



Otterbine Service Manual

1/2HP Fractional Series



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ADDITIONAL RESOURCES

- Physical Installation Instructions
 - refer to Fractional Series Installation Manual
- Troubleshooting, Diagnostic Forms & Supply Lists
 - refer to Warranty & Reference Service Manual



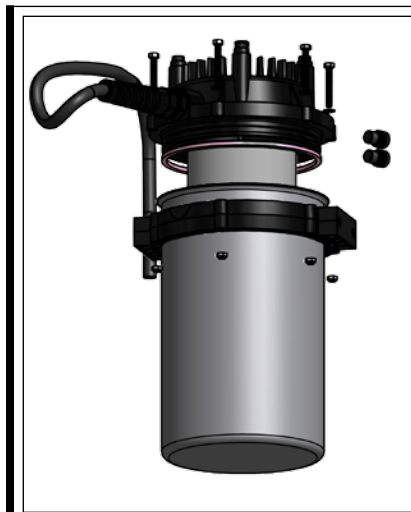
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This manual and more can be found online through Otterbine’s Distributor Extranet.

To Register: www.otterbine.com/register
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*Fractional Series Power Unit
(Exploded View)*

Power Unit

The Power Unit will need to be removed from the float in order to complete the following procedures.

Power Unit | Disassembly

NOTE: Always complete the [Power Unit Diagnostics](#), 10-Step process prior to disassembly, it will aid you with identifying problems.

Complete disassembly of the Power Unit involves three primary steps. (Refer to “[Exploded Views & Technical Data](#)” for additional details)

1. Remove Power Unit from Float Bracket
2. Remove Pumping Chamber Configuration from Power Unit
3. Disassembly of the Power Unit

! CAUTION: ALWAYS WEAR PROTECTIVE SAFETY GLASSES WHEN PERFORMING ANY OF THE FOLLOWING PROCEDURES!

! CAUTION: Never operate the Fractional Series Fountain when not submersed (EXCEPT FOR “JOGGING” DURING TESTING).

NOTE: The motor has an internal thermal protection overload switch and will re-start automatically if tripped.

Power Unit Disassembly | Motor Base Plate:

Refer to Exploded View Illustrations for additional assistance.

- A. Remove the two (2) oil plugs with a 7/32 inch Allen wrench, from the motor base plate, and then drain the oil.
- B. Remove the Housing Ring (P/N: 42-0101), using an 8mm nut driver, remove the six (6) Hex Bolts (P/N: 22-0006) and remove the housing ring. (See Fig. 1a)
- C. Remove the motor/motor base plate from the motor housing by reinstalling one of the oil plugs and installing an air fitting into the other oil plug opening. (Service Center Tool P/N: SS-C320) Slowly apply air pressure to a “maximum of 5PSI”. Wrap a rag around the motor base plate assembly to catch any excess oil that may escape when the motor/motor base plate assembly pops out. (See Fig. 2a) Set the motor/motor base plate assembly on the motor stand (See Fig. 3a).

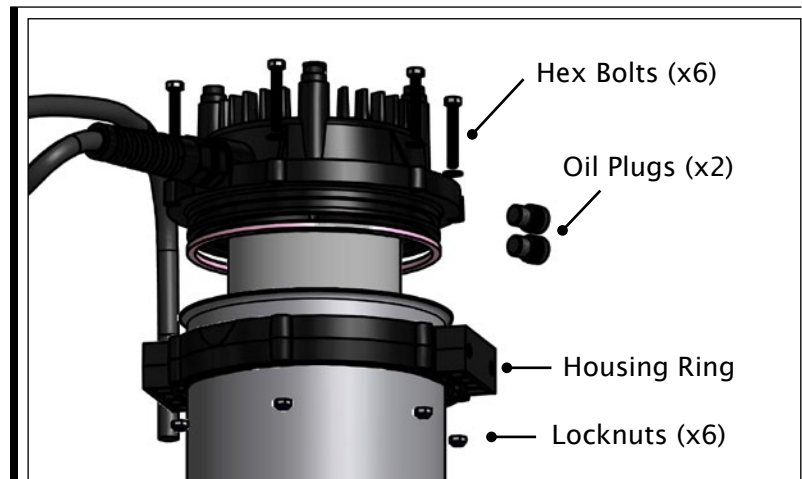


Fig. 1a | Motor Base Plate Assembly Exploded View

! WARNING: DO NOT PRY ON MOTOR BASE PLATE ASSEMBLY IN ORDER TO REMOVE, DAMAGE TO SEAL WILL OCCUR.

Disassembly of the Power Unit involves different stages depending on results from the [Power Unit Diagnostics](#) process and other testing, some stages may be omitted. (refer to Warranty Reference Service Manual.)

D. Perform a visual inspection of the motor and motor base plate assembly. Note any abnormalities. (Example: blown capacitor, motor wired improperly, water damage.) Spin the motor shaft by hand, are the bearings noisy, do they drag?

a) Should bearings have failed motor replacement is required.

E. Motor: If motor failed the Megger/Hi Pot testing procedure during the [Power Unit Diagnostics](#), it is necessary at this time to perform further testing to rule out a conductive bulkhead wire assembly versus a shorted motor. (Disconnect all bulkhead wires from the motor and also remove the capacitor from the motor and retest both assemblies).

NOTE: It is possible to reuse a motor in which some water was present in the oil. Be absolutely sure that all moisture is out of the motor before reuse.

Should water contamination be present, the unit should be disassembled. Separate the motor's rotor from the stator and wash both in mineral spirits (a parts washer is ideal for this type of cleaning). Allow the motor to dry overnight before retesting. (See Fig. 4a)

F. Test Capacitor

Refer to [Motor & Capacitor Wiring Diagrams](#).

a) If it is determined that this component has failed; replace it at this time.

To check the capacitor:

1. Remove capacitor from motor.
2. Inspect capacitor for cracks/defects.
3. Test the cap with Digital Capacitor Tester. (See Fig. 5a)
4. Replace if faulty. Refer to [Motor Wiring and Capacitor Rating Diagram](#).
5. After component is attached, the power unit can now be re-assembled without disturbing



Fig. 2a | When removing motor base plate with air pressure, wrap a rag around the assembly to catch excess oil.

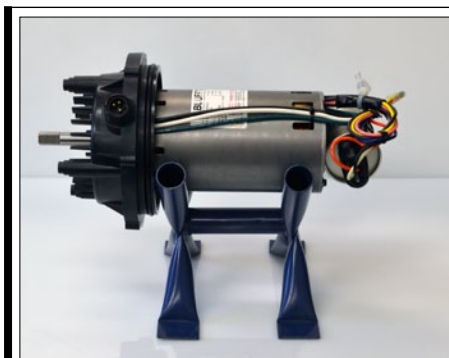


Fig. 3a | Fractional Series Motor with MBP Assembly on Stand



Fig. 4a | If water was present in oil, you might be able to reuse motor. Separate motor rotor and stator and wash both in mineral spirits; allow to dry overnight before retesting.

the rotary seals. Proceed to Power Unit Assembly/Final Assembly & Testing.

G. Motor Base Plate Removal/Inspection

- a) Disconnect all Bulkhead or Hardwired Cable Assembly wires from the motor. Using Channel Lock Pliers de-crimp the crimp connectors and separate motor lead wires from bulkhead wires. Remove ground wire from motor. (See Fig. 6a)

NOTE: Each motor bolt has protective sleeves, therefore when you remove the bolts you may need to reinstall the protective sleeves. Partial removal of the end bell may be necessary to accomplish this task. (See Fig. 7a)

- b) With 10mm nut driver, remove the four (4) Self Sealing Hex Bolts (P/N: 22-0040) and carefully pull/remove the motor base plate assembly away from the motor.
- c) Remove the rotary seal portion of the mechanical seal from the motor shaft, taking care not to scratch the motor shaft.
- d) Remove the seal seat portion of the mechanical seal from the motor base plate assembly, taking care not to scratch the seat counter bore.
- e) Thoroughly clean the motor base plate. Use a de-greaser that will not leave a residue behind.
- f) Inspect the motor base plate and bulkhead/hardwired cable assembly for abnormalities. (Inspect seat counter bore for wear marks/cracks, bulkhead for wear marks/electrolysis)
- g) If there are any defects, do not reuse. (Replace using the correct assembly; refer to the [Fractional Series Parts List & Exploded View](#))

NOTE: Rotary seals, self-sealing bolts, and O-rings are not reusable after they are removed.

H. Ground Clip Inspection:

- a) Check condition of motor housing's Ground Clip (P/N: 47-0002) which is attached to a motor bolt replace if damaged.
 - Ground Clip should bend towards the top of the motor. (See Fig. 8a)
- b) Using a ¼ inch (7mm) nut driver tighten the motor bolts to 25 in-lbs. (2.8 N-m). Insure ground clip is at a ninety



Fig. 5a | Digital Capacitor Tester



Fig. 6a | Disconnect bulkhead wires from motor.



Fig. 7a | Partial removal of endbell may be required to replace protective sleeves on motor bolts.

degree (90°) angle to make proper contact with housing. Re-check each bolt to insure they are torqued to 25 in-lbs. (2.8 N-m).

- c) The motor bolts must be tightened evenly in a cross pattern. (See Fig. 9a)

Power Unit | Assembly

Complete assembly of the Fractional Series Power Unit involves three primary steps.

1. Assembly of the Power Unit
2. Assemble Pumping Chamber Configuration to Power Unit (Refer to “[Exploded Views & Technical Data](#)”)
3. Install Power Unit to Float/Float Brackets (Refer to “[Exploded Views & Technical Data](#)”)

! CAUTION: ALWAYS WEAR PROTECTIVE SAFETY GLASSES WHEN PERFORMING ANY OF THE FOLLOWING PROCEDURES!

Power Unit Assembly | Motor Assembly:

Refer to Exploded View Illustrations found in the next section for additional assistance.

- A. Place the motor onto the motor stand. (Service Center Tool P/N: SS-C290) (See Fig. 1b)
- B. Clean both the motor shaft and motor base plate’s seat counter bore with denatured alcohol.

NOTE: Make sure to clean motor shaft surface using fine emery cloth or equivalent. Remove rust, burns, and wipe clean with denatured alcohol.

C. Install Mechanical Seal

- a) Slide Mechanical Seal Washer (P/N 28-0005), down motor shaft, and rest it up against the flat.
- b) Install Rotary Seal portion of the Mechanical Seal (P/N: 49-0054). Using a cotton swab, apply seal lubricant (P/N: 48-0003) around the inside rubber bellow of the rotary portion of the seal. (See Fig. 2b)

TIP: Use a piece of Mylar film to protect the seal

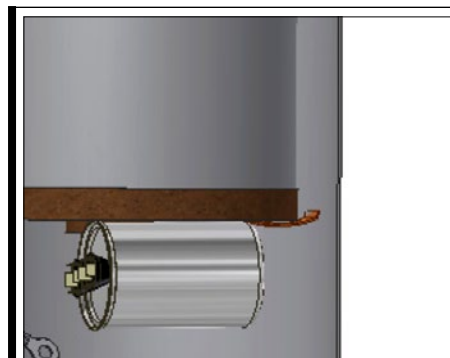


Fig. 8a | Ground clip should bend toward the top of the motor.

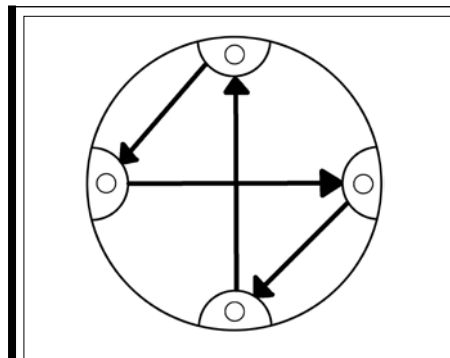


Fig. 9a | Tighten motor bolts evenly in a cross pattern.



Fig. 1b | Fractional Series Motor on Stand



Fig. 2b | Apply seal lubricant to inside of rotary portion of the seal with cotton swab.

- bellow from being scratched by the flat indent on the shaft where the impeller connects. (See Fig. 3b)
- c) With rubber side of seal towards the motor, install seal onto motor shaft. Place thumb tips on outer edge of seal and push until the seal is seated against washer.
 - d) Clean face of seal surface (Graphite infused silicon/ carbide), with denatured alcohol.
 - **Dirt & Fingerprints will Create Leak Path**
 - Both the graphite infused silicon/carbon face of the rotary and seal seat surface must be free of dirt/fingerprints/any abnormalities. If contaminants are present, clean surfaces using denatured alcohol and cotton swab.
 - e) Apply one drop of “3-in-One” oil onto face of rotary portion of the seal. (See Fig. 4b)
 - f) Install Seal Seat portion of the Mechanical Seal (P/N: 49-0054). Using a cotton swab, apply Seal Lubricant to outside surface of rubber seal seat cup and insert into counter bore of MBP, with seal surface facing out. Press seal seat firmly into counter bore, turn MBP over and make sure the seal seat is bottom square into place. Clean any excess lubricant off of seal face with denatured alcohol. (See Fig. 5b)
- D. Install O-ring (P/N: 49-0056) onto the motor base plate.
- **Never reuse old O-rings.**
- E. Install the motor base plate onto the motor. (With motor leads @ 12 o'clock align the bulkhead @ 10 o'clock) (See Fig. 6b)
- a) Place a dab of Loctite “Medium Strength Thread Locker” on the threads of the four (4) Self Sealing Hex Bolts. (P/N: 22-0040)
 - b) Thread into the motor. (Do not cross thread into the end bell.)
 - c) Using a 10mm nut driver tighten each bolt to 30 in-lbs. (3.4 N-m), or until the Red O-ring on the Self-Sealing Hex Bolt begins to bulge, however do not tear into the O-ring.
- F. Wire the Bulkhead or Hardwired Cable Assembly to the motor, and also the Ground Clip.
- a) Install bulkhead ground wire to motor.

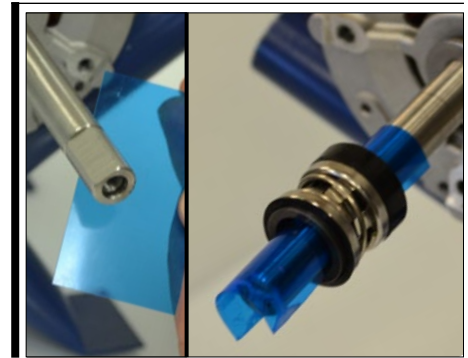


Fig. 3b | When installing the rotary seal, wrap Mylar film around motor shaft to prevent damage to the seal.



Fig. 4b | Apply one drop of 3-in-1 oil onto face of rotary portion of the seal.



Fig. 5b | Apply seal lubricant to outside surface of rubber seal seat cup and insert it into counter bore of MBP with seal seat facing up, press firmly.

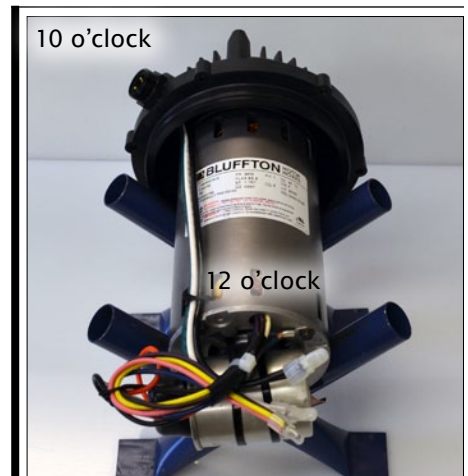


Fig. 6b | Install motor base plate onto motor. (Place motor leads at 12 o'clock, and align bulkhead at 10 o'clock.)

- b) Pull the motor bolt located to the right of the motor lead wire assembly and slip the ground lug of the bulkhead over it and reinstall. (See Fig. 7b)

NOTE: Each motor bolt has protective sleeves, therefore when you remove the bolts you may need to reinstall the protective sleeves. Partial removal of the end bell may be necessary to accomplish this task. (See Fig. 8b)

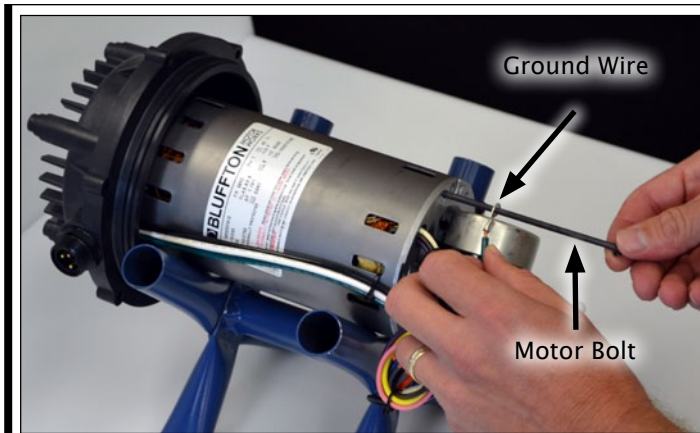


Fig. 7b | Pull motor bolt at right of motor lead wire assembly and slip the ground lug of the bulkhead over it and reinstall.

- c) Install the motor housing's Ground Clip (P/N: 47-0002) to the motor. Pull the motor bolt directly under the motor lead ground connection, and install the ground clip.
 - Ground Clip should bend towards the top of the motor. (See Fig. 9b)
- d) Using a ¼ inch (7mm) nut driver and a cross pattern formation, tighten the motor bolts to 25 in-lbs. (2.8 N-m). Insure ground clip is a ninety degree (90°) angle to make proper contact with housing. (See Fig 9b) Re-check each bolt to insure they are torqued to 25 in-lbs. (2.8 N-m). (See Fig. 9a)
- e) Using the [Motor & Capacitor Wiring Diagrams](#) found later in the manual, make all wiring connections for subsequent voltage.
- f) Secure all bulkhead/motor wire connections with Crimp Connectors.
 - **DO NOT USE Twist-On Wire Connectors;** they will eventually twist off with the presence of oil and vibration. (See Fig. 10b)
- g) Strap the wires down using two to three ty-raps. (P/N: 46-0106)

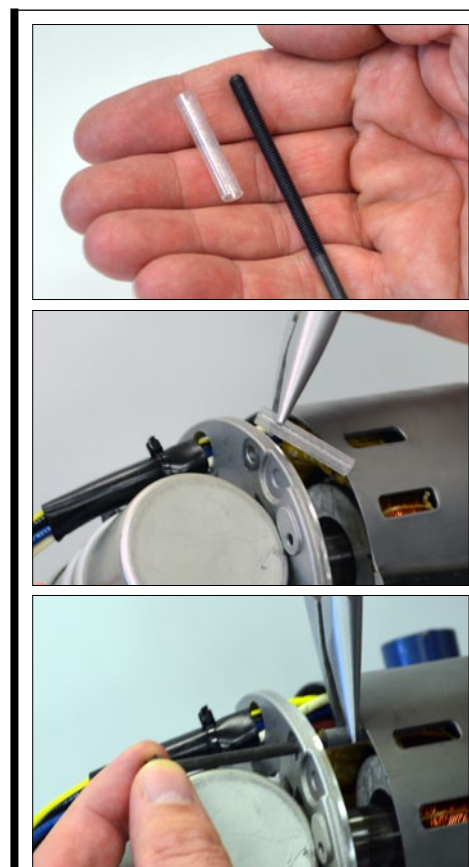


Fig. 8b | Partial removal of endbell may be required to replace protective sleeves on motor bolts.

G. Perform the following motor tests to verify correct wiring and motor operation.

- a) Perform Megger and Hi Pot testing. Reference [Unit Analysis Using a Megohm Meter](#) (“Megger”) which can be found at Otterbine’s Distributor Extranet. (See Fig. 11b)
- b) Take a resistance reading across the motor windings at bulkhead pins.

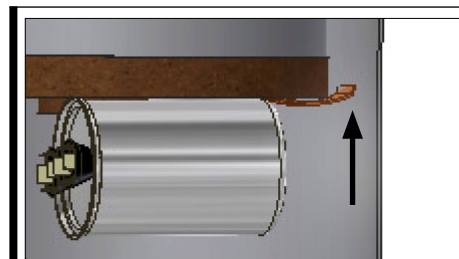


Fig. 9b | Ground clip to face up and at a 90 degree angle from motor

NOTE: For correct Resistance readings refer to [Motor Wiring and Motor Resistance Diagram](#) later in the manual.

- c) Jog or Bump start the motor to verify wiring and operation. (Verify counter clockwise rotation). (See Fig. 12b)

TIP: Otterbine Service Panels work great for testing. Call for pricing.

Power Unit Assembly | Final Assembly & Testing

Refer to Exploded View Illustrations found in the next section for additional assistance.

- A. Motor Base Plate/Bulkhead Preparation: Draw the motor/motor base plate assembly into the motor housing using vacuum.

- a) Wipe clean the motor housing. Be sure to remove any oil deposits, and dirt.

TIP: Use Putty Knife to scrape off debris around rim of the motor housing.

- b) Wipe a generous amount of Seal Lubricant around the top of the motor housing to ease seating of the motor base plate into the motor housing. (See Fig. 13b)

NOTE: Make sure the motor housing's Ground Clip (P/N: 47-0002) is properly installed to the motor prior to placement into the motor housing. Ground Clip should bend towards the top of the motor. (See Fig. 9b)

- c) Lower the motor/motor base plate assembly into the motor housing. Be sure it is even/square on the housing.
- d) Use Compressor capable of reaching 20 in. Hg of vacuum.
- e) Insert an air fitting into one of the oil plug openings. (Service Center Tool P/N: SS-C320) Install an oil plug in the other opening.
- f) Apply 20 in. Hg of Vacuum, you may hear a pop sound when the assembly is seated. (See Fig. 14b)
- g) Clamp off Vacuum for 5 minutes, verifying no drop in Vacuum. This is a check to insure that the rotary seal is seated correctly and there are no leaks present within the entire assembly.
- h) Insert the six (6) Hex Bolts (P/N: 22-0006) with six (6) Flat Washes (P/N: 28-0016) into the motor base plate at the proper locations.

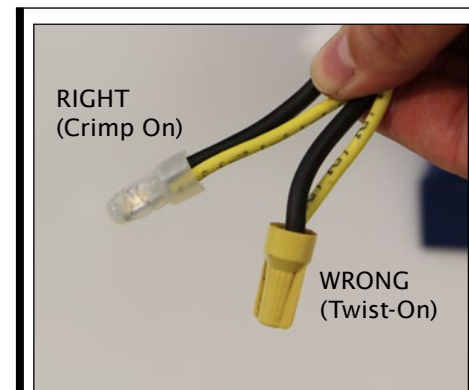


Fig. 10b | Use Crimp-on Connectors to secure wiring.

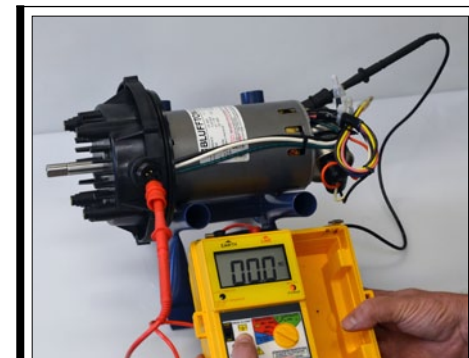


Fig. 11b | Megger and Hi-Pot tests will verify correct wiring and operation. (Megger test shown)



Fig. 12b | Bump start the motor to verify wiring and operation.



Fig. 13b | Wipe seal lubricant around the top of the S/S housing to help with seating the motor/motor base plate assembly.

NOTE: Apply anti-seize on bottom of Hex Bolts (Bostik “NEVER SEEZ”).

- i) Lift the Housing Ring (P/N: 42-0101) insert the Nylon Locknuts (P/N: 26-0006) into the bottom side of the Housing Ring and start to thread them by hand.

NOTE: Make sure that the two (2) flats on the Housing Ring align with the Bulkhead or Hardwired Cable Assembly and oil plugs. (See Fig. 15b)

- j) Using 8mm nut driver, tighten hex bolts to 12 in.-lbs. (1.4 N-m).

B. Vacuum/Pressure Procedures: Should a drop in vacuum occur, perform the following pressure test procedure to pin point the leak.

- a) Re-configure the compressor for pressure.

! CAUTION: VACUUM/PRESSURE COMPRESSOR - THE AIR SUPPLY MUST HAVE AN ADJUSTABLE REGULATOR. The Fractional Series unit must only be tested at a maximum of 5 PSI. Damage/physical harm may occur if a unit is tested at a pressure greater than 5 PSI!

- b) Insert an air fitting into one of the oil plug openings. (Service Center Tool P/N: SS-C320) Install an oil plug in the other opening.
- c) Apply air pressure - **DO NOT USE ANY MORE THAN 5 PSI.**
- d) Use a soapy water solution or water dunk tank to check for leaks. Locate the source of the leak and take corrective actions to resolve.

TIP: Water Dunk Tank works well for leakage testing (See Fig. 16b)

- e) Once it is determined that there are no leaks, remove the air fitting and oil plug.

C. Jog or Bump start the motor to make sure it works. (Verify counter clockwise rotation).

TIP: Otterbine Service Panels work great for motor testing purposes. (Call for Pricing.)

D. Fill unit with Oil, refer to “[Oil Change](#)” under Routine Maintenance Quick Guide and begin at [Step C](#).

E. Final Electrical Tests



Fig. 14b | Draw motor base plate assembly into S/S housing using 20 in. Hg of Vacuum.



Fig. 15b | Make sure two flat areas of the Housing Ring align with the bulkhead or hardwire cable assembly & oil plugs.



Fig. 16b | Water dunk tank works well for testing leakage, you can also use a soapy water solution.

- a) Connect power to the motor and let run for 5 seconds. Verify No-Load amperage draw is correct. No load amperage rating can be found on the [Motor & Capacitor Wiring Diagrams](#). **DO NOT RUN UNIT for more than 5 seconds, damage will occur.**
- b) Electrical connector (*Bulkhead/Pigtail only – skip when Hardwired*) Apply fresh Dielectric Compound or Silicone Grease (P/N: 48-0001) in the bulkhead connector. This will prevent water penetration which will lead to electrolysis and nuisance tripping. (See Fig. 17b)

NOTE: The motor's internal thermal protection overload switch will restart automatically if tripped.

This completes the unit assembly; for details related to the pumping chamber assemblies reference the [Pump Chamber Exploded View](#) illustrations.



Fig. 17b | Place dielectric compound or silicone grease in the bulkhead connector to prevent water penetration which will lead to nuisance tripping.

Routine Maintenance Quick Guide

Otterbine's Fractional Series product line requires periodic maintenance. When a unit is properly cared for, it will provide years of trouble free service.

Fractional Series Maintenance Schedule

Once a Year:

- 1) The aerator should be disconnected from the power source and physically inspected along with the underwater cable for any cuts, cracks or breaks.
- 2) Inspect and clean the pumping chamber components and screen.
- 3) Check ground points on the Power Unit. Check for continuity between the motor housing and the ground pin on the bulkhead. This is to confirm that the motor housing and ground clip are making contact and therefore the unit is properly grounded. (See Fig. 1c)
- 4) Electrical connector (*Bulkhead/Pigtail only – skip when Hardwired*) Apply fresh Dielectric Compound or Silicone Grease (P/N: 48-0001) in the bulkhead connector. This will prevent water penetration which will lead to electrolysis and nuisance tripping. (See Fig. 17b)
- 5) Test the controls inside the Otterbine® Power Control Center (GFCI/Contactor/Timers).

! CAUTION: Never operate the Fractional Series Unit when not submersed (EXCEPT FOR "JOGGING" DURING TESTING).



Fig. 1c | Check for continuity between S/S housing and ground pin on bulkhead to confirm that S/S housing and ground clip are touching.

After Every Three Running Seasons

- 1) An oil change is recommended to keep the unit running smoothly. Otterbine Oil is recommended for this oil change. Reference P/N: 667-002-008 (Oil Aerator 2 Gallon Pail).

Oil Change:

- A. Remove the Power Unit from the float brackets.
- B. Remove the two (2) oil plugs with a 7/32 inch Allen wrench. Drain used oil out of the power unit. The condition of the oil will provide important information on the running condition of the unit. Therefore, when draining oil use a clean bucket and note the condition of the used oil; some items to look for include but are not limited to: (See Fig. 2c)
 - **Milky:** Water present in oil.
 - **Dark, foul smell like sulfur:** Possible burnt winding, unit developed extreme internal heat.
 - **Dark, molasses like in color:** Blown capacitor.



Fig. 2c | [Top] Remove oil plugs and drain oil, note condition of oil. [Bottom] Condition of oil: (a) Clean Oil (b) Milky Oil (c) Dark Oil

DO NOT REUSE OIL! Dispose of the drained oil in accordance with local EPA regulations.

NOTE: It is possible to reuse a motor in which some water was present in the oil. Be absolutely sure that all moisture is out of the motor before reuse.

Should water contamination be present, the unit should be disassembled. Separate the motor's rotor from the stator and wash both in mineral spirits (a parts washer is ideal for this type of cleaning). Allow the motor to dry overnight before retesting. (See Fig 4a)

- C) Before adding oil, check for continuity between the motor housing and the ground pin on the bulkhead. This is to confirm that the motor housing and Ground Clip are making contact. (See Fig. 1c)
- D) Pour the new Otterbine Oil into the top oil plug opening, using a funnel. With the unit standing upright on a flat surface, fill until the oil level starts to come out of the lower oil plug opening, and allow to drain. **DO NOT OVERFILL.**

TIP: Use a funnel with a flexible nozzle, and also install an oil drainage tube within the lower oil plug cavity to allow for proper drainage (See Fig. 3c)
- E) Install the two (2) oil plugs with a 7/32 inch Allen wrench. Always use new Oil Plugs (P/N: 10-0004 x2). The O-ring within the plug will provide the proper sealing surface.



Fig. 3c | Use a funnel with a flexible nozzle, and also install an oil drainage tube within the lower oil plug cavity to allow for proper drainage

! CAUTION: DO NOT OVER TIGHTEN OIL PLUGS OR THEY WILL BREAK, once you feel tension they are tight.

F) If an oil plug becomes damaged during installation or removal, it may be removed by carefully pressing a screwdriver, (Phillips type preferred,) into the center of the plug and turning the plug out, or by using a socket screw extractor.

Zinc Anodes:

(Used on Otterbine systems placed in brackish waters.)

Zinc Anodes are considered a sacrificial metal and work well to protect other metals within a brackish water environment. However they need to be maintained and will require periodic replacement.

- Zinc Anode kits are available for the Fractional Series unit, reference P/N: 12-0130.

Storage and Winterization:

Storage:

The unit/float should never be stored in an upside down position (float down), this could create oil leakage. For proper storage stand the unit/float upright or tilted on its side with the bulkhead connection facing up.

Winterization:

Damaged caused to the motor and pump chamber due to freezing will not be covered under warranty.

The following units can stay in the water; however they should be run a minimum of 12hrs a day, preferably 24hrs a day to avoid freezing in and damaging the motor/pump.

NOTE: If you experience severe weather for prolonged periods we suggest that you remove and store the unit.

Units that Can Run During Winter

These units can remain in water during the winter:

Chamber Configuration Type

- Mixer
- High Volume
- Gemini

NOTE: If the power is shut down and the unit freezes in, it must not be run until the ice clears, otherwise severe motor damage may occur.



P/N 12-0130

Fractional Series Zinc Anode Kit Includes:

Qty	Description	P/N
2	S/S Lock Nut, 1/4-20	C2-112
2	Flat Washer, 1/4", S/S	927-000
2	Hex Bolt, 1/4-20 x 1.5" S/S	24-0016
1	Clamp Hose	46-0066
2	Zinc, Machined	41-0001
4	Mounting Bracket	40-0001
1	Instructions	75-0042-FS

Units to be Removed in Winter

If you live in freezing climates, Otterbine recommends that you winterize and take the following units out of the water in the winter:

Chamber Configuration Type

- Rocket
- Phoenix

NOTE: These models are especially prone to freezing in. If an aerator becomes frozen-in there is a possibility of motor and pump chamber damage.

Replacing Cable:

Pigtails | Splice Kits | Cable Assemblies

When replacing cable, cable assemblies, pigtails and quick disconnects refer to the following. Instructions for splicing will come with individual splice kits when ordered.

Replacement Pigtails:

For Otterbine replacement pigtails reference the following item numbers:

- P/N: MP6511 (Pigtail 3 Pin Small Fractional)
- P/N: 35-0019 (CE Pigtail 12/3 Harmonized)
- P/N: 35-0014 (Light Cable Pigtail 2-Pin)

Splice Kits:

A splice kit is required to complete the connection when performed in the field or service center:

- P/N: 614-016 (Splice Kit Small 5/8 Max)
- P/N: 12-0049 (Splice Kit for 16/2 Light Cable)

Convert Hardwire to Quick Disconnect Cable

A kit is available to convert a hardwired Fractional Series to a Quick Disconnect.

- P/N 17-0057 (QDC Option Frac Unit Field Apply)

Cable Assemblies:

Cable Assemblies come with a cable strain relief, pigtail, factory vulcanized splice and 50ft/15m of raw cable, (additional cable can be added at time of order to accommodate longer runs.) (*Reference Cable Assembly Chart in the Parts Pricelist.*)

Pigtail Protectors

Pigtail Protectors are available to protect plugs on units with quick disconnect cables, where units are removed and cables are left in the water. Pigtail Protector for Fractional Series is: P/N GP1225 (Small Light Cables with Quick Disconnect feature)

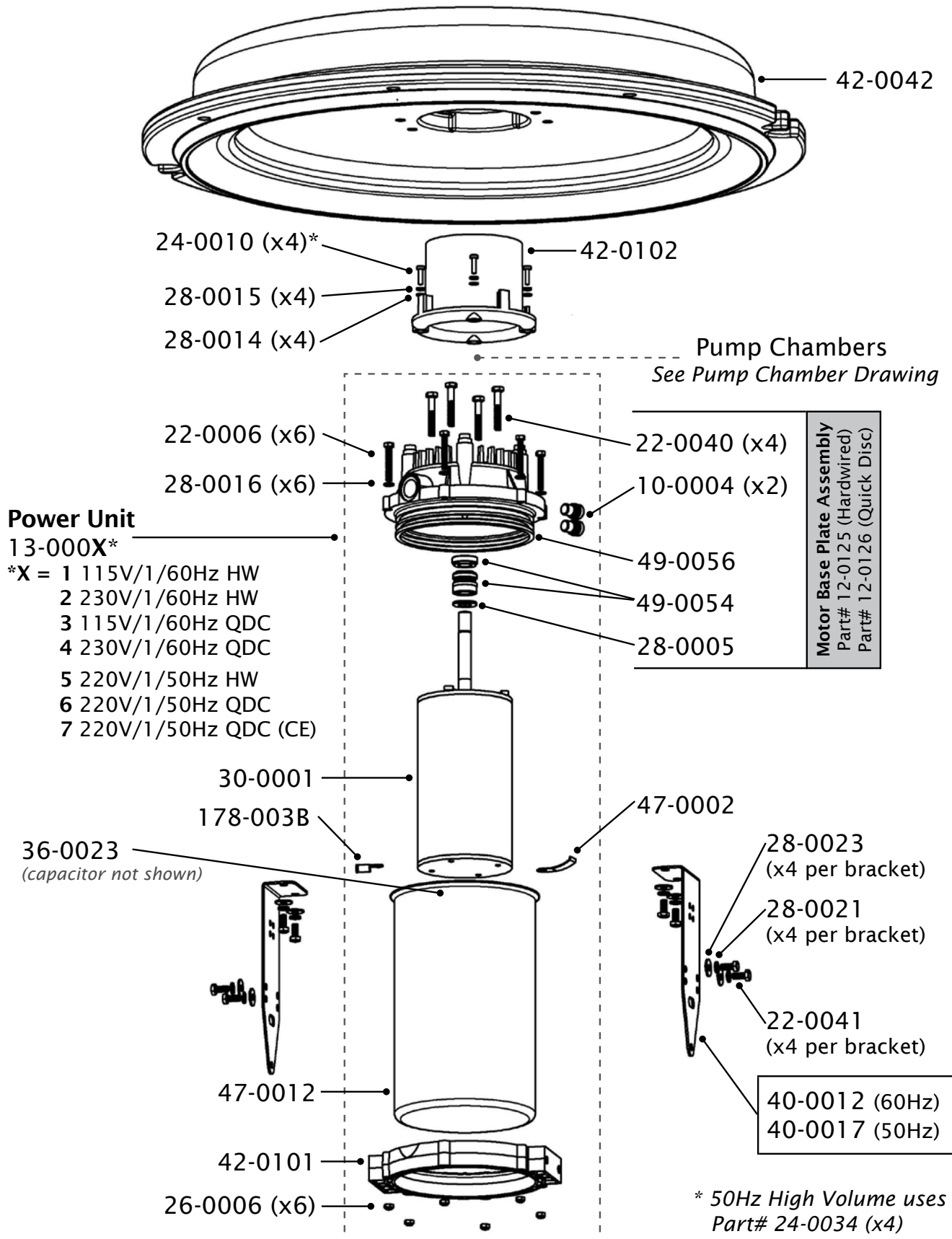
SERVICE TIP: *When not in use store Pigtail Protectors inside the unit's Power Control Center.*

Exploded Views & Technical Data

The following pages contain exploded view illustrations of Fractional Series components and assemblies, including:

- Exploded View | Fractional Series Unit
- Parts List | Fractional Series Unit
- Exploded View | Pump Chambers
 - Aeration Pumps: Gemini, High Volume, Mixer
 - Decorative Pumps: Phoenix, Rocket
- Parts List | Fractional Series Pump Chambers
- Technical Specifications
- Motor & Capacitor Wiring Diagrams | No Load Amp & Motor Resistance Readings

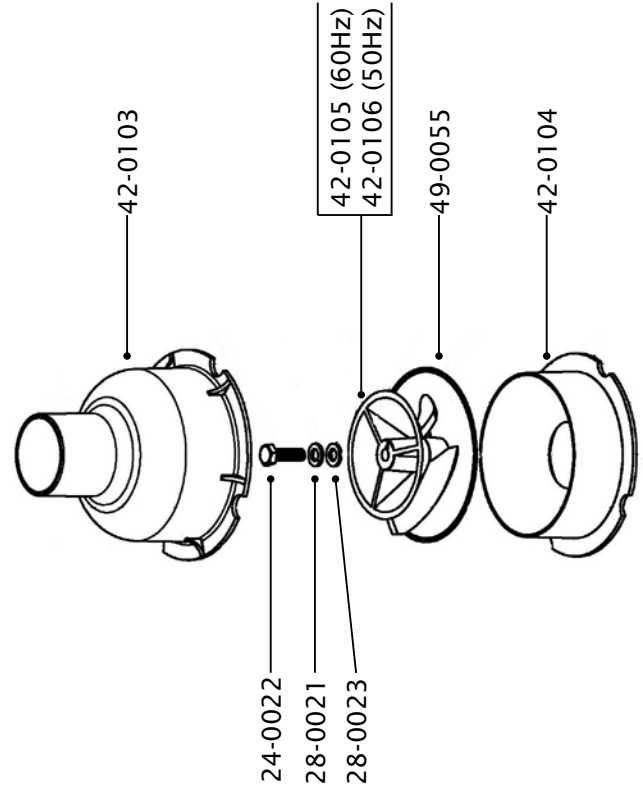
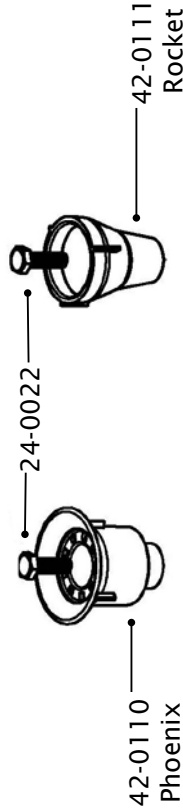
Fractional Series Unit



Parts List | Fractional Series Unit

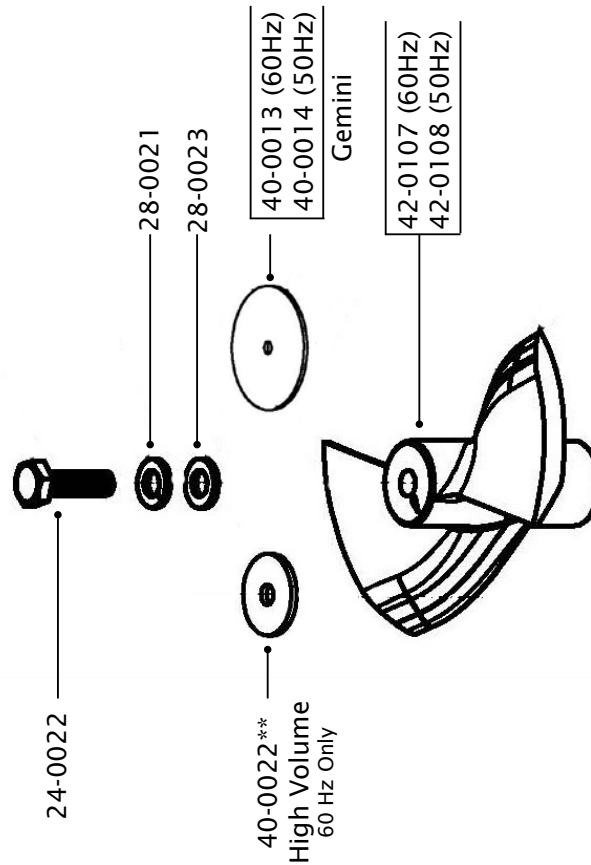
P/N	Description	Quantity
10-0004	OIL PLUG C-2 w/O-RING	2
12-0125	MBP KIT, FS HARDWIRED 6FT 12/3	1
12-0126	MBP KIT, FS QDC & CE	1
13-0001	FS POWER UNIT 115/1/60 HDWIRED	1
13-0002	FS POWER UNIT 230/1/60 HDWIRED	1
13-0003	FS POWER UNIT 115/1/60 QDC	1
13-0004	FS POWER UNIT 230/1/60 QDC	1
13-0005	FS POWER UNIT 220/1/50 HDWIRED	1
13-0006	FS POWER UNIT 220/1/50 QDC	1
13-0007	FS POWER UNIT 220/1/50 QDC (CE)	1
178-003B	CONNECTOR RING 16-14awg #4X283	1
22-0006	BOLT HEX S/S M5x35	6
22-0040	BOLT, M6-1x40 SEALING HEX MBP FS	4
22-0041	BOLT, M6-1x14 S/S HEX FS	8
24-0010	SCREW PAN PHIL S/S M4x16	4
26-0006	NUT NYLON LOCK 316S/S M5	6
28-0005	WASHER, SPACER FS "G" SEAL	1
28-0014	WASHER FLAT S/S M4	4
28-0015	WASHER SPLIT LOCK S/S M4	4
28-0016	WASHER FLAT S/S M5	6
28-0021	WASHER SPLIT LOCK S/S M6	8
28-0023	WASHER FENDER S/S M6	8
30-0001	MOTOR 1/2HP FRACTIONAL SERIES	1
36-0023	CAPACITOR FRACTIONAL SERIES	1
40-0012	BRACKET, 60Hz FLOAT, FS	2
42-0042	FLOAT FRACTIONAL SERIES	1
42-0101	MOUNTING RING FS	1
42-0102	THROAT CHAMBER FS	1
47-0002	GROUND CLIP C2 & C3 MOTOR	1
47-0012	HOUSING 316 S/S FS MOTOR	1
49-0054	SEAL, FS UNIT TYPE G ROTARY	1
49-0056	O-RING MOTOR BASE PLATE FS	1

DECORATIVE PUMPS
Phoenix and Rocket



AERATION PUMPS
Mixer*, High Volume, Gemini

* Slinger Discs are not used with Mixer

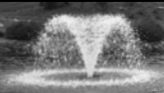



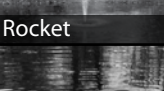


** 50 Hz High Volume replaces slinger with 4 spacers mounted between motor base plate and Open Throat Chamber.
[Throat Spacer = Part# 41-0064 (x4)]

Parts List | Fractional Series Pump Chambers

P/N	Description	Quantity
24-0022	SCREW HEX S/S M6x20 FULL THRD	2
24-0034	SCREW PAN PHIL S/S M4x30	4
28-0021	WASHER SPLIT LOCK S/S M6	1
28-0023	WASHER FENDER S/S M6	1
40-0013	SLINGER DISC, GEMINI 60HZ FS	1
40-0014	SLINGER DISC, GEMINI 50HZ FS	1
40-0017	BRACKET, 50Hz FLOAT, FS	1
40-0022	SLINGER DISC, HV 60HZ FS	1
41-0064	SPACER, HIGH VOLUME FS 50HZ or SPACER, THROAT HV 50HZ FS	4
42-0103	CHAMBER, DECORATIVE FS	1
42-0104	INTAKE, DECORATIVE IMPELLER FS	1
42-0105	IMPELLER, DECORATIVE 60Hz FS	1
42-0106	IMPELLER, DECORATIVE 50Hz FS	1
42-0107	PROP, OPEN THROAT 60Hz FS	1
42-0108	PROP, OPEN THROAT 50Hz FS	1
42-0110	NOZZLE, PHOENIX FS	1
42-0111	NOZZLE, ROCKET FS	1
49-0055	O-RING PUMP CHAMBER FS	1

Fractional Series Technical Specifications

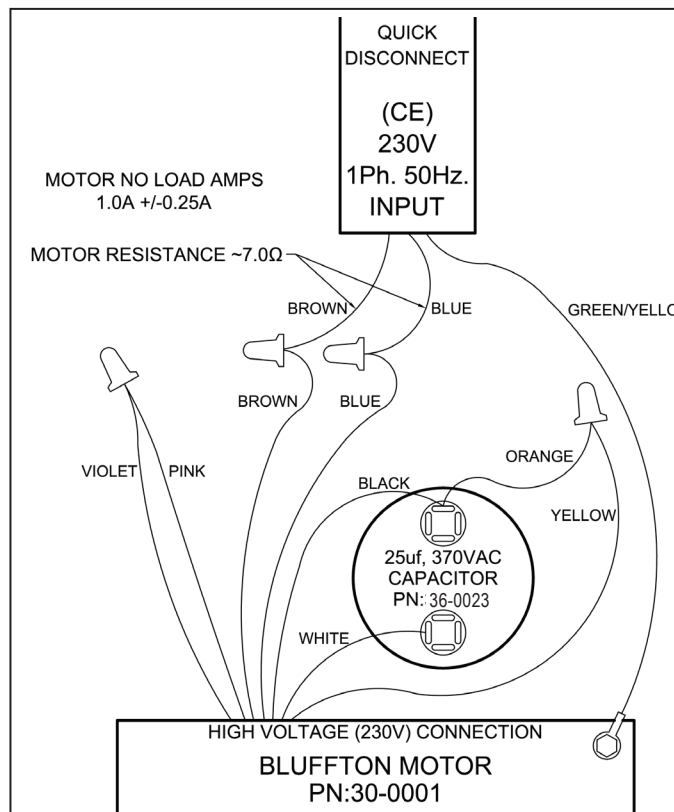
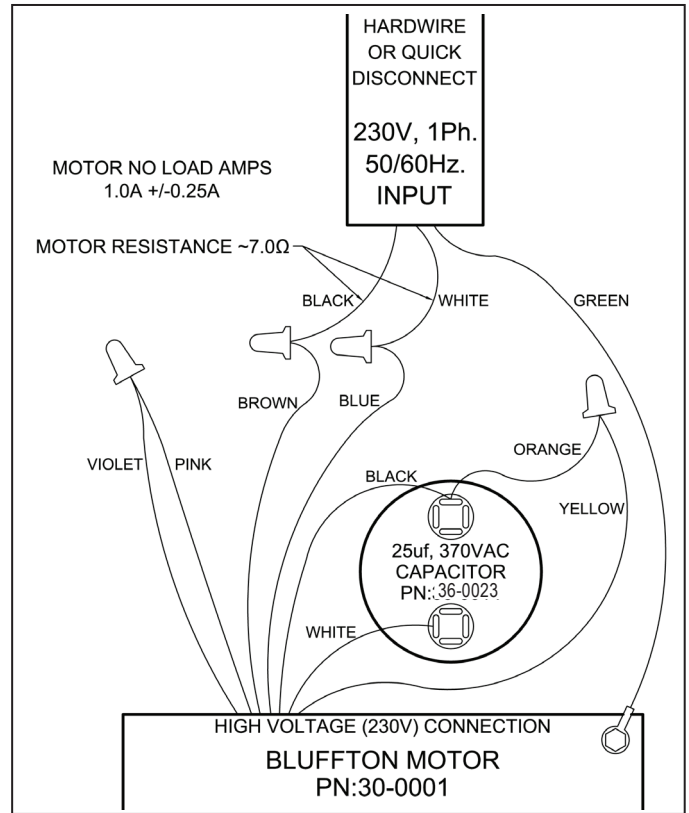
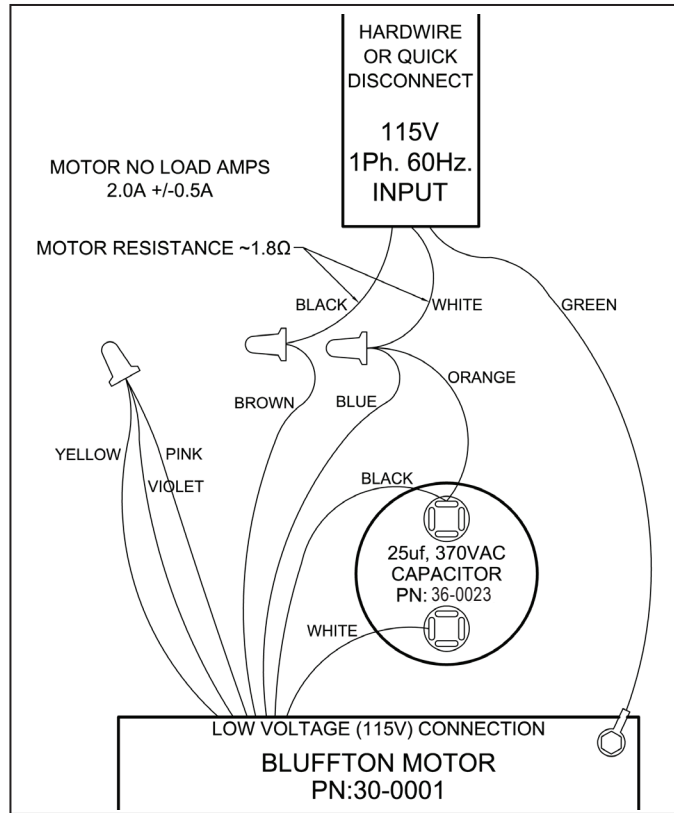
Model	1/2HP Motor RPM/Hz	Voltage/Phase	Running Amps	Spray Height	Spray Diameter	Pump Rate*	Max Cable** 12AWG/4mm ²
 Gemini	3250/60	115/1	5.6	4ft	4.5ft	506GPM	300ft
		230/1	2.8				600ft
	2750/50	230/1	2.8	1.2m	1.8m	115m ³ /hr	183m
 High Volume	3250/60	115/1	5.2	2ft	2.5ft	435GPM	300ft
		230/1	2.6				600ft
	2750/50	230/1	2.8	1m	1.4m	99m ³ /hr	183m
 Phoenix	3250/60	115/1	6.4	Upper: 10.6ft	Upper: 4ft	195GPM	300ft
		230/1	3.2	Lower: 3.8ft	Lower: 10.6ft		600ft
	2750/50	230/1	2.6	Upper: 2.8m	Upper: 30cm	44m ³ /hr	183m
 Rocket	3250/60	115/1	6.4	10.6ft	3ft	179GPM	300ft
		230/1	3.2				600ft
	2750/50	230/1	2.6	3m	40cm	41m ³ /hr	183m
 Mixer	3250/60	115/1	5.6	X		n/a*	300ft
		230/1	2.8				600ft
	2750/50	230/1	2.6			n/a*	183m

*Pumping rates may vary due to voltage, elevation and relative humidity. Specifications are subject to change.

** !IMPORTANT! Cable Lengths are based on a 5% cable voltage drop between the PCC and the motor unit.

Motor & Capacitor Wiring Diagrams

(Includes No Load Amps & Motor Resistance Ratings)



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