

## WARNING & SAFEGUARDS

Read and follow these guidelines to ensure the proper use and application of this <sup>®</sup>Rio+ pump. Failure to follow these guidelines may result in damage to the aquatic environment, serious injury, and void the warranty.

### Operation and Safety Precautions

The National Electrical Code requires that a GFCI (Ground Fault Circuit Interrupter) be utilized in the branch circuit supplying all water pump and aquarium electrical equipment. If you do not have a GFCI, please contact your local electrical supplier for this device.

### Important Warnings and Safeguards

- Do not operate any <sup>®</sup>Rio+ pump without it being fully submerged at all times. Running pump out of water can result in permanent damage and may void your warranty.
- Never operate any <sup>®</sup>Rio+ pump with an electronic wave maker or timing device. These devices can cause permanent damage to the pump and/or demagnetize the magnetic impeller.
- Replace the impeller and/or shaft if there are any excess signs of wear. Monthly cleaning is highly recommended.
- Prior to any aquarium maintenance or appliance cleaning or repair, you must

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unplug all electrical aquarium devices.

- Routine maintenance is required to ensure the maximum performance and longevity of your <sup>®</sup>Rio+ pump. See Maintenance Guidelines.
- The National Electrical Code requires all aquarium equipment to be plugged into a GFCI (Ground Fault Circuit Interrupter) electrical outlet.
- Do not operate if any wire is damaged.
- Failure to use the main housing strainer and/or filter conversion kit may allow sand and/or debris into the impeller chamber, thus causing permanent damage to the impeller, ceramic shaft, and/or pump.
- Do not plug into a power strip or extension cord. Always plug the pump directly into a GFCI outlet using a drip loop.
- <sup>®</sup>Rio+ pumps are designed to run completely submerged in water. Do not operate pump outside of water! The pump should be submerged in water before connecting to a power source.
- <sup>®</sup>Rio+ pumps may be used in either freshwater or saltwater, but not in foreign fluids, flammable liquids, or any chemical.

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## WARNINGS!

It is your sole responsibility to verify that the plug and the receptacle are clean and free of moisture and salt build-up at all times. The receptacle must be free of water, salt, calcium, magnesium, and dust. Failure to do so can cause fire, damage to property, permanent damage to the product, and personal injury not limited to loss of life.

Do not plug into an extension cord or power strip. A drip loop must be used when using all electrical aquarium devices. A drip loop is the part of the cord hanging below the receptacle. (See Diagram)

The National Electrical Code requires that a GFCI (Ground Fault Circuit Interrupter) be used in the branch circuit supplying all power to water pumps and electrical aquarium equipment. If you do not have a GFCI, have an electrician install one prior to operating any aquarium component.

Note: It is important that the proper pump and flow rate is used for each specific application. Use the flow chart to determine the proper size pump and tubing to be used for your application.



DRIP LOOP

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Warning! User assumes all liability for any use that is not in accordance with directions and/or safety labels. Such use may void warranty.



## Rio+ Aqua Pump/PowerHead



## MAINTENANCE

Preventing debris and free-floating material from entering your <sup>®</sup>Rio+ pump is of utmost importance for performance and longevity. Your pump requires regular cleaning to maintain a reliable water flow. Note: gravel, sand, and calcium deposits can also diminish or damage the performance and longevity of your <sup>®</sup>Rio+ pump and impeller.

- IMPORTANT:** You must disconnect all electrical power to the aquarium and water pump before beginning any maintenance on any electrical equipment, including your <sup>®</sup>Rio+ pump.
- Do not use any type of soap or detergent to clean the <sup>®</sup>Rio+ pump or parts. Remove main housing strainer. Clean and rinse off all dirt and debris. Carefully turn housing endcap retainer counter-clockwise to disconnect. Housing endcap, ceramic shaft, and impeller may now be removed from motor housing. Rinse all dirt and grime off the impeller before reassembling. In environments that have a high amount of calcium, it may be necessary to soak impeller in a 1 part vinegar 3 parts water solution for 15 minutes. This will help to break down the calcium. Clean and rinse the impeller parts thoroughly, then verify that the impeller spins freely on the shaft. Note: Replace impeller or ceramic shaft if you notice any signs of excess wear on impeller, ceramic shaft, and/or shaft endcap.
- After cleaning, reassemble impeller into the pump and fasten by turning housing endcap and the

housing endcap retainer until snug to ensure a proper seal. Shaft endcap must be on each end of shaft. Your <sup>®</sup>Rio+ pump will not restart if impeller is not positioned or assembled correctly.

- Impeller may need to be replaced periodically to maintain peak performance. <sup>®</sup>Rio+ pump replacement parts are sold at your local aquatic retailer, or contact us for more information on purchasing replacement parts.
- Never tamper with or replace the power cord of this appliance. If the cord is damaged, the appliance should be discarded.

## LIMITED WARRANTY

We warrant that your <sup>®</sup>Rio+ pump is free from defects for a period of 12 months from the initial date of purchase shown on the original receipt. We disclaim all other warranties of merchantability and/or fitness for a particular purpose. Although this limited warranty may give you specific rights, you may have other rights that vary from state to state. This warranty is void if the failure of the pump or any part, sealant, or component thereof is due to (i) misuse, (ii) tampering, (iii) negligence, (iv) misapplication, (v) abuse, (vi) accident and/or (vii) failure to properly (a) maintain, (b) clean, (c) keep pump fully submerged, and/or (d) use the pump with a Ground Fault Circuit Interrupter (GFCI).

To extend your warranty, visit [hikariusa.com/riowarranty](http://hikariusa.com/riowarranty).

Your <sup>®</sup>Rio+ Aqua Pump/Powerhead is a versatile water pump system designed with the discriminating hobbyist's needs in mind. Incorporating our next-generation magnetic rotor technology, the <sup>®</sup>Rio+ Aqua Pumps/Powerheads offer the ultimate in efficiency, performance, and extended life. The largest and most powerful models provide excellent performance within wet and dry filters, and in venturi protein skimmers when high pressure and flow rates are needed. Energy efficient and quiet, <sup>®</sup>Rio+ pumps do not use oil to operate so they cannot contaminate the aquatic environment. Our full range of <sup>®</sup>Rio+ Aqua Pumps/Powerheads, designed to work in a variety of aquatic environments, offers hobbyists superior selection and value.

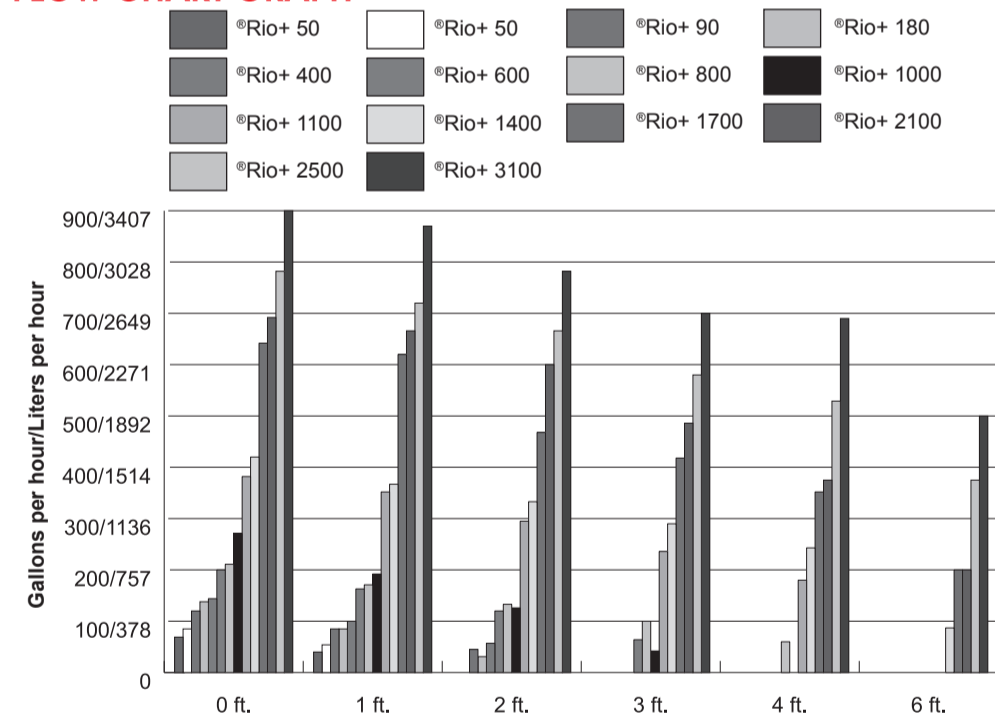
## FEATURES

- Enhanced Motor Design
- Versatile
- High Flow Rate
- Low Energy Consumption
- Silent and Cool Operation
- Fully Submersible
- Magnetic Rotor Technology
- Ceramic Shaft and Bearings
- Marine and Freshwater Environments

## FLOW CHART

Item #	Watts		Dimensions L x W x H (approx.) inches/mm	Gallons per hour/liters per hour						Output O.D.	Max. head
	115V / 60Hz	220V / 50Hz		0ft./cm	1ft./cm	2ft./cm	3ft./cm	4ft./cm	6ft./cm		
<sup>®</sup> Rio+ 50 (UL)	5.3	3.1	2.3 x 1.5 x 1.8 / 59 x 37 x 46	69/262	40/152						2ft./60cm
<sup>®</sup> Rio+ 90 (UL)	3	1.5		85/323	54/205						
<sup>®</sup> Rio+ 180 (UL)	4	1.8	2.8 x 1.7 x 2.4 / 71 x 44 x 60	120/456	85/323	45/171					3ft./90cm
<sup>®</sup> Rio+ 200 (UL)	8	2.4		138/524	85/323	31/118				13mm 1/2"	2ft./60cm
<sup>®</sup> Rio+ 400 (UL)	10	2.9		144/547	100/385	57/216					3.5ft./105cm
<sup>®</sup> Rio+ 600 (UL/PT)	10	4.5		200/760	163/619	120/456	64/243				4ft./120cm
<sup>®</sup> Rio+ 800 (UL/PT)	13	5.4	3.9 x 2.1 x 2.5 / 99 x 53 x 65	211/801	171/650	133/506	100/385	60/228			5ft./150cm
<sup>®</sup> Rio+ 1000 UL	13	11.5		271/1030	192/730	126/479	42/160			16mm 5/8"	4.6ft./140cm
<sup>®</sup> Rio+ 1100 UL	22	17	5 x 2.6 x 3.3 / 126 x 65 x 83	382/1451	352/1327	295/1121	236/896	180/684			6ft./180cm
<sup>®</sup> Rio+ 1400 UL	27	18.5		420/1596	367/1395	333/1265	290/1102	243/923	87/330		6.5ft./195cm
<sup>®</sup> Rio+ 1700 UL	31	22	5.9 x 2.8 x 3.7 / 150 x 70 x 95	642/2439	620/2356	486/1847	418/1588	352/1338	180/684		8ft./240cm
<sup>®</sup> Rio+ 2100 UL	40	29		692/2630	666/2530	600/2280	486/1847	375/1425	200/760		
<sup>®</sup> Rio+ 2500 UL	55	29.5		782/2972	720/2736	666/2531	580/2204	529/2010	375/1425		
<sup>®</sup> Rio+ 3100 UL	73	53	6.4 x 4.3 x 3.1 / 163 x 109 x 80	900/3420	870/3306	782/2972	700/2660	690/2622	500/1900	25.4mm 1"	10ft./300cm

## FLOW CHART GRAPH



## OPTIONAL PARTS

### Magnet Mount

Item No.	Dimension L x H x W (approx.)	<sup>®</sup> Rio+	Glass Thickness
MM100	1.9 x 3.25 x 0.83in (5 x 8.3 x 2.1cm)	1000	3/8" (10mm)
MM200		1100-1400	1/2" (12mm)
MM300			
MM350	2.5" x 4.3" x 1.1" (6.5 x 11 x 2.9cm)	1700-2500	3/4" (19mm)
MM500		3100	



### Needle Wheel Impeller • Creates ultra-fine bubbles and uses a ceramic bearing

<sup>®</sup>Rio+ Needle Wheel Impellers were designed to provide an ultra-fine bubble which creates extra surface area and contact time in the skimmer. We use the finest materials, including a ceramic bearing embedded in the rotor for superior longevity and durability. Combine with our specially designed intake venturi and you can turbo charge your skimmer. <sup>®</sup>Rio+ Needle Wheel Impellers can be retrofitted to operate on <sup>®</sup>Rio+ pump models 1000-3100 HP.

Description
<sup>®</sup> Rio+ needle wheel impeller 1000
<sup>®</sup> Rio+ needle wheel impeller 1400
<sup>®</sup> Rio+ needle wheel impeller 2100
<sup>®</sup> Rio+ needle wheel impeller 3100



### Needle Wheel Conversion Kit

- Ceramic bearing and shaft
- Needle wheel made of high impact plastic
- Large intake venturi

Description
<sup>®</sup> Rio+ needle wheel impeller conversion kit 1000
<sup>®</sup> Rio+ needle wheel impeller conversion kit 1100-1400
<sup>®</sup> Rio+ needle wheel impeller conversion kit 1700-2500
<sup>®</sup> Rio+ needle wheel impeller conversion kit 3100



## AVAILABLE MODELS

Item No.	Description
<sup>®</sup> Rio+ 50	69/262 GPH/LPH
<sup>®</sup> Rio+ 50 UL	Mini Pump & Powerhead
<sup>®</sup> Rio+ 90	85/323 GPH/LPH
<sup>®</sup> Rio+ 90 UL	Mini Pump & Powerhead
<sup>®</sup> Rio+ 180	120/456 GPH/LPH
<sup>®</sup> Rio+ 180 UL	Mini Pump & Powerhead
<sup>®</sup> Rio+ 200	138/524 GPH/LPH
<sup>®</sup> Rio+ 200 UL	Pump & Powerhead
<sup>®</sup> Rio+ 400	144/547 GPH/LPH
<sup>®</sup> Rio+ 400 UL	Pump & Powerhead
<sup>®</sup> Rio+ 600	200/760 GPH/LPH
<sup>®</sup> Rio+ 600 UL	Pump & Powerhead
<sup>®</sup> Rio+ 600 PT	Pump & Powerhead
<sup>®</sup> Rio+ 800	211/801 GPH/LPH
<sup>®</sup> Rio+ 800 UL	Pump & Powerhead
<sup>®</sup> Rio+ 800 PT	Pump & Powerhead
<sup>®</sup> Rio+ 1000 UL	271/1030 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 1100 UL	382/1451 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 1400 UL	420/1596 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 1700 UL	642/2439 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 2100 UL	692/2630 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 2500 UL	782/2972 GPH/LPH Pump & Powerhead
<sup>®</sup> Rio+ 3100 UL	900/3420 GPH/LPH Pump & Powerhead

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## Rio+ Aqua Pump/PowerHead



## APPLICATION

**NOTE:** When installing the pump for any application there will be extra parts.

### APPLICATION I: Fountains, Water Features & Waterfalls (see figure A)

*Rio+ pumps are designed to run completely submerged in water. Do not operate pump outside of water! This pump should be submerged in water before connecting directly to a GFCI outlet. Do not operate pump without the main filter strainer. When using your Rio+ pump in fountains, water features, and waterfalls, the use of a filter conversion kit is recommended as a pre-filter.*

Follow all warnings and safeguards.

#### Rio+ 50-800

Filter conversion kit 50-180  
Filter conversion kit 200-800

1. Verify that the pump size fits the application without restricting the flow. Consult your local aquatic retailer or manufacturer's guidelines for the proper Rio+ pump size and model.
2. Attach Rio+ filter conversion. (Optional accessory)
3. Choose discharge adapter option.
4. Position the pump so that the tubing used will not kink and connect it to the discharge adapter. Note: Do not reduce the diameter of the recommended output tubing.
5. Secure the tubing with a hose clamp.

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#### Rio+ 1000-3100

Filter conversion kit 1100-1400  
Filter conversion kit 1700-2500  
Pro filter conversion kit 1700-3100

1. Verify that the pump size fits the application without restricting the flow. Consult your local aquatic retailer or manufacturer's guidelines for the proper Rio+ pump size and model.
2. Attach Rio+ filter conversion. (Optional accessory)
3. Choose discharge adapter option.
4. Position the pump so that the tubing used will not kink and connect it to the discharge adapter. Note: Do not reduce the diameter of the recommended output tubing.
5. Secure the tubing with a hose clamp.

### APPLICATION II: In-Tank Circulation (see figure B)

Do not run on wavemakers or timers!

*Rio+ pumps are designed to run completely submerged in water. Do not operate pump outside of water! This pump should be submerged in water before connecting directly to a GFCI outlet. Do not operate pump without the main filter strainer. When using your Rio+ pump in fountains, water features, and waterfalls, the use of a filter conversion kit is recommended as a pre-filter.*

Follow all warnings and safeguards.

#### Rio+ 50-800

Filter conversion kit 50-180  
Filter conversion kit 200-800

3. Connect either outlet pipe adapter or flow control directly to the flexible tubing and secure with a hose clamp.
4. Submerge pump in water and plug directly into a GFCI outlet.

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1. Choose a location for the pump.
2. If using the optional filter conversion accessory, remove the main housing strainer and attach filter conversion kit.
3. Choose discharge adapter option.
4. Secure to the aquarium using suction cups. Note: Verify that the surface the pump is attached to is clean and suction cups are secure.
5. Verify the pump is stationary and plug directly into a GFCI outlet.

Optional Venturi Attachment: Remove the air stopper and attach the airline tube and silencer to the venturi inlet. Note: the venturi will not work if the pump is submerged more than 1" below the surface of the water.

#### Rio+ 1000-3100

Note: Rio+ 2500 and 3100 are better suited for sump or fountain pump use than as water circulation pumps.

Filter conversion kit 1100-1400  
Filter conversion kit 1700-2500  
Pro filter conversion kit 1700-3100

1. Choose a location for the pump.
2. Remove the main housing strainer and slide on either the suction cup bracket and suction cups or the hanging bracket.
3. If using the optional filter conversion accessory, remove the main housing strainer and attach filter conversion kit.

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4. Choose discharge adapter option.
5. If securing to the aquarium using suction cups, verify that the surface the pump is attached to is clean and suction cups are secure.
6. Verify the pump is secure and plug directly into a GFCI outlet.

Optional Venturi Attachment: Remove the air stopper and attach the airline tube and silencer to the venturi inlet. Note: the venturi will not work if the pump is submerged more than 1" below the surface of the water.

### APPLICATION III: Wet/Dry Filtration Systems, Protein Skimmers & Sumps (see figure C)

*Rio+ pumps are designed to run completely submerged in water. Do not operate pump outside of water! This pump should be submerged in water before connecting directly to a GFCI outlet. Do not operate pump without the main filter strainer. Use the flow chart to determine the proper water flow and tubing size. Never reduce water flow of the pump by more than 15% using a control valve.*

Follow all warnings and safeguards.

#### Rio+ 1000-3100

1. Remove main housing strainer.
2. Attach suction cup bracket and suction cups together, then slide suction up bracket set onto motor housing.

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3. Connect either outlet pipe adapter or flow control directly to the flexible tubing and secure with a hose clamp.
4. Submerge pump in water and plug directly into a GFCI outlet.

#### Helpful Hints:

1. The use of a float valve (not included) will help ensure a consistent water level and ensure the pump will operate fully submerged at all times.
2. If the pump is making excessive noise, verify that the pump is free standing and is not vibrating against the wall of the sump.
3. Excessive noise can also be caused by using undersized tubing that restricts flow, or restricting flow by more than 15% with a valve.

#### UNDER GRAVEL FILTER (see figure D)

1. Remove the main housing strainer.
2. Attach either the suction cup bracket and suction cups or the pump hanger to the pump.
3. Attach the undergravel filter strainer and an undergravel filter adapter to the intake of the pump.
4. Choose a discharge adapter.
5. Verify the uplift tube is cut to the proper length so that the pump will be operated fully submerged.
6. Place the pump inlet on top of the uplift opening.
7. Plug directly to a GFCI outlet.

Optional Venturi Attachment: Remove the air

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stopper and attach the airline tube and silencer to the venturi inlet. Note: the venturi will not work if the pump is submerged more than 1" below the surface of the water.

### INSTALLATION for 600PT-800PT (see figure E)

Note: There may be performance variances when connecting this pump directly to a protein skimmer, as there are many different protein skimmer manufacturers. Consult with the manufacturer of the protein skimmer for exact installation instructions for their specific skimmer.

1. The pump comes out of the box and is ready to run.
2. Connect directly to the intake of the protein skimmer.
3. Position the air tubing silencer outside the water.
4. Plug the unit directly into a GFCI outlet.
5. Verify that there is water and air entering the skimmer.

**IMPORTANT:** Wet/dry filtration via a sump causes excessive evaporation. Failure to maintain a consistent water level or the daily addition of top-off water will cause the pump to operate without being fully submerged. If the pump is not operated fully submerged, permanent damage to the pump will occur, thus resulting in loss of livestock and/or injury or loss of property or life. If the pump is not operated fully submerged at all times the warranty is void.

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## TROUBLESHOOTING

### PROBLEM: PUMP IS EXCESSIVELY NOISY

#### Reason & Solution

- Wrong size flexible tubing is being used.
- Pump is touching the wall of the sump or holding tank.
- Flow has been reduced by more than 15% using a ball valve.
- Main housing strainer is clogged.
- Impeller and ceramic shaft need to be cleaned.
- The ceramic shaft is broken.
- Impeller was not reinstalled properly. Verify that ceramic shaft and shaft endcap are in place.
- Wrong size pump for the given application.
- If rigid PVC is used, connect a 1" piece of flexible tubing in between the pump and the rigid PVC. This will take tension off the pump and help reduce noise.

### PROBLEM: PUMP WILL NOT START

#### Reason & Solution

- Impeller needs to be cleaned or replaced.
- When reinstalling the impeller, the rubber bushings were not installed on the shaft prior to reinstalling the motor housing.
- Impeller is not rotating freely on ceramic shaft.
- Main housing strainer is clogged.
- GFCI has tripped and needs to be reset. Before restarting circuit or pump, resolve reason for

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- GFCI trip.
- If using a check valve, it has air trapped inside the impeller well and/or intake elbow.
- Impeller and/or ceramic shaft are damaged and need to be replaced.

### TROUBLESHOOTING FOR Rio+ 600PT-800PT

#### PROBLEM: NO AIR

#### Reason & Solution

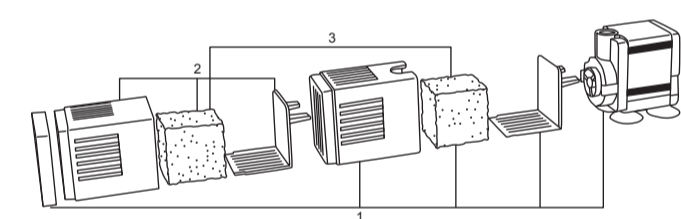
- Verify that the air tubing with silencer is out of water.
- The venturi needs to be cleaned. Remove the silencer and place the end of the airline tubing in a cup of warm water and let the pump suck water through airline and back through pump to clear.
- If regular maintenance has not been performed, it may be necessary to remove the pump and disassemble the venturi. When doing so, verify that all holes are clear of debris or buildup. It may be necessary to soak parts in a 1 part vinegar 3 parts water solution for at least 15 minutes.
- Impeller and impeller well cover need to be cleaned.
- The pump is positioned too deep in the water column. Do not place the pump deeper than 6" below the water surface.

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## Rio+ INTERNAL POWER FILTERS

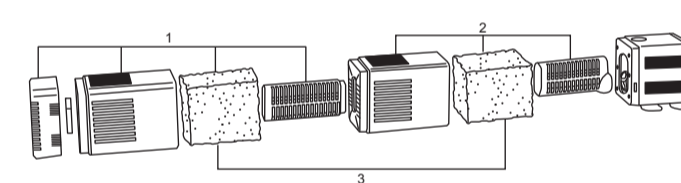
### Rio+ Internal Power Filters 50, 90, 180

1. Rio+ filter conversion kit
2. Rio+ additional filter
3. Rio+ filter sponge (2/pkg)



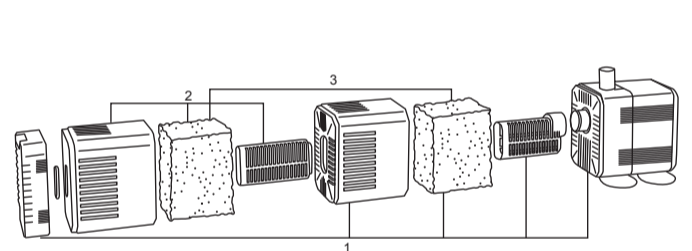
### Rio+ Internal Power Filters 200, 400, 600, 800

1. Rio+ filter conversion kit
2. Rio+ additional filter
3. Rio+ filter sponge (2/pkg)



### Rio+ Internal Power Filters 1100, 1400, 1700, 2100, 2500

1. Rio+ filter conversion kit
2. Rio+ additional filter
3. Rio+ filter sponge (2/pkg)



## PART LIST FOR ALL PUMPS

**NOTE:** When installing the pump for any application there may be extra parts.

- |  |   |
|--|---|
| 1. Main housing strainer               | 12. Flow control                              |
| 2. Impeller endcap                     | 13. Elbow                                     |
| 3. Impeller                            | 14. Duck bill                                 |
| 4. Motor housing                       | 15. Intake and output pipe adapter (optional) |
| 5. Suction cups                        | 16. Air tubing and silencer                   |
| 6. Suction cup bracket                 | 17. Air tubing                                |
| 7. Pump hanger                         | 18. Air intake elbow                          |
| 8. Pipe adapter                        | 19. Under-gravel filter adapter               |
| 9. 3/4" MPT (option)                   | 20. Under-gravel filter strainer              |
| 10. 3/8" Pipe adapter                  |   |
| 11. Discharge adapter with venturi jet |   |

#### FLEXIBLE TUBING SIZE:

Rio+ 50-180: 1/2" (13mm) or 3/8" (9.5 mm)  
Rio+ 200-800: 1/2" (13mm) ID  
Rio+ 1000-2500: 3/4" (19mm) ID or 3/4" (19mm) MPT  
Rio+ 3100: 1" (25.4mm) ID or 3/4" (19mm) MPT

(MPT = Male Pipe Thread)

### APPLICATION I: Fountains, Water Features & Waterfalls

#### Rio+ 50-800

NOTE: Part #10 is not included in Rio+ 200-800

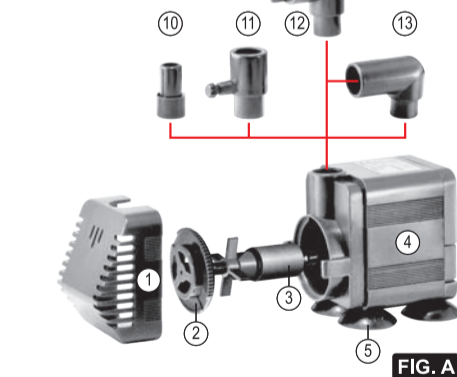
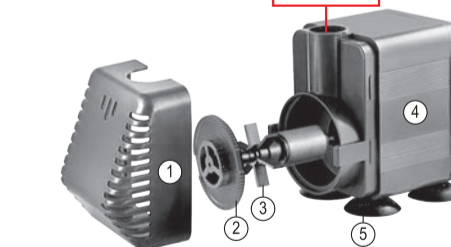


FIG. A

### APPLICATION II: In-Tank Circulation

#### Rio+ 200-800



#### Rio+ 1100-2500

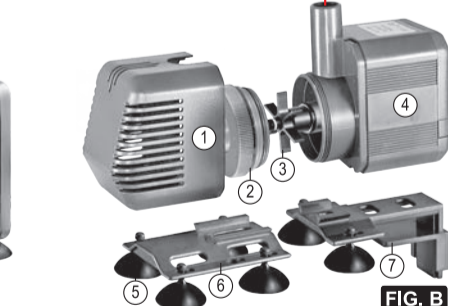


FIG. B

### APPLICATION III: Wet/Dry Filtration Systems, Protein Skimmers & Sumps

#### Rio+ 1100-2500



#### Rio+ 3100

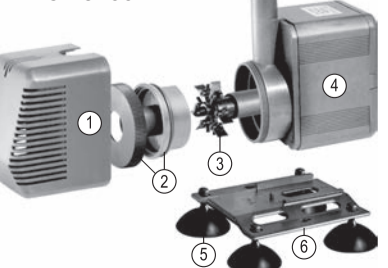


FIG. C

### UNDER-GRAVEL FILTER

#### Rio+ 200-800

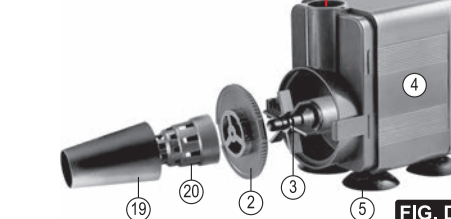


FIG. D

### Rio+ 600PT-800PT

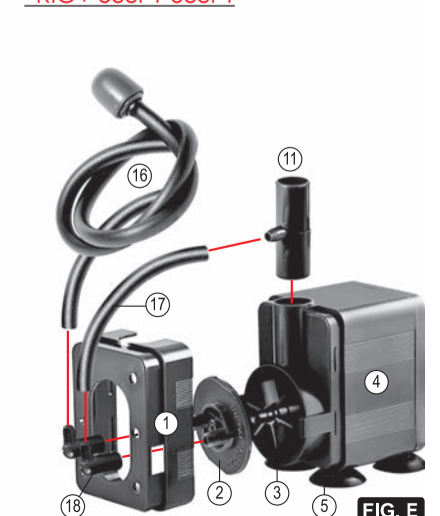


FIG. E