



Series 1 nano installation and operations manual updated February 2019 for units with serial numbers after N0103

All Arid Bilge Systems are designed to remove trace amounts of residual bilge water typically left behind by the average bilge pump. Traditional high volume bilge pumps still need to be kept in service, to prevent sinking or changes in vessel trim, which can be brought about anytime a sudden 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 a proper maintenance schedule.

Installation . . .

Your new Series 1 nano dry bilge system can be mounted virtually anywhere aboard your boat, except in the bilge. 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 are 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 four #6 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 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.

The unit comes with a single bilge pickup and a 20 foot length of the 5/32” intake tubing. The specific 20 foot length provides the correct resistance needed, so that the virtual float switch will operate correctly. If you were to change the length of the intake tubing, the system would not correctly recognize the fact that bilge water is present at the bilge pickup, and will

prematurely cycle off, resulting in a wet bilge. This 20' length also provides the correct backpressure during discharge, in order to assure that all the previously collected water is purged from the internal collection chamber and sent overboard. So please coil any excess intake tubing if necessary, never cut it.

The black ½" 90 degree barbed discharge fitting can be rotated in any direction as needed, and its best if turned clockwise when possible. Alternatively, this standard discharge fitting can be swapped for a ¼" to a 5/8" barbed fitting, as long as it has a ½"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 one foot above the unit, preferably down hill to the discharge, if at all possible. The other end of the discharge hose is usually T-connected to an existing outflow. The unit is much more powerful in suctioning water up to six feet above the bilge, but it is not as efficient at pushing the water above the black 90 degree discharge port. Hatch drains, deck drains and sink drains are usually best to 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 is overloaded and the thru hull were to become temporarily 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 to see 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, all leaks start to leave trails through the dry bilge back to the different sources. Now we can look for water, fuel, oil leaks etc. and actually locate them. This is very different from the conventional wisdom, where a small lake exists in the bilge where all liquids are combined, sloshing around, preventing both identification and quantification of the liquids. 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.

The two-conductor power cord needs to be connected to a DC power source of either 12 or 24 volts. The Series 1 units will accept either voltage. Please connect the red to positive and the black to negative. The power cord does need to be protected by a 3 to 10 amp fuse or circuit breaker. The unit does have an internal one amp fuse mounted on the printed circuit board which protects all of the Arid Bilge System internals. The system draws approximately 19 milliamps in standby, and ¼ of an amp (250 milliamps) at 12 volts when running.

There are two styles of bilge pickups available for the Series 1 units. The 2” x 3” mini standard bilge pickup is designed for flat bottomed bilges that are at least 2” wide. The L shaped pickup wand is designed for V bottomed bilges. One of these bilge pickups was provided with your unit. The intake tubing should be routed first and then 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 just 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.** The tubing is removable both from the bilge pickup and the Arid Bilge System, simply by fully depressing the brass ring that surrounds the tube where it enters the two fittings. Next, pull out on the tube while continuing to hold the brass ring in, and the tube will release. 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 pickup loose in the bilge, to verify that it is at the lowest point. Excess intake tubing coiled near the bilge pickup will allow it to be easily relocated. Once the low point has been found and the bilge is absolutely dry, there are three different ways to secure the mini standard bilge pickup if needed. First, leave it loose and monitor to see if it does flip or move. Second, if it is not stable, you can tie-wrap the intake tubing to something directly above the pickup. Pulling down on the tubing, as the tie wraps are pulled tight will exert additional pressure to help it stay in place. And third, if the pickup is still wandering, its time to purchase a ¾” x 1/8” aluminum flat bar available at the local hardware stores. You then drill a ½” 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, not kinked.

Operation . . .

Once discharge, intake and power are all connected and power is applied, The Arid Bilge Series 1 will show a slow flashing green LED light. It is visible through a small hole behind and below the black 90 degree discharge fitting on the left side of the box. After 10 seconds of discharge time, an audible click will be heard and the LED will flash more rapidly. This is when the vacuuming of the collection chamber starts to occur. If, after another 16 seconds has past, only air has been pulled, the LED will then light solid and the unit will enter a three hour hibernation cycle. If, however, water is being pulled instead, then the internal vacuum switch will transfer after 8 to 15 seconds and the LED will now flash long, then short, and continue to flash long, then short, as the pump shuts off and the unit continues to pull water for a total of 45 seconds. After the 45 seconds have passed the unit repeats the process above, discharging a small amount of water at the start of each new cycle.

Alarms . . .

There are two issues that can cause your Series 1 nano unit to audio alarm.

The first one would be a **continuous tone alarm**. There would also be a solid red LED light coming from the adjoining hole next to the green LED on the left side of the box. This is caused by a “system flooded fault” where the collection chamber is over filled with bilge water. The unit is now blowing air into the collection chamber for 30 seconds with the compressor running. Then it will seamlessly reset itself. If the chamber is no longer flooded the unit will resume normal operation. If, however, the chamber is still flooded, the unit will repeat the same process two additional times. If the chamber is still flooded at this time, the red LED will remain lit with no audio alarm. The unit will hibernate for three hours with just the red LED lit solid and then three hours later attempt to resume normal operation. The causes of this alarm could be a blocked discharge, a discharge running too high above the unit, or a mechanical failure in the unit itself. Please remove the discharge hose and with a cup or small bucket at hand to catch the potential outflow coming from the black 90 degree discharge fitting. Reset the system’s power. If 3 to 5 ounces of water come out once the pump starts running again, then please check your discharge hose for blockage. Also note that if the discharge is mounted too high above the unit, you would hear the alarm every 5 to 15 minutes and after the third round you would see the solid red LED after 15 to 45 minutes.

The second type of alarm would project an **intermittent audio alarm** with a flashing red LED. This alarm is caused by a blocked intake. As with the other alarm above, the unit will use the compressor to blow air into the collection chamber for 30 seconds with the intermittent alarm sounding. If the pickup were clogged, and it clears with the backpressure from the compressed air, then normal operation will resume. If, however, the intake remains clogged, the unit will reset and repeat this process two additional times before entering a three-hour hibernation cycle with the red LED flashing, instead of the solid green LED. After three hours, the unit will reset itself and attempt to resume normal operation. With the intermittent alarm, we will first recommend that the bilge pickup be inspected, removed and cleaned. Also, a kinked or crushed

intake tube will cause the same alarm. So if the pickup looks perfect, you can remove the intake tube from the unit and see if it runs a single cycle after a power reset. If it runs just a single cycle and then shows a solid green LED instead of the red flashing LED, then we know that there is a problem with the 20 feet of intake tubing or the bilge pickup. Next, connect the tube back into the unit and leave the bilge pickup disconnected. Make sure that the intake tubing is in the air, sitting away from anything that it could touch and reset the system power again. If it does go back to a solid green LED with the intake tube attached to the unit, but not to the bilge pickup, then the bilge pickup would be the fault. If, however, the alarm returns with just the intake tube attached, it's time to remove and inspect the intake tubing and probably call us for a replacement. If the intermittent alarm is sounding without an intake tube attached to the unit, then please call us for technical support.

Other issues . . .

This unit has a 5 quart (1.25 GPH) per hour capacity. 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 little water remains inside the unit during the normal hibernation cycle. The unit should always be allowed to enter this sleep mode, with the green LED lit solid, before shutting off the power. 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 and the system power should then be reset. Once the system re-enters the hibernation mode and the green LED remains solidly lit, the power can be shut off. In the springtime, you should verify that the discharge thru hull valve, if so equipped, is open, before restoring power.

Shipping the unit . . .

Should it become necessary re-box and to ship the unit back to us, please follow these guidelines. 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. Now when the unit is placed 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, then to damage the

system internals. We have received the occasional unit back, inside a plastic bag where water found its way into the processor and this will run your repair bill up considerably.

Questions or comments please call 954-328-9705 or 954-478-7066 or email at al@aridbilge.com