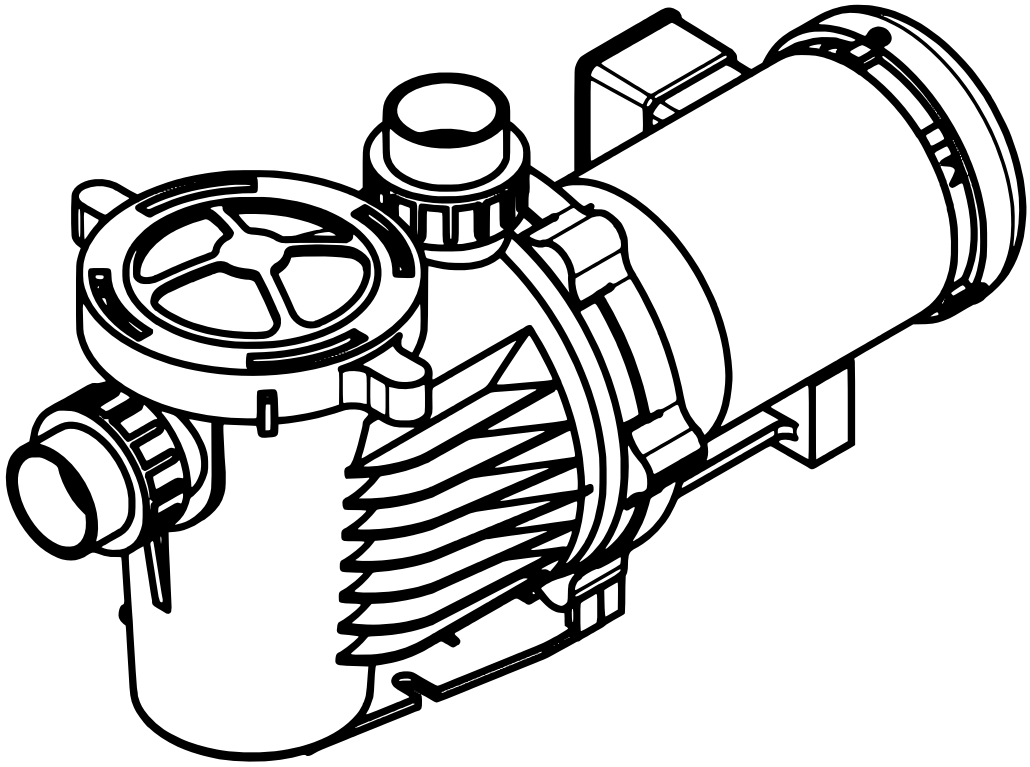
OWNER'S MANUAL

Tidal A Series

Self-Priming Aquaculture Pumps

AL, AF, AH, VAF, VAH



PUMP MODEL _____

SERIAL NO. _____

DATE PLACED IN SERVICE _____

RETAIN THIS INFORMATION FOR FUTURE REFERENCE.

For questions regarding installation, operation or maintenance, call (503) 356-5888 or email techhelp@performancepropumps.com

PerformancePro

PROUDLY BUILT IN THE USA SINCE 2000 PUMPS

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SECTION 1

Important Safety Instructions

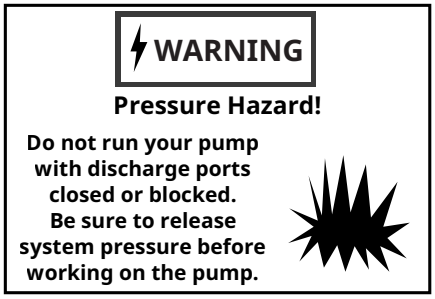
Read all instructions before installing or operating this pump.

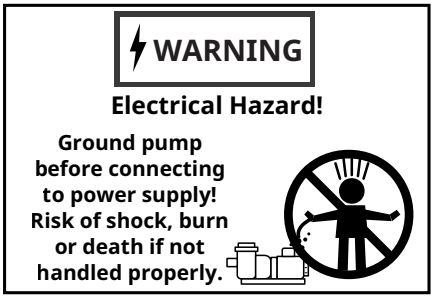
Keep this manual with the equipment. It covers installation, operation, maintenance and troubleshooting of the AL, AF, AH, VAF and VAH series.

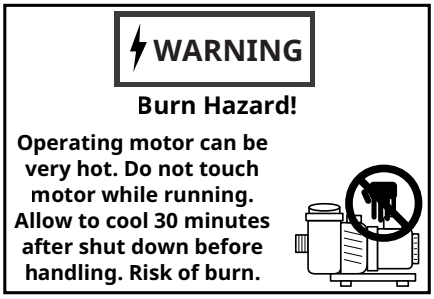
Safety Symbols Used in This Manual

⚡	A condition that can damage the pump or cause minor personal injury if not avoided.
⚡ WARNING	A hazard that, if not avoided, can result in serious personal injury or death.

Principal Hazards







General Warnings

1. This pump and motor must be installed by a qualified electrician or serviceperson in accordance with all applicable state and local codes and ordinances, and in accordance with the National Electrical Code. Improper installation may create a mechanical or electrical hazard that could cause damage to property and result in serious injury or death.
2. Disconnect and lock out power at the source before servicing the pump.
3. **For three-phase AL, AF and AH models, verify motor rotation before placing the pump in service.** Supply phase sequence determines rotation. A pump running in reverse rotates and moves water but will not develop rated flow. See Section 4.
4. **Unexpected start and restart hazard.** A stopped motor is not a safe motor. A drive, timer, PLC, float switch or other automatic control can start the pump, and the pump can restart without warning when power is restored after an interruption or when an overload device resets. Disconnect and lock out power at the source before opening, cleaning or servicing the pump.
5. **Rotating parts hazard.** Keep hands, hair, clothing and tools clear of rotating components. Do not operate the motor with guards or the fan cover removed.
6. Wire to the schematic on the motor.

7. Do not run the pump dry. Fill the priming pot and secure the lid before starting. Dry running destroys the mechanical seal and can cause permanent damage to the pump. Dry-running damage is not covered by the warranty.
8. Install a ball or swing check valve to prevent reverse rotation. Do not use spring loaded check valves.
9. Maintain a minimum flow of two gallons per minute.
10. Inspect the pump and motor weekly. Leakage between the motor and the pump housing indicates mechanical seal failure; replace the seal. Seal faces are a wear item: replace on evidence of leakage, or every three years in fresh water and annually in salt water, whichever occurs first. Abnormal noise requires shutdown. See Section 6.
11. Protect the pump from freezing. Water left in the volute or plumbing can freeze and crack the housing. A freeze-damaged housing can fail when the system is repressurized. Inspect and replace damaged components before returning the pump to service. Freeze damage is not covered by the warranty. See Section 8.

Variable Speed Models APPLIES TO VAF AND VAH ONLY

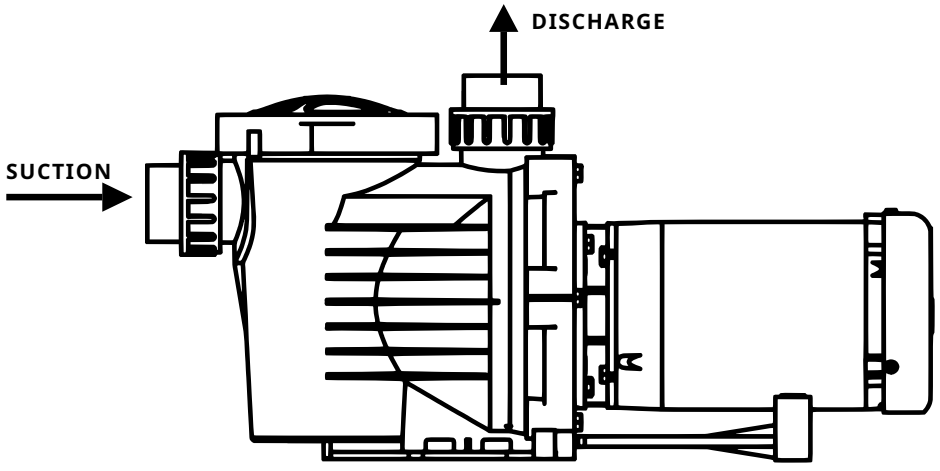
12. Do not lift the motor by the control unit.
13. Shade the motor and control from sun, rain and snow. Provide cross ventilation and protect the ventilation openings from debris.

SECTION 2

Plan the Installation

Siting, pipe sizing and valve selection determine priming performance, seal life and energy consumption. The Tidal A Series has 2″ ports by default and works best with plumbing components sized at 2″ and above.

How the Pump Works



Water enters the suction port and leaves through the discharge port on top of the volute.

Motor speed determines flow rate. Water is drawn from the source into the strainer pot, where the basket captures debris ahead of the rotating assembly, and passes into the eye of the

impeller. The impeller vanes accelerate the water outward; the diffuser converts that velocity into static pressure at the discharge port.

Any restriction upstream of the impeller reduces output: loaded basket, undersized pipe, excess fittings, partially closed valve.

Receiving Inspection

Inspect the pump on receipt for handling damage and verify the product against the order. Report damage to the freight carrier and the vendor. Report order discrepancies to the vendor.

Siting the Pump

Position the pump as near the water and as low as practical. This reduces priming time and cavitation risk.

The installation location must be no higher than 9 feet above the water surface level. The pump will not prime reliably above that height. Position also governs prime retention and cavitation once running.

Mount the motor to a stable base where it will not be submerged. In a vault installation, provide drainage to prevent flooding, mount the pump on a pedestal to raise it clear of the floor, and ventilate the vault.

Locate the motor on a slight elevation so that water does not run or puddle beneath the pump. Avoid splashing or spraying near the motor.

Protecting the Motor

These motors are totally enclosed and fan cooled. The enclosure protects the windings from dust and moisture.

The outer surface of the motor is the cooling surface. Keep the fan cover inlet and the motor exterior clear. Do not stack material against the motor or enclose it. Shade the motor from direct sun and shelter it from rain and snow while maintaining air movement around it. Ambient temperature governs winding temperature: a motor in a still, hot equipment room runs hotter than the same motor in open air.

> **WARNING**
> Protect the motor from dirt, water and foreign matter. Do not operate a flooded motor until an authorized motor technician has inspected it and confirmed it safe to operate. Damage from dirt, moisture, foreign matter or corrosion is not covered by the warranty.

Pipe Sizing and Plumbing

Minimize friction loss. Size pipe diameter to the design flow rate. Keep runs short and minimize elbows and fittings.

Undersized pipe lengthens the prime cycle. Pipe below 2 inches, excess elbows, sweeps or reducers, long runs, additional strainers and any other restriction increase prime time. See Section 5.

The pump ports are 2 inch slip on both the inlet and discharge. The supplied fittings connect to PVC or flex pipe. Support and align all plumbing to avoid stress on the housing and fittings. Use primer and PVC cement at the tailpiece fittings.

Check Valves

Where the water level is above the pump, install a check valve, ball type or swing type, to prevent backflow and reverse rotation. **Do not use spring loaded check valves.** A check valve does not isolate the pump: fit a separate ball valve for isolation and flow adjustment.

SECTION 3

Mechanical Installation

Mount the pump and connect the plumbing before any wiring.

> **WARNING**
> When replacing an existing pump, disconnect and lock out power at the source before removal. Do not connect power to the new pump until the mechanical installation is complete and Section 4 has been followed.

1. Remove the pump from the box after inspection.
2. Secure the pump on a solid, flat foundation. Mount under cover and provide ventilation. See Section 2 for siting and motor protection.
3. Install isolation valves on the inlet and discharge so the pump can be shut off and removed for servicing. Install a check valve, ball type or swing type, to prevent backflow and reverse rotation. Do not use spring loaded check valves.
4. Dry fit the plumbing first to confirm fit and alignment. **Fit the union nut onto the union tailpiece before gluing.**
5. Use pipe sealant rated for plastic pipe. Support the plumbing to prevent strain on the housing. Hand tighten the quick connect fittings; do not over tighten.
6. Check the intake and discharge fittings for a snug fit.

Mechanical installation is complete. Wire the pump per Section 4, then fill and prime it per Section 5. Do not start the pump before the priming pot is filled.

SECTION 4

Electrical

> **WARNING**
> Disconnect and lock out power at the source before wiring any part of the motor. Wiring must be performed by a licensed electrician or professional serviceperson.

Before You Wire

1. Verify that the motor is configured for the supply voltage. A mismatch will damage the motor and voids the warranty. *Example: on a 460V circuit, the motor connections must match the 460V wiring diagram on that motor.*

2. Supply voltage must be within ±10% of nameplate, measured at the motor terminals under load. Incorrect voltage can cause fire or motor damage and voids the warranty.

Making the Connections

3. Wire the motor based on the connection diagram located on or near the nameplate of the motor. High and low voltage arrangements differ.
4. Make all connections clean and tight. Ground the motor. The green ground terminal is located inside the motor connection box and must be connected to an electrical service ground.
5. Connect the pump to an adequately sized dedicated circuit. Shared circuits cause voltage drop.

Circuit Protection

Size branch-circuit conductors, branch-circuit short-circuit and ground-fault protection, and motor overload protection in accordance with NEC Article 430 and all applicable local codes. Conductor ampacity depends on insulation rating, ambient temperature, conduit fill, termination temperature rating and the length of the run — none of which can be specified in advance.

Branch-circuit protection is not motor overload protection. These motors have no integral thermal protector, so overload protection must be provided by the overload relay in a motor starter or by a drive.

When operated without a VFD, these motors may be started across the line. Reduced-voltage and wye-delta starting are not required.

Size overload protection from the full-load current stamped on the motor nameplate. The nameplate is the controlling reference.

Provide ground-fault protection as required by the National Electrical Code and all applicable local codes. Installations in or adjacent to ponds, tanks or other bodies of water may be subject to additional requirements; confirm with a qualified electrician. On single-phase models — VAF, VAH, and single-phase AL, AF and AH — where cord-connected, or where the branch circuit otherwise requires it, supply the pump through a GFCI-protected circuit.

Verify Rotation — AL, AF and AH — Three Phase

> **WARNING**
>
> Do not place the pump in service until rotation has been verified.
>
> Reverse rotation is not only a loss of performance. The impeller is threaded onto the motor shaft and reverse rotation acts against that thread. The impeller can loosen, damaging the impeller, diffuser, seal and shaft. Reverse rotation damage is not covered by the warranty.

Three-phase motors run in either direction depending on supply phase sequence. The pump is close coupled; the motor cannot be run uncoupled. Verify rotation by jogging the motor.

1. Fill the strainer pot, confirm the lid o-ring is clean and close the lid. Do not jog a dry pump.
2. Observe from the opposite drive end, where the fan is visible through the fan cover openings. Keep hands, hair, clothing and tools clear of the fan.
3. Energize the motor for one to two seconds, then cut power. **A jog of this length will not loosen the impeller. Damage results from sustained reverse running, which is why rotation must be confirmed before the pump enters service.**
4. **The fan must turn in the direction of the arrow embossed in the seal plate**, which is clockwise viewed from the opposite drive end.
5. If rotation is incorrect, disconnect and lock out power, exchange any two motor leads and retest.

Reading the fan direction — use either method:

- **Video.** Record the fan through the cover at 120 or 240 frames per second and review the playback. Direction is unambiguous in slow motion and the fan cover remains fitted. A strip of light-colored tape on one blade provides a reference mark.
- **Coast-down.** Observe the fan as the motor slows. Direction cannot be read at full speed. If the fan cannot be seen through the cover, disconnect and lock out power, remove the cover, mark one blade with light-colored tape, refit the cover, then restore power and jog. **Do not jog or run the motor with the fan cover removed.**

Confirm rotation before running the pump beyond the jog.

AL, AF and AH are supplied three-phase as standard. Single-phase versions are available as an option. A single-phase motor has a fixed direction of rotation and does not require the rotation check above.

Variable Speed Models APPLIES TO VAF AND VAH ONLY

VAF and VAH accept single-phase supply at 115 or 230 volts and carry an onboard drive. No external drive panel or motor starter is required. The 2.7 HP models are 230V only.

Where a cord is fitted, do not bury it except in certified conduit, and route it to minimize damage. Replace damaged cords. Do not supply the pump through an extension cord.

Fixed-Speed Models on a Customer-Supplied VFD

AL, AF and AH are inverter capable and may be operated from a separately supplied variable frequency drive. Size input conductors to the drive rating and follow the drive manufacturer's instructions. The drive provides motor overload protection in place of a starter.

SECTION 5

Startup & Priming

Fill the pump basket with water and replace the lid. Do not start the pump until the mechanical installation in Section 3 and the wiring in Section 4 are complete.

Before You Start

- Motor rotation verified on three-phase AL, AF and AH. See Section 4.
- Supply valves open.
- Intake and discharge fittings snug.
- Strainer pot lid o-ring clean and lid closed.

Fill the Pump

The priming pot must be filled with water before the pump is started.

Open the lid and fill until the intake plumbing and the pot are full. Confirm the lid o-ring is free of debris and close the lid.

> **WARNING**
> Do not run the pump dry. Dry running destroys the mechanical seal and can cause permanent damage to the pump. Dry-running damage is not covered by the warranty.

Start the Pump

1. With the priming pot filled and supply valves open, apply power.
2. Water continues to flow into the basket through the priming cycle.
3. The priming cycle must not exceed 15 minutes.
4. If flow into the strainer pot stops, shut the pump down. See Section 9.

What to Expect at Initial Start-Up

The water level in the housing, visible through the clear lid, drops rapidly. Flow into the pump begins within three minutes. Absent air leaks, that flow increases until the pump is fully primed and at rated performance.

Priming With a Check Valve

A correctly installed swing check valve shortens the priming cycle. All connections must be seated and airtight. With the check valve holding, the pump is primed from the first revolution.

A strainer pot level that falls continuously while running indicates either a flow restriction or a union fitting, intake connection or lid that is not airtight. Inspect all connections for debris, crimping and cracking. Tighten or replace as required.

Priming Without a Check Valve

Where the pump and plumbing sit above the water level with no check valve, pressure in the suction pipe falls below barometric pressure and atmospheric pressure drives water toward the pump. The priming cycle is correspondingly longer.

Incoming flow may be minimal or absent for the first few minutes. **If no water enters the priming pot within three minutes, shut down, recheck connections, refill and restart.**

How Long Priming Takes

Prime time depends on pipe type and diameter, suction lift, horizontal distance, motor speed and horsepower. The full cycle ranges from one to fifteen minutes. Flow must be present within three minutes.

All models prime at any rated speed; higher speed primes faster. AL Series runs at 1725 RPM and takes longer to complete the cycle than the 3450 RPM AF and AH on identical plumbing. On VAF and VAH, prime at full speed and reduce to the operating setpoint once primed and flow is established.

If flow does not begin within three minutes, install a rubber flapper swing check valve as low and as close to the source as possible. See Section 2.

Trapped Air

Some plumbing arrangements trap air at a high point, which impedes priming. Fit a manual vent or bleed valve at the high point and use it to vent trapped air. **Do not loosen a union or any other plumbing fitting to vent a pump that is running or pressurized.**

System specific assessments: 503-356-5888, sales@performancepropumps.com.

SECTION 6

Routine Maintenance

Maintenance that does not require disassembly. Disassembly is Section 7.

Inspection Schedule

Weekly	Inspect the pump and motor. Leakage between the motor and the pump housing indicates seal failure; replace the seal. Clean the strainer basket, more frequently under heavy debris load.
Monthly	Record discharge pressure and motor amp draw. Amp draw must remain at or below the motor nameplate full-load current. A rising trend indicates a developing fault.
Every three years	Replace the mechanical seal. Annually in salt water or poor water quality.

Cleaning the Basket

1. Shut down the pump. Disconnect and lock out power at the source and relieve system pressure before opening the strainer pot.
2. Close the ball valve on the return side, where fitted, to prevent backflow.
3. Remove the clamp ring by holding the tabs and turning counter-clockwise. Bump the tabs to release a tight ring. Remove the lid and clean the basket with a hose sprayer and brush. Do not strike the basket against a hard surface; this weakens and damages it.
4. Reinstall the basket with the tab locked in place.
5. Fill the priming pot with water.
6. Refit the lid.
7. Open the ball valve where fitted.
8. Restore power and start the pump.

> **WARNING**
> If the pump has run without incoming flow for more than three minutes, shut down and disconnect and lock out power at the source. Allow a hot volute to cool for a minimum of one hour before opening the lid. The volute housing and strainer pot must be cool to the touch before opening. Risk of burn if opened hot.

Seals and Bearings

Seals and bearings are wear items. The standard mechanical seal is **MPS-564**, a non-metallic seal for salt water service. **MPS-517** is a stainless seal for salt water service. **MPS-513** is a stainless seal for fresh water service.

Replace the mechanical seal on evidence of leakage, or every three years in fresh water and annually in salt water, whichever occurs first. Interval depends on environment and water quality.

This interval is planned wear maintenance, separate from the seal warranty period. Periodic maintenance is not covered by the warranty. See Warranty.

Premature seal failure is caused by dry running, cavitation and abrasives rather than face wear. The weekly inspection governs; the interval is a backstop. On any evidence of leakage, see Section 9.

Abnormal noise indicates failing bearings. Shut down and contact support.

Repair Options

1. Obtain a return authorization from PerformancePro Pumps and ship the pump for repair.
2. Request a list of authorized motor repair centers from PerformancePro Pumps. Repairs performed outside the factory may void the warranty.
3. Order bearings and a seal kit from PerformancePro Pumps and perform the repair on site. See Section 7.

Parts and Service Department — (503) 356-5888, techhelp@performancepropumps.com

SECTION 7

Service & Parts

Work requiring disassembly: mechanical seal, impeller, diffuser and bearing replacement. Maintenance that does not require disassembly is in Section 6.

All moving parts are in the rear sub-assembly. Item numbers refer to the exploded view and the parts list at the end of this section.

> **WARNING**
> Disconnect and lock out power at the source and relieve all system pressure before beginning. Protect the polished and lapped seal faces from damage during handling. Do not run the pump dry; it must be filled and sealed before starting.

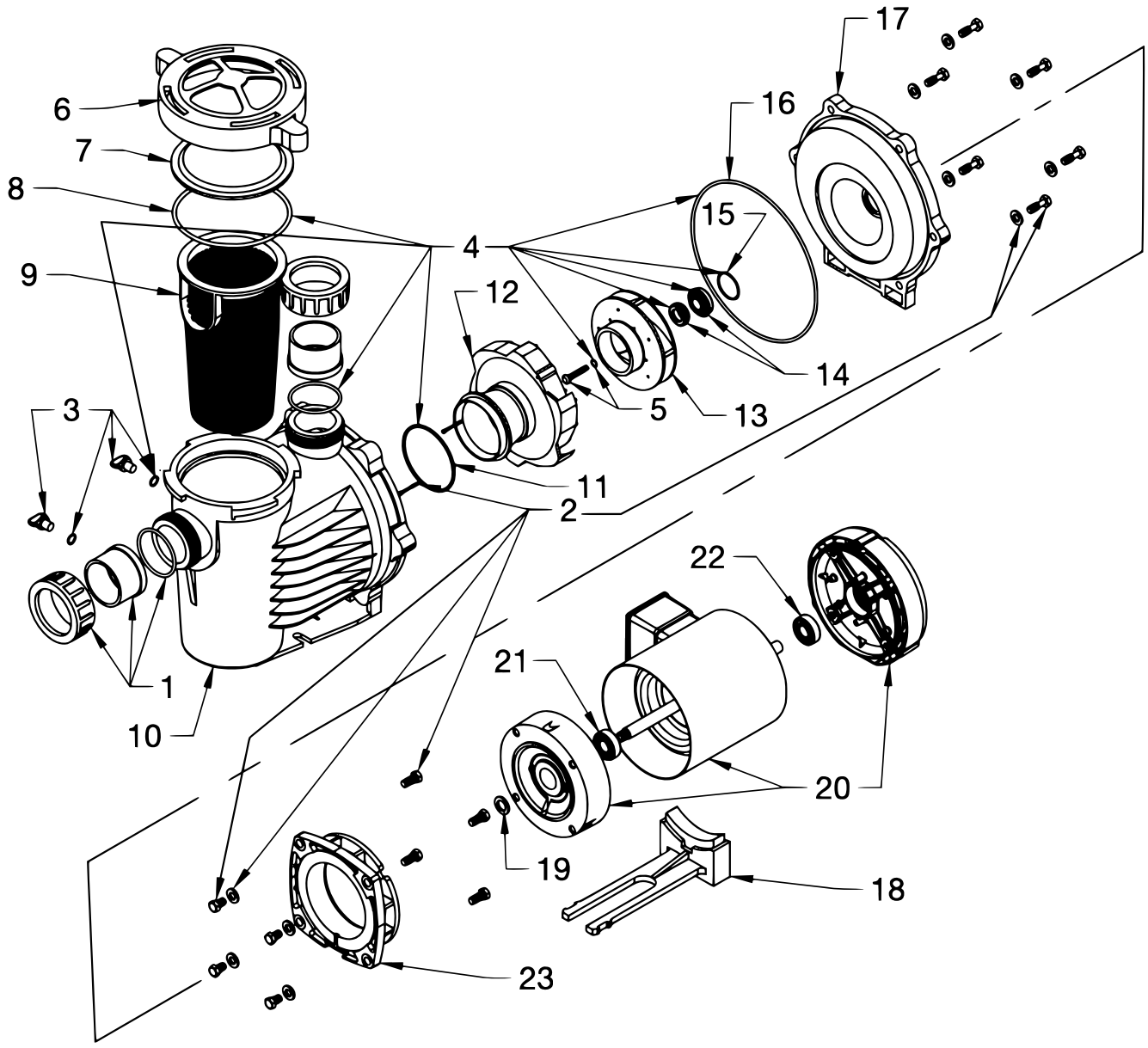
Tools Required

- 3/32 inch Allen wrench
- 7/16 inch open end wrench
- 9/16 inch open end wrench
- Small and large flathead screwdrivers
- #3 Phillips screwdriver

Seal Kit Contents

Seal kit **A-SK1-P** (non-metallic, standard), **A-SK1-S** (stainless, salt water) or **A-SK1** (stainless, fresh water) contains the mechanical seal, lid o-ring, seal plate o-ring, seal plate bore o-ring, reverse set o-ring, two tailpiece o-rings and two drain plug o-rings. The procedure below is the same for all three kits.

Exploded View



Tidal A Series exploded view. Item numbers match the parts list at the end of this section.

Disassembly

1. Disconnect and lock out power at the source.
2. Close the inlet and discharge valves. Drain the pump by removing both drain plugs **(3)**.
3. Loosen and remove the six 3/8-16 × 1-1/8″ bolts **(2)** that hold the pump housing **(10)** and the seal plate **(17)** together.
4. Withdraw the rear sub-assembly from the housing. The housing may remain attached to the plumbing.
5. Loosen and remove the two diffuser set screws that hold the diffuser **(12)** to the seal plate.
6. Remove the impeller reverse set screw **(5)** from the impeller eye where fitted. Hold the impeller stationary and turn the set screw **clockwise** to loosen; it is left-hand threaded.

7. Hold the motor shaft stationary — remove the cap at the opposite drive end and engage the shaft slot with a screwdriver, or the shaft flat with a wrench, depending on motor design — and unscrew the impeller **(13)** counter-clockwise.

8. Loosen and remove the four 3/8-16 × 7/8″ bolts **(2)** that hold the seal plate **(17)** to the motor. On AL, AF and AH models these bolts hold the seal plate to the square flange adapter **(23)**.

9. **AL, AF and AH only.** Loosen and remove the four 3/8-16 × 7/8″ bolts **(2)** that hold the square flange adapter **(23)** to the C-face motor. VAF and VAH models have no adapter; the motor mounts directly to the seal plate.

10. Place the seal plate face down on a flat surface and press the stationary seat **(14)** out from the back. Do not pry it from the front. Remove the rotating half of the seal from the impeller hub by prying with a small flathead screwdriver.

11. Clean the seal plate, seal bore and motor shaft. Remove the slinger **(19)** if replacing bearings **(21, 22)**.

Reassembly

1. Clean or replace the seal plate bore o-ring **(15)**. Moisten with water before installing to prevent rolling.

2. Press the stationary seat **(14)** into the seal plate bore against the stainless steel collar. Moisten the rubber boot with water first. Do not contact or load the polished seal face; a large socket or pipe nipple may be used as a driver. **The seat must sit flat. If one side is higher than the other the seal will leak.** The polished face must be exposed.

3. Clean the impeller hub and fit the rotating half of the seal, polished face outward toward the seat. Moisten the elastomer with water first and press it in squarely.

4. **AL, AF and AH only.** Bolt the square flange adapter **(23)** to the C-face motor with four 3/8-16 × 7/8″ bolts **(2)**. The motor now presents a square flange. VAF and VAH models have no adapter.

5. Install the slinger **(19)** on the motor shaft. Install the seal plate **(17)** to the motor — to the adapter on AL, AF and AH — and tighten the four 3/8-16 × 7/8″ bolts **(2)**.

6. Thread the impeller **(13)** clockwise onto the motor shaft, holding the shaft stationary, until firm contact. Where fitted, reinstall the impeller reverse set screw **(5)** with its o-ring; it is left-hand threaded, so turn counter-clockwise to tighten.

7. Mount the diffuser **(12)** to the seal plate, locating the plastic pins in the seal plate holes, and tighten both diffuser set screws.

8. Confirm the diffuser o-ring **(11)** and seal plate o-ring **(16)** are clean and seated.

9. Assemble the rear sub-assembly to the housing **(10)** with the six 3/8-16 × 1-1/8″ bolts **(2)**. Fit and hand tighten all six before torquing, then tighten uniformly in an alternating opposing pattern.

10. Fit both drain plugs **(3)** with o-rings and tighten. Install the strainer basket **(9)** and fill the housing and strainer pot.

11. Refit the lid **(7)** and clamp ring **(6)**, turning clockwise until snug.

12. Open all valves, restore power and start the pump. Monitor the water level in the housing and basket through the priming cycle; water must be present at all times. Priming may take up to fifteen minutes; see Section 5. **Once primed and running, loss of incoming flow for more than three minutes requires immediate shutdown.** Contact PerformancePro Pumps.

Parts List

ITEM	DESCRIPTION	REPLACEMENT PART OR KIT
1	Tidal A Union Kit	MPF-2-200

ITEM	DESCRIPTION	REPLACEMENT PART OR KIT
2	Pump Hardware Kit	MPH-30 or MPH-30.5
3	Drain Plug Kit	PPD-10
4	Tidal A Seal Kit	A-SK1-P (non-metallic, standard), A-SK1-S (stainless, salt water), or A-SK1 (stainless, fresh water)
5	Impeller Reverse Set Screw Kit	ASI-09
6	Clamp Ring	APC-50
7	Clear Lid	ALL-40
8	Lid O-ring*	ABL-30*
9	Strainer Basket	AAS-2-20
10	Pump Housing	APV-2-10
11	Diffuser O-ring*	APD-06.5 or APD-06.6*
12	Diffuser	APD-2-08 or APD-09
13	Impeller	Various
14	Mechanical Seal*	MPS-564 (non-metallic, standard), MPS-517 (stainless, salt water), or MPS-513 (stainless, fresh water)*
15	Seal Plate Bore O-ring*	PBO-10*
16	Seal Plate O-ring*	APO-3-30*
17	Seal Plate	APB-3-30
18	Motor Base	APF-3-10
19	Motor Shaft Slinger	PMP-12
20	Motor	Various
21	Motor DE Bearing	Various
22	Motor ODE Bearing	Various
23	Square Flange Adapter — AL, AF and AH only	PSCB-10

Kit Contents

KIT NAME	PART NUMBER	CONTENTS
Tidal A Union Assembly	MPF-2-200	(1) 2″ tailpiece, (1) Tidal A Nut, (1) 2″ tailpiece o-ring
Pump Hardware Kit	MPH-30 or MPH-30.5	(6) 3/8-16 × 1-1/8 bolts, (8) 3/8-16 × 7/8 bolts, (10) 3/8″ SS washer, (2) SS socket head screws (size is kit dependent)
Drain Plug Kit	PPD-10	(2) poly drain plugs, (2) o-rings
Tidal A Seal Kit	A-SK1-P (standard), A-SK1-S or A-SK1	(1) mechanical seal, (1) lid o-ring, (1) seal plate o-ring, (1) seal plate bore o-ring, (1) reverse set o-ring, (2) tailpiece o-rings, (2) drain plug o-rings
Impeller Reverse Set Screw Kit	ASI-09	(1) reverse set screw, (1) reverse set screw o-ring

Items marked * are not available for individual sale; use the kit.

SECTION 8

Extended Shutdown

Prepare the pump for any extended period out of service. Required where freezing temperatures occur for extended periods; recommended wherever freezing is possible.

> **WARNING**
> Water expands on freezing and can damage the pump, plumbing and connected components. A freeze-damaged housing can fail when the system is repressurized. Inspect and replace damaged components before returning the pump to service.

Full Disconnection Method

For pumps installed outdoors without the protection of a building or vault.

1. Disconnect and lock out power at the source. These motors are hardwired: either have a qualified electrician disconnect the supply, or leave the motor connected and separate the pump end per Section 7, then insulate and cover the motor.
2. Close the inlet and discharge valves and drain the pump by removing both drain plugs **(3)**. Loosen the lid to improve drainage. Retain the drain plugs.
3. Release the intake and discharge ports by turning the union nuts counter-clockwise.
4. Remove the pump. Store fully drained, with the lid removed and dried and the drain plugs out, in a dry, heated location.

Note: Drain the system plumbing and connected components.

Connected Method

For pumps in a vault, shed or other covered outdoor location where removal is impractical.

1. Disconnect and lock out power at the source. Close the inlet and discharge isolation valves. Remove both drain plugs **(3)** and allow the pump to drain completely. Loosen the lid to improve drainage.
2. Remove and dry the lid, then rest it in place without latching.
3. Drain all system plumbing.
4. Insulate the pump and exposed pipes, covering them fully against moisture intrusion and freezing. **Do not cover directly with plastic sheeting**; it creates condensation.

SECTION 9

Troubleshooting

Common faults and corrective action. Error codes on VAF and VAH models are listed in the Neptune *Installation and Operation Manual* supplied with the pump. Technical support: 503-356-5888, techhelp@performancepropumps.com.

> **WARNING**
> Electrical troubleshooting involving energized circuits, voltage measurements, breakers, motor terminals or electrical panels must be performed by a qualified electrician or serviceperson.
>
> Disconnect and lock out power at the source before mechanical troubleshooting or touching pump components. Relieve system pressure before opening or disassembling the pump or plumbing.

PROBLEM	KNOWN ISSUE	TRY THIS
Pump will not prime	No water in strainer pot	■ Fill the strainer pot and close the lid. ■ Confirm plumbing valves are open.
	Low water in the strainer pot	■ Confirm the basket is seated and refit the lid. ■ Inspect the lid for cracks and the lid o-ring for flat spots and cracking. ■ Inspect intake and discharge unions for cracks and loose connections. Tighten or replace; connections must be airtight.
	Priming cycle running long	■ Prime at full speed on VAF and VAH. See Section 5.
Low or intermittent flow	Flow has slowed or is intermittent	■ Clean the strainer basket. ■ Inspect the impeller for obstruction. See Section 7. ■ Inspect the pump housing, lid and union connections for leaks. ■ Clear any obstruction in the plumbing.
	Reverse rotation	■ On three-phase AL, AF and AH, a pump in reverse rotation develops substantially less head and draws less current. Discharge pressure well below the published curve with amp draw well below the motor nameplate full-load current indicates reverse rotation. See Section 4.
Motor will not start	Circuit breaker tripped, or no power	■ Reset the circuit breaker. ■ Verify supply voltage is present. Test at a second location to confirm.
	Incorrect voltage	■ Verify supply voltage against the nameplate. ■ Verify all connections are secure.
	Bearing seized	■ Disconnect and lock out power at the source, then rotate the motor shaft by hand. Replace the bearings if the shaft does not turn freely.
Motor stalls during operation	Motor overloaded	■ With power disconnected and locked out, confirm the motor turns freely by hand.
	Low voltage	■ Have a qualified electrician measure voltage under load at the connection terminals. Must be within ±10% of nameplate.
	Tripping breaker	■ Repeated tripping indicates a circuit overload beyond the breaker rating. Refer to an electrician.
Motor overheating	Overly hot, shutting down or cycling on and off	■ Incorrect wiring. Refer to an electrician. ■ Have a qualified electrician test the breaker and replace it if faulty. ■ Clear any airflow restriction. Keep the fan cover inlet and motor exterior clear. ■ Provide vented shade where the pump is in direct sunlight.
Motor vibrates or is excessively noisy	Motor base	■ Inspect the motor base for cracks. Confirm mounting bolts are tight.
	Pump	■ Disconnect and lock out power. Confirm the impeller is seated on the shaft. Inspect for impeller damage and obstruction.
	Bearings	■ Abnormal noise indicates failing bearings. Shut down and contact support. See Section 6.
Pump is leaking	Water leaking between motor and pump housing	■ Replace the mechanical seal **(14)** and seal plate o-ring **(16)**. ■ Check the six 3/8-16 × 1-1/8″ bolts **(2)** for loose fit, which indicates worn brass inserts in the pump housing. Tighten or replace.
	Water leaking at lid or union	■ Inspect the lid **(7)** and union nut for cracks. Replace as required. ■ Inspect the lid o-ring **(8)** and union o-rings for cracking and flat spots. Replace as required.

Limited Warranty

PerformancePro Pumps
Tidal A Series
LIMITED WARRANTY

This Tidal A Series product is warranted to the Purchaser (defined herein as the original end user) to be free of defects in construction and workmanship at the time of purchase. Fixed speed models are warranted for three years from the date of purchase for fresh water use, or one year for use with salt water or other suitable fluids. Variable speed models are warranted for one year from the date of purchase, regardless of fluid. In the event this product malfunctions within the applicable period the sole obligation of PerformancePro Pumps will be to replace or make this product capable of being operated according to the original product description without charges for labor or parts to the Purchaser, and are subject to the following conditions:

1. The malfunction is proved attributable to a defect in construction or workmanship, including repairs performed under this warranty. Malfunction for any other reason — including but not limited to misuse, abuse, negligence, accident, corrosion or salt build up, incorrect wiring or electrical supply, tampering with parts, or improper installation — will not be remedied under this warranty. Problems or damage from failure to comply with instructions in the owner's manual, improper plumbing and positioning, flooding, incompatibility with fluid chemistry and running the unit dry are not covered under this warranty.
2. PerformancePro Pumps must perform all warranty repairs. Purchaser must retain the purchase receipt and present it with this certificate as proof of ownership and entitlement to warranty repairs. The cost of unauthorized repairs will not be reimbursed to Purchaser by PerformancePro Pumps, and are not the responsibility of PerformancePro Pumps. If repairs by Purchaser or a third party damage the product, such damage is not remediable under this warranty.
3. Purchaser shall bear all shipping, packing, and insurance costs and all other costs, excluding labor and parts necessary to effectuate repairs under this warranty. Purchaser will pay for return freight.
4. For applications that involve fluids other than water, the Purchaser shall retain and present to PerformancePro Pumps evidence of purchaser's compatibility tests under actual operating conditions. Any problems caused by a chemical incompatibility of the fluid with the pump materials, are expressly not covered by this warranty.
5. Periodic check-ups and/or maintenance are not covered by this warranty.
6. For all sales in the State of Oregon this is the sole and exclusive manufacturer's warranty. There are no warranties which extend beyond the warranty set forth herein, and in accord with Oregon Revised Statutes ORS 72.3160 any and all implied warranties, including any warranties of merchantability and fitness for particular purpose, are disclaimed and excluded. Some States do not allow disclaimers/exclusions of, or limitations on how long an implied warranty lasts, so in such States, and except as is otherwise provided by applicable law of said States, no action on a warranty implied at law shall be commenced more than one year following the date of purchase. No action shall be brought for breach of any express warranty subsequent to the expiration of the express written warranty.
7. Incidental and consequential damages (specifically including, but not limited to, damages for loss of profits or damages relating to down time of personnel, equipment, or facilities) caused by malfunction, defect, or otherwise, whether alleged to be the result of breach of any express or implied warranty, or the negligence, willful misconduct or other act of PerformancePro Pumps are not the responsibility of PerformancePro Pumps, and to the extent permitted by law, are hereby excluded, including, but not limited to property damage, and to the extent not prohibited by applicable law, personal injury or death and Purchaser hereby agrees to expressly waive any claim for all such damages. If a final determination is made in a court of competent jurisdiction that any one or more of the damages which are disclaimed, excluded and/or waived under this paragraph are not allowed under public policy or applicable law, then the disclaimer, exclusion and waiver of all of the other damages not prohibited by public policy or applicable law shall continue to apply.
8. This warranty does not apply to any malfunction arising out of any application of this product other than in a use compatible with the manufacturer's product description, unless such application is, upon request, specifically approved in writing by PerformancePro Pumps.
9. The provisions of this warranty are severable and if any provision shall be deemed invalid, the remaining provisions shall remain in full force and effect.
10. This limited warranty extends only to the original Purchaser (end user) and does not extend to transferee or purchaser from the original Purchaser. Any purported assignment without the consent of PerformancePro Pumps shall be null and void.
11. No warranty whatsoever of chemical compatibility or application suitability is given. It is the sole responsibility of the Purchaser to determine if the merchandise purchased is suitable for Purchaser's specific application. PerformancePro Pumps strongly advises that the customer perform any and all tests necessary to determine material compatibility and product suitability for customer's specific conditions and needs.
12. This contract shall be governed by and in accordance with the laws of the State of Oregon. Purchaser agrees that proper jurisdiction and venue for any claim brought hereunder is in Washington County, Oregon.
13. This limited warranty is incorporated by reference into the contract of purchase for the products supplied by PerformancePro Pumps to Purchaser under said contract.

QUICK REFERENCE

Important Numbers

Maximum suction lift	9 ft above the water surface
Pump ports	2 in slip, inlet and discharge
Minimum flow	2 GPM at all times
Supply voltage	Within ±10% of nameplate, measured under load
Before first start	Verify rotation, three-phase AL, AF and AH — Section 4
Before every start	Fill the priming pot, secure the lid
Priming	Flow within 3 minutes; full cycle up to 15
Loss of flow when running	Shut down within 3 minutes
Weekly	Inspect for leakage, clean the strainer basket
Mechanical seal	3 years fresh water, 1 year salt, or on leakage

Do not run the pump dry.

Keep This Manual With the Pump

Technical support	(503) 356-5888
Email	techhelp@performancepropumps.com
Parts and service	Return authorization required before shipping

Service Record

Record all service performed on this pump. Seal replacement intervals in Section 6 are measured from the last replacement, not from the date of purchase.

DATE	OPERATING HOURS	WORK PERFORMED	BY

PerformancePro

PROUDLY BUILT IN THE USA SINCE 2000 PUMPS

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