



Series 2 with Indicator LEDs*



Installation and Operations Manual

IMPORTANT DISCLAIMER: All Arid Bilge Systems are designed to remove the trace amounts of residual bilge water typically left behind by the average bilge pump. The boat’s existing traditional high-volume bilge pumps must always be kept in service to prevent sinking or changes in vessel trim, which can be brought about anytime a sudden larger inflow of undesired water occurs. The conventional bilge pump is still a necessary safety item that the prudent mariner always verifies proper operation of as part of their regular maintenance schedule.

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*Please note: If your Series 2 unit does not have visible indicator LEDs, you should refer to the manual for that style, which was in production until 2024. Please visit our website or contact us to get this manual.

Installation

Mounting the unit:

- Your new Series 2 dry bilge system can be mounted virtually anywhere aboard your boat, except in the bilge, as the central unit is basically a vacuum cleaner and is **not waterproof**. The perfect installation would be to mount the box slightly above the discharge thru-hull fitting on a bulkhead, similar to a battery charger.
- Please note the “**up^**” arrow on the upper right-hand corner of the face plate for correct box orientation. All Arid Bilge Systems operate similar to the common wet vac and cannot be mounted on their side, as gravity does play a part in the system’s operation. If mounting aboard a sailboat, it is even more important that these guidelines are met, as the occasional heeling angle of the vessel will place the unit on that same angle.
- There are six #8 mounting holes on the two mounting flanges which will work well for the average bulkhead mounting. If the unit needs to be shelf mounted, then it is easy to attach a pair of 1/8”x1”x7” flat aluminum bars to the bottom of the box (protruding out on both sides, similar to those existing mounting flanges). Then, the aluminum can in turn be secured to the shelf.

Discharge:

- The black 1/2” 90-degree barbed discharge fitting can be rotated in any direction as needed, and it’s best if turned clockwise when possible. Alternatively, this standard discharge fitting can be swapped for a 3/8” to a 5/8” barbed fitting, as long as it has a 1/2” NPT thread on the other end of the adaptor which will thread directly into the unit.
- A half inch Polybraid hose is the most commonly used discharge hose. This discharge should be under 12 feet in length, **the shorter the better**, and should not run uphill more than two feet above the unit, **preferably downhill to the discharge**, if possible. The unit is much more powerful in suctioning water up to twelve feet above the bilge, but it is not as efficient at pushing the water above the black 90-degree discharge port.
- The other end of the discharge hose is usually T-connected to an existing outflow thru-hull. **Hatch drains, deck drains and sink drains are usually best to T-connect to**, as they are both static and vented.
- If you *must* connect to an existing bilge pump outflow, it absolutely must have a **riser loop**. Most of the boat manufacturers today do place a riser (or anti-siphon) loop that runs above the thru-hull fitting between it and the bilge pump. Its sole purpose is to prevent backflow from outside the vessel back into the bilge through the bilge pump, if the vessel were temporarily overloaded and the thru-hull were to become submerged. As long as the **Arid Bilge discharge is T-connected between the peak of the riser loop and the thru-hull fitting**, the discharge water should harmlessly travel overboard through the common shared thru-hull fitting. If, however, the T-connection were made between the bilge pump and the peak of the riser loop, then the bilge water will return to the bilge through the bilge pump. Why not place a check valve near the bilge pump to prevent this instead? Because then you will likely create a condition called “vapor lock.” This is where the water that is on the thru-hull side of the check- valve remains,

providing resistance to the bilge pump. Meanwhile, the bilge pump is sitting in a flooded bilge compartment attempting to prime itself. Visually, when this occurs, we see 10 to 20 minutes of run time on the submerged bilge pump, as small bubbles of air continue to escape from the pump housing. Finally, as the pump reaches prime, the water rushes overboard. So, if you already have a check-valve in your bilge pump discharge hose, it might be a good time to remove it during the installation of an Arid Bilge System, as this system only increases the likelihood of vapor lock, whether or not the Arid Bilge is T-connected to the bilge pump discharge.

- As with all overboard discharge devices, the vessel owner or Captain is responsible for seeing that hydrocarbons are not expelled from the vessel into the surrounding waters. Fortunately, at Arid Bilge, we do offer solutions for this issue as well. Once the Arid Bilge System is installed and running and the bilges remain parched, any leaks will start to leave trails through the dry bilge back to the different sources, meaning that your Arid Bilge System becomes an early leak detector. Now you can look for water, fuel, oil leaks etc., and actually find them. This is very different than the standard scenario, where a small lake exists in the bilge that combines all liquids, preventing the identification and quantification of any leaks. At Arid Bilge, we also offer inexpensive oily water separators which we market as the “Eco Friendly Discharge Companion III.” This device allows the bilge water to pass overboard while retaining virtually all of the Hydrocarbons.

Power:

- The two-conductor power cord needs to be connected to a DC power source of either 12 or 24 volts. The voltage is regulated automatically. There is a label on the unit just above the power cord entry point that designates 12 - 24 volt power. If, instead, your voltage sticker says “12 VDC” or “24 VDC” and you have no indicator LEDs on the side of the unit, then you have the wrong manual for your Series 2 unit. Please look for Series 2 manual updated 7-21 which is for the earlier units.
- Please connect the red to positive and the black to negative. The power cord must be protected by a 2-to-10-amp fuse or circuit breaker. The unit has an internal 1.5-amp fuse in a fuse holder next to the power cord terminals. This fuse protects all of the Arid Bilge System internals.
- The system draws between 24 and 41 milliamps in standby, and up to 0.8 of an amp at 12 volts when running on a single intake.

Intake Tubing:

- The unit comes with either 80 or 100 feet of the 5/32” intake tubing.
- The intake tubes can have different overall lengths, anywhere between 20 and 50 feet.
- **All intake tubes need to have a finished cut length of between 20 and 50 feet** to ensure that the virtual float switch will operate correctly. If you were to cut the length of the intake tubing to less than 20 feet, the system would not correctly recognize the fact that bilge water is present at that bilge pickup and will prematurely cycle off. This would result in that bilge compartment remaining wet. Please coil any excess intake tubing as needed on runs under 20 feet, never cut it too short.

Pickups:

- There are three styles of bilge pickups available for the Series 2 units. We provide the bilge pickup(s) of your choice, one for each zone plus a single spare.
- The most popular is the 2" x 3" mini standard bilge pickup, which is designed for flat bottomed bilges that are at least 2" wide.
- The second choice is the 2.75" x 4.25" offset bilge pickup, which pulls from the edge of the pickup where the push to lock fitting is located. The offset is designed to sit with the fitting edge down into a V compartment and the offset pickup should have an angle not to exceed 45 degrees from level.
- The third choice is the L shaped pickup wand which is designed for V bottomed or very narrow bilge compartments.
- The intake tubing should be routed first and then **cut square** and pushed approximately 7/16" into the fittings at the pickup and the unit. When you start to feel resistance while inserting the tube into the fittings, you are only half inserted on your way to the proper locked and seated position for the intake tubing. **When the tube is not fully inserted, it creates a vacuum leak and your Arid Bilge will not be able to dry the bilge, as it would be suctioning air instead.**
 - If you purchased the pinch valve upgrade, there will be soft walled Silicon tubes dangling out of the intake ports instead. If this is the case, simply insert the hard walled intake tube from the bilge pickup into the soft walled Silicon tube and continue to massage the soft walled tube until there is about a 1/2" overlap of the two different tubes. You can place a small micro tie wrap over this connection point for added security.
- The tubing is removable both from the bilge pickup and the Arid Bilge System. Simply depress the orange plastic ring that surrounds the tube where it enters the fittings fully, and hold. Next, pull out on the tube while continuing to hold the orange ring in, and the tube will release and slide back out.
 - If you have the soft walled Silicon tubes at the unit end, then simply pull back on the edges of the soft walled Silicon tubing until it releases. **Do not try to pull the two tubes apart.**
- Securing the mini standard bilge pickup is usually not necessary, as it has a non-skid surface on the bottom side and a very low center of gravity. Initially, the unit should be run with the pickups loose in the bilge, to verify that they are at the lowest points. Excess intake tubing coiled near the bilge pickups will allow them to be easily relocated. Once the low points have been found and the bilges are absolutely dry, then there are three different ways to secure the mini standard bilge pickups if needed. First, leave them loose and monitor to see if they do flip or move. Second, if they are not stable, you can tie-wrap the intake tubing to something directly above the pickups. Pulling down on the tubing as the tie wraps are pulled tight will exert additional pressure to help the bilge pickup stay in place. And third, if the pickup is still wandering, it's time to purchase a 3/4" x 1/8" aluminum flat bar at the local hardware store. You then drill a 1/2" hole near one end, place a 90-degree bend about an inch from that same end and then

cut your bracket to length. Drilling two smaller holes into the vertical portion of the bracket will allow you to secure it to whatever is available in the bilge area. The intake tube is removed from the pickup, the ½" hole is placed over/around the pickup's fitting, and the intake tube is then re-inserted. No downward pressure should be exerted on the pickup, as the pad underneath acts as a sponge and needs to breathe in order to absorb water. If you purchased the pickup-wand instead, it has a vertical tube that is easily tie-wrapped to whatever is available at its location. Make sure that the bottom of the L is pointed down, as it absorbs from under the L of the pickup wand. Also, the wand is made of soft-walled copper, so you can hand bend the vertical black part of the L, but care must be taken to see that it is gently curved with a radius, not kinked.

Normal Operation

Once discharge, intake and power are all connected and power is applied, the Arid Bilge Series 2 will go through the following sequence:

- Three seconds after power is applied, the compressor starts running.
- For the next six seconds, the unit will discharge any previously collected water.
- Then we hear a click, and for the next three seconds, the unit will pump air backwards through the active intake tube while continuing to discharge any remaining water. If the bilge pickup is submerged, it will often be passing bubbles at this time.
- Next, we hear another audible click with a tonal change. This is when the vacuuming of the collection chamber starts to occur. As the chamber reaches a full vacuum level at 20", we hear the pump speed up, then shut off and this happens roughly 12 seconds later for a total pump run time of about 23 seconds.
- As the pump shuts off, an intake valve opens and this is when liquids or air starts to flow rapidly through the 5/32" intake tube. The length of the tube as well as the height of the unit above the bilge pickup all affect the timing. If it's pulling air or water or some combination thereof, the timing of this part of the cycle will also vary accordingly.
- Next, the unit will repeat this process for intake number 2, and if equipped, run a third time for zone 3. If the unit finds two wet zones i.e. both 1 & 2 are pulling water, it will run cycles pulling from both in tandem until either of them starts to pull air.
- Eventually, the unit will return to checking the two or three ports and find that it's pulling air on all individually.
- It then enters a 3-hour siesta or rest mode, where the unit will be completely silent and the green LED is lit solid. Hopefully, the siesta mode is where your Arid Bilge will spend most of its time. To wake the unit up at any time it's taking a siesta, simply turn power off for three seconds and then reapply.

Internal Processor Indicator Lights Legend

There are three indicator LEDs on the left side of the unit: a Blue, Green, and Red along with an internal audio Piezo buzzer that buzzes with the red LED.

The **Blue LED** tells you which intake or intakes are active. If it's repeating a single flash, . . . then it's pulling from zone 1 the top port. Two rapid flashes zone 2, the second port. If equipped with a third zone: three rapid flashes means it's pulling from the bottom most port. If the blue light is lit solid, _____ then it is pulling from two different zones at the same time.

The **Green LED** will flash long and slow _ _ _ when the unit is discharging. The Green LED flashes rapidly . . . while the unit is vacuuming the collection chamber. And finally, the Green LED lights solid _____ while the unit is in the sleep mode after all bilge compartments are dried. The unit will remain in the sleep mode for 3 hours before checking the bilge compartments again for liquids. You can wake the unit up and make it run a new set of cycles at any time simply by turning the power off for a few seconds and seeing that the green LED went out. Then turn power back on and the unit will start to cycle again in 3 seconds.

If the compressor pump is not running, then check the middle green LED. If it's lit _____ solid, then the unit is in the three hour hibernate mode. If all LEDs are *not* lit, then the unit is probably not receiving power. Check the terminals with your voltmeter and see if the correct 12 or 24 voltage is present. If you see the correct voltage and the LEDs are all not lit then the internal GMA 1.5 amp fuse is probably blown.

Alarms with matching **red LED**

There are several different issues that can cause your Series 2 unit to produce an audio alarm. If it is alarming, both the red LED and the piezo buzzer will flash and sound different sequences to let you know the cause of the alarm.

1. **A blocked intake / clogged zone.** The unit will run its normal cycles, pulling all but the affected zone dry. After the other zones are dried, the unit will alarm with the compressor running as it is attempting to blow air backwards through the blocked intake. Both the alarm buzzer and the red LED will sound and flash together in the following sequence: 1 short flash & beep followed by three long flashes & beeps . _ _ _ _ would be a zone 1 clog. Two short flashes & beeps followed by three long flashes & beeps . . _ _ _ would be a zone 2 clog. And if your unit is equipped with a third zone then 3 short flashes & beeps followed by three long flashes & beeps . . . _ _ _ _ would be a third zone clog. Once you have isolated which zone is causing this alarm, you now have three possibilities:

- a) The intake valve is not opening or the intake tubing is clogged, crushed, kinked or the bilge pickup pad is clogged. You should first visually inspect the pickup pad. If it looks like it is significantly clogged up, then remove and clean. You can depress the orange ring surrounding the tubing where it enters the fitting and pull the tube out. To prove or disprove that the pickup is indeed the problem, place the bare intake tubing out in the air where it can't come in contact with anything. Reset the system and let it run through its cycles. If it no longer pauses for two minutes when it gets to that zone and it fails to alarm again, then we are certain that the pickup was the problem. The pickups are easy to clean: just spray some degreaser on the pad, massage it a little, take it out on the dock and place a garden hose over the fitting so that the fitting completely disappears under the hose end. Turn the water on and back wash. Inspect the perimeter of the pad to make sure that it's not releasing or delaminating. Then reinstall it if all looks good.
 - b) If removing the pickup did not change anything, i.e., the unit is still pausing for 2 minutes and the alarm is still sounding, then disconnect the tubing for that zone from the Series 2 unit and reset the power again. If the alarm has been cleared this time, then inspect the intake tubing as this will be the problem.
 - c) If removing the intake tubing from the Series 2 unit still does not clear the alarm, then the intake valve is no longer opening, and this may require that the unit be sent in for service. There are two different intake valves that we use in our current production units.
2. **A blocked discharge.** The unit alarms with rapid beeping and a rapidly flashing red LED.
- a) If it's springtime and your boat has just been splashed and you are hearing this alarm, please check and see if the seacock valve on the thru-hull has been opened. We get these calls at the start of every season. If you see this, then open the valve, reset power and your Series 2 unit will alarm one more time for 90 seconds while it discharges water, then resume normal operation.
 - b) The collection chamber is flooded and the seacock was not the problem. Get a Big Gulp cup or small bucket and remove the discharge hose from the black 90-degree barbed fitting. Hold the container under the fitting and reset the power. If the unit alarms and discharges into your container, then there is something else blocking the discharge that you need to locate.
 - c) If the unit still alarms with a rapid beeping and red LED flashing after a power reset and no water comes out of the discharge, then either the compressor is bad, or there is a bad three-way air valve. In either event, it is best to call or email us, and you may likely be dismounting and shipping the unit in for service.
3. **Open port alarm:** If the buzzer & red LED beep & flash 2 short and 2 long . . _ _ after the system has just run a cycle for each zone, then you do not have any tubes connected, or the tubes are not pushed into the fitting far enough, or the intake tubes are too short in overall length i.e. under 20 feet in overall length.

4. **Internal leak(s).** The unit runs two cycles in 90 seconds (or 135 seconds for a 3 zone) and then alarms with 4 long beeps & flashes. _ _ _ _ If you don't hear the pump speed up before it shuts down, then there are several potential leak points.
- a) The discharge check valve will usually seal even with a dry discharge riser, but not always. The simplest check is to remove the discharge hose from the 90-degree discharge fitting. Reset the power and after 11 seconds of runtime, there will be a second audible click. Place your thumb over the end of the 90-degree fitting for the next several seconds and see if you feel any suction. If you do feel suction, then you can try rotating the 90-degree fitting so that the opening is pointed up. Next, pour a small amount of water in – about 5 ounces should do the trick. Run the system and see if operation is restored. If this is the case, you may consider rinsing one of your dry compartments every couple of weeks so that the Series 2 unit sees some water flow.
 - b) If holding your thumb over the discharge does not cause you to feel suction and the pump does not speed up, then the internal leak could be caused by a stuck open intake valve, a failed fitting or a bad compressor or 3-way air valve. We would disconnect the intake tubes at this point. If you have any of the intake tubing left over from the original installation, you can cut a 4-inch piece. If you have a three-zone version, then you will have to cut a second piece and block the end off or kink it, to block the third intake port. Loop the short piece of tubing into two of your intakes so that they are sealed to each other. Reset the power and listen to see if the pump now speeds up before shutting off. Does the unit pause for two minutes with the loop in place? If so, reset the power and run the unit and just after the unit shuts off, turn power off. Now disconnect the looped tube and see if there is any suction on any of the ports. If you do hear a hiss and quickly place your fingers over the ports to determine which one has a problem, this will help you repair the problem faster.
 - c) If there is no leakage in any of the valves, discharge or intake, then there is probably an internal leak in the system or a faulty vacuum sensor. In this case, it's probably best to dismount the unit and prepare to ship it back for service.

Other Issues

This unit has a 3.5 GPH per hour capacity, but 84 gallons per day sounds better. If your vessel has a slow and continuous leak or leaks, they should be located and repaired. Obviously, if the volume generated by your leaks exceeds the capacity of the unit, the bilges will never become dry.

Winterizing

If the system is exposed to freezing, there is little damage potential, as it is pneumatically driven and water never goes through the air pump. However, if the discharge has been installed above the unit, i.e., the black 90 degree discharge has been rotated 180 degrees and is pointed up, or the discharge hose loops above the unit, then the internal discharge riser could become completely filled with water and would then need to be protected as follows: About 5 ounces of biodegradable anti-freeze should be placed at the bilge pickup locations and the system power should then be reset. Once the system re-enters the hibernation mode after running several cycles and has removed all the biodegradable antifreeze, you should shut the power off until spring. In the springtime, before restoring power, you should verify that the discharge thru-hull valve (if so equipped) is open.

Maintenance

The Arid Bilge Systems usually require no routine maintenance. If you feel it necessary to clean the pickup pads, annually should suffice.

For best results with your Arid Bilge System, please consider the following and make changes to your general maintenance as necessary:

- **If you have become accustomed to pouring bilge cleaners or bleach into your different bilge compartments on a regular basis, then** with the introduction of the Arid Bilge System, it becomes necessary to **dilute these cleaners** with at least **10 parts of tap water**. Undiluted at full concentration, any cleaner will create suds inside the Arid Bilge System and when done on a continual basis will eventually damage the unit. There are also some liquids to avoid at all costs: **“Simple Green”** available in most marine stores and **“Fantastic”** available in most supermarkets both tend to create suds that pass through the air circuit (compressor and 3-way air valves). The compressor eventually becomes coated internally and the three-way air valves will rust. Down the road, usually after ~20 months have passed, the unit stops working. We don't seem to have these issues with other bilge cleaners or soaps unless fully concentrated, so **please remove the “Simple Green” and “Fantastic” from your boat and choose different cleaners.**
- If the AC techs show up to clean the coils on your air conditioning units, they often use acids that will dissolve barnacles, and these have also been known to melt the discharge check valve in a couple of the Arid Bilge Systems. So, if the AC techs are on their way, please do the following: Turn off power to the Arid Bilge unit. After the AC techs are done, take a garden hose and rinse/flood your bilges with enough fresh water to set off the automatic bilge pumps. At this point, the acids should be diluted enough that you can turn the power back on to the Arid Bilge System and put the garden hose away.

Shipping the Unit

Should it become necessary to re-box and to ship the unit back to us, please follow these guidelines:

- Dismount the unit, leaving the intake tubing and pickups in place on your boat. Refer to the “Pickups” subsection under “Installation” in this manual for instructions on how to properly disconnect the intake tubing.
- Once the unit is dismounted, take the unit out on the dock and rotate it so that the black, 90-degree discharge fitting is at the lowest point, essentially rotating the entire box 135 degrees. Next, rock the unit so that it is sideways, and back to having the discharge fitting down. Every time you rock the unit you will see a small amount of water drip out of the discharge fitting. Please continue rocking the unit back and forth until no more water comes out.
- Next, take electrical tape and wrap the discharge fitting. You run the tape over the discharge, then up over the 90-degree shoulder for a few wraps.
- When you place the unit into a box, refrain from placing it into a plastic bag. If any water escapes from the unit during shipping, it’s far better to have a little wetness in the cardboard box than to damage the system’s electronic internals. We have received the occasional unit back inside a plastic bag where water found its way into the processor, and this runs the repair bill up considerably.
- Always tag the Series 2 unit with all your contact information (name, phone, and email address) before sending it back.

Contact Us

Questions or comments? Please call 954-328-9705 or 954-478-7066 or email us at al@aridbilge.com or info@aridbilge.com. You can also submit a question or repair request through the forms on our website.