Spyglass Fluidized Cone Reactor Instruction Manual

Quick Start Guide

Your Spyglass reactor comes nearly ready to run out of the box. The following describes how to quickly install the reactor in the most common flow configuration, Single Pass (Mode A). Refer to the assembly diagram for part numbers.

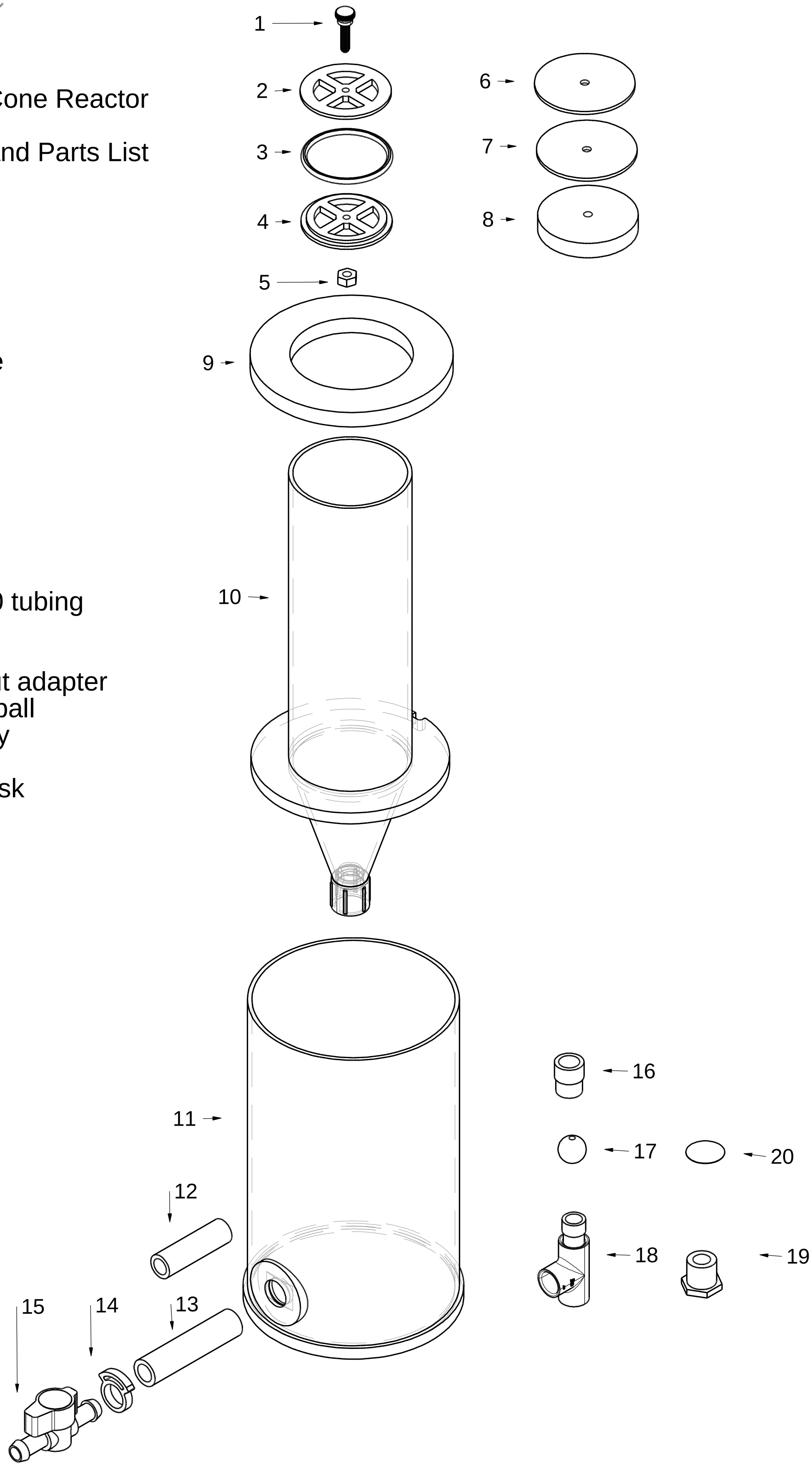
1) Assemble the Sicce pump by installing the suction cup feet, the threaded output adapter (16), and a threaded intake barb fitting. For the Sicce Nano, you'll first need to change the volute to the external capable model with the cylindrical intake stem. See the Sicce instructions for details. Use the grey PVC bushing as the output adapter instead of #16.
2) Place the Sicce pump in the bottom of the Spyglass chamber with the output nozzle as close to the center of the chamber as visually possible. The grooved circle in the center of the Spyglass base can serve as a guide.
3) Connect the valve in the closed position (15) to the short section of black tubing (12) and secure with hose clamp (14). Push this through the hole in the side of the reactor chamber and onto the intake barb of the pump. This will cause the pump to draw water from outside the reactor body, push it through the media, then overflow the inner and outer chambers back into the sump. This is known as single-pass flow through the reactor.
4) Drop the silicone weighted ball (17) into the inner cone chamber. This will act as a check valve to retain media. Fill the chamber with media. **Only if** you are using very fine grained media such as Purigen or a similar resin, press-fit the small stainless mesh disk (20) into the female side of the cone nozzle. **Be careful! The edge of this mesh is sharp.**
5) Place the top screen assembly in the reactor chamber. The stainless mesh is pre-installed to prevent it from bending during shipping. Use a tiny amount of the included silicone grease and some water to lube both the o-ring and the inner top edge of the reactor chamber if needed. If using coarse media like biopellets, swap the stainless mesh for the biopellet mesh.
6) If the media hasn't been rinsed already, you can do this in the reactor chamber. Just hold it over the sink or a bucket and pour RO/DI water (or used saltwater) into the top. Water will slowly drain past the ball and out the bottom. Once the media is wet, you can usually pour the rinse water out the top by gently tipping the reactor. The ball and majority of the wet media will typically stay in place. Repeat a few times for dusty media like GFO. Rox carbon typically only needs one or two fills to sufficiently rinse.
7) Place the reactor chamber onto the pump nozzle and optionally place the foam ring (9) over the white flange of the reactor chamber. Plug in the pump. Slowly open the valve and let the pump fill the chamber. Sometimes, air trapped in new media (especially biopellets) will cause the entire mass of media to rise up in the chamber. Gently swirl the water in the chamber to break up the air pockets.
8) Adjust the valve to the desired flow rate. For biopellets, this valve may not be needed; the pump should run wide open. Carbon and GFO should gently fluidize. Resin-based media require very little flow to fluidize, so slowly open the valve to find the correct level. Ideally, the media should rise to within 2 inches of the top screen if the maximum amount of media is used.
9) Upon first use, water may form channels as it flows over the edge of the chambers. This will usually stop after a few days as the reactor develops a bacterial slime coating and lower water surface tension on the acrylic. The foam pad is used to help trap any initial fine particles that weren't flushed out from rinsing, and to help reduce any potential splash or noise. We've found it is usually unnecessary to use the foam pad once the reactor “breaks in” and develops the slime coat.

For the complete Spyglass documentation including additional setup diagrams, please go to the website:
www.avastmarine.com/products/spyglass

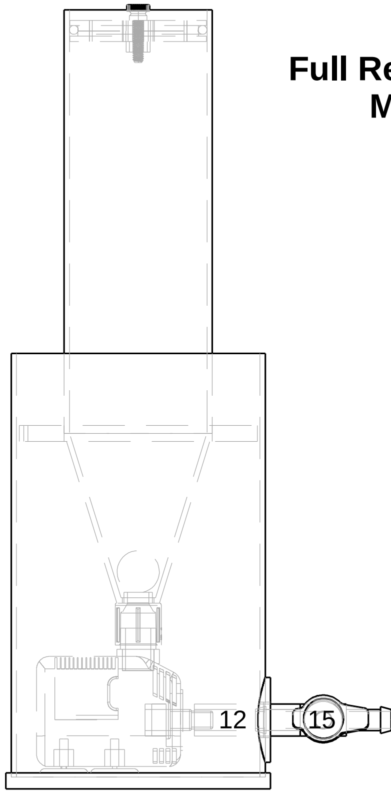
Spyglass Fluidized Cone Reactor

Assembly Diagram and Parts List

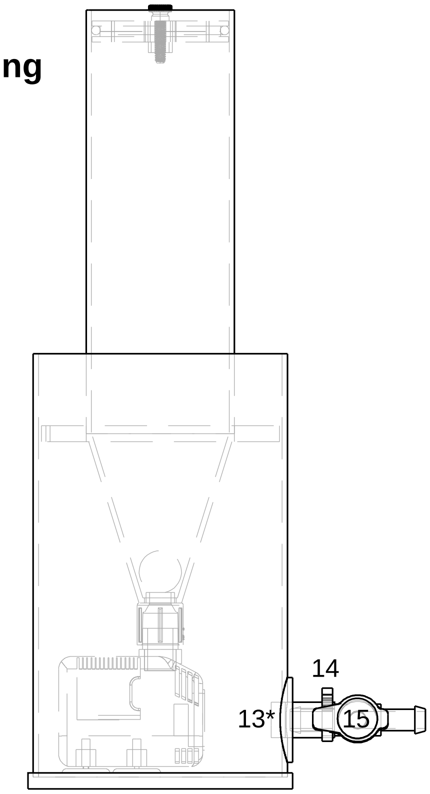
1 Thumbscrew
2 Top media plate
3 O-ring
4 Bottom media plate
5 Nut
6 Stainless mesh
7 Plastic mesh
8 Foam disk
9 Foam ring
10 Spyglass reactor
11 Outer chamber
12 Black tubing
13 Clear schedule 40 tubing
14 Hose clamp
15 Valve
16 Sicce pump output adapter
17 Weighted rubber ball
18 Manifold assembly
19 Maintenance plug
20 Stainless mesh disk



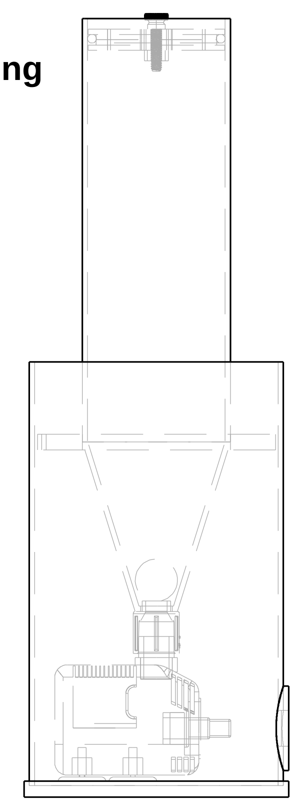
Single Pass
Mode A



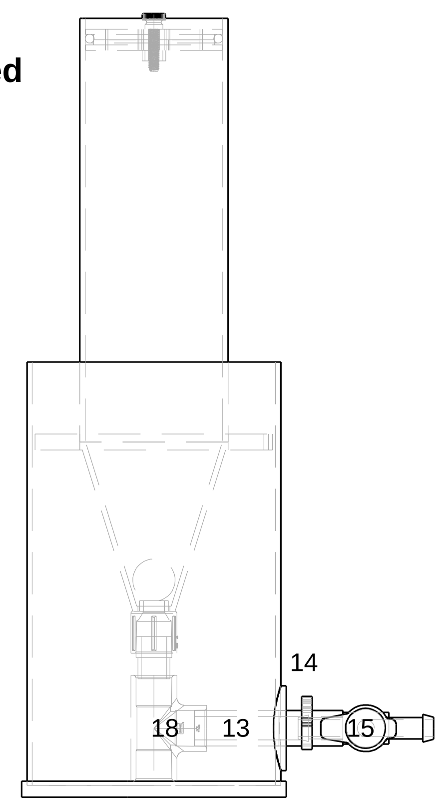
Full Recirculating
Mode B



Passive Recirculating
Mode C



Manifold Feed
Mode D



Introduction

Congratulations on purchasing the most efficient and versatile fluidized media reactor available to the marine aquarium hobby! In designing the Spyglass, we wanted to create a reactor that is both easy to use and maintain, in terms of both maintaining media fluidization with the correct flow rate and simple maintenance procedures. We also wanted to minimize the pump capacity required to achieve correct media fluidization while saving money on electricity usage and pump cost. By using a few simple interchangeable parts, the Spyglass is capable of running a large variety of media sizes, from tiny resin beads like Purigen, fine grained ROX 0.8 carbon, and all the way up to heavy chunks like All-in-One Biopellets. Finally, the Spyglass can even be configured to process water in a traditional single-pass design, or converted so that the pump recirculates water inside the reactor while using a secondary means of injecting aquarium water.

Media Selection

In order maximize Spyglass energy efficiency, it is worthwhile to choose the correct pump for the media you plan to use. Since the pump runs continuously year-round, even a small change in wattage can add up to significant energy bill savings. Using a larger than needed pump is fine though, if you plan to switch to a different media type in the future. The intake valve is used to restrict the flow from the pump. Media particle size and composition determines how much water flow is needed to achieve ideal fluidization. Generally, smaller media particle sizes require less flow than larger particles. Resin-based media like Purigen can be kept in suspension with very low flow rates. Typically, a Sicce nano pump with a partially open intake valve is all that is needed to fluidize resin beads. Heavy chunks such as All-in-One Biopellets require nearly all the capacity of a Sicce 1.0 or 1.5 in order to fluidize one or two liters of media. The following table shows recommended pumps for common media:

SPECIFICATIONS	Small	Medium	Large
Media Type	**Capacity/Pump/Watts**	**Capacity/Pump/Watts**	**Capacity/Pump/Watts**
Biopellets	1/2 Liter / Nano / 2.8w	1 Liter / Sycra .5 / 8w	2 Liters / Syncra 1.0 / 16w
AIO Biopellets	1/2 Liter / Nano / 2.8w	1 Liter / Sycra 1.0 / 16w	2 Liters / Syncra 1.5 / 23w
Resin Media (Purigen, etc)	400ml / Nano / 2.8w	800ml / Sycra .5 / 8w	1.6 Liters / Syncra .5 / 8w
Rox Carbon, GFO	1/2 Liter / Nano / 2.8w	1 Liter / Sycra .5 / 8w	2 Liters / Syncra 1.0 / 16w
Footprint and height	4.75" x 18"	6.25" x 19.5"	6.25" x 22.5"

Flow Configurations

The Spyglass reactor is capable of running in four different water flow configurations. The most common usage is single pass mode. This mode allows the pump to pull water directly from the sump, push it through the media, where it then overflows the reactor and returns back to the sump. This is the fastest way to filter all of your aquarium water. As seen in the Mode A diagram, configuring the Spyglass to run this way is by using the short piece of black tubing (12) to connect the intake of the pump to the valve (15) through the hole in the side of the reactor.

It is usually best to avoid “shocking” your aquarium with a lot of new media that can rapidly remove nutrients, such as GFO or All-in-One Biopellets may do for phosphate, or Rox carbon for yellowing compounds. This situation can be prevented by either initially using a very small amount of media in single-pass mode then slowly adding more every few days, or configuring the Spyglass to use one of two recirculating modes.   Recirculating water within the reactor limits the exposure of the media to aquarium water while still allowing complete fluidization and optimal contact of water to all portions of the media. The Spyglass design enables two modes of recirculation, full (Mode B) and passive (Mode C).

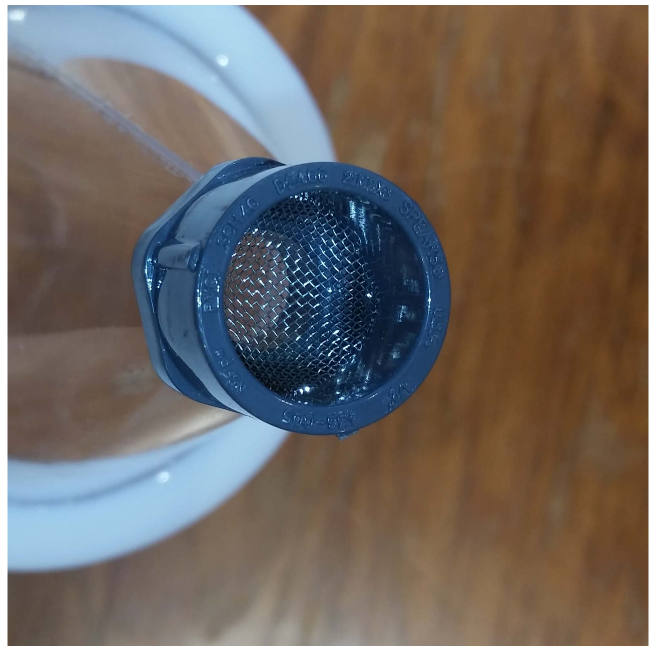
In Mode B, water is force fed into the side of the outer reactor chamber by an external source such as small feed pump, or a tee from a return pump. The internal Sicce pump then handles mixing that with water already in the reactor, and pushing it through the media. As water overflows the inner chamber, it falls back into the outer chamber, where some then overflows back into the sump, while some returns to be pushed through the media again. The throughput rate of aquarium water is exactly the flow rate of the external water source. This can be as low as a few gallons per hour if desired, but a rate any higher than the flow rate of the Sicce pump might result in some water not being forced through the media. Configuring the reactor for this mode requires a short piece of the schedule 40 soft tubing (13) connected to the valve (15), which is then connected to the external water source by user-supplied tubing. Alternatively, you can use any schedule 40 spigot fitting or 1/2” pvc pipe to achieve this connection, as the hole in the side of the reactor is the outer diameter of 1/2” plumbing (0.84”).

Mode C is an even simpler approach to recirculation. In this configuration, the hole in the side of the outer reactor chamber is left open. The Sicce pump pulls water from inside the chamber, pushes through the media, then the overflowing water mixes in the lower chamber again. Reactor water will naturally mix with aquarium water without needing a secondary pump or other force-fed water source. The amount of water recirculated from within the chamber vs. pulled from the sump can even be somewhat controlled by using the barbed fitting on the intake of the Sicce pump. If it is positioned so the end of the fitting is close to the hole in the side of the chamber, more water will be pulled from the sump vs. the chamber. Of course, this is not easily quantifiable. The best way to evaluate the turnover of aquarium water in this configuration is to monitor water chemistry changes, e.g., a phosphate test kit or “yellow bucket test” when using Rox carbon. If the Sicce pump flow needs to be slowed down to avoid overly aggressive tumbling of the media, use the pump cover with flow dial rather than the intake threaded barb fitting.

Mode D is a variation on single-pass Mode A, except in this mode, no internal pump is used to fluidize the media. Instead, water is fed into the reactor from an external pressurized water source, e.g., a manifold tee, full-siphon gravity drain from a Herbie-style overflow, etc. This water is run directly into the bottom of the cone using the supplied manifold assembly (18). You can use the supplied soft sch40 tubing (13) and valve (15) to connect to the external water source, or the manifold tee can be hard plumbed with 1/2” pvc pipe through the side of the reactor for better rigidity and less movement of the reactor chamber when lifting and removing the inner chamber for maintenance.

Operating Environment Considerations

In either single-pass configuration (Mode A or D), the water depth in which the reactor rests is not important. It can even be completely underwater if desired. In recirculation mode, the water depth should not exceed the height of the outer chamber. This forces filtered water that overflows the inner chamber to fall back into the outer chamber. The maximum water depth is approximately 10.5 inches (26.5 cm) for the small and medium reactors, and 12.25 inches (31cm) for the large model. The minimum water depth for all models is 3 inches (7.6cm) when using a Sicce pump. If configured in Mode D, manifold mode, there is no real minimum depth, although very shallow water may result in splashing near the base.



Installing the small stainless mesh disk in the cone nozzle. This is useful when using ultra fine media such as Purigen.

Warranty and contact information

AVAST Marine Works products are warranted for a period of one year from the date of purchase against defects in materials and workmanship. AVAST will provide necessary parts and factory labor to repair or replace any failed component without cost to the Buyer.

Service

Warranty shall be void if any alteration or service is performed without written authorization from AVAST Marine Works or if the equipment has been connected to incorrect power. Buyer will be responsible for requesting warranty service through the AVAST Marine RMA process which requires buyers to return the defective unit for repair. The Buyer is liable for properly packaging the equipment and shipping cost for the initial return for repair. Return shipping cost is covered by AVAST if within the warranty period.

Equipment damaged due to accident, neglect, abuse, misuse, natural or man-made disasters is not covered by this warranty, and the Buyer will be contacted with cost and approval for repair.

Liability

In no event will AVAST Marine Works be liable for any lost livestock, profits or any special, indirect or consequential damages due to loss of use.

The laws of the Commonwealth of Virginia will govern this warranty plan.

AVAST Marine Works
12953 Back Rd

Strasburg, VA 22657
www.avastmarine.com