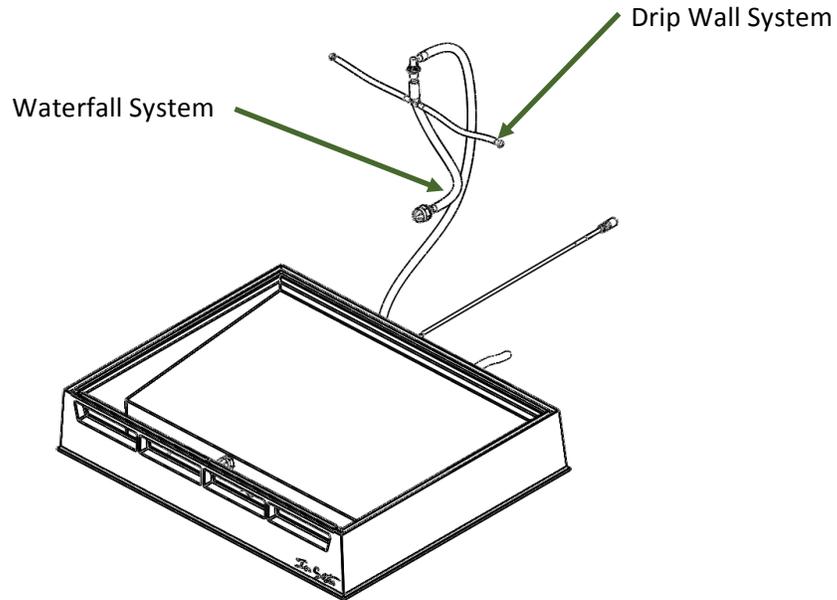


Do-It-Yourself Rio Water Flow System



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System Design

The Rio water flow system is our approach to incorporating water features in our vivariums. Purchasers have the option for either factory or do-it-yourself (DIY) installation. Both approaches include the ability to create either a stream, waterfall or drip wall. With the factory installation, you can decide which configuration you prefer (stream, waterfall, or drip wall), which determines where the base penetration will be made for the water feed line.

Installation Options

The DIY user will install their pump on the outside of the vivarium's rear base panel. This makes maintenance easier and critical pieces of equipment more accessible. Our in-factory installation, however, installs the pump under/inside the base as it results in less energy required to power the pump and improves water flow control, as well as make shipping possible.

WARNING: The User should not attempt to install the outlet fitting on the vivarium sloped deck, as is done on the Factory Installation. Any drilling into the base accomplished by the User voids In Situ's warranty. Further, the Modified Fitting (see parts list) will not operate properly unless it is located at the top of the vivarium.

RIO Water Flow System Components

Basic Kit Components

Balloon Number	Item	Part Number	Description	Quantity	DIY Kit
12		4501-1310	Pump Assy	1	x
4		F014MC	Bulkhead Fitting	1	x
2		1001-1260	Strainer	1	x
7		TR014x0532	Bulkhead Fitting - Elbow	1	x
9			Filter Sock	1	x
8			Tube - Trough Inlet x 0.25 x 2.5	1	
15			Tube - Pump Inlet x 0.25" x 10.0"	1	
16			Tube - Pump Outlet x 0.25" x 24"	1	
42			Tube – Drain	1	
38		Tee x 0.25	Anti-siphon Tee fitting	1	
		M3x16	Pan Cross Head SS Screw	2	x
		M3	Flat Washer - SS	2	x
		M3	Nut - SS	2	x
		DSCN1533	Regulated 9v 5.5/2.5 Power Supply	1	x
		66-9797-10	Potentiometer	1	x
		Tubing	6 feet of 1/8" ID tubing		x

Waterfall System Components

Balloon Number	Item	Part Number	Description	Qty In Situ	Qty DIY	DIY Kit
17		F014X014C	Bulkhead Fitting - Passthrough	1		
2		1001-1260	Strainer	1	1	x
23			Tube - Waterfall Outlet x 0.25" x 20"	1	1	
4		F014MC	Bulkhead Fitting	1	1	x
25		MTR014x0532	Bulkhead Fitting – Elbow - <i>Modified</i>		1	x

Stream System Components

Balloon Number	Item	Part Number	Description	Qty In Situ	Qty DIY	DIY KIT
7		TR014x0532	Bulkhead Fitting - Elbow	1		
2		1001-1260	Strainer	1	1	x
24			Tube - Stream Outlet x 0.25" x 10"	1	1	
4		F014MC	Bulkhead Fitting	1	1	x
25		MTR014x0532	Bulkhead Fitting – Elbow - <i>Modified</i>		1	x

Drip Wall System Components

Balloon Number	Item	Part Number	Description	Qty In Situ	Qty DIY	DIY KIT
17		F014X014C	Bulkhead Fitting - Passthrough	1		
18		TR014X0532	Tee - 0.25 to 5/32 ID Airline	1	1	x
20		BP 0532	Air Hose Plugs	1	1	x
19			Tube - Riser to Tee 0.25 x 20"	1	1	
22			Tube - Dripwall Air Tubing - 5/32" x 20"	1	1	
25		MTR014x0532	Bulkhead Fitting – Elbow - <i>Modified</i>		1	x

Hardware Identification

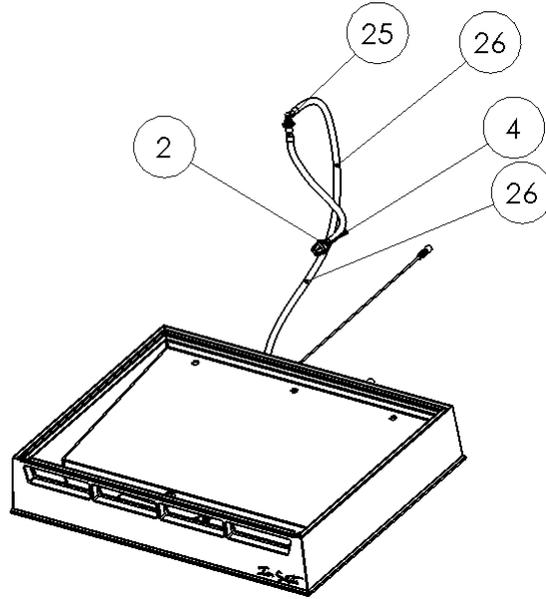


Figure 4 - Picture showing Do It Yourself (DIY) Hardware – Stream and Waterfall
Isometric View

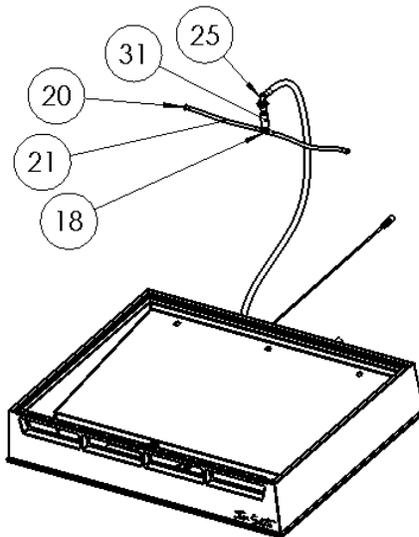


Figure 5 - Picture showing Do It Yourself (DIY) Hardware – Drip Wall

Isometric View

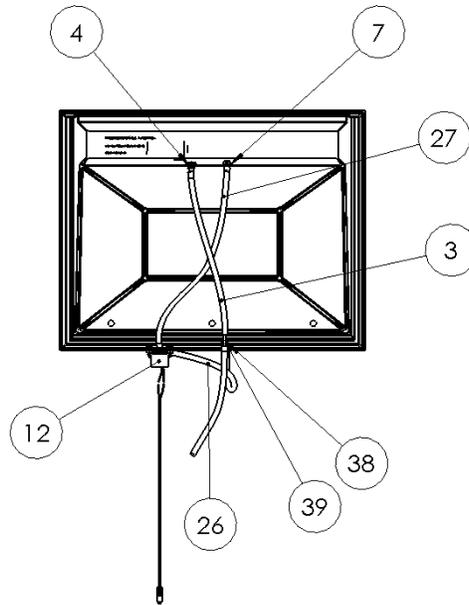


Figure 6 - Picture showing Do It Yourself (DIY) Hardware

View Looking Up

DIY Installation & Assembly

Getting Started

Before you start, be sure to check the components tables to ensure that you have all of the necessary pieces.

To complete the assembly you will need the following tools:

- Drill motor
- Drill bits
 - 9/64" (3.5mm)
 - 13/32" (10mm)
 - 1/2" (12.5mm)
- Metric wrench/socket set (to tighten screws)
- #1 and #2 Phillips head screwdrivers
- Fine tipped soldering iron, or, sewing needle or push-pin (for Drip Wall configuration)
- Lighter (for Drip Wall configuration)

You will also need the following materials

- Silicone adhesive (e.g. GE I or II).

Drilling

You will need to locate and drill holes for a new drain location as well as a location for mounting the pump. Appendix A is a full-size drawing with cut-out templates: **it is very important that you set your printing options to “Actual Size” when printing the document so that the dimensions are correctly translated to the paper.**

The base is made from ABS plastic, which is much softer than most plastics and likely will not split if you drill slowly, applying a low to medium amount of pressure on the drill bit. Be sure to trim off any burrs with a sharp edge.

Figure 7 shows the correct drill locations. For DIY installation the pump is mounted on the rear face of the base, which allows for easier repair and/or maintenance. If you prefer to mount the pump under the base, locate and drill the **Base Inner Support** as indicated in below pictures using the provided Appendix-A template.

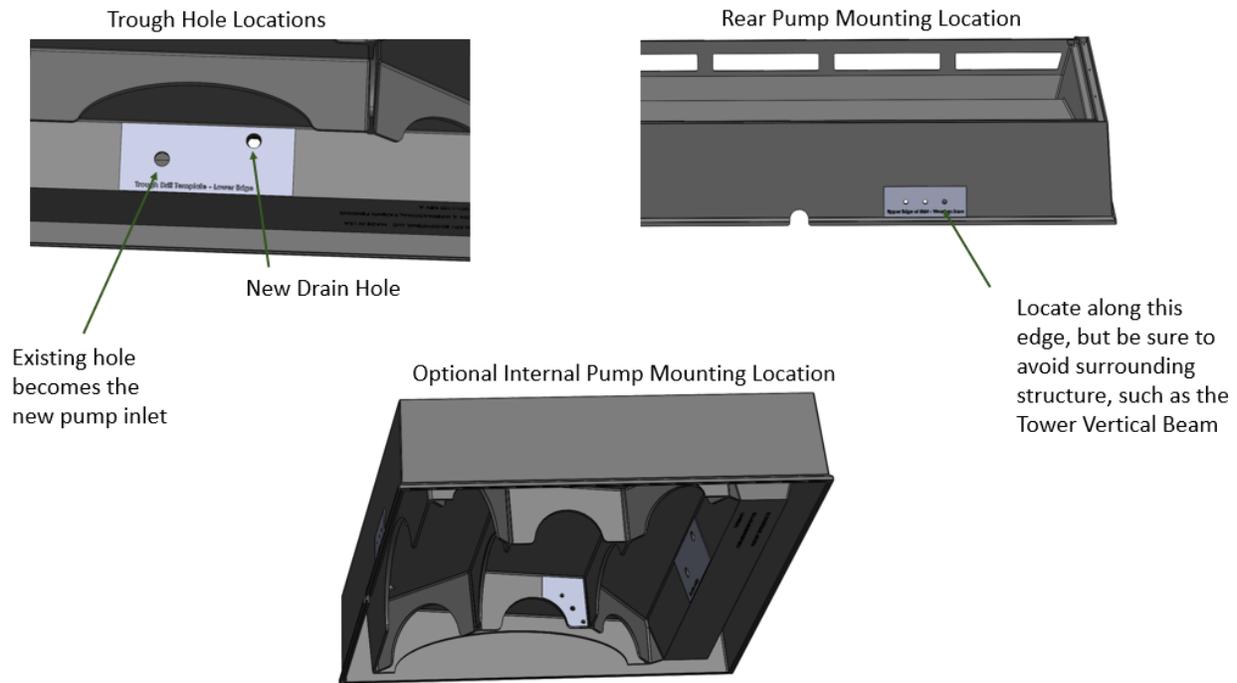
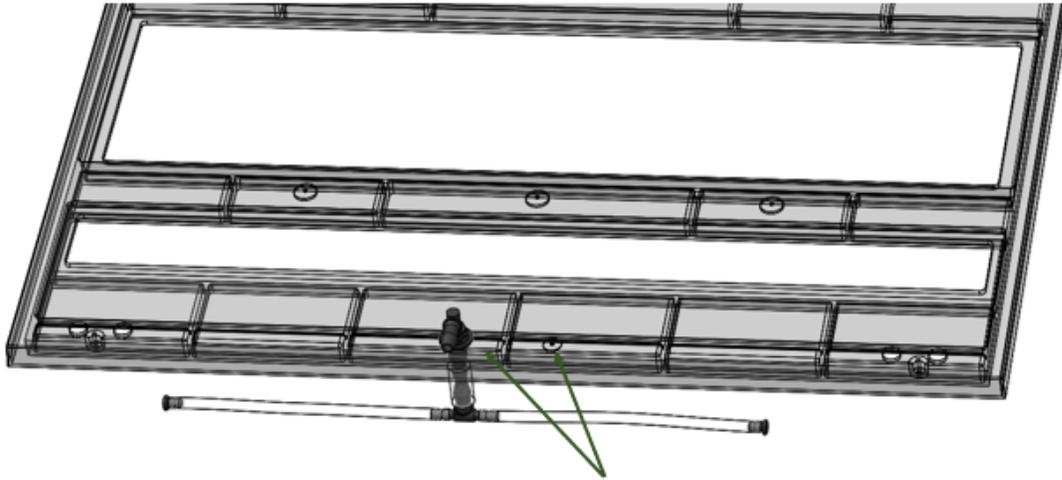


Figure 7 – Drill Locations – Base (Use Templates Provided)

Once the holes are drilled in the base, an additional 10mm (13/32”) hole must be drilled in the Rear Canopy Bar. You will need to choose the location where the penetration will occur. Figure 8 shows a configuration for installing a Drip Wall system. **Note:** there are drill starts located along the rear inside edge of the Canopy. You can take advantage of these, or drill your own location. If your vivarium has a composite back panel upgrade, you can drill/install your feed line through it as well



User may take advantage of drill starts on the lower surface of the rear Canopy Bar, or create his/her own location.

Figure 8 – Drill locations on vivarium Top

Assembly

Re-position Drain Tube Assembly

Once the mounting holes have been drilled, assembly of the components is relatively quick. Follow the pictorial representations to assemble the rest of the system.

Reposition the drain tube assembly so that the inlet is in the upper, newly drilled hole.

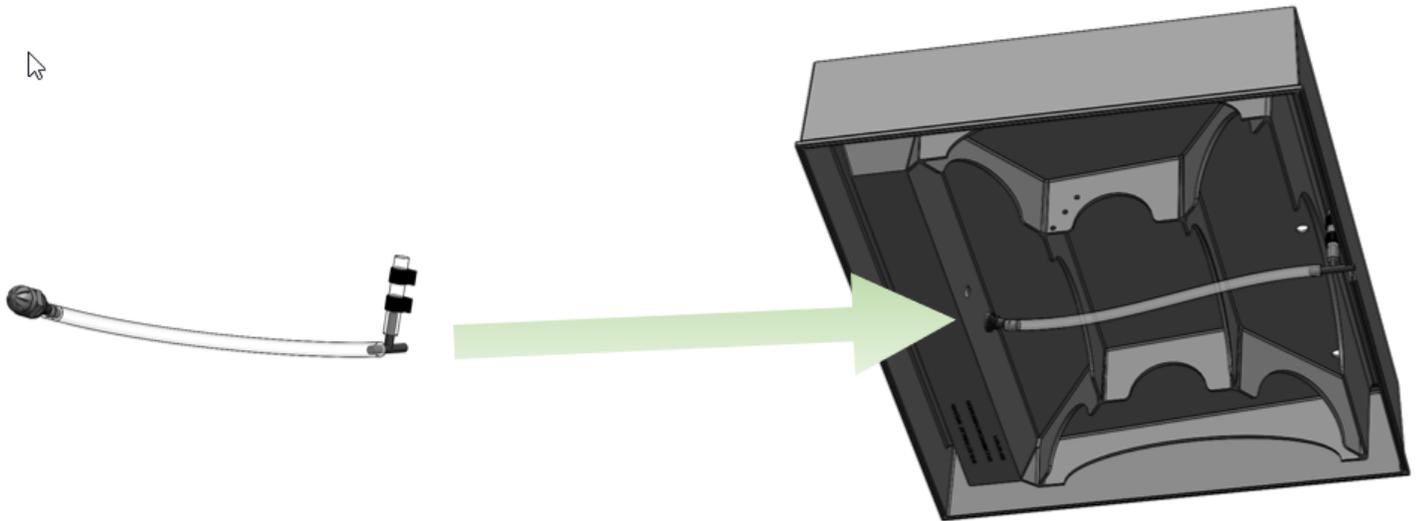


Figure 9 – Drain Tube Assy and Installation

Create Trough Inlet Assembly and Install

Create the Trough Inlet Assembly and position into existing hole as shown. Apply a dab of silicone adhesive to the threads to hold the nut securely and tighten firmly. **Note:** the inlet should lie as close to the bottom of the trough as possible to maximize the amount of free water available for circulation.

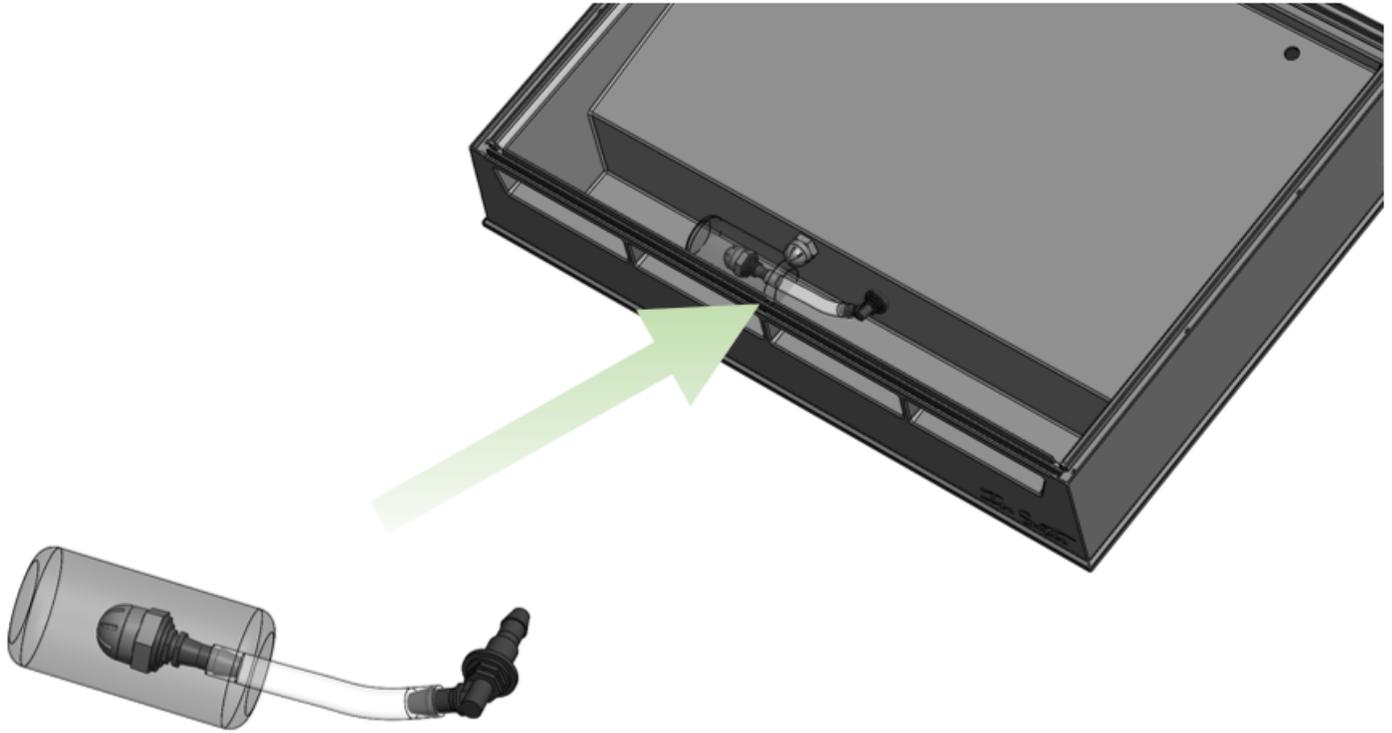


Figure 10 – Trough Inlet Assembly & Installation

Pump Installation

Install the Pump and pump inlet tubing using the supplied M3 screws and hardware.

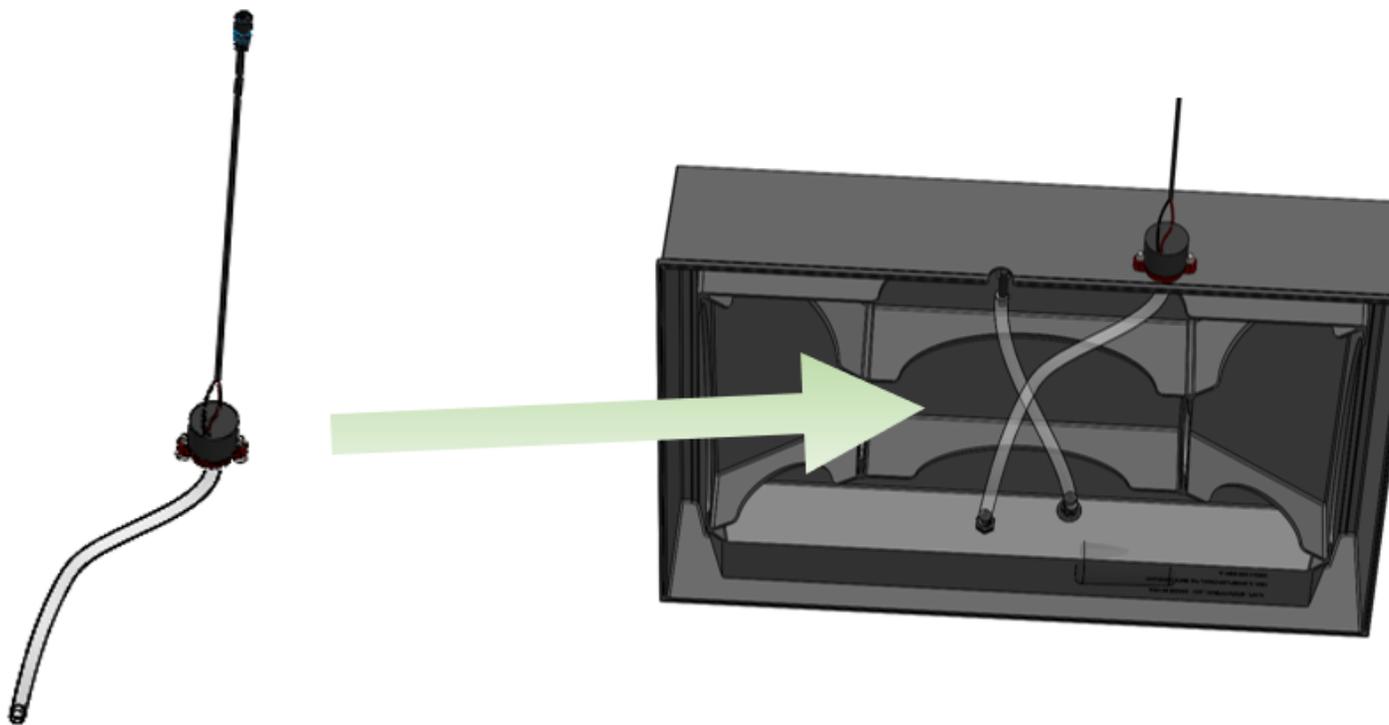
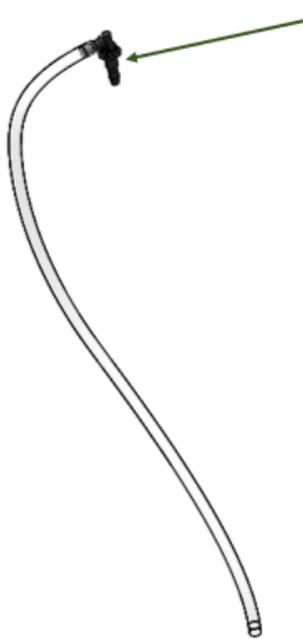


Figure 11 – Pump Assembly Installation

Modified Elbow Installation

Install the modified elbow fitting onto the canopy. **Note:** If you place the penetration hole in the rear canopy bar (as shown) the nut will not fit. Instead, apply silicone sealant on the mating flanges to adhere the fitting. Tape in place while the silicone is curing to assure correct fit. (Adhesion level is likely to be low – use care when handling this fitting in the future.)

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Very Important Note: This fitting is modified to allow air to leak into the flow stream. There is a very small diameter hole drilled into its stem. **DO NOT** exchange this fitting with the Trough elbow fitting, or the system will leak (water will run out of the drilled hole).

The fitting is delivered in the kit within its own sealed bag labeled **“Bulkhead Fitting - Modified.”**

Figure 12 – Modified Elbow Installation

WATERFALL & STREAM INSTALLATION

To configure a waterfall or stream configuration, install the assembly as shown. **Note:** For DIY installation, configuration is the same both the stream and waterfall, but tubing is longer for the waterfall.

The end fitting is a bulkhead pass-through, in case you choose to mount the fitting onto an applicable substrate. Once the fitting is mounted, apply a small amount of silicone to the inside of edge of the diffuser (strainer) common to the nut to hold it onto the nut (the purpose of the diffuser is to 'break' and soften the stream of water coming from the tube).

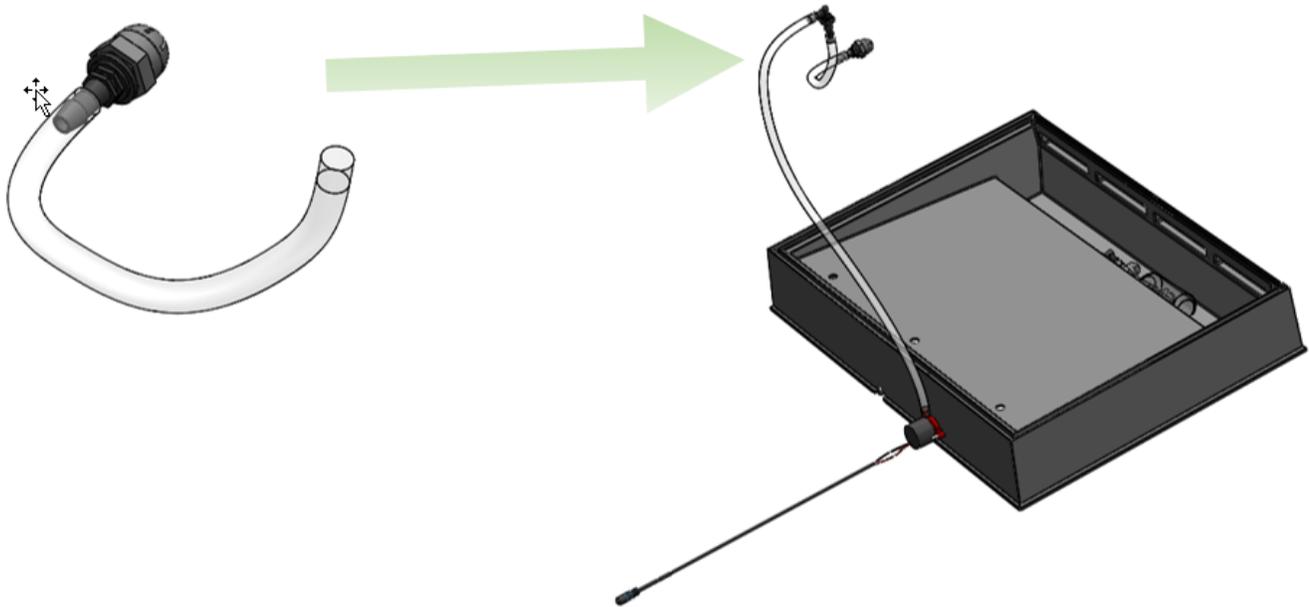


Figure 13 – Waterfall/Stream Tubing Installation w/ Diffuser

DRIP WALL INSTALLATION

To configure a drip wall, install the assembly as shown. **Note:** InSitu has not created the water outflow orifice holes in the tubing – you must choose where you would like those placed, and create the drip orifices, accordingly, using a hot pin or fine tipped soldering iron to melt them open. If using a pin, simply heat it with a lighter and insert into the tubing while it is hot. Be careful not to burn yourself.

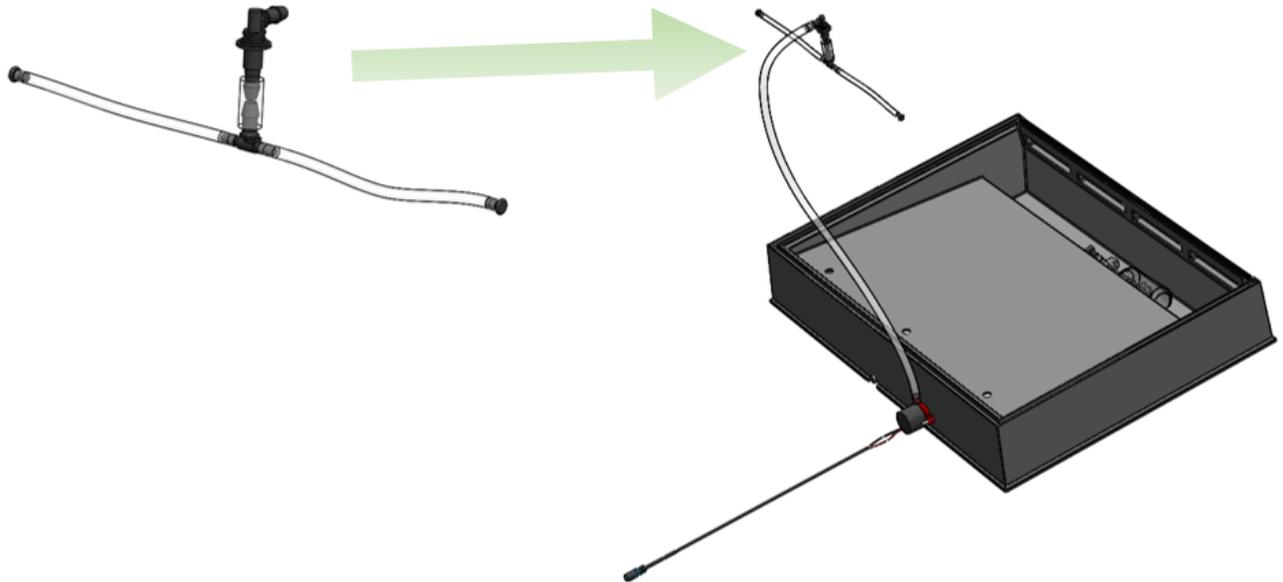


Figure 14 – Drip Wall Tubing Installation

Starting the System

1. Attach the pump wire leads to the potentiometer
2. Connect the potentiometer's lead to the DC power supply.
3. Turn the adapter all the way off before plugging it in.
4. Start the pump on its lowest setting and increase the energy gradually until a stream appears from the diffuser.

It is likely that air will be trapped inside the tubing when the system is first started. The air must be evacuated in order for the pump to run effectively. If water is not flowing at all, we recommend attaching a length of tubing to the outflow fitting and sucking on it until water appears. A bulb syringe (which can be purchased at a local drug store) is another possible method of creating suction.

The pump will be noisy if there is air trapped in its impellers. If this is the case, simply turn the pump off and re-prime to ensure all air is evacuated.

NEVER RUN THE PUMP DRY! Doing so will damage the pump, and likely require complete pump replacement.

Ongoing System Recommendations

Once the pump is running as it should, routinely monitor the trough's water level: it must never dip below the pump inlet or the pump will lose its prime and the system will stop. Top off the water level as needed to keep the system in balance. If you are using automated misting to replenish your vivarium's water system, we recommend the following practices:

- Provide automatic misting that produces an excess of water every day to offset evaporation and to maintain proper water level in the vivarium trough. If your misting cycle isn't of a long enough duration, one way of solving this problem is to increase the number of misting heads in your enclosure can help accomplish this.

If your Rio water flow system is run intermittently but still automated, we recommend:

- Activation of the pump preceded by 1 or more minutes of misting
- The pump be activated during the misting cycle
- The misting cycle continue for an additional 1-3 minutes after the pump has turned on.

The above sequence, more or less, should allow for filling of puddles, depressions and pools without affecting the water level in the trough. Once the pump is turned off, any excess/overflow water introduced into the vivarium will be automatically shed via the vivarium's drain.