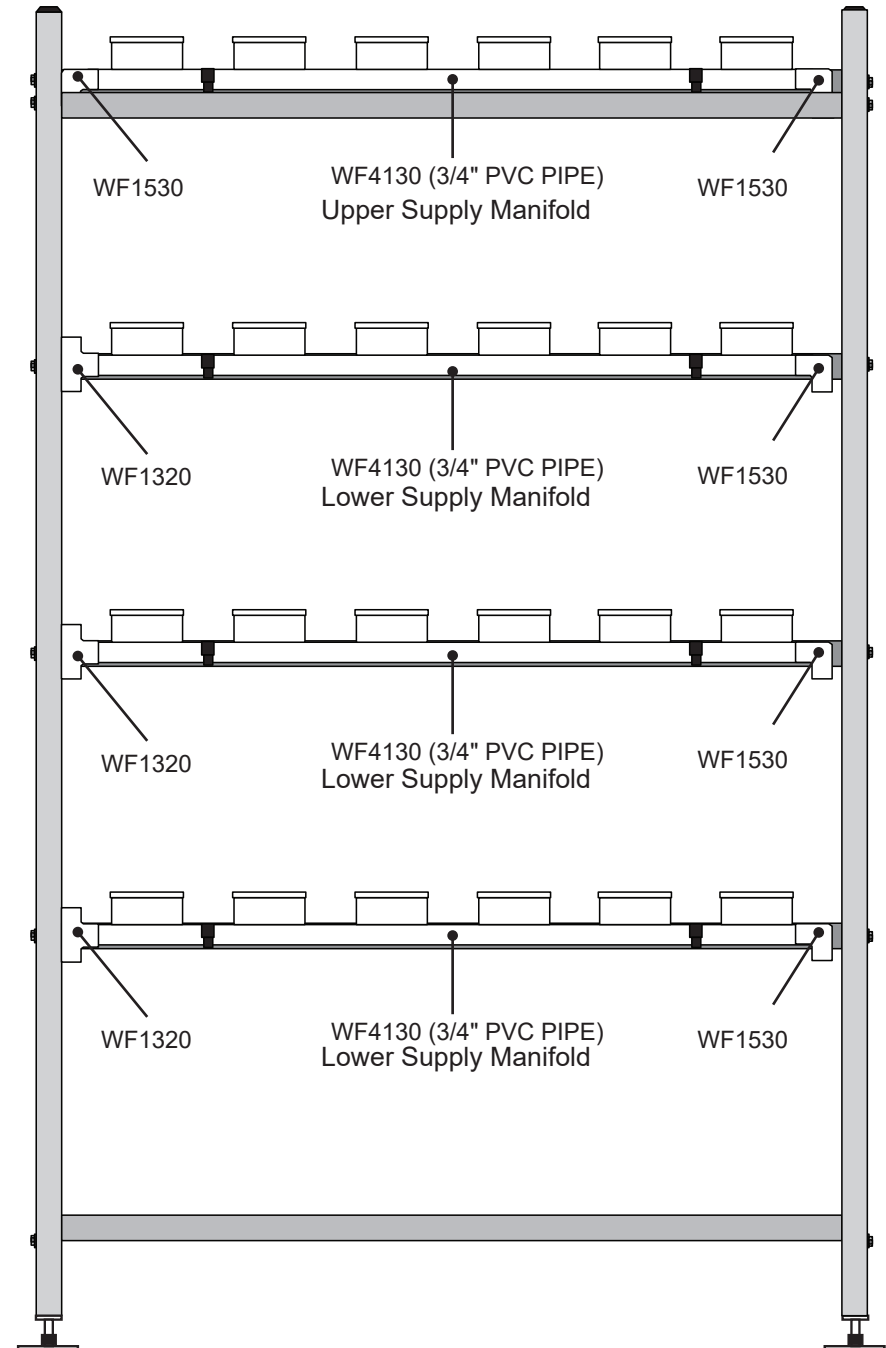


One (1) Upper Supply Manifold:
Elbow at each end.



Three (3) Lower Supply Manifolds:
Tee at one end; elbow at the other.

2. Snap the upper manifold into place on the frame. (Remove cross brace if needed for easier installation.) Snap the lower manifolds into place on the lower three levels.



Assemble and Install Nutrient Supply Manifolds

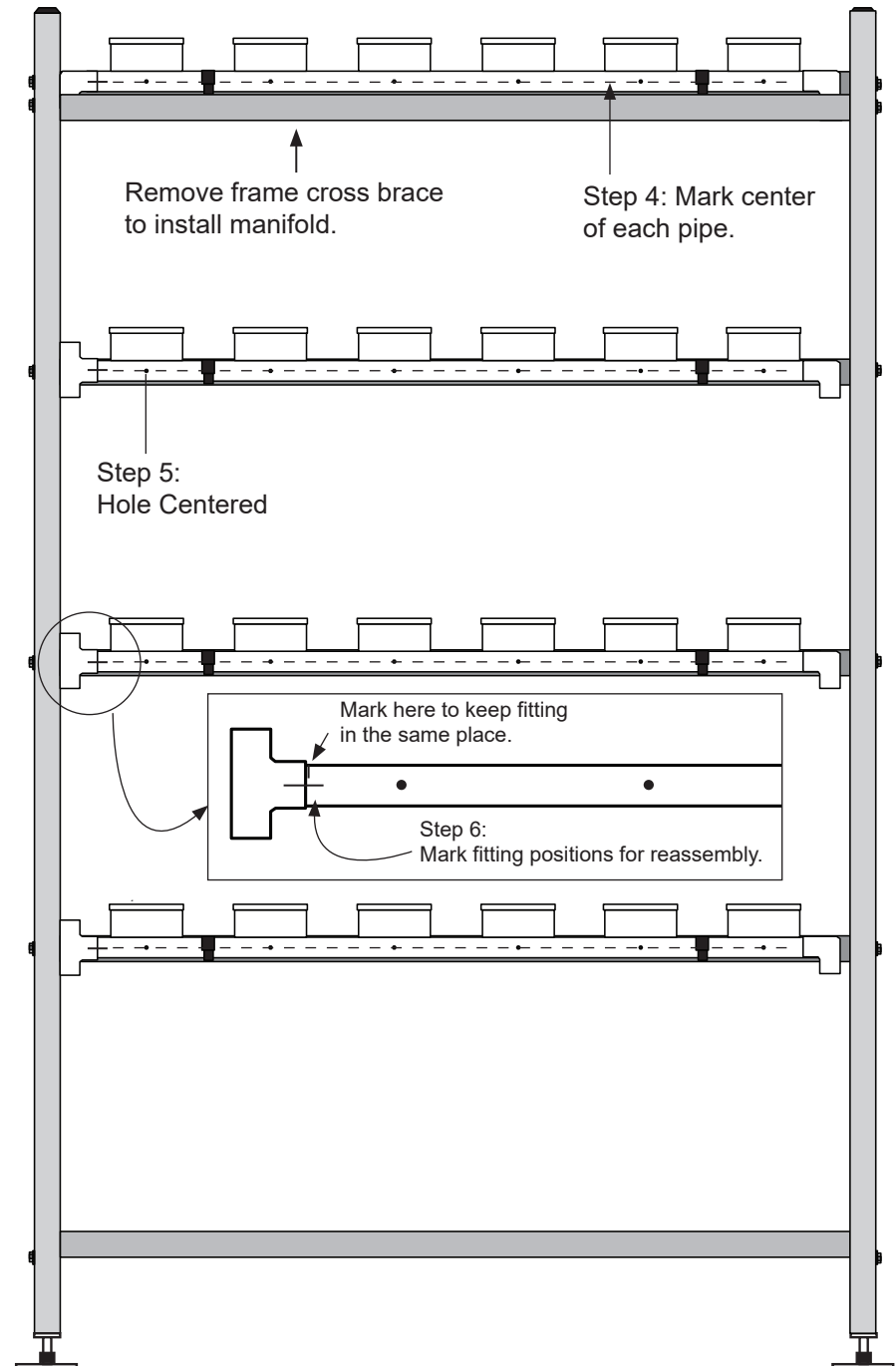
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS— CONTINUED

- Align and evenly space all channels at each level. Channels will run parallel with each other and the long tubes of the frame. Insert drain elbows into drain manifold to keep channels in place.
- With all manifolds snapped into place on the frame, mark the center of each manifold along its length using a chalk line. You can also rotate the pvc pipe so the printing shows. Use non-permanent chalk.



- Using a marker, mark one (1) hole location for each channel on each manifold pipe. Mark holes in the center of the manifold pipe. After holes are marked, mark each fitting to more easily reassemble the manifolds after drilling the holes and cleaning the pipe.
- Once the manifolds are marked, carefully remove each manifold from the frame. Use a small screwdriver to carefully release the jaws of the pipe hangers. If desired, mark the frame level (1, 2, or 3) on each of the lower manifolds to reinstall them in the same location.



Assemble and Install Nutrient Supply Manifolds

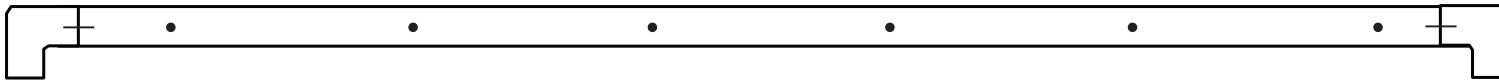
6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED



Step Bit

7. Choose one manifold and place it on a flat surface with the marks facing up. Upper manifold is shown below.



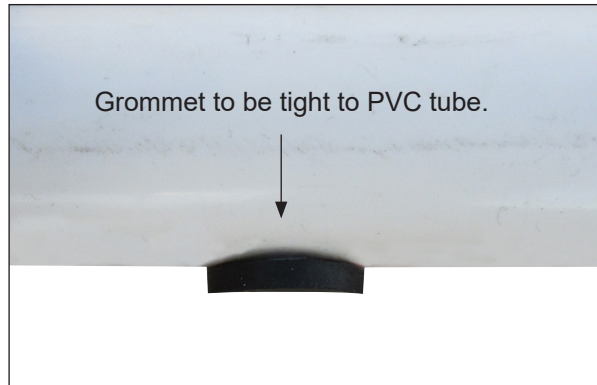
8. Using a **3/8" drill bit** — a step bit is highly recommended — drill holes in PVC tube for top hat grommets at each of the marks. Repeat this step to drill the remaining supply manifolds.

9. Next, disassemble each manifold and clean the pvc pipe to remove debris from inside the tube. **Keep parts for each manifold together.**

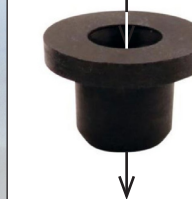
10. Insert one 115820 top hat grommet into each 3/8" hole in the PVC tube. Dip grommet in water for easier installation. Wipe off chalk line if desired. Verify through holes in grommets. Puncture if necessary.



ATTENTION: If using a twist drill bit (as shown), apply slight pressure to allow bit to cut a smooth hole in PVC tube.



115820 Grommet



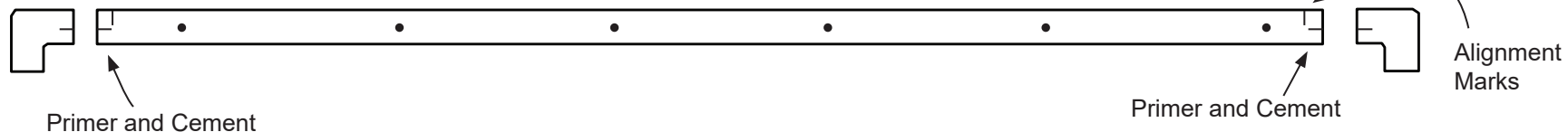
IMPORTANT: Verify there is an open hole through the grommet before installing. Puncture through if necessary.

ATTENTION: Grommet fit should be snug. If grommet seems loose or slides into hole with little effort, verify you have drilled holes using a 3/8" bit. **Grommets will leak if hole diameter is too large.**

11. Apply pvc primer and pvc cement to each end of one manifold pipe and reassemble the manifold using the fittings for that pipe. Use the marks to position the fittings as they were before manifold was disassembled. Set the assembly aside and repeat the step to reassemble all manifolds. Allow cement to set before continuing with next step.



WF6990
PVC Cement and
113372 PVC Primer

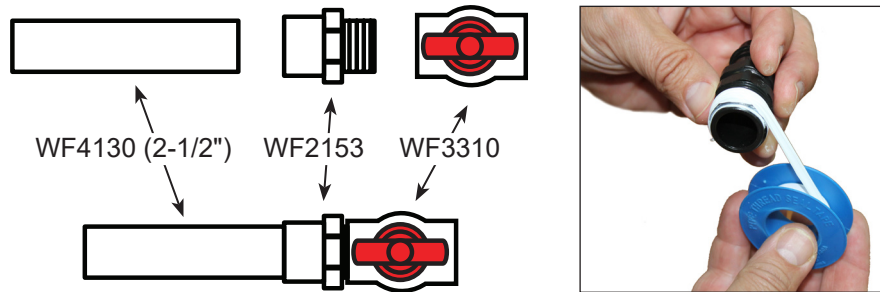


Assemble and Install Nutrient Supply Manifolds

6

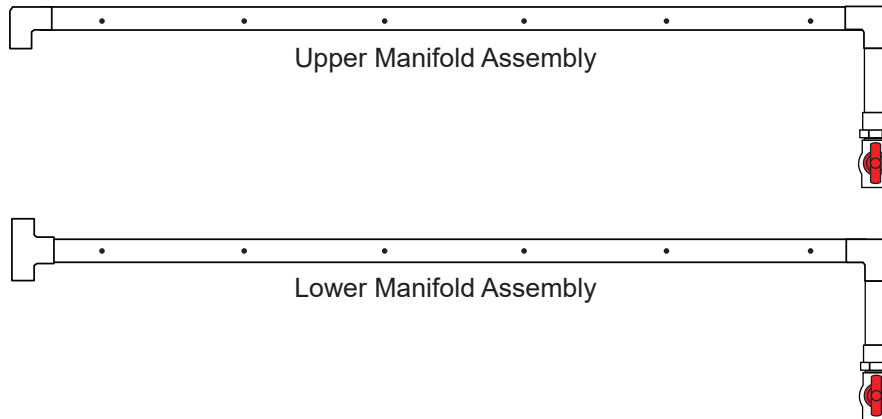
ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED

12. Assemble the four (4) valve assemblies as shown.



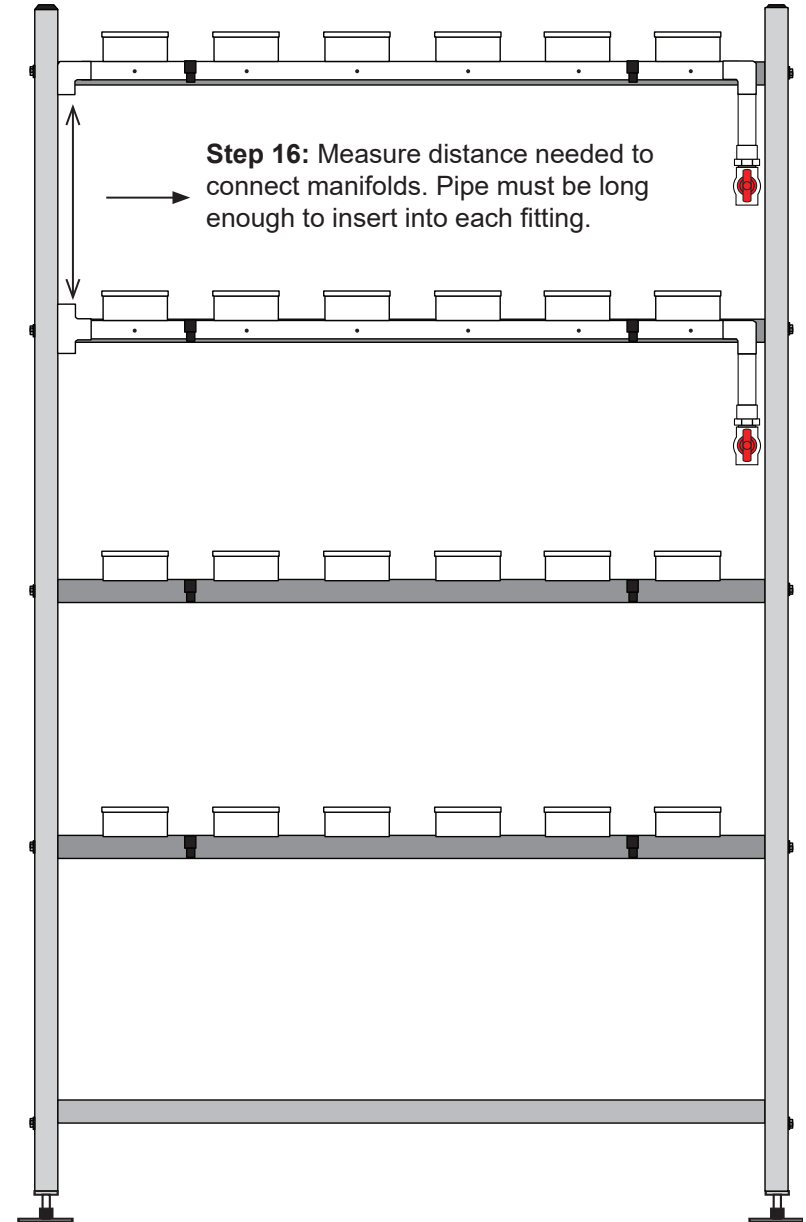
13. Wrap the threads of each WF2153 adapter four or five times with the WR1095 thread sealing tape. Wrap in a direction that will not loosen when installed in the threaded elbows of the supply manifolds.

14. Apply pvc primer and pvc cement to the PVC end of the valve assembly and slip it into the elbow fitting at the end of a manifold assembly. Repeat to install all remaining valve assemblies. Valves will all be at the same end when manifolds are attached to the frame.



15. Snap upper manifold and first lower manifold assemblies into place. Measure length needed for first vertical pvc pipe and cut a piece of 3/4" pvc pipe to that length. Remember to allow enough length for pipe to connect two supply manifolds.

Do not cut the pipe too short. Dry fit pipe before adding pvc primer and cement.

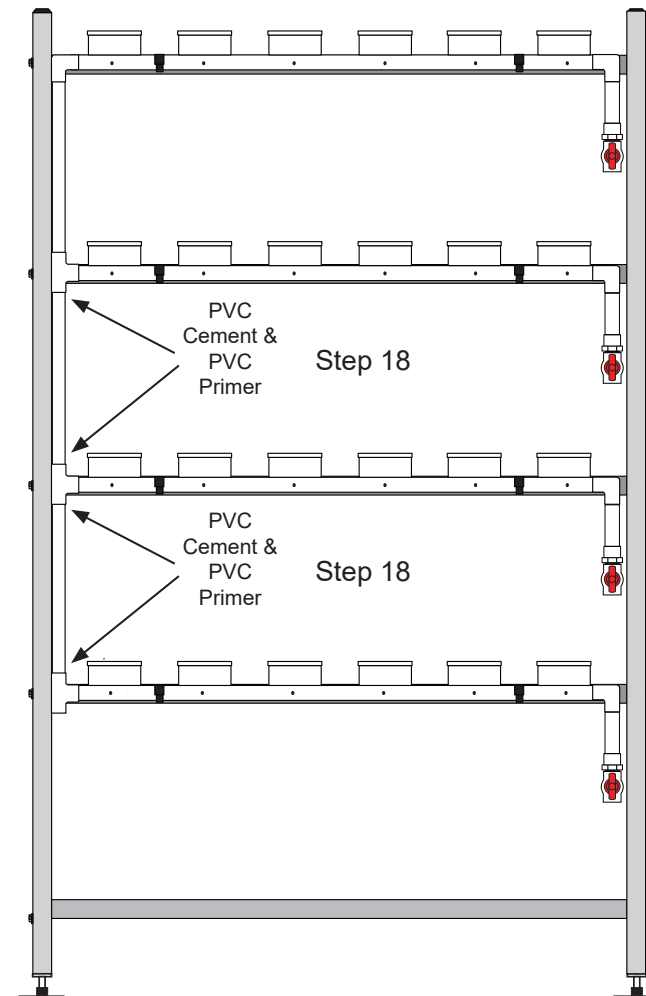
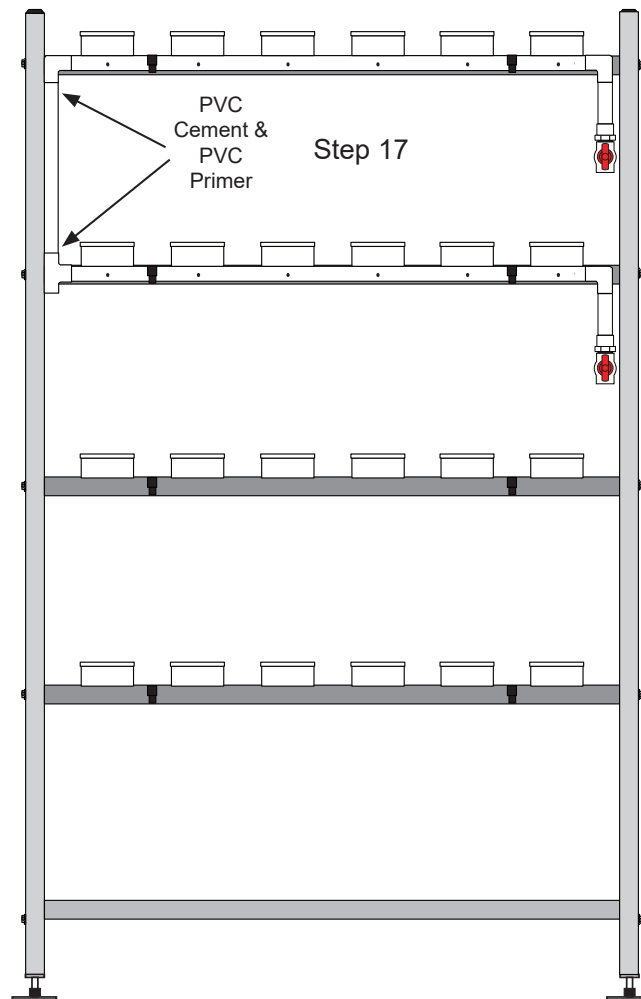
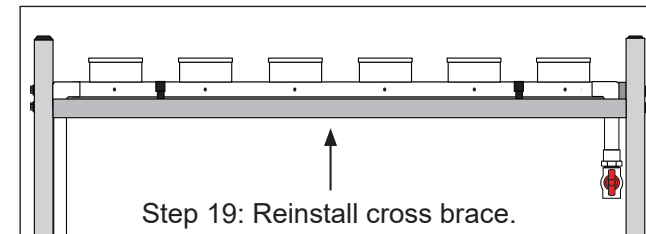


Assemble and Install Nutrient Supply Manifolds

6

ASSEMBLE AND INSTALL NUTRIENT SUPPLY MANIFOLDS—CONTINUED

16. After confirming length, disassemble as needed to apply pvc primer and cement and reassemble. Remove and reinstall lower manifold as needed.
17. Continue working down the end frame and adding the 3/4" vertical manifold pipes. Dry fit all pipes before applying the pvc primer and cement.
18. Reinstall frame cross brace if needed.
19. Continue with the next procedure.



Cut and Install 1/4" Nutrient Supply Tubes

7

CUT AND INSTALL THE 1/4" NUTRIENT SUPPLY TUBES



111047

Complete these steps:

1. Determine the desired 1/4" tube length. Tube should reach from the adapter in the supply manifold to a hole in the channel lid immediately above the adapter pair.
2. Adjust the tube length if needed and cut the remaining tubes from the 111046A bulk roll. There are 24 tubes for this system. Use a scissors or utility knife to create a clean, smooth cut.
3. Once all tubes are cut, determine where you want to install the 111047 micro valve in the tube. Cut the tube in two at that position. See photo—upper right for a complete assembly.
4. Slide the two pieces of tubing onto the 111047 micro valve.
5. Move to the assembled frame and slide one end of a tube assembly into a grommet in the manifold. Wet the tube end for easier installation.
6. Take the free end of the same tube and slide it into the hole of the channel lid. Review the photo (upper right) for a suggested tube pattern. Diagram to the right shows another tube installation pattern. Trim the tube end at an angle.
7. Repeat the steps to assemble and install all remaining 1/4" nutrient supply tubes.

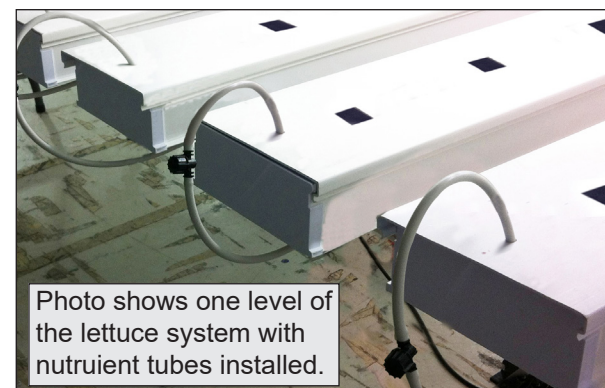
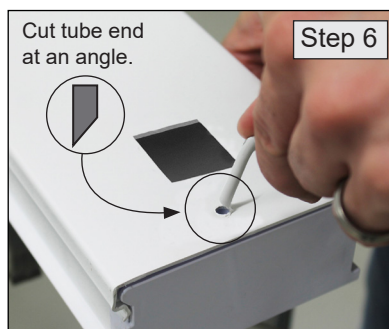
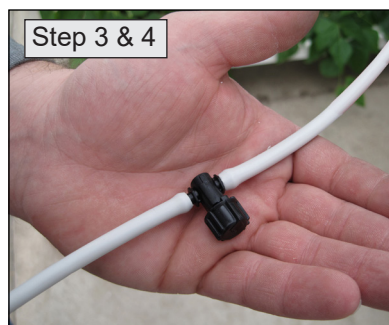
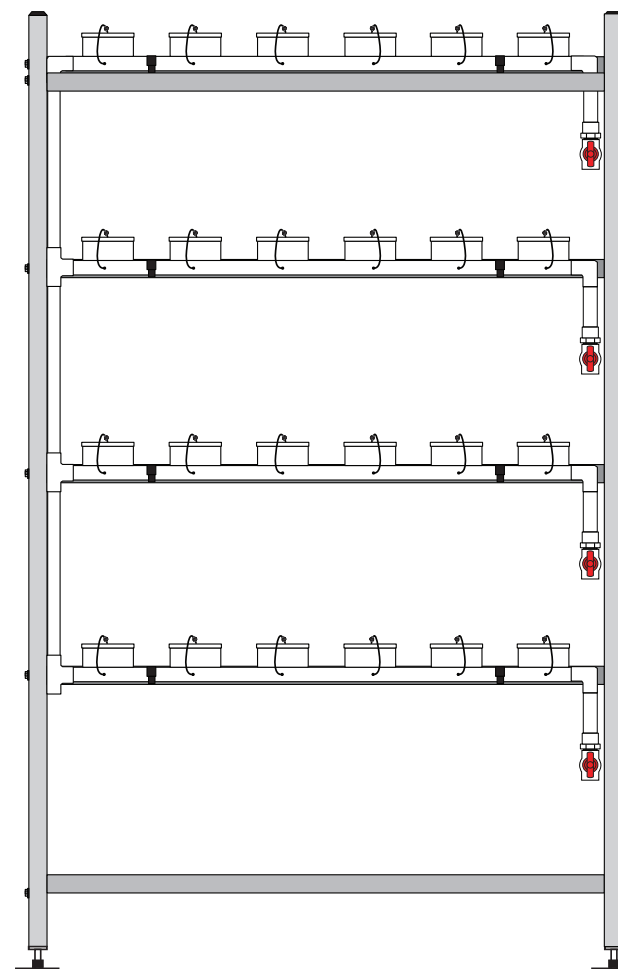


Photo shows one level of the lettuce system with nutrient tubes installed.



Level Frame and Set Slope

8

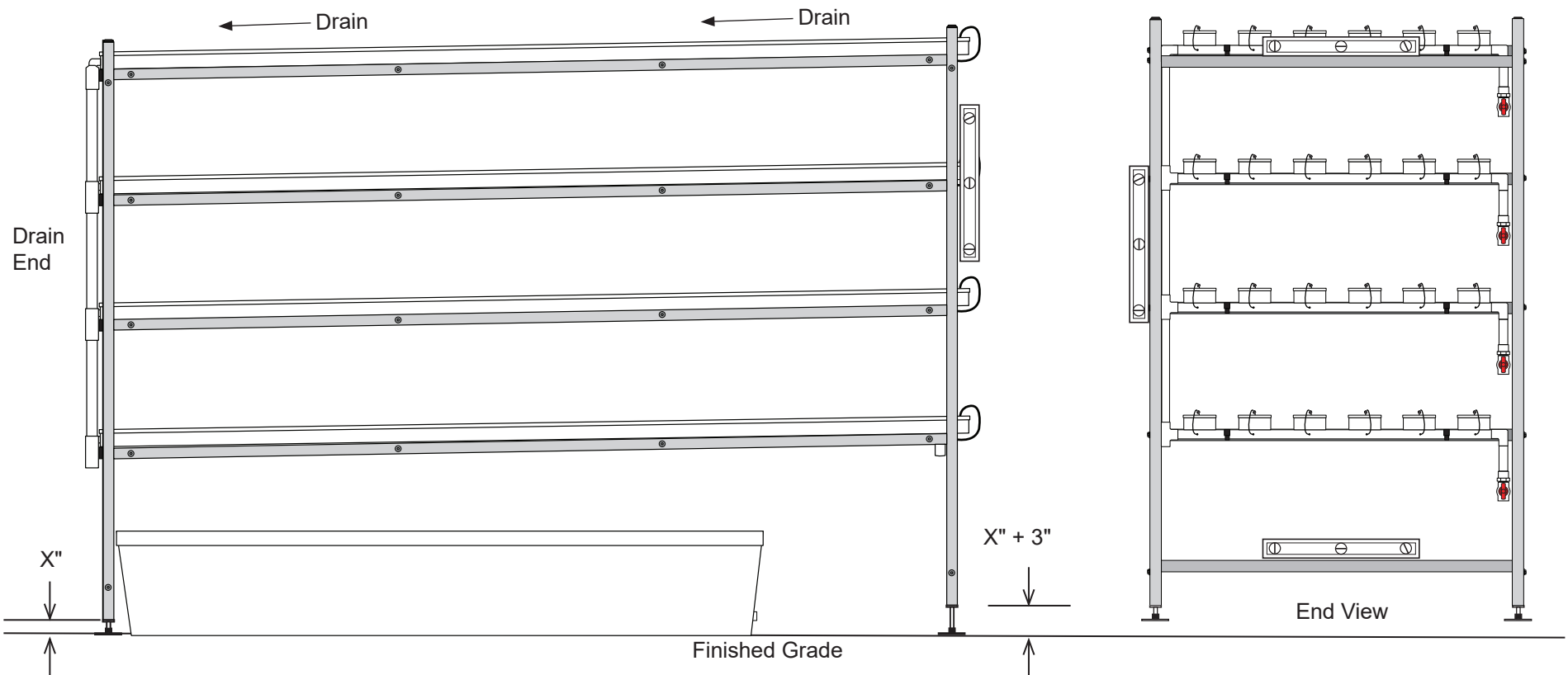
LEVEL FRAME AND SET SLOPE

To ensure that water flows through and properly drains from the plant channels, a **3" slope toward the drain end** of the system is required. Frame must also be level from side-to-side when viewed from the end.

Complete these steps:

1. Move the frame to the location where it will be used if needed.
2. At the drain (low) end of the frame, adjust the adjustable feet to lower that end of the frame as much as possible. Allow enough room between the top of each foot and the locking nut to make final adjustments and to lock the feet in position. Set a level on the lower frame cross brace and check. Adjust side-to-side frame position so frame is level. See end frame diagram below.
3. Move to the supply end of the frame and raise that end to achieve the required slope.
4. Level the frame side-to-side after setting end-to-end slope.
5. Recheck the frame slope. Verify that ends are level. Tighten the lock nuts to secure feet.

ATTENTION: Example below shows a system setting on a level finished grade. If finished grade is sloped, make the necessary adjustments in the calculations to account for any differences. When slope is properly set, frame should slope 3" from the supply end down toward the drain end.



Install the Main Pump and Plumbing

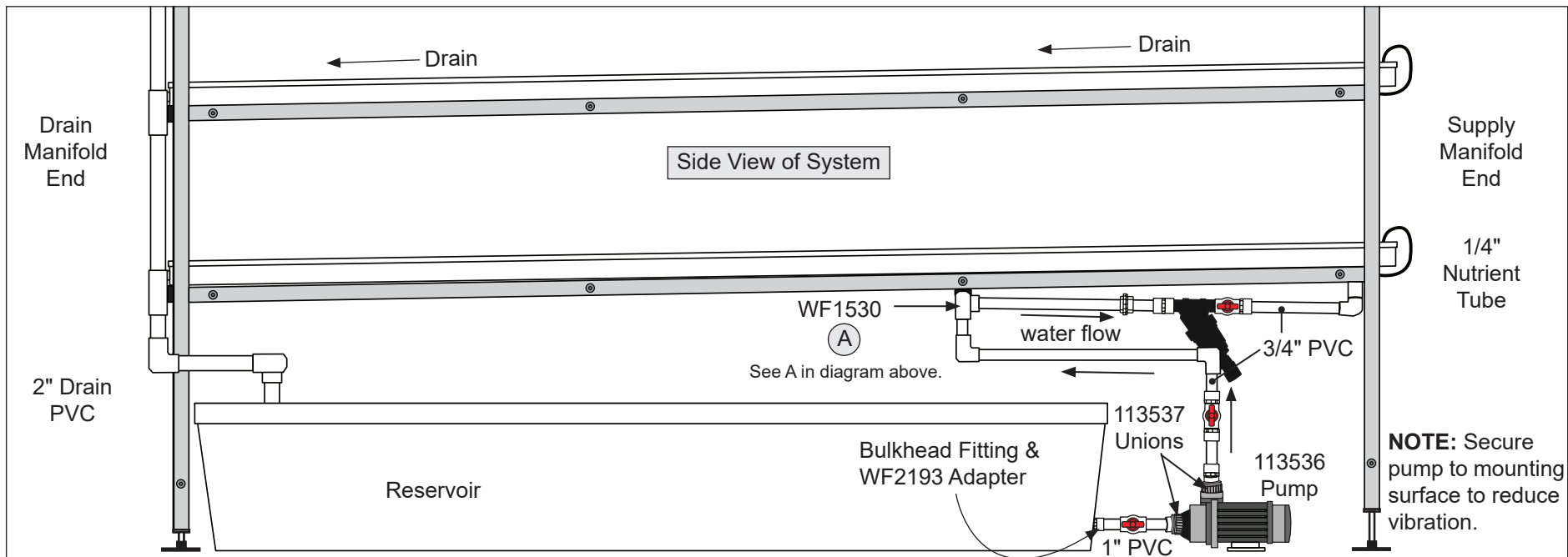
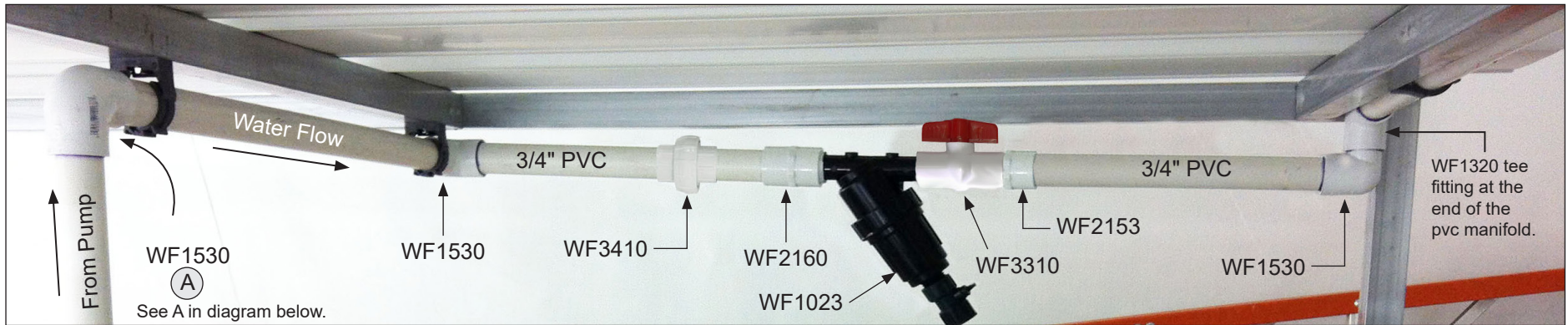
9

INSTALL THE MAIN PUMP & PLUMBING

Gather parts identified in the photo and construct main pump supply plumbing. Review assembly and installation notes that follow before you begin. For best results, complete this procedure after setting frame slope.

- Dry fit all connections before applying pvc primer and pvc cement.
- Install the WF1023 Y-filter with the water-flow direction arrow pointing away from the pump.
- Center reservoir so bulkhead fitting points toward the supply manifold end of the frame.

WARNING: All electrical wiring to be completed by a qualified electrician according to recognized local building codes.



NOTE: Secure pump to mounting surface to reduce vibration.

Assemble and Attach 2" PVC Drain Manifold

10

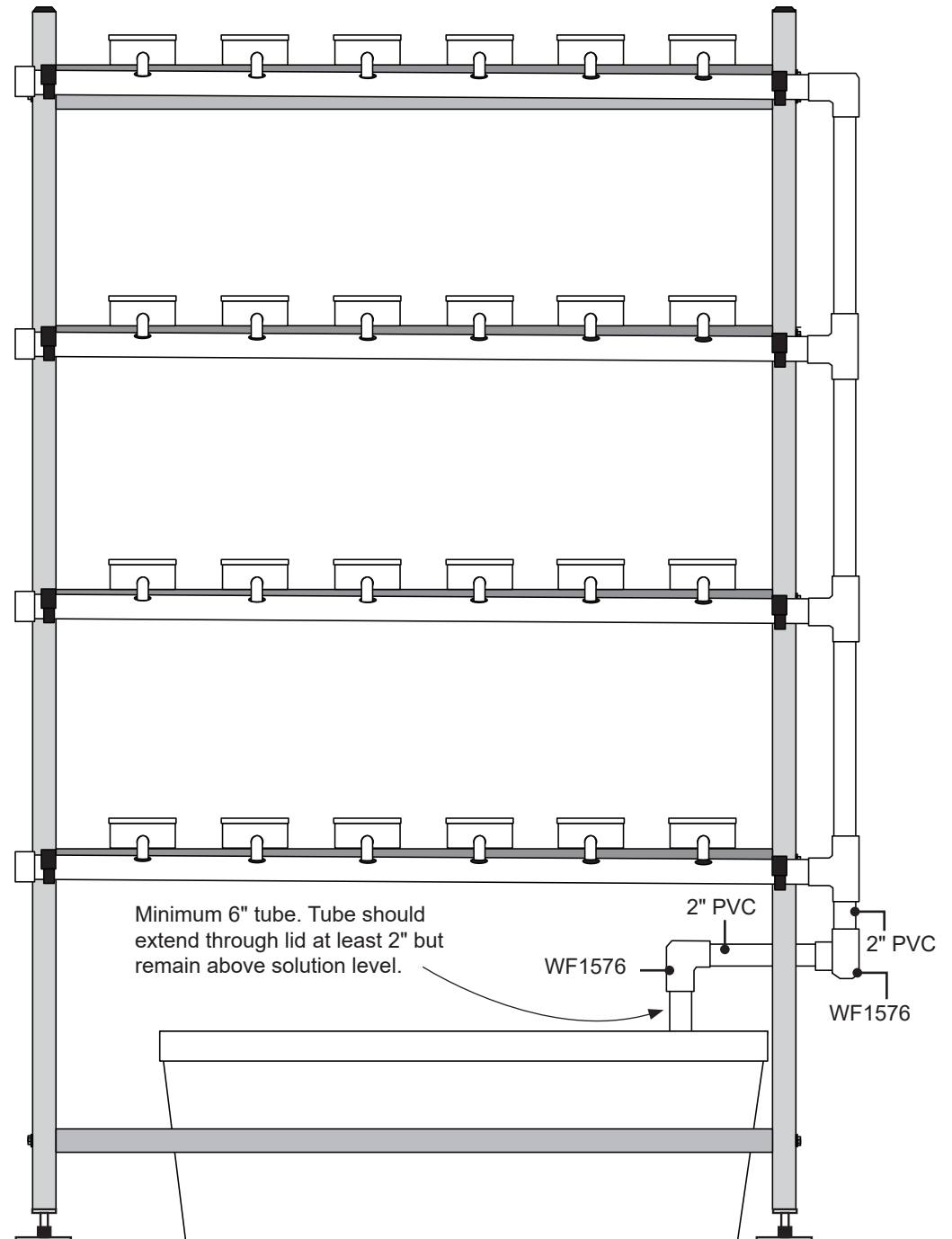
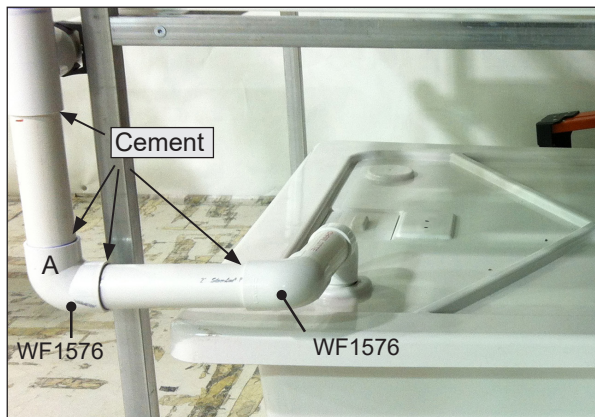
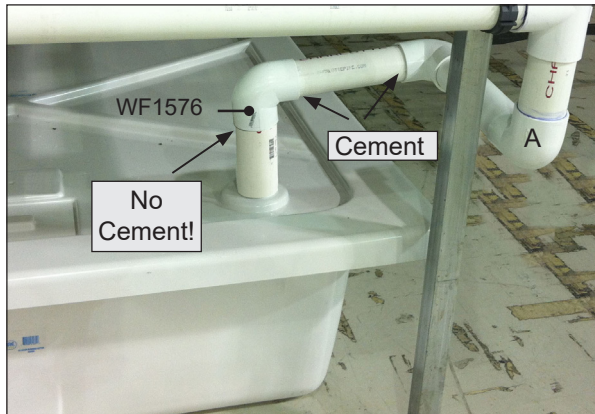
ASSEMBLE AND ATTACH PVC DRAIN MANIFOLD

Complete these steps:

1. Measure, cut, and dry fit the remaining sections of the 2" pvc drain manifold as shown in the photos below.
2. Once the fit is confirmed, disassemble and apply pvc primer and pvc cement to drain tubes and fittings. See below.

ATTENTION: Do not cement the extension tube that extends through the lid from the WF1576 elbow. Extension tube must remain free to remove for routine tank maintenance.

3. Allow the cement to set and continue with following procedure.



Install the Air Pump and Tubing

11

ATTENTION: Always position the air pump *above* the nutrient level to prevent siphoning of the reservoir.

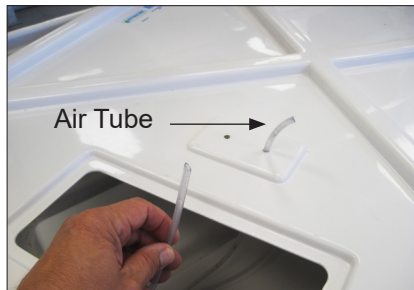
ATTACH THE AIR PUMP AND AERATOR STONES

For optimal system performance and to extend the life of the nutrient solution through increased oxygenation, an aerator pump and aerator stones are included. Position stones at the bottom of the reservoir opposite the water pump. *Air pump must remain above nutrient level to prevent siphoning.*

1. Choose a position for the air pump and use it to determine the length of each air tube. Cut two air tubes of equal length using the 110091 tubing.

ATTENTION: Position the air pump at a level that is **above the nutrient level at all times to prevent siphoning** of the reservoir in the event of a power outage.

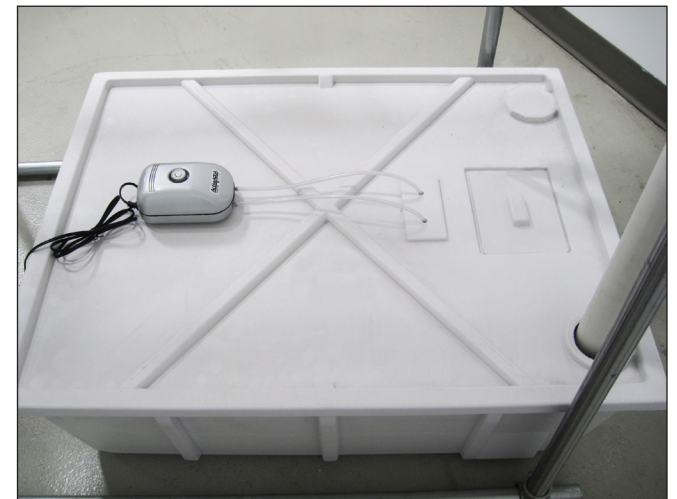
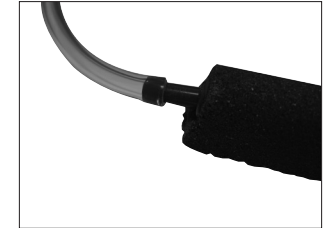
2. Attach one stone to each line and set the stones in the reservoir. See photo for stone position opposite the water pump.
3. Place the reservoir cover on the reservoir and feed the tubing up through the access holes and connect the free end of each tube to the air pump.



4. Place the air pump in the position chosen in Step 1.
5. Connect the air pump to power and test the operation. Verify that air is filtering through each air stone. Monitor the air pump regularly to ensure proper operation of the aerator system.

NOTE: When the system is fully operational, the air pump will run continuously. **Do not connect the air pump to any circuit controlled by a timer or shutoff switch.**

6. After testing air flow, turn off the aerator pump until the system is fully functional.



Basic System Check & Operation

12



WARNING: KEEP ALL ELECTRICAL CORDS AND CONNECTIONS OUT OF RESERVOIR. CONSULT THE SERVICES OF A QUALIFIED ELECTRICIAN TO ADEQUATELY AND SAFELY CONNECT PUMPS TO POWER.

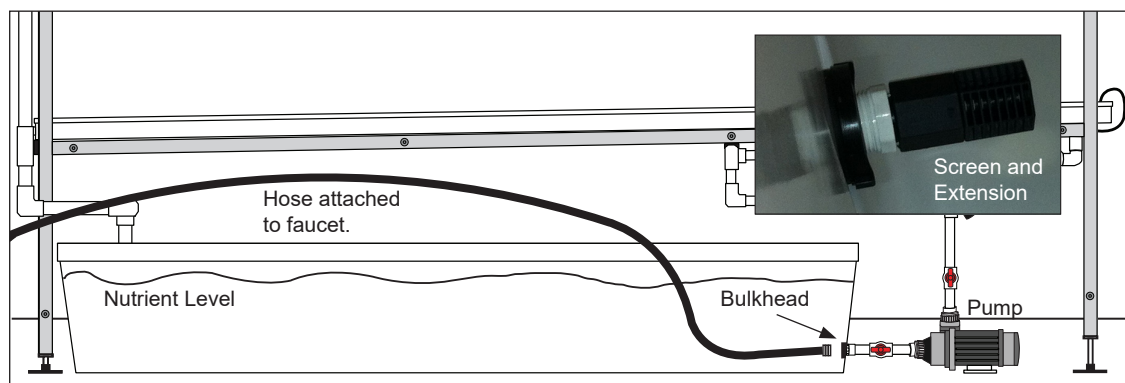
ALL ELECTRICAL CIRCUITS SHALL BE DESIGNED IN ACCORDANCE WITH LOCAL AND REGIONAL BUILDING CODES AND STANDARDS.

Basic System Check and Operation

Complete these steps to check and start up the system:

1. Verify that all electrical cord ends are outside reservoir.
2. Ensure that all 1/4" supply tubes are fully inserted in channel lids and that all micro valves are open.
3. Verify that drain elbow of each channel is fully inserted into drain manifold.
4. Add water to reservoir through porthole until reservoir is at least half full.
5. Verify that 2" drain manifold extension pipe is inserted through reservoir lid.
6. Verify that the WF3310 valve at the end of each supply manifold is closed.
7. Open the one (1) WF3316 in-line ball valve between the reservoir and water pump and the two (2) WF3310 in-line ball valves after the pump and after the y-filter.
8. Turn on water and air pumps.
9. Check each channel to ensure that water is running out each 1/4" supply tube and drain end of each channel. If water flows from all tubes at all levels, continue with next step. If water is not flowing through all tubes, **turn off pump** and complete the "Prime the Pump" procedure that follows.

WF3316
&
WF3310



Prime the Pump

- a. Slide cover off reservoir, reach inside, and remove screen from bulkhead fitting. See photo (left).
- b. Attach a hose to water faucet and place hose end in front of bulkhead fitting inside tank.
- c. Open hose faucet and turn on pump. Pump sound will change when pump is primed and pumping.
- d. Check all levels of system for water flow.
- e. Remove hose, reinstall screen, and set cover in place on reservoir.

10. Check all plumbing connections—main supply line and filter—for leaks. Check all pump fittings for leaks.
11. Check all pvc fittings for leaks.
12. Look for bubbles in the reservoir to verify that the air is pumping to each air stone. Remember to always mount the air pump on a surface that is above the water level. Vibrations of the pump can cause it to move. Make sure the pump does not fall into the reservoir or other liquids.
13. Once the system is checked and all adjustments made, it is ready for use.

Operational and Maintenance Information

General Cleaning and Maintenance Instructions

For optimal performance and to increase yields, check and clean the system periodically. Time between maintenance and cleaning depends on the growing environment and specific use of the system. Complete the following steps as needed to ensure that your system is working properly.

1. Inspect the frame and mounting screws to ensure they are tight and frame is not damaged.
2. Disconnect the main power supply to turn off all pumps. Remove the reservoir cover and inspect the inside of the reservoir. Reservoir should be cleaned each time the nutrient solution is changed. Keep the reservoir and porthole covers in place during operation to prevent light from entering the reservoir.
3. Check all plumbing and main supply connections to ensure that all are operating as designed. No leaks.
4. Replace worn or cracked supply tubes as needed.
5. Clean the drain tube if needed. Remove the end plugs and inspect the inside of the tube. Clean the drain tube by pulling or pushing a brush or cloth through the it. Rinse with clean water.

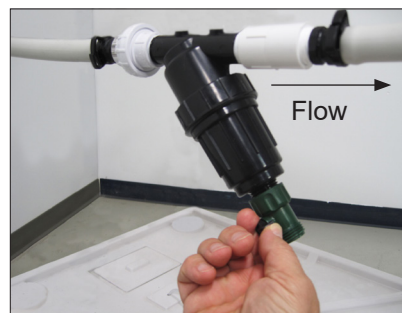
NOTE: Do not allow debris from the drain tube to contaminate the contents of the reservoir. Remove extension tube before cleaning.

6. With the pump off, disassemble the filter and clean the screen and housing. Reassemble for use. See procedure in the right column.

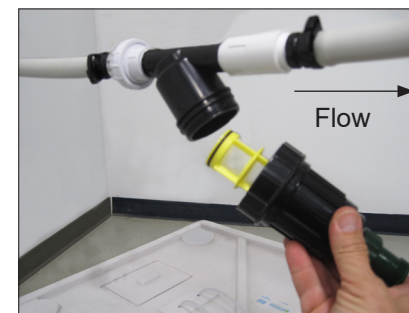
ATTENTION: Actual system may differ from the example shown. Photos are provided for filter cleaning only. They do not shown actual system.

Clean the Filter Screen and Housing

For best results, clean the filter screen regularly or when the flow rate changes unexpectedly. Complete these steps to clean the filter screen.



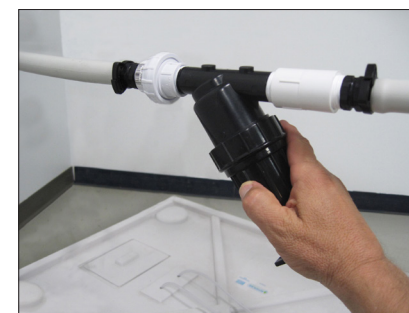
1. Shutoff the power to the nutrient pump. Open the valve on the filter to drain into a bucket.



2. Grip the filter housing and the main supply line and unscrew the housing. Do not apply force to the filter fittings.



3. Remove the screen from the housing. Using clean water, rinse the housing and the screen.



4. Insert the screen back into the housing, reassemble the filter, and *close the valve*.
5. Turn on the pump and check the flow from the supply tubes to each channel.
6. Check filter and fittings for leaks.

Operational and Maintenance Information

RESERVOIR CLEANING AND MAINTENANCE

Clean the reservoir periodically to maximize plant growth and to minimize system contamination. The steps that follow can be used to change nutrient solution and to pump the reservoir for cleaning and typical maintenance. *Cleaning the filter is strongly recommended after cleaning the reservoir.*



1. Turn off the nutrient pump and connect a garden hose to the shutoff valve of the filter. Place the end of the hose in a bucket or run it to the desired location.



2. Open the shutoff valve on the filter and turn the pump on to pump out the reservoir. Turn off the pump once the reservoir is empty.



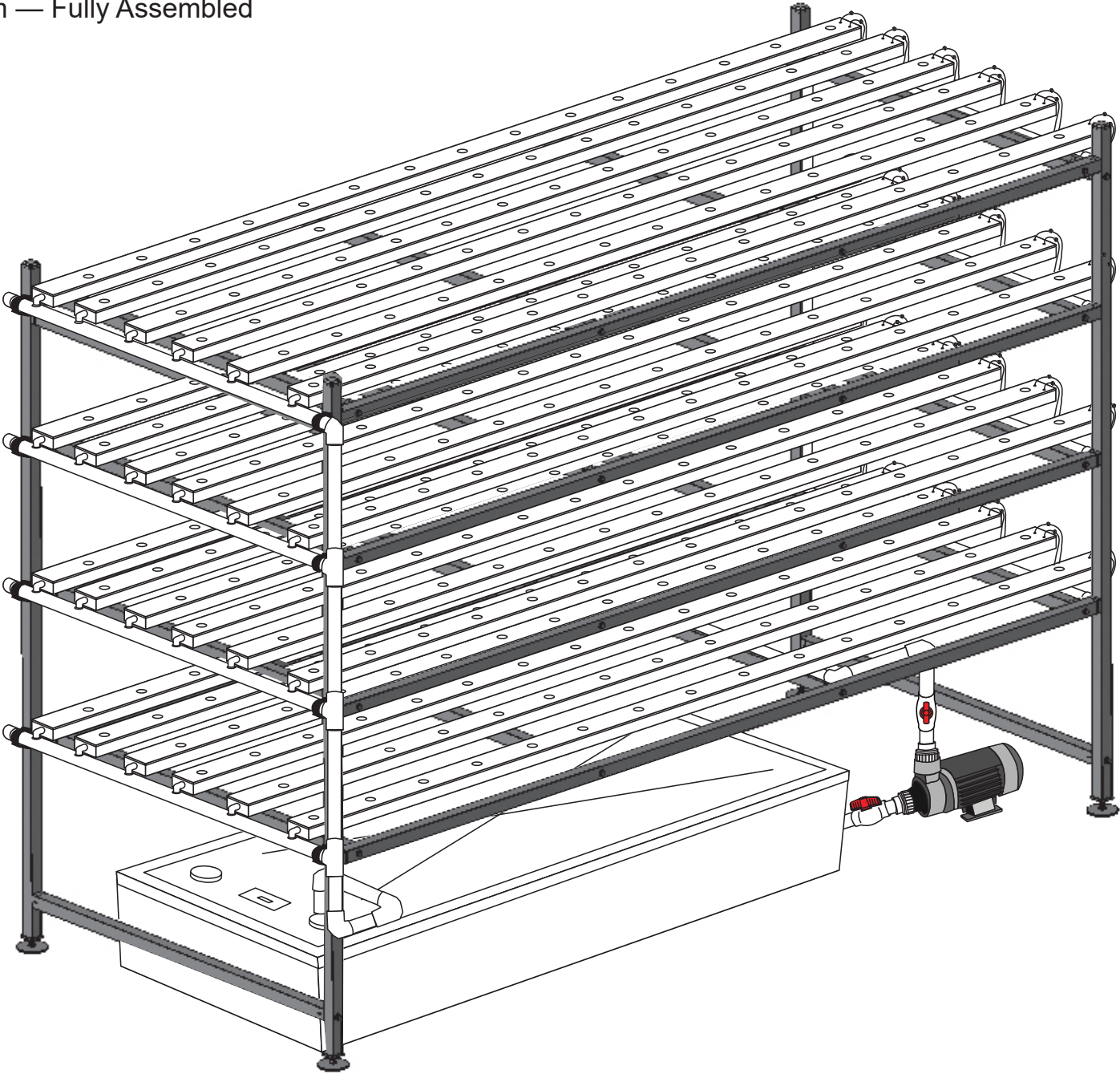
3. Clean reservoir. Repeat steps to pump it out if needed.
4. Close the shutoff valve.



5. Remove the hose and clean the filter. See previous page for filter cleaning procedure.
6. Refill the reservoir with nutrient solution. Turn on the pump to resume operation. Check all fittings, tubes, and filter for leaks.

Quick Start Guide

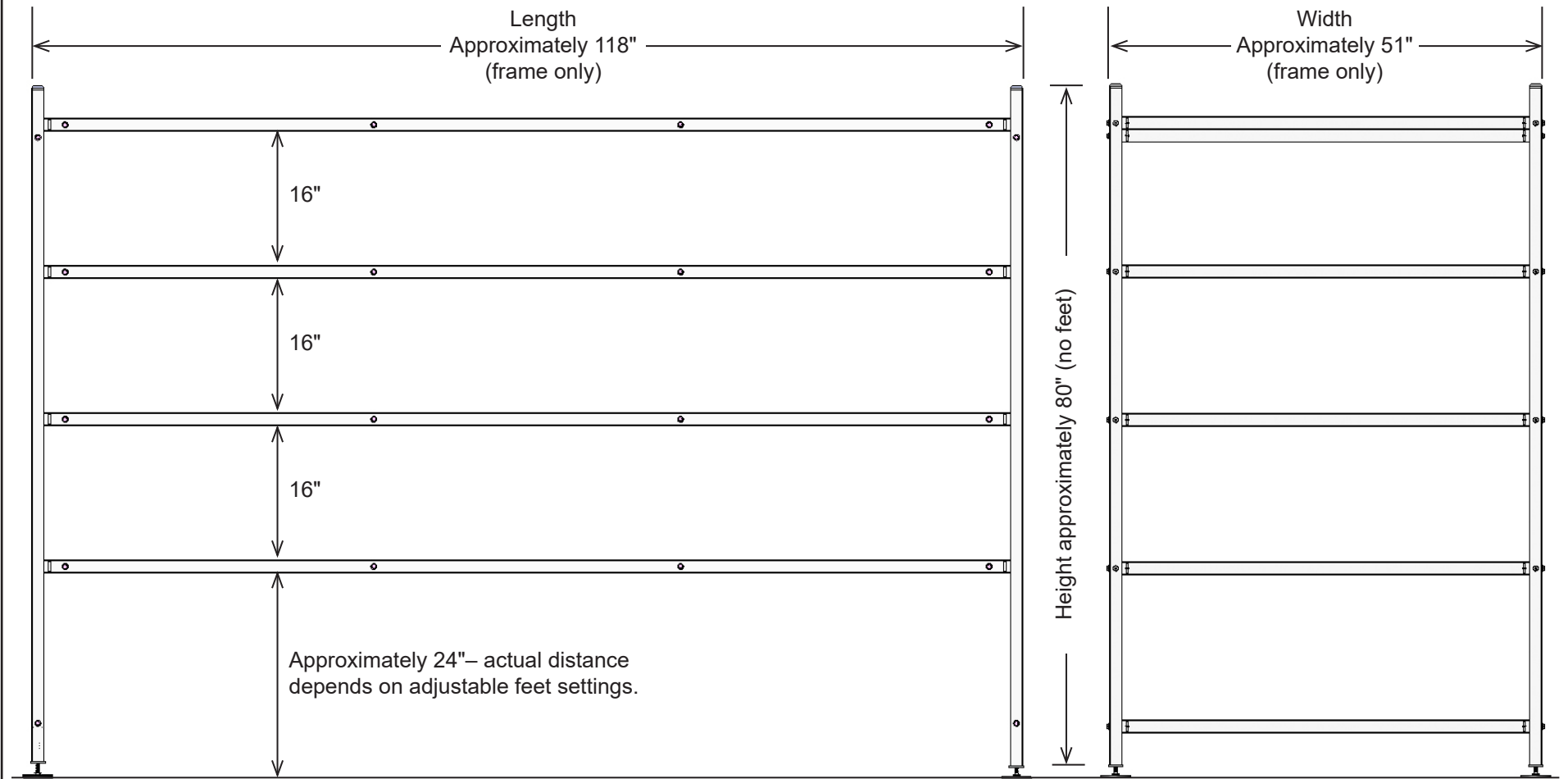
Sample System — Fully Assembled



Frame Dimensions

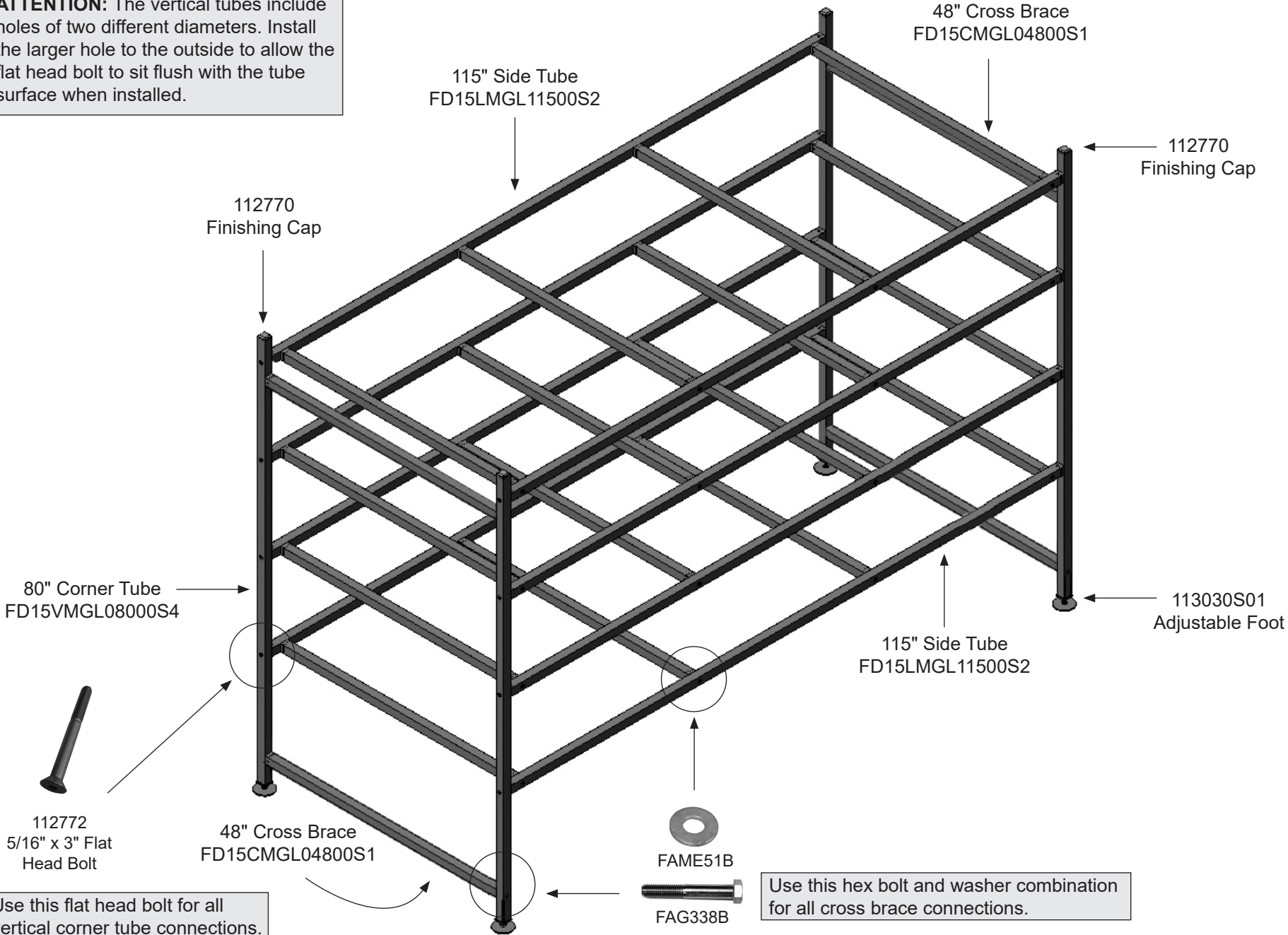
Side View—Frame

End View—Frame



Full Frame Diagram

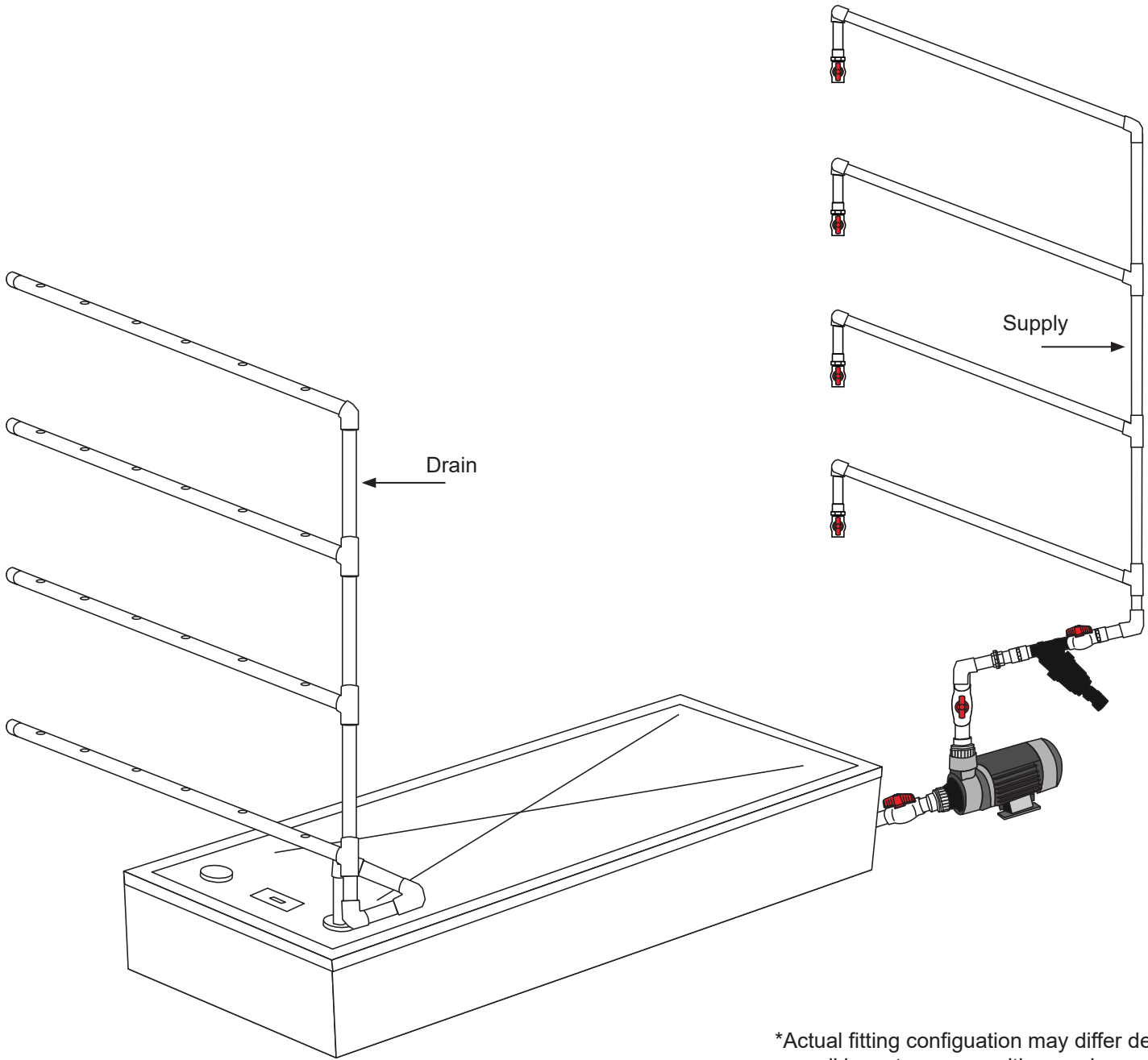
ATTENTION: The vertical tubes include holes of two different diameters. Install the larger hole to the outside to allow the flat head bolt to sit flush with the tube surface when installed.



Use this flat head bolt for all vertical corner tube connections.

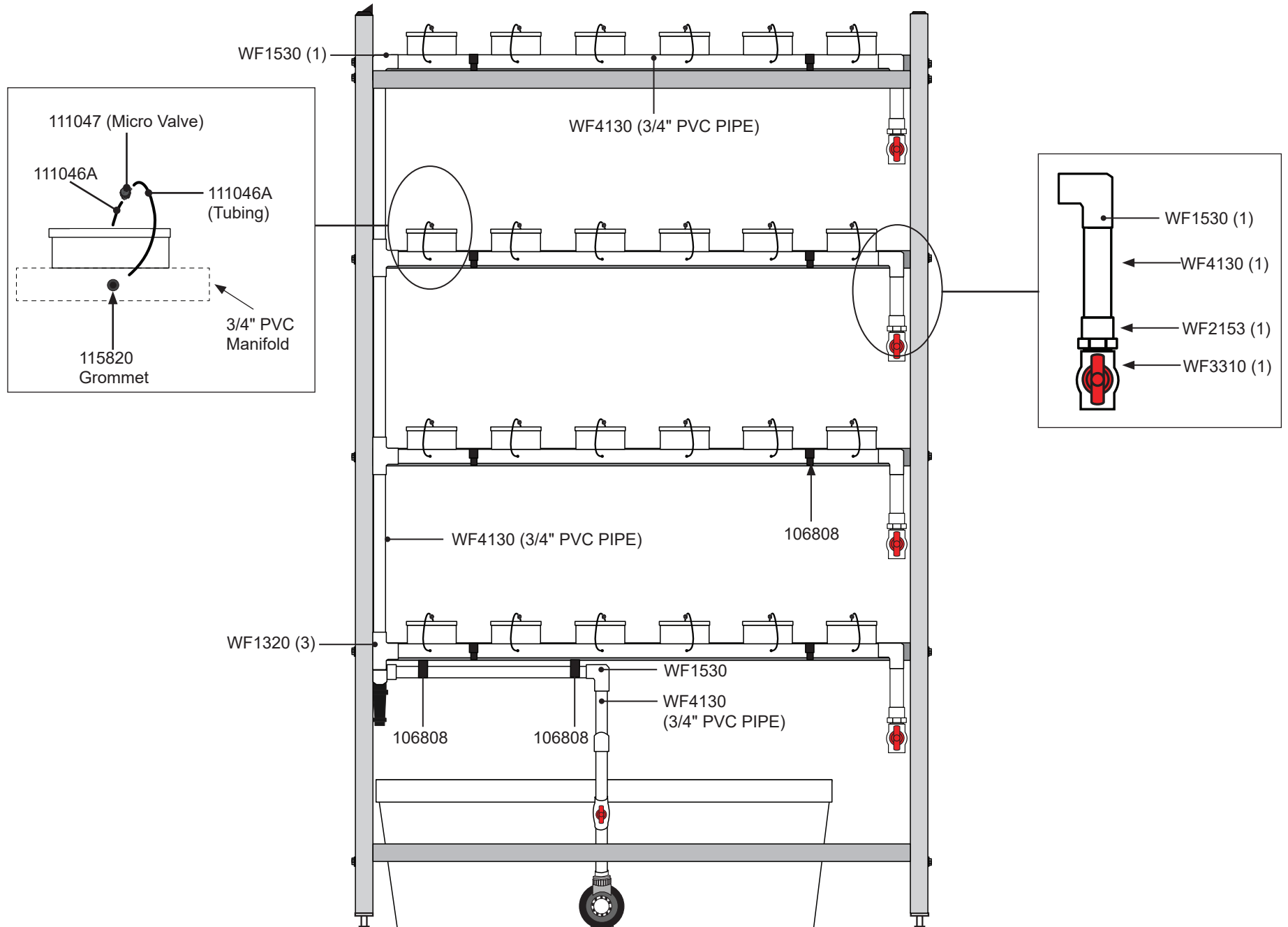
Use this hex bolt and washer combination for all cross brace connections.

Supply & Drain Manifolds Only*

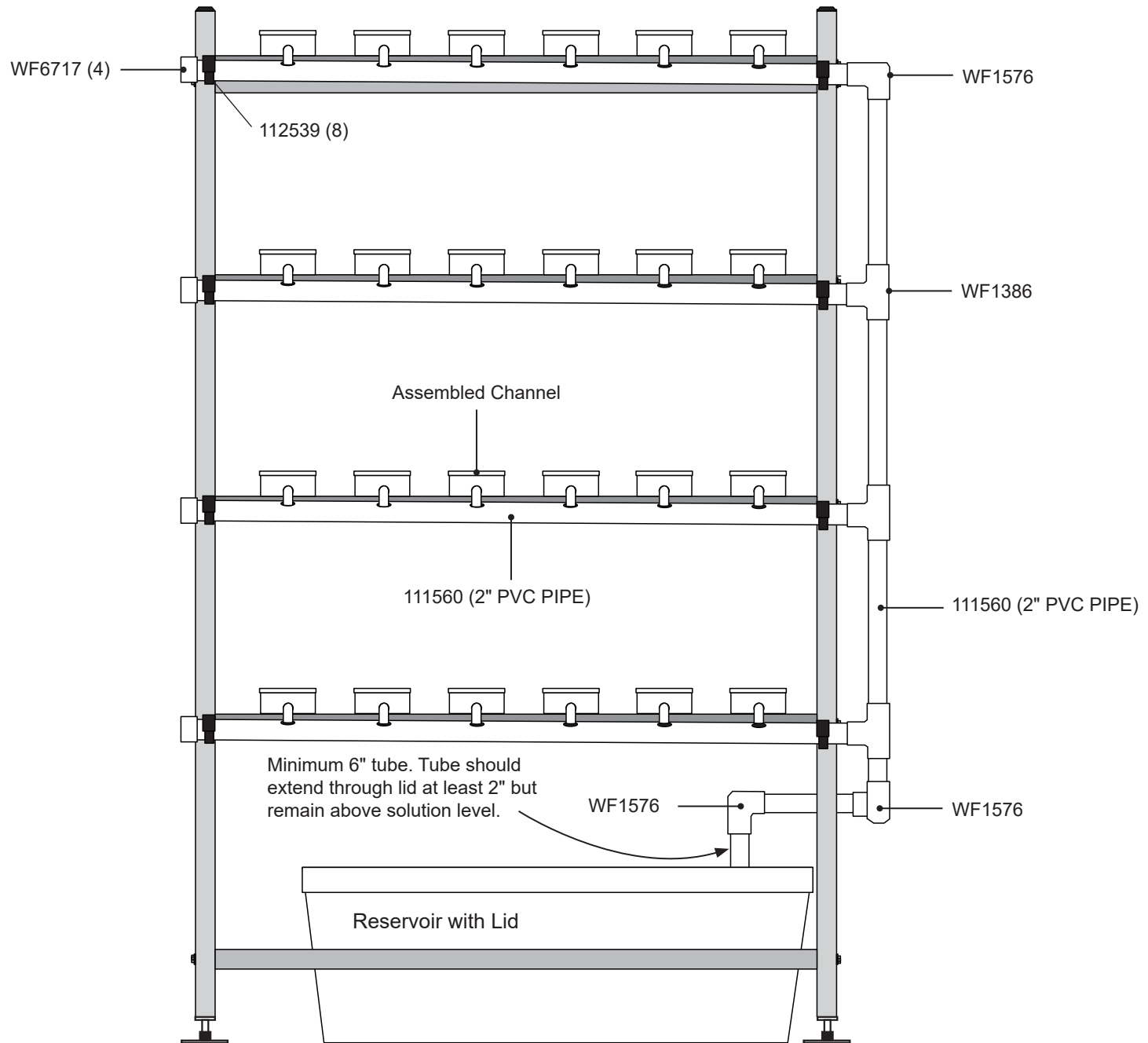


*Actual fitting configuration may differ depending on overall layout, pump position, and personal preference. Diagram not to scale.

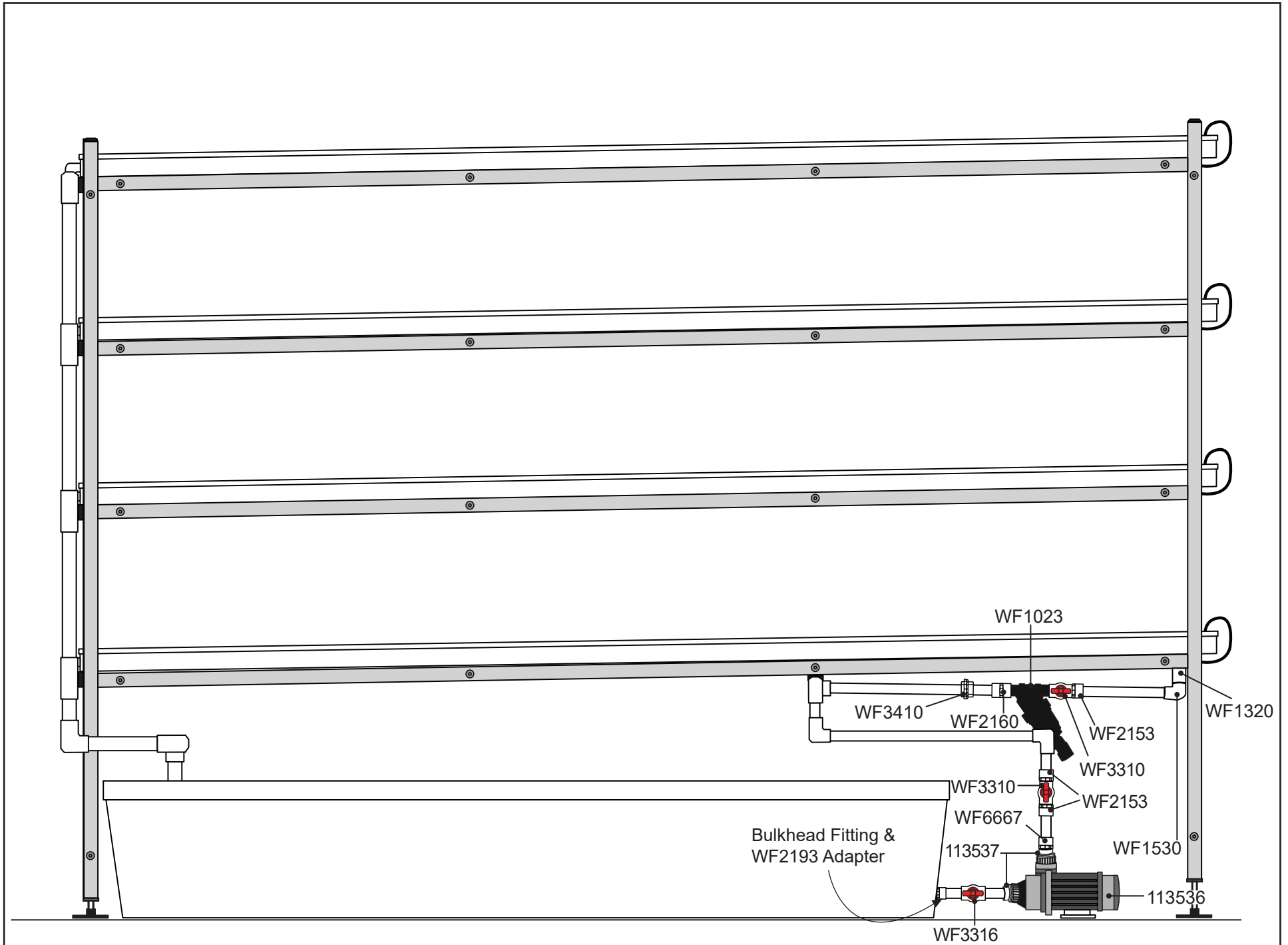
End View — 3/4" Supply Manifold with Channels



End View — 2" Drain Manifold with Channels

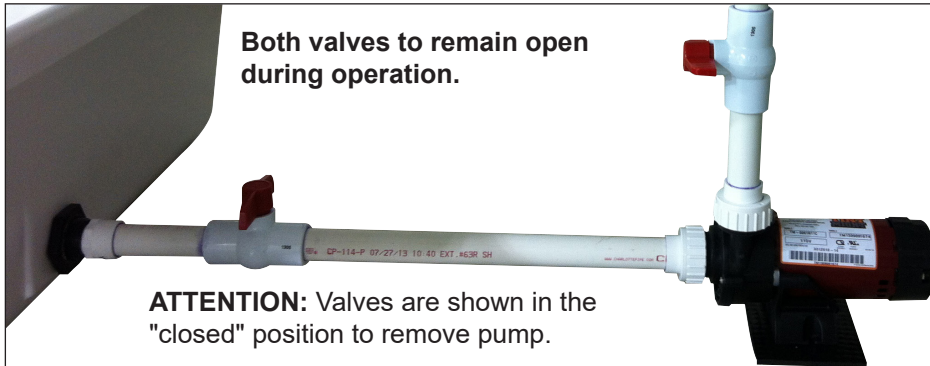


Side View with Channels

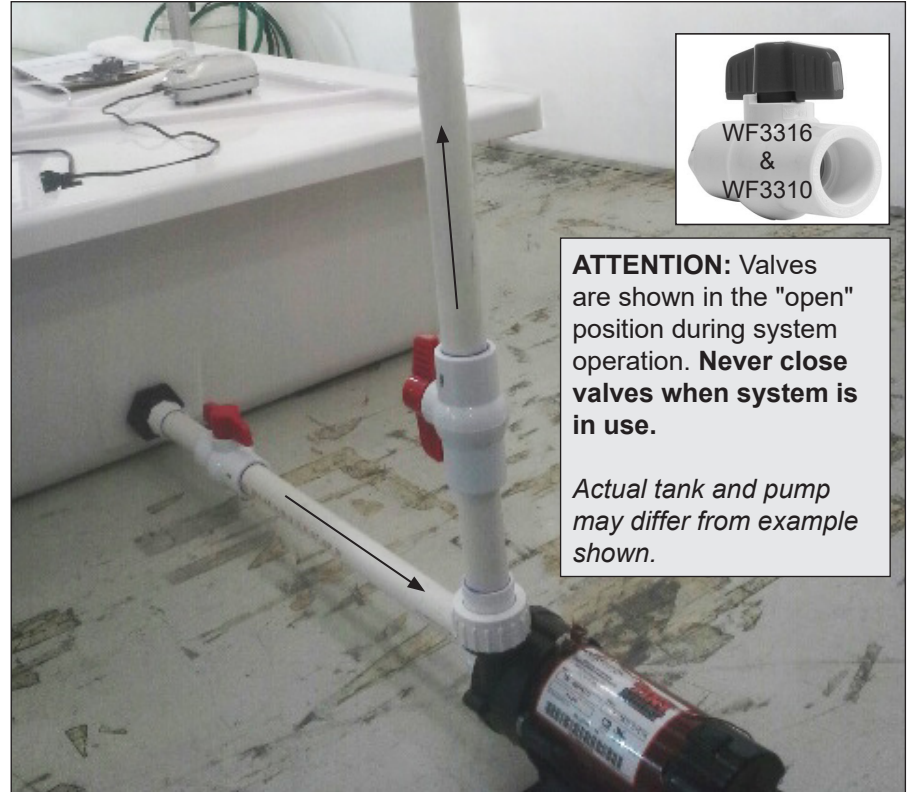


Additional Photos — Supply Manifold and Pump

ATTENTION: Actual tank may differ from example shown. Pipe length and position of components depends on assembly. Completed assembly of actual system may differ from the example shown in photos throughout this guide.



ATTENTION: Pump shown may differ from actual pump. Connections and valves are the same.



Additional Photos



ATTENTION: Photo shows a system with the 112920 light kit installed. Contact your sales representative to purchase a light kit for your system. Actual tank and plumbing components may differ from those shown in the photo. Assembly is similar.

