2026 SERIES 1 INSTALLATION AND OPERATIONS MANUAL

Arid Bilge Systems

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IMPORTANT SAFETY NOTE

Arid Bilge Systems are designed to remove residual bilge water that traditional bilge pumps leave behind. Arid Bilge Systems do not replace standard emergency bilge pumps. Traditional high-volume bilge pumps must remain installed, operational, and properly maintained to protect the vessel from flooding, sudden water intrusion, or changes in vessel trim. The Series 1 system is a dry bilge management system. It is intended to keep one selected bilge area dry, fresh, and protected by removing trace residual water from a selected low point after the primary bilge system has done its job.

INSTALLATION OVERVIEW

The Series 1 system may be mounted in many locations aboard the vessel, but it should not be mounted directly in the bilge. The central unit is not waterproof and should be installed in a dry, accessible bulkhead or protected mechanical area. The best installation location is usually near the discharge route and above the discharge through-hull or selected drain path when possible. The unit should be mounted upright with the UP arrow on the faceplate pointing upward. The system uses gravity as part of its internal collection and discharge process. Do not mount the unit on its side, upside down, or in any position that prevents it from operating upright. This is especially important on sailboats or vessels that may operate at a heeling angle. If the vessel heels, the unit will heel with the boat, so the system should be mounted as upright and level as reasonably possible during normal vessel operation.

GENERAL INSTALLATION RULES

- Do not mount the Series 1 unit inside the bilge.
- Mount the unit upright with the **UP** arrow facing upward (Right side of system).
- Mount the unit in a dry, accessible service location.
- Keep the discharge hose as short and direct as practical.
- Do not cut the intake tubing shorter than the supplied 20-foot length.
- Coil excess intake tubing neatly instead of cutting it.
- Keep the unit accessible for service, inspection, and future troubleshooting.
- Keep existing emergency bilge pumps installed, operational, and properly maintained.

MOUNTING THE SERIES 1 UNIT

The Series 1 unit includes four #6 mounting holes on the two mounting flanges. These mounting flanges are intended for typical bulkhead mounting. If the unit must be shelf-mounted, a pair of flat aluminum bars may be attached to the bottom of the box so they protrude beyond the sides, similar to the existing mounting flanges. The aluminum bars can then be fastened to the shelf or mounting surface on a legacy series 1, but not the current gen series 1.

Use appropriate stainless steel fasteners for the mounting surface. Before fastening the unit or any bracket, verify that the fastener length will not damage the enclosure or interfere with system components. mjThe unit should be mounted securely, but it should also remain accessible. Do not install the unit in a sealed or unreachable location where future inspection, tubing removal, power service, or troubleshooting would be difficult.

INTAKE TUBING REQUIREMENTS

The Series 1 system is supplied with a single bilge pickup and one 20-foot length of 5/32-inch intake tubing. This 20-foot intake tubing length is required for proper system operation. The tubing length provides the correct resistance so the system can recognize when fluid is present at the pickup.

Important: Do not cut the intake tubing shorter than 20 feet.

If the intake tube is shortened, the system will not correctly recognize when bilge water is present at the pickup through its resistance length. This can cause the system to cycle off too early and leave the bilge wet. The 20-foot length also helps provide the correct backpressure during discharge so previously collected water can be purged from the internal collection chamber and sent through the discharge route. If the full tubing length is not needed for the physical distance between the unit and pickup, coil the excess tubing neatly near the system or along the route. Do not cut the tubing shorter.

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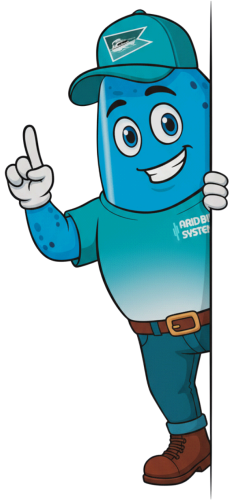
- If the full tubing length is not needed for the physical distance between the unit and pickup, coil the excess tubing neatly near the system or along the route. Do not cut the tubing shorter.

INTAKE TUBING BEST PRACTICES

- Use the supplied 5/32-inch intake tubing.
- Keep the finished intake tube length at 20 feet.
- Coil excess tubing instead of cutting it.
- When possible, leave a service loop at both the system end and the pickup end.
- Route tubing cleanly and securely.
- Avoid kinks, crushing, tight bends, or heat-damaged areas.
- Keep tubing away from moving machinery, sharp edges, and hot surfaces.
- Label the intake tube if the installation may be serviced by someone unfamiliar with the boat.



DISCHARGE HOSE ROUTING

The Series 1 system is supplied with a black 1/2-inch 90-degree barbed discharge fitting. This fitting can be rotated in the direction needed for the installation. When possible, rotate the fitting clockwise.

A 1/2-inch polybraid hose is the most commonly used discharge hose. The discharge hose should be kept as short and direct as practical.

For best performance:

- Keep the discharge hose under 12 feet whenever possible.
- The shorter the discharge route, the better.
- Avoid running the discharge hose uphill more than 1 foot above the unit.
- Route the discharge downhill to the discharge point whenever possible.
- Avoid kinks, restrictions, tight bends, undersized fittings, or unnecessary check valves.
- Secure all discharge hose connections with proper clamps.
- Verify that the final discharge path is clear before leaving the installation.

The Series 1 system is more efficient at lifting fluid from the bilge pickup than it is at pushing discharge water uphill above the unit. For this reason, discharge routing should be planned carefully before the unit is mounted.

PREFERRED DISCHARGE CONNECTION POINTS

Preferred discharge connection points include:

- Hatch drains
- Deck drains
- Sink drains
- Other static, vented overboard drains
- Approved discharge routes suitable for the vessel

Static and vented drains are usually preferred because they are less likely to interfere with bilge pump operation and are easier to understand during future service. Do not discharge the Arid system back into the same bilge area the system is trying to keep dry.

CONNECTING TO AN EXISTING BILGE PUMP DISCHARGE

If the Arid Bilge System must be connected to an existing bilge pump discharge line, the vessel must have a proper riser loop or anti-siphon loop. The Arid discharge should be T-connected between the top of the riser loop and the thru-hull fitting. Do not T-connect the Arid discharge between the bilge pump and the top of the riser loop. If the T-connection is made in the wrong location, the discharge water may return to the bilge through the bilge pump. When this happens, the Arid Bilge System may continue running cycles while moving the same water in an endless loop. Over time, this can cause unnecessary runtime and may reduce system performance.

CHECK VALVE WARNING

Do not add a check valve to the bilge pump discharge line to solve backflow issues. A check valve can create a vapor lock condition. Vapor lock may prevent the bilge pump from priming properly, causing the pump to run for an extended period while air slowly escapes from the pump housing. If a check valve is already installed in the bilge pump discharge hose, review whether it should be removed during the Arid Bilge System installation. Traditional bilge pumps are emergency safety equipment. Nothing in the Arid installation should interfere with the bilge pump's ability to remove emergency water.

ENVIRONMENTAL RESPONSIBILITY

As with all overboard discharge devices, the vessel owner or captain is responsible for ensuring that hydrocarbons, fuel, oil, or other contaminants are not discharged into surrounding waters. Once the Arid Bilge System is installed and the bilge remains dry, leaks often become easier to identify. Water, fuel, oil, or other fluids may leave visible trails through the dry bilge, making it easier to locate and correct the source. Arid Bilge Systems also offers Eco-Drain oily water separator options for customers who want an additional environmental protection layer before discharge. Collected hydrocarbons, oil, fuel, or contaminated residue should be collected in an approved container and disposed of properly. Do not discharge hydrocarbons into the water, storm drains, the ground, or back into the bilge.

POWER CONNECTION

The Series 1 system accepts either 12- 24 VDC power.

Power wiring:

- Red wire: positive
- Black wire: negative
- Protect the circuit with a 3- to 10-amp fuse or circuit breaker
- The unit also contains an internal 1-amp fuse mounted on the printed circuit board to protect internal components

Typical power draw:

- Standby: approximately 19 milliamps
- Running: approximately 0.25 amps at 12 volts

Before connecting power, verify polarity and confirm that the circuit is properly protected. The breaker or fuse should be clearly labeled so the owner, captain, or service technician can turn the unit off when needed.

BILGE PICKUP OPTIONS

There are three pickup styles available for the Series 1 system. One pickup is supplied with the unit depending on the application.

Common Series 1 pickup options include:

- Mini standard bilge pickup
- Pick-up Offset
- L-shaped pickup wand

The mini standard pickup is designed for flat-bottomed bilge areas where the pickup can sit properly at the water collection point. The standard Series 1 mini pickup is approximately 2 inches by 3 inches and is intended for low points that are wide enough for the pickup to sit flat. The pickup offset is for Offset is designed for V-bottomed bilges, narrow bilge compartments, or tight spaces where a flat pickup cannot sit properly at the water collection point. The L-shaped pickup wand is designed for those tight spaces, such as an A.C. drip pan, or shower sump.

PICKUP PLACEMENT

The pickup should be placed where water actually collects. The purpose of the pickup is to remove residual water from the low point that a traditional bilge pump cannot reach. Initial placement should be tested before securing the pickup permanently. Run the system with the pickup loose in the bilge at first so the installer can confirm that the pickup is located at the true low point. Leave extra tubing near the pickup when possible. This allows the pickup to be moved during testing and makes future adjustment easier.

PICKUP INSTALLATION RULES

- Place the pickup at the true low point where water collects.
- Do not drill into the pickup body.
- Do not crush or over-clamp the pickup.
- Do not block the pad or underside flow path.
- The pickup pad must be able to breathe and absorb water.
- Test the pickup location before securing it.

- Use light tubing tension or an approved retaining method if the pickup needs help staying in position.
- Keep the pickup accessible for cleaning and service.

CONNECTING THE INTAKE TUBING

Route the intake tubing first, then connect it to both the pickup and the Series 1 unit. Push the tubing approximately 7/16-inch into the fittings at the pickup and at the unit. When resistance is first felt, the tube is only partially inserted. Continue pushing until the tube is fully seated and locked in position. If the tubing is not fully inserted, the connection may create a vacuum leak. A vacuum leak can prevent the system from drying the bilge because the system will pull air instead of water.

REMOVING INTAKE TUBING

To remove the tubing from a push-to-connect fitting:

1. Depress the orange plastic ring around the tube.
2. Hold the ring fully depressed.
3. Pull the tubing out while continuing to hold the ring in.
4. Do not pull the tubing out without depressing the ring.

Use care when disconnecting tubing so the fitting and tubing end are not damaged.

SECURING THE MINI STANDARD PICKUP

Securing the mini standard pickup is often not necessary. The pickup has a non-skid underside and a low center of gravity.

If the pickup moves or flips during operation, use one of the following methods:

1. Leave the pickup loose and monitor it during testing.
2. Tie-wrap the intake tubing to a point directly above the pickup to help hold the pickup in position.
3. Fabricate a light aluminum retaining bracket if additional support is needed.

If using an aluminum bracket, do not apply downward pressure to the pickup. The pad underneath the pickup needs to breathe and absorb water. Over-clamping can prevent proper water entry and reduce performance.

SECURING THE L-SHAPED PICKUP WAND

The L-shaped pickup wand has a vertical tube that can be tie-wrapped to a nearby structure. Make sure the bottom of the L-shaped section points downward because the wand absorbs water from under the L. The wand is made from soft-walled copper and can be gently hand-bent if needed. Use care when bending the wand. The bend should be smooth and gradual. Do not kink the wand. A kinked wand can restrict flow and reduce system performance.

STARTUP SEQUENCE AND NORMAL OPERATION

Once the intake tubing, discharge hose, pickup, and power are connected, the Series 1 system will begin its automatic operating sequence.

The basic operating sequence is:

1. Power is applied.
2. The green LED begins slowly flashing.
3. The system begins with a discharge cycle.
4. After approximately 10 seconds of discharge time, an audible click may be heard.
5. The LED begins flashing more rapidly.
6. The system begins vacuuming the collection chamber.
7. If only air is pulled after approximately 16 seconds, the green LED turns solid and the unit enters its three-hour rest mode.
8. If water is being pulled, the internal vacuum switch transfers after approximately 8 to 15 seconds.
9. The LED flashes in a long-short pattern.
10. The pump shuts off and the unit continues pulling water for approximately 45 seconds.
11. After the 45-second intake period, the system repeats the process and discharges a small amount of collected water at the start of each new cycle.
12. When the pickup area is dry, the system enters its three-hour rest mode.

The Series 1 system operates automatically. When the bilge is dry, the system remains in rest mode until the next programmed cycle or until power is reset.

LED STATUS SUMMARY

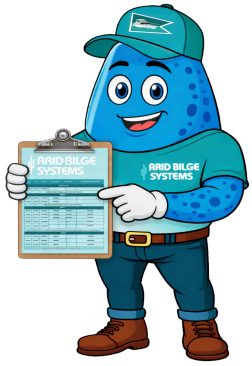
Typical LED behavior:

- Slow flashing green LED: system is powered and preparing to cycle
- Rapid flashing green LED: vacuuming sequence active
- Solid green LED: system has entered rest mode
- Long-short flashing green LED: water is being pulled into the collection chamber
- Solid red LED with continuous alarm: system flooded fault
- Flashing red LED with intermittent alarm: blocked intake condition

Use the alarm sections below to identify the likely cause and the recommended next step.

ALARMS AND TROUBLESHOOTING

There are two primary alarm conditions that can cause the Series 1 Nano unit to sound an audio alarm.



The two main alarm types are:

1. System flooded fault / blocked discharge condition
2. Blocked intake condition

Always inspect the installation carefully before assuming the unit has failed. Many alarm conditions are caused by pickup clogging, tubing restriction, blocked discharge routing, or improper installation.

ALARM 1: SYSTEM FLOODED FAULT / BLOCKED DISCHARGE

A continuous tone alarm with a solid red LED indicates a system flooded fault. This condition occurs when the internal collection chamber is overfilled with bilge water or when the system cannot discharge collected fluid properly.

Typical behavior:

- Continuous tone alarm
- Solid red LED
- Compressor runs and blows air into the collection chamber for approximately 30 seconds

- The unit attempts to reset itself
- If the chamber is no longer flooded, normal operation resumes
- If the chamber remains flooded, the unit repeats the process two additional times
- If the chamber is still flooded after three attempts, the red LED remains lit with no audio alarm
- The unit enters a three-hour rest period and then attempts to resume operation again

Possible causes:

- Blocked discharge hose
- Closed or blocked discharge path
- Discharge hose routed too high above the unit
- Kinked discharge hose
- Obstruction in the thru-hull or drain path
- Internal discharge issue
- Mechanical failure inside the unit

CLEANING A PICKUP

To clean a pickup:

- Remove the pickup from the tubing.
- Spray degreaser onto the pad.
- Massage the pad gently.
- Backwash the pickup using a garden hose or sink over the fitting.
- Inspect the pad for separation or damage.
- Reinstall if the pickup is clean and intact.

BLOCKED DISCHARGE TROUBLESHOOTING

If a continuous alarm and solid red LED occur:

1. Turn power off.
2. Place a cup or small bucket under the black 90-degree discharge fitting.
3. Remove the discharge hose from the discharge fitting.
4. Restore power to reset the system.
5. Observe whether water discharges from the unit.
6. If 3 to 5 ounces of water come out once the pump starts running, inspect the discharge hose and discharge path for blockage or restriction.

7. If the alarm repeats every 5 to 15 minutes, check whether the discharge hose is routed too high above the unit.
8. If the alarm remains after the discharge route has been confirmed clear, contact Arid Bilge Systems for service guidance.

If the discharge hose is mounted too high above the unit, the system may repeatedly alarm and then enter the solid red LED condition after multiple attempts.

ALARM 2: BLOCKED INTAKE

An intermittent audio alarm with a flashing red LED indicates a blocked intake condition. A blocked intake means the system is unable to move air or fluid through the intake line properly.

Typical behavior:

- Intermittent audio alarm
- Flashing red LED
- Compressor blows air into the collection chamber for approximately 30 seconds
- If backpressure clears the pickup, normal operation may resume
- If the blockage remains, the unit repeats the process two additional times
- If the blockage still remains, the unit enters a three-hour rest period with the red LED flashing

Possible causes:

- Clogged pickup pad
- Dirt, debris, oil, or sediment around the pickup
- Kinked or crushed intake tubing
- Blocked intake tubing
- Pickup pad saturated, damaged, or unable to breathe freely
- Intake tubing not fully seated in the fitting
- Vacuum leak at the fitting
- Pickup placed too tightly against the bilge surface

BLOCKED INTAKE TROUBLESHOOTING

If an intermittent alarm and flashing red LED occur:

1. Inspect the bilge pickup.
2. Remove and clean the pickup if needed.
3. Inspect the pickup pad and screen area for dirt, oil, debris, or damage.
4. Check the intake tubing for kinks, crushing, tight bends, or restrictions.
5. Remove the intake tube from the unit.
6. Reset power and allow the unit to run a single cycle.
7. If the unit runs one cycle and returns to a solid green LED, the issue is likely in the intake tubing or pickup.
8. Reconnect the intake tube to the unit but leave the pickup disconnected.
9. Make sure the open end of the intake tube is sitting in clean air and not touching anything.
10. Reset power again.
11. If the system returns to a solid green LED with the tubing attached but the pickup removed, the pickup is likely the source of the restriction.
12. If the alarm returns with only the tubing attached, remove and inspect the intake tubing.
13. If the intermittent alarm sounds with no intake tubing attached to the unit, contact Arid Bilge Systems for technical support.

CLEANING A PICKUP

To clean a pickup:

- Remove the pickup from the tubing.
- Rinse the pickup with fresh water.
- Clear debris from the pad, screen, and fitting area.
- Gently work out any dirt, sediment, or residue.
- Backwash the pickup using a garden hose or sink over the fitting when possible.
- Inspect the pad for separation, saturation, damage, or excessive buildup.
- Reinstall the pickup only if it is clean and intact.

A clogged pickup does not always mean the system has failed. In many cases, it means the pickup is doing its job by stopping debris before it enters the intake tubing or the internal system.

Replace the pickup if it is damaged, saturated, separated, clogged beyond cleaning, or no longer performing properly.

SYSTEM CAPACITY

The Series 1 system is designed to remove residual bilge water, not to manage major leaks or emergency flooding.

Approximate system capacity:

- 5 quarts per hour
- Approximately 1.25 gallons per hour

If the vessel has a slow but continuous leak, the leak should be located and repaired. If the volume of water entering the vessel exceeds the capacity of the Series 1 system, the bilge will not become dry. The Series 1 system supports normal dry bilge maintenance. It is not a replacement for emergency bilge pumps.

WINTERIZING

If the system may be exposed to freezing conditions, winterization may be required. The Series 1 system is pneumatically driven, and only a small amount of water normally remains inside the unit during rest mode. Before shutting off power for winter storage, allow the unit to enter rest mode with the green LED solid. If the discharge has been installed above the unit, if the black 90-degree discharge fitting has been rotated upward, or if the discharge hose loops above the unit, the internal discharge riser may remain filled with water and should be protected.

Winterizing process:

1. Allow the system to enter rest mode with the green LED solid.
2. Place approximately 5 ounces of biodegradable antifreeze at the bilge pickup.
3. Reset power to the system.
4. Allow the system to pull the antifreeze through the unit.
5. Once the system re-enters rest mode and the green LED remains solid, shut off power.
6. In spring, verify that the discharge thru-hull valve, if equipped, is open before restoring power.

Use only appropriate biodegradable marine antifreeze suitable for the vessel and storage conditions.

MAINTENANCE

The Series 1 system is designed to be low-maintenance. For best performance, inspect the pickup periodically and clean it when needed. A good general practice is to inspect the pickup every 6 to 12 months, depending on how dirty the bilge environment is.

Clean or inspect the pickup sooner if:

- The bilge is dirty
- Construction debris is present
- Fiberglass dust or paint chips are present
- The pickup has been exposed to oil, fuel, sludge, or heavy residue
- The system gives a blocked intake alarm
- The bilge remains wet longer than expected

CLEANING PRODUCTS AND SOAP WARNING

Avoid allowing concentrated foaming cleaners, heavy detergents, harsh chemicals, or soap residue to enter the Arid Bilge System. Foam can interfere with normal system operation and may damage internal air-circuit components over time. Harsh chemicals may also damage pickup materials, tubing, seals, check valves, or other components.

Before major deck washdowns, bilge cleaning, or air-conditioning coil cleaning:

1. Turn off power to the Arid Bilge System.
2. Complete the cleaning process.
3. Rinse the bilge thoroughly with fresh water.
4. Allow traditional bilge pumps or normal drains to clear the bulk water and cleaner residue.
5. Turn the Arid Bilge System back on after the area has been thoroughly rinsed.

The simple rule is:

Let the bilge pump handle bulk soapy water. Let Arid finish drying the residual water.

AIR-CONDITIONING COIL CLEANING WARNING

Air-conditioning technicians may use acidic coil cleaners that can damage marine system components if allowed to collect in the bilge and enter the Arid system.

If AC coil cleaning is scheduled:

1. Turn off power to the Arid Bilge System before service begins.
2. After the AC service is complete, rinse the bilge thoroughly with fresh water.
3. Use enough fresh water to dilute and flush the cleaning residue.
4. Allow traditional bilge pumps to clear the bulk water.
5. Restore power to the Arid Bilge System after the cleaner residue has been diluted and cleared.

Do not allow concentrated acidic cleaner or harsh chemical residue to be pulled directly into the Arid Bilge System.

SHIPPING THE UNIT FOR SERVICE

If the unit must be returned to Arid Bilge Systems for service, prepare it carefully before shipping.

Shipping preparation:

1. Dismount the unit.
2. Leave the intake tubing and pickup in place on the boat unless otherwise instructed.
3. Take the unit to an area where water can drain safely.
4. Rotate the unit so the black 90-degree discharge fitting is at the lowest point.
5. Rock the unit gently side to side and back toward the discharge fitting.
6. Continue until no more water drips from the discharge fitting.
7. Wrap the discharge fitting with electrical tape to help contain remaining moisture.
8. Do not place the unit inside a sealed plastic bag.
9. Pack the unit securely in a cardboard box with protective material.
10. Complete the Arid Bilge Systems Repair Request Form before shipping the unit whenever possible.

If the form cannot be completed online or printed, include a written note inside the box with:

- First and last name
- Company name, if applicable
- Return shipping address
- Phone number
- Email address

- Unit model
- Serial number
- Clear description of the issue

Do not seal the unit in plastic. If moisture escapes during shipping, it is better for a small amount of moisture to enter the cardboard box than to trap water against the electronics inside a sealed plastic bag.

CONTACT INFORMATION

Questions, service requests, or troubleshooting support:

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And as always.

Stay Dry, Fresh, and Protected!