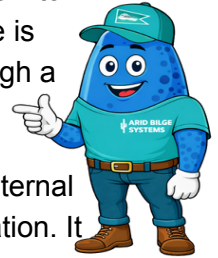


Arid Academy Master Course

Certified Dealer Training Program

5 Lecture Series • 30 Courses • Final Certification

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Downloadable Dealer Resources:

- Retail / wholesale price sheet
- Dealer digital catalog
- Series 1 owner's manual
- Series 2 owner's manual
- Series 4 owner's manual
- Dealer service request form
- Purchase order submission form
- Dealer order submissions for displays, brochures, and other marketing materials
- Approved Arid Bilge Systems logos and branding elements
- Suggested example dealer landing page layout examples
- Installation and service reference documents
- Arid Academy Master course in digital format



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Arid Academy — Course Roadmap

Introductory Series

Lecture 1 • 4 Courses • Pages 7–34

Course 1: The Origin of Arid Bilge Systems- Introduces the company origin story, beginning with *Thirsty Lady V*, and explains the real-world problem that inspired Arid Bilge Systems.

Course 2: Why Every Boat Needs an Arid Bilge System- Explains moisture-related issues and how Arid Bilge Systems help solve them using vacuum-based dry bilge technology.

Course 3: The Superior Technology Behind Arid Bilge Systems- Explains why Arid's vacuum-based system is different from traditional bilge pumps, dry pumps, and other moisture-control methods.

Course 4: Internal Function Overview- Explains internal system operation, pressure and vacuum cycles, processor logic, collection chamber function, sensors, and alarm behavior.

Product Education Series

Lecture 2 • 9 Courses • Pages 35–75

Course 1: *Which Arid Bilge System is Right for Your Boat?*
Helps match models to boat size and bilge layout

Course 2: *Series 1 – Product Explanation*
Details dimensions, design, and features of Series 1

Course 3: *Series 2 – Product Explanation*
Compares legacy and molded Series 2 models

Course 4: *Series 4 – Product Explanation*
Larger unit built for 4–8 zone moisture control

Course 5: *Series 9 – Product Explanation*
Heavy-duty system for 9–11 zone mega yachts and commercial applications

Arid Bilge Systems - Dry, Fresh, & Protected



Course 6: *Which Pickup is Right for Your Bilge?*

Breakdown of pickup types and why clamping can be problematic

Course 7: *Eco-Friendly Product Line — Eco-Drain Hydrocarbon Separation Systems*

Explains environmental separator and its use cases

Course 8: *Eco-Alarm System — Smart Hydrocarbon Monitoring for Eco-Drain*

Applications- Overview of the accessory alarm system and smart triggers

Course 9: *Bluetooth Diagnostics Integration*

Details Bluetooth app functionality and service logging

 Installation Series
[Lecture 3 • 5 Courses • Pages 77–87](#)
Course 1: *Where to Mount Power and Discharge Lines*

Power and discharge best practices for install

Course 2: *Series 1 – Install & Troubleshooting Guide*

Complete walkthrough of Series 1 installation

Course 3: *Series 2 – Install & Troubleshooting Guide*

Detailed installation process for Series 2

Course 4: *Series 4 – Install & Troubleshooting Guide*

Guide for Series 4 full system installation

Course 5: *How to Maintain Your Arid Bilge System*

Recommended maintenance and upkeep schedule

 Internal Troubleshooting Guide
[Lecture 4 • 4 Courses + Supplemental Form • Pages 89–106](#)
Course 1: *Series 1 – Internal Troubleshooting Guide*

Troubleshooting guide for Series 1 diagnostics

Course 2: *Series 2 – Internal Troubleshooting Guide*

Internal diagnosis and fix steps for Series 2



Course 3: Series 4 – Internal Troubleshooting Guide

Troubleshooting guide for multi-zone systems

Course 4: Service Call Procedures

Protocols for in-field dealer service visits

Supplemental Form: Dealer Service / Repair Request Form

 Sales Training Series

Lecture 5 • 7 Courses • Pages 107–131

Course 1: Dealer Sales Course Script

Covers talking points and product value pitch

Course 2: Protecting Wooden Boats – The Power of a Dry Bilge

Highlights the protection and longevity benefits for wood hulls

Course 3: Preserving Metal-Hulled Yachts

Focuses on corrosion protection for aluminum and steel vessels

Course 4: Cost Advantage of Arid Bilge Systems vs. Traditional Systems

Outlines long-term cost savings and value

Course 5: Dealer Pricing, Quotations & Essentials Checklist

Retail pricing strategies, quote procedures, and checklist for sales readiness

Course 6: Dealer Benefits Overview

Breakdown of program perks, sales support, and ongoing partnership resources

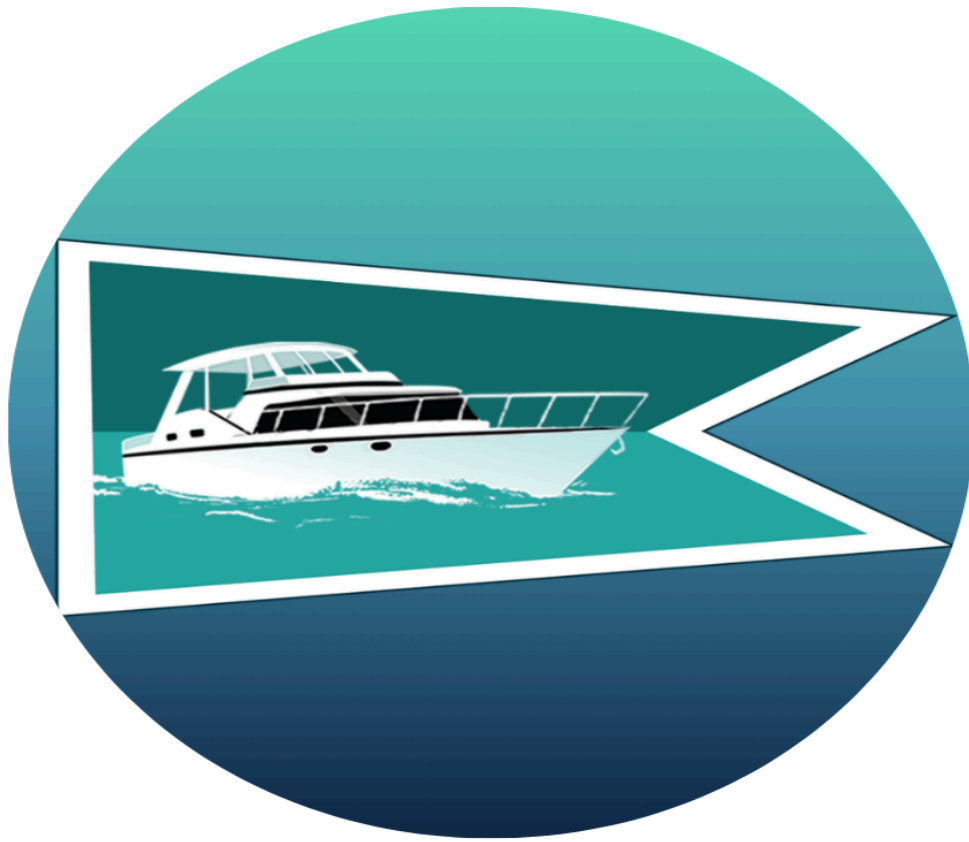
Course 7: Warranty Certificate and Customer Record- Summarizes key warranty expectations, dealer responsibilities, customer communication, and terms-of-service references.

 Final Step – Dealer Certification
Final Dealer Certification Test

Includes 30 multiple-choice questions and 4 written responses confirming the dealer's understanding of Arid Bilge Systems.



Arid Bilge Systems



Introduction

[Lecture 1: Pages 7-34~4 courses](#)

Arid Bilge Systems - Dry, Fresh, & Protected



Course 1: The Origin of Arid Bilge Systems

Where It All Began: “Thirsty Lady V”

Arid Bilge Systems was created from decades of real-world marine experience, hands-on boat building, and the search for a better way to remove the water traditional bilge pumps leave behind.

This opening course introduces the origin of the story behind Arid Bilge Systems, the problem the technology was designed to solve, and how one family’s experience with boats led to the development of a dry bilge system that has been operating in the marine environment for more than 25 years.



Figure 1.1 — The Baurley family’s custom-built boat, Thirsty Lady V and the first Arid Bilge prototype.

Thirsty Lady 5 was a 62-foot vessel designed and built by Al Baurley Jr. and his father, Al Baurley Sr. Construction began in 1986, and she splashed in 1992 at Merritt’s Shipyard in Pompano Beach, Florida. She was a revolutionary design for her time, thanks to her Hamilton jet drives, which allowed her to operate with only about two feet of draft. Her hull lines were ahead of their time — sleek, shallow, and efficient. But despite the brilliance of the design, Thirsty Lady 5 was plagued by moisture intrusion that slowly damaged the vessel from the inside out. For years, the Baurley family worked around boats and saw the same problem appear again and again: low-lying moisture collecting in areas that traditional bilge pumps could not fully reach. Traditional bilge pumps are essential emergency devices. They are designed to remove larger amounts of fluid when enough water is present to activate the pump. However, once the water level drops below the bilge pump’s

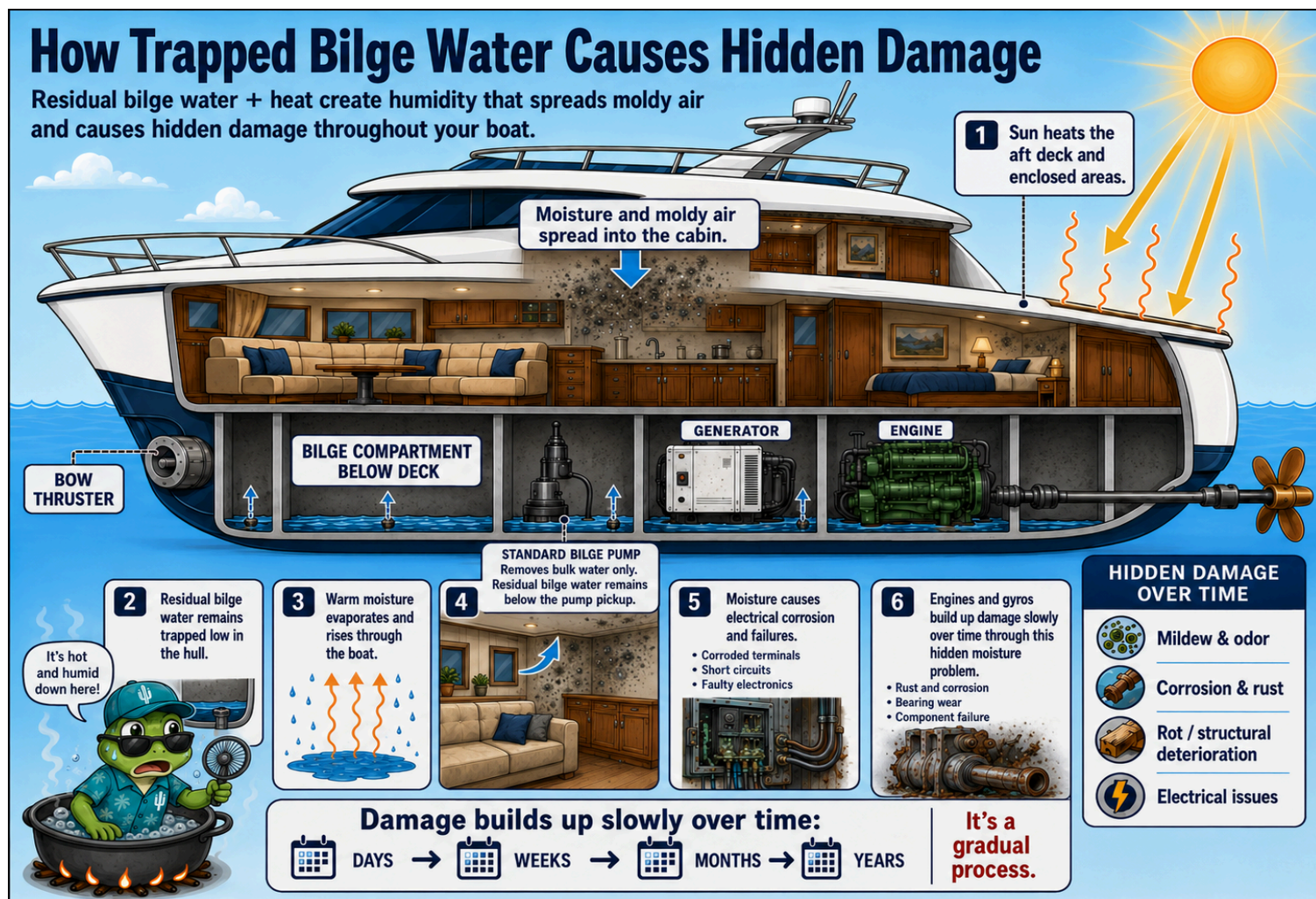
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pickup point, a shallow layer of residual water is left behind. In many boats, additional water can also backflow from the pump's discharge line, returning fluid back into the bilge after the pump shuts off. That leftover water may seem minor (to the novice boater), but over time it can create serious problems inside a boat. Residual bilge water can lead to: odor, mildew, corrosion, rot, electrical issues, contaminated bilge compartments, destroyed machinery, and overall Long-term deterioration from the inside out. The physics behind this problem is simple: **heat moves moisture.**

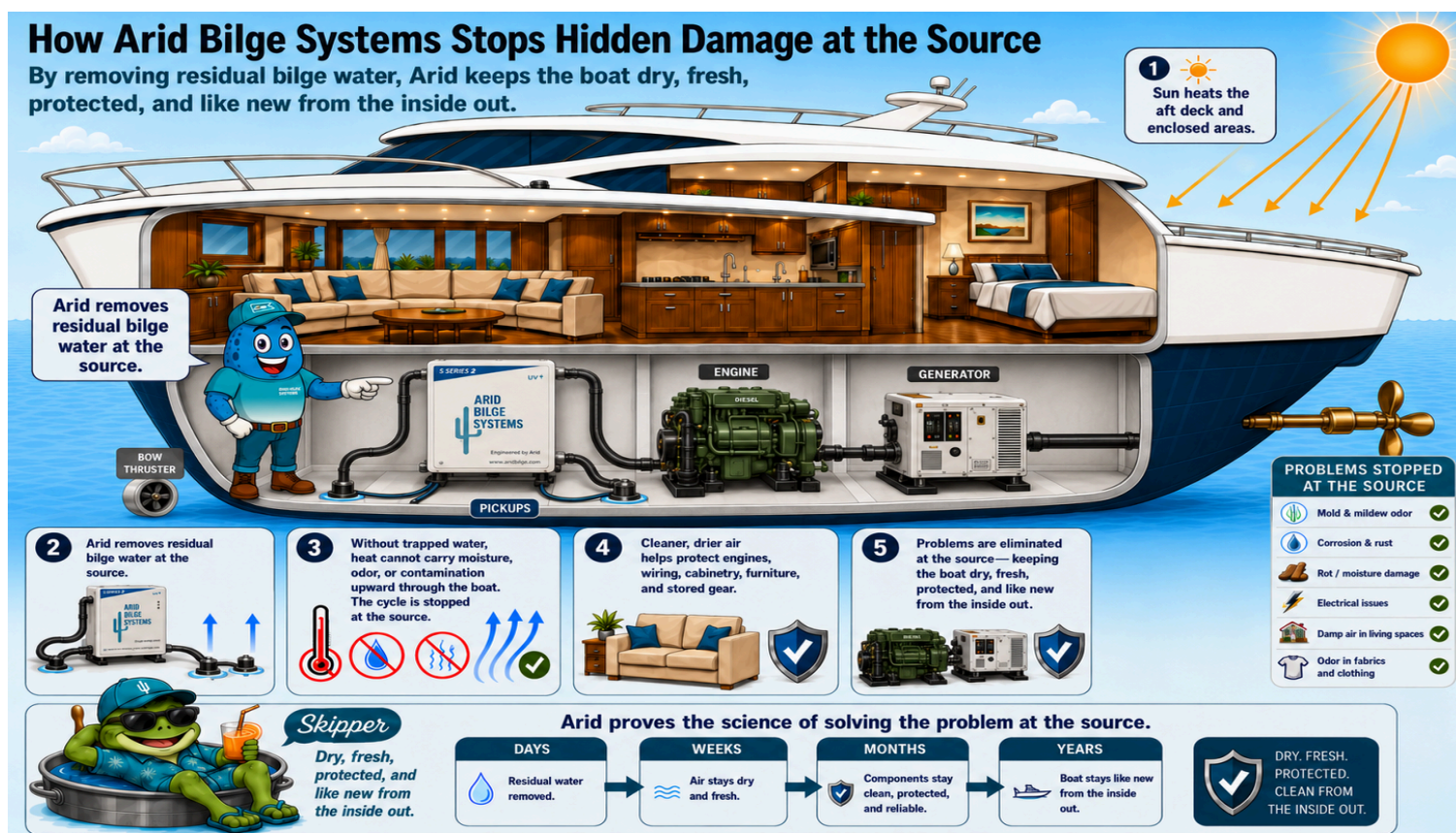
When the sun heats the deck, cockpit, hatches, and exterior surfaces of the boat, that heat transfers into the compartments below. As the temperature inside the bilge rises, standing water and contaminated bilge fluid begin to evaporate. Evaporation changes liquid water into water vapor. That vapor then rises and spreads throughout the local bilge compartment. Because the bilge is often enclosed, dark, humid, and poorly ventilated, the moisture vapor does not simply leave the boat. Instead, it circulates through the compartment and contacts surrounding surfaces. As temperatures change, the vapor reaches cooler surfaces and condenses back into liquid moisture. This can happen on the underside of hatches, engine surfaces, generators, gyro stabilizers, bow thrusters, stern thrusters, tanks, wiring, connectors, pumps, brackets, fasteners, and other mechanical or electrical components. In basic physics terms: **Heat causes evaporation. Cooler surfaces cause condensation. Enclosed compartments trap the moisture cycle. Repeat.**

Figure 1.2 — How trapped bilge water causes hidden damage.



That repeated evaporation-and-condensation cycle allows a small amount of leftover bilge water to affect a much larger area of the boat. Odor follows the same physics. Bilge water often contains salt, this means water does not need to splash directly onto an engine, generator, wire harness, or metal component to cause damage. If water is sitting in the bilge, it can evaporate, travel as vapor, and return as condensation on nearby surfaces leaving residue, fuel traces, cleaning chemicals, organic material, bacteria, and other contaminants. When that fluid sits in a warm, enclosed space, odors and contaminants can spread throughout the boat with the moisture vapor. Over time, this physics-driven moisture cycle can corrode metal components, create surface rust on engines and generators, oxidize electrical connections, collect condensation under hatches, and expose machinery, wiring, thrusters, pumps, brackets, fasteners, wood, and fiberglass compartments to damp, corrosive air. This is why a wet bilge is not just a cosmetic problem. It is a physics problem inside the boat. Arid Bilge Systems were designed to interrupt that cycle at the source by removing the residual water traditional bilge pumps leave behind. Before Arid Bilge Systems existed, that problem had to be managed manually. On Thirsty Lady V, trapped bilge water created a persistent odor problem in the lowest, hardest-to-reach areas of the boat. At times, Al Baurley Sr. went to dramatic lengths to fight it, even bundling newspapers and placing them into low bilge compartments to absorb leftover moisture. That temporary fix revealed the real challenge: the problem was not always the obvious water. It was the hidden layer of fluid left behind in places people could barely reach or see. That frustration helped shape the idea for a better solution — a system that could automatically reach those low areas, remove trapped fluid, and help stop the moisture cycle before it became odor, corrosion, and long-term damage.

Figure 1.3 — How Arid Bilge Systems stops hidden damage at the source.



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The Broward Breakthrough

Around the same era as Thirsty Lady V, an incident aboard a 100-foot Broward yacht helped inspire Al Baurley Jr. and the first pilot model of what would eventually become Arid Bilge Systems. The yacht was undergoing work at Bradford Marine around the early 2000s. During work in the master stateroom area, carpenters were removing and rebuilding interior sections of the boat. At the same time, the crew was working with the boat's Tank Tender system, a fuel-level measuring system that used small polyethylene tubing to read pressure from the tanks. The Tank Tender system worked by applying pressure through the tubing into the tank, allowing the operator to read back pressure and determine the amount of fuel inside. That tubing was similar to the polyethylene tubing later used in Arid Bilge Systems.

At the time of the incident, the yacht was sitting in the water with a slight list, and the fuel tank was overfilled, holding roughly 3,000 gallons of diesel. While the carpenters were working in the master stateroom area, one of the Tank Tender lines was accidentally cut. The captain later went away to the Keys, the boat was left unattended over the weekend, and no one realized what had happened until the damage had already occurred. Because of the boat's list and the pressure inside the overfilled tank, diesel fuel was forced up through the cut polyethylene tube and into the master cabin interior space. Roughly 65 to 85 gallons of diesel fuel may have escaped before the fuel level in the tank dropped below the siphoning point, to the opening of the cut Tank Tender tube. That was more than enough to create a serious contamination problem, damaging woodwork, cabinetry, flooring, and surrounding interior materials.

When everyone returned after the weekend, the situation had become a major cleanup operation. The captain was fired, and no one was allowed back onboard for several days while specialists treated the boat and addressed the diesel contamination. For most people, the incident was simply a disaster. But from an engineering perspective, something clicked for Al Baurley Jr. On the drive home, thinking through what had happened, one detail kept standing out: a small-diameter polyethylene tube had moved a significant amount of fluid from one area of the boat to another. The event was not a simple siphon in the traditional sense. It was a pressure-driven fluid movement event caused by the combination of an overfilled tank, the boat's list, and the cut tubing. That raised a powerful question: If a small tube could move diesel fuel through pressure and fluid behavior, could that same principle be controlled and used with vacuum to remove unwanted water from a bilge? That question connected directly back to the moisture problem aboard Thirsty Lady V, a problem Al Baurley Sr. and Al Baurley Jr. had lived with, talked about, and tried to solve for years. In fact, they had been discussing that very issue shortly before the Broward incident occurred. The Broward incident became the Eureka moment that helped turn those conversations into a working idea.

From there, Al Baurley Jr. began experimenting with the idea in his garage. Instead of relying on temporary absorption methods or conventional bilge pumps, the concept evolved into an automatically controlled system that could reach all those individual low compartments/ trapped pockets, and vacuum them all into one centralized location. That disaster moment helped move the idea from frustration to invention.

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From Idea to First Prototype

The earliest version of Arid Bilge Systems was not the refined system dealers know today. It was a working pilot model built with practical marine logic, available components, and one clear goal: to prove whether a system could remove trapped fluid from low bilge areas that were difficult to reach by hand. The first pilot model was installed aboard *Thirsty Lady V*, forward of the engine room near the starboard engine area, figure 1.1 does not show the earliest crude pilot model; it shows the first Arid Bilge System built around the same core concept used in today's systems. It was simple, experimental, and crude compared to today's production models, but it proved the foundation of the concept. Unlike later systems, it did not have processor-controlled logic, refined vacuum switches, quiet compressor isolation, molded housings, faceplates, a compact collection chamber, or a polished internal layout. It also did not run through the advanced cycle logic used in modern Arid Bilge Systems.

Instead, it operated more like a basic timer-controlled, on/off vacuum experiment. The system used a larger compressor, polyethylene tubing, air valves, relay-style controls, and an early collection chamber design. It pulled from two pickup locations at the same time and moved fluid into one centralized collection chamber. Unlike later multi-zone systems, the first pilot model did not use intake valves to isolate each zone. It did not build vacuum inside the collection chamber first, then open one intake valve at a time to pull from a selected pickup location. Modern multi-zone systems operate differently. They first allow the collection chamber to reach vacuum. Once the vacuum sensor confirms the proper vacuum level, the processor opens one intake valve at a time. That controlled sequence allows vacuum to be applied to a single selected pickup line, pulling fluid from that zone into the collection chamber before moving to the next zone.

The original pilot model was much simpler. Since both pickup lines were open to the system at the same time, it depended on both pickup locations having enough fluid resistance to pull properly. If both pickups were wet, the system could pull fluid from both zones at once. But if one pickup became dry while the other still had fluid, the dry line would begin pulling air. Once that happened, the vacuum force would favor the open air path, reducing the system's ability to keep pulling fluid from the remaining wet line. That limitation became part of the learning process and helped guide later improvements in zone control, vacuum management, intake valve design, and processor logic. The discharge design was also different from the systems used today. The original pilot model used a U-shaped discharge path, rather than the later straight crossover discharge design that rises through a riser and check valve. That early U-shaped discharge design reflected the original engineering approach and was similar to the layout shown in the early patent drawings. At first, the system was loud, simple, and far from production-ready. But it worked. That first pilot model proved the most important point: controlled vacuum, small tubing, and a centralized collection chamber could remove trapped bilge fluid from places that were difficult to reach manually. From that point forward, the mission became refinement — improving the controls, reducing noise, strengthening the discharge design, developing better collection chambers, and turning the concept into a scalable product line.



The First Real-World Discovery: Drying the Bilge Exposes What Was Hidden

One of the more interesting discoveries came after the first systems began removing standing water from older boats. In most cases, removing residual bilge water helps reduce odor, moisture, and contamination. However, on some older vessels with years of buildup below the waterline, something interesting happened: once the standing water was removed, the odor temporarily became stronger. At first, this seemed unusual. But it revealed an important truth. The water was not the only problem. In some boats, the standing bilge water had been covering years of slime, oil residue, diesel residue, soap, bilge cleaner buildup, organic material, and biological contamination attached to the inside of the hull. Once the water was removed, that buildup became exposed to air. As the trapped contamination dried and broke down, the odor could rise and become more noticeable. This was especially true in severe cases where the bilge had not been properly cleaned for years. Boats such as Thirsty Lady V, Fanfare, and Blue Guitar helped reveal this lesson. These vessels had accumulated years of moisture, residue, soap, fuel traces, bilge cleaner, and organic buildup below deck. Once the standing water was removed, the remaining contamination needed to be cleaned so the system could maintain a dry environment going forward.

This became an important part of the Arid Bilge Systems philosophy: **Drying the bilge reveals the problem. Cleaning the bilge resets the environment. Arid Bilge Systems helps maintain the result.**

In severe cases, a professional bilge cleaning service may be needed before the system can deliver the best long-term results. In lighter cases, the bilge may only need a proper rinse, cleaning procedure, and fresh-water flush before the system continues cycling and removing the remaining fluid. The important point is simple: Arid Bilge Systems is designed to remove residual water and help prevent the moisture cycle from returning. Once the bilge is clean and dry, the system helps stop the conditions that allow slime, odor, corrosion, and contamination to rebuild. This was never a failure of the system. It was a real-world lesson from early installations. The system could remove the fluid. The boat still needed the old contamination cleaned away. Once both were addressed, the bilge could finally stay dry, fresh, and protected.

“Fanfare”: The Second Working Model and the Clothing Test

After the first working pilot model was installed aboard Thirsty Lady V, the next major step in the development of Arid Bilge Systems came with Fanfare, a 58-foot 1968 Hatteras owned by Jim Grove. For the purposes of the Arid Bilge Systems origin story, Fanfare represents the second working model, and the first sale in the early development timeline. Thirsty Lady V proved the concept, Fanfare helped prove the customer value. Fanfare had a common problem found on many older yachts: the boat smelled inside. More specifically, she had what many boat owners recognize as the classic “Hatteras smell,” a deep, lingering odor that seemed to stay in the boat no matter how often it

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was cleaned. The odor was not only noticeable onboard. It followed people off the boat. Jim explained that when he and his family traveled to the Bahamas, they would bring several bags of clothing with them. After weeks onboard, most of the clothing would be worn and taken home to be washed. But even the clean clothes that had never been worn still absorbed the smell of the boat. Before Arid Bilge Systems was installed, Jim explained that when he and his family traveled to the Bahamas, they would bring several bags of clothing with them. After weeks onboard, the worn clothes would naturally go home to be washed. But even the clean clothes that had never been worn still absorbed the smell of the boat. If Jim could take a bag (He would seal multiple bags) of unworn clothing off Fanfare, bring it home, and place it in a closet without it smelling like the boat, then he felt he accomplished something. When the Arid was installed, all of this stopped in its tracks; he had no more need for sealed bags, which changed the entire onboard experience. The odor was no longer being masked. The source was being controlled. The clean clothes no longer carried the smell of the boat back home. Fanfare became one of the early proof points that dry bilge technology was not just about machinery. It was about comfort, cleanliness, livability, and the way a boat feels to the people who spend time onboard.

“Blue Guitar”: Larger Yacht Application, Eco-Friendly Companion & Early Alarm Proof

Blue Guitar became another important vessel in the early Arid Bilge Systems development story. For the purposes of the company timeline, Blue Guitar represents the third major working model and one of the first major applications involving the Eco-Friendly Companion and Eco Alarm concept. Blue Guitar was a 102'7" 1967 Camper & Nicholson's yacht. Before dry bilge technology, many yachts tried to manage bilge odor by repeatedly adding bilge cleaners, soaps, and odor-control chemicals. Those products could temporarily suppress smell, but they did not solve the source of the problem. In some cases, they created new problems. On Blue Guitar, the crew had been using large amounts of bilge cleaner to mask odor in the bilge. The cleaner helped suppress the smell, but it also created a soapy, contaminated bilge environment. When there was not enough water in the bilge to dilute the cleaner properly, the remaining fluid became highly concentrated. That concentrated soapy mixture could interfere with system operation and create service challenges.

Blue Guitar helped demonstrate an important lesson: After Arid Bilge Systems was installed, the boat no longer relied on the same old cycle of dumping bilge cleaner into the bilge to hide the smell. Instead, the system helped remove the remaining water and direct collected fluid into the Eco-Friendly Companion, where oil and water separation could take place. This became especially important when Blue Guitar experienced a hydraulic fluid leak from a fin stabilizer system. In a traditional wet bilge, a leak like that can hide inside standing water, soap, bilge cleaner, and general contamination. The crew may not immediately know where the fluid is coming from, how serious it is, or whether it is increasing over time. On Blue Guitar, the Arid Bilge System pulled the leaking hydraulic fluid from the affected zone and delivered it into the Eco-Friendly Companion. The Eco Alarm system then provided an early warning that a significant hydrocarbon fluid event was

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occurring. That early warning mattered. A leaking fin stabilizer can become a serious mechanical problem, especially if the vessel is underway in rough seas (This was the case). If the issue is not caught early, the stabilizer can lose function, lock up, or create a much more expensive repair situation. Because the bilge was being actively managed, the crew could respond sooner. They were able to check the system, identify that oil was entering through a specific zone, and trace the clean oil trail back toward the source of the leak. That was a major difference. In a wet/ oily, soapy bilge, the leak could have blended into the contamination. In a dry, controlled bilge, the leak stood out. Blue Guitar showed that Arid Bilge Systems was not only useful for odor control or bilge drying. It could also help reveal new fluid events, support cleaner onboard maintenance, reduce reliance on bilge chemicals, and provide early warning when hydrocarbons or hydraulic fluids entered the bilge environment. This became one of the most important lessons from the early larger-yacht applications: **In a wet bilge, leaks can hide. In a dry bilge, leaks stand out.**

Figure 1.4 — Series 9, Eco-Friendly Companion, and Eco Alarm system aboard Blue Guitar.



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From Prototype to Product Line

From those early boats, Arid Bilge Systems continued to evolve from a working idea into a complete product line. The first pilot model proved the core concept, but it was large, crude, and experimental compared to the systems dealers know today. It showed that controlled vacuum, small tubing, and a centralized collection chamber could remove residual bilge water from low areas of a boat. After that first working prototype, the system was refined into a larger early production design for yachts and high-capacity vessels. This early large-format version was slightly larger than the Series 9 production model that would come later, but it helped establish the foundation for multi-zone dry bilge technology. Over time, the design became more compact, more refined, and easier to install. That proto series 9 eventually led to a smaller Series 9, primarily for mega yachts, large vessels, and complex multi-zone bilge layouts. From there, Arid Bilge Systems scaled the technology down into smaller models to the Series 4 for larger yachts (four-to-eight-zone), from there the Series 2 for center consoles (two-to-three-zones), and finally the Series 1 for smaller boats (single-zone applications). Once the full product line existed, the development process moved in a new direction. Arid Bilge Systems began refining the smaller systems first, starting with the Series 1. The original Series 1 was much larger than the compact molded version seen today. By developing custom components and a smaller dedicated processor, Arid Bilge Systems was able to redesign the Series 1 around the electronics and internal layout, instead of forcing the electronics into an oversized box. That same design approach then carried into the Series 2, where custom components and a smaller processor allowed the system to become more compact, more refined, and better suited for production. The larger systems Series 4 and Series 9, continued to be refined through improved cosmetic design, internal layout, serviceability, and overall system improvements.

In other words, the product line first evolved downward from large-yacht systems to smaller boat systems. Then the refinement process began again from the smallest models upward, using lessons learned from the compact Series 1 and Series 2 redesigns to improve the broader product family.

Each system still follows the same core principle:

Remove the water traditional bilge pumps leave behind and help keep boats dry, fresh, and protected automatically.

Why This History Matters

This origin story matters because Arid Bilge Systems was not created in a corporate boardroom. It was created from real-world marine problems that traditional products failed to solve.

It came from boat building. It came from repair work. It came from odor problems. It came from contamination problems. It came from seeing water sit in low compartments year after year.

It came from asking a better question: **What if the bilge did not have to stay wet?**

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That question led to the first prototype aboard Thirsty Lady V, the early proof-of-concept systems on boats like Fanfare and Blue Guitar, and eventually the full Arid Bilge Systems product line. Every certified dealer should understand this history because it explains why the product exists. The story gives dealers more than background information, it gives them the knowledge, confidence, and real-world examples needed to explain the value of Arid Bilge Systems to customers. When a dealer understands the history, they can explain the problem more clearly. When a dealer understands the physics, they can explain the solution more confidently. When a dealer understands the early proof points, they can show customers that this technology was built from real marine problems, not theory.

Arid Bilge Systems is not simply an accessory. It is a dry bilge technology created to protect boats from the inside out.

A certified dealer who understands the story, the science, and the system will have the right tools to educate customers, answer objections, and make the sale with confidence.

Let's Get Started

Course 2: Why Every Boat Needs an Arid Bilge System

The Hidden Moisture Cycle Below Deck

Many boat owners understand obvious water problems. They understand a flooded bilge, a failed bilge pump, or water collecting where it should not be. What many owners do not see is the hidden moisture cycle happening below deck every day. A boat may look spotless from the outside. Owners spend thousands of dollars washing, waxing, detailing, polishing, and protecting the visible surfaces of the vessel. But the real health of a boat often starts where most people do not look: below deck, inside the bilge, and throughout the hidden compartments that make up the “guts” of the boat. A cockpit, cabin, or engine room walkway may look clean, but residual water can still remain in low compartments, stringer pockets, gutters, and hard-to-reach areas. That trapped water creates humidity. Humidity creates condensation. Condensation creates odor, mildew, corrosion, electrical issues, and long-term deterioration.

This is why Arid Bilge Systems is not simply another marine accessory. It is a protection system designed to remove the source of the problem before the moisture cycle begins.

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The Illusion of a Dry Boat: Out of Sight, Out of Mind

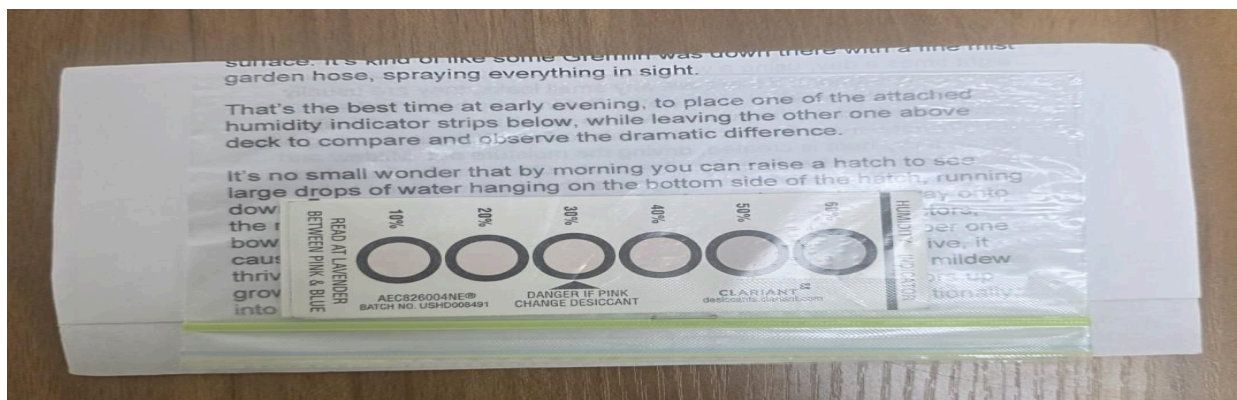
One of the biggest challenges in explaining bilge moisture is that the problem is often invisible. A boat owner may lift a hatch, look inside, and assume the boat is dry because there is no obvious standing water. But moisture can still be hiding farther back in the bilge, in low compartments, beneath equipment, around through-hull areas, inside stringer pockets, under machinery, in air-conditioning drip pans, in shower sumps, or in spaces the owner cannot easily see or reach. Because it is out of sight, it often becomes out of mind. But that hidden water does not stay still. As explained in Course 1, when the boat heats up during the day, residual bilge water and dirty trapped fluid can evaporate into the air below deck. As the boat cools later in the day or overnight, that vapor can condense back onto cooler surfaces (often dirty vapor). This includes wiring, connectors, engines, generators, tank senders, pumps, brackets, fasteners, hatch undersides, thrusters, stabilizers, and surrounding structures.

Many owners work hard to keep the visible parts of their boat clean. They wash, wax, polish, detail, and protect the exterior, cockpit, cabin, and engine room walkway. But below deck, in the hidden “guts” of the boat, the environment may still be humid, damp, and corrosive. Over time, that unseen moisture can slowly damage the boat from the inside out. Our philosophy is that the boat's health starts from the inside out.

Original Boat Show Demonstration: Moisture Indicator Strips

One of the original ways Arid Bilge Systems demonstrated the hidden moisture problem was through simple moisture indicator strips handed out at boat shows (2012- 2018). These strips were packaged with an informational handout explaining what happens below deck when residual bilge water, heat, humidity, and condensation interact inside a boat. The purpose was simple: give boat owners a visual way to understand what they normally could not see. By placing one strip below deck and comparing it with the environment above deck overnight, owners could see the difference for themselves. In many cases, the contrast could be dramatic. This demonstration helped explain that moisture is not only a puddle of water sitting in the bilge. It can also exist as vapor, humidity, and condensation moving invisibly through the boat.

Figure 2.1 — Boat show moisture indicator strip demonstration.



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Why Boats Develop Odor

Boat odor is often treated like a cosmetic issue, but it usually begins as a moisture, contamination, and biological activity problem below deck. Many owners first blame the head, holding tank, cushions, carpet, or cabin materials when a boat starts to smell. Sometimes those areas can contribute, but in many boats the odor is actually coming from deeper inside the vessel from the bilge compartments, stringer pockets, sumps, gutters, and hidden low areas where contaminated water has been sitting (The same out of sight out of mind areas).

Bilge water is rarely clean water. It can contain salt, oil residue, fuel traces, cleaning chemicals, soap, organic material, bacteria, mildew spores, and other contaminants. When that fluid sits in a warm, enclosed compartment, it becomes a perfect environment for odor to develop. The science is simple: heat, moisture, organic material, and poor ventilation create biological activity. As the sun heats the boat, the bilge compartment warms up. Warm air holds more moisture, and trapped bilge water begins to evaporate. That vapor can carry odor-producing compounds from the contaminated fluid into the air. At the same time, bacteria and microorganisms begin breaking down organic material, oils, soaps, and other residue inside the bilge. As that breakdown process occurs, it can release volatile odor compounds into the enclosed air space.

Mildew and mold-related growth will also develop when humidity stays high. These organisms do not need standing water on every surface. They only need moisture, warmth, poor airflow, and a food source such as dust, residue, fabric fibers, wood, organic film, or contaminated bilge buildup. As they grow and break down material, they release musty odors and microscopic particles that can move through the boat's compartments. That is why the smell may not stay limited to the bilge. Once odor compounds and moisture vapor enter the air, they can move into lockers, cabins, storage compartments, cushions, clothing, soft goods, and interior spaces. The boat may smell clean for a short time after cleaning, but if the source remains wet below deck, the odor will usually return.

This is how a boat develops what many owners recognize as the "old boat smell" or the mature vessel smell. It does not happen overnight. A new boat can slowly "settle" into that odor over time as moisture, residue, bacteria, mildew, and contamination remain trapped below deck. The owner may not notice it day to day because they become used to the smell, but guests, customers, surveyors, or people stepping onboard for the first time often notice it immediately. In many cases, that smell is not simply age. It is the result of a repeating moisture cycle: contaminated water sits below deck, heat causes evaporation, vapor carries odor through the boat, cooler surfaces collect condensation, and the damp environment keeps feeding the biological and chemical processes that create odor. Then that odor becomes stuck onto the fabric surface for example. A dry bilge interrupts that cycle. By removing the problem at the source.

The science is simple: heat, moisture, organic material, and poor ventilation create biological activity.

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Figure 2.2 — The science of boat odor below deck.

Why Traditional Fixes Are Temporary

Boat owners often try to manage moisture and odor with temporary solutions:

- Dehumidifiers
- Ozone machines
- Odor eliminators
- Air filtration systems
- Bilge cleaners
- Extra bilge pumps
- Manual wet vacs
- Towels, sponges, or absorbent materials

Each of these may have a use, but they do not solve the source of the problem. A dehumidifier treats the air. An odor product masks the smell. A bilge cleaner treats contamination. A bilge pump

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removes bulk water. A wet vac removes what a person can reach manually. Traditional products manage symptoms. Arid Bilge Systems removes the water that starts the cycle.

How Arid Bilge Systems Changes the Environment

Arid Bilge Systems changes the below-deck environment by removing the residual water that feeds the moisture cycle. Instead of waiting for water to rise high enough to activate a traditional bilge pump, Arid uses small tubing, vacuum, controlled cycling, and strategic pickup placement to remove fluid from low areas before it has time to sit, evaporate, and spread through the boat.

The science is straightforward: when the source water is removed, there is less evaporation. With less evaporation, there is less humidity. With less humidity, there is less condensation on engines, generators, wiring, pumps, brackets, fasteners, hatches, and hidden compartments. When the environment stays dry, odor-producing bacteria, mildew conditions, corrosion exposure, and contamination buildup are reduced.

A dry bilge also changes how leaks behave. In a wet bilge, new leaks can blend into standing water, soap, oil residue, or existing contamination. In a dry bilge, new fluid stands out. That makes leaks easier to identify, trace, and correct before they become larger service problems. This is what makes Arid Bilge Systems more than a comfort upgrade. It changes the environment below deck from reactive to preventative, helping keep the boat dry, fresh, protected, and easier to maintain.

Why This Matters to Boat Builders and Boat Dealers

For dealers and builders, moisture below deck can become a long-term service, warranty, and customer satisfaction issue. Dealers often understand this problem first because they are on the front lines after the sale. They sell the boat, service the boat, speak directly with the owner, and see what happens months or years later when the vessel comes back with odor complaints, corrosion, damp compartments, electrical issues, generator problems, gyro concerns, thruster problems, or premature component aging. Builders may not always see the moisture problem the same way dealers do (at least from our experience). In most cases, builders are focused on designing and constructing the boat, improving layouts, managing production costs, and delivering as much value as possible to the customer. That is already an extremely difficult job. However, builders may still experience the consequences. Those consequences may appear through warranty claims, dealer feedback, service records, component replacement costs, customer complaints, or long-term satisfaction issues. A generator, gyro, thruster, wiring connection, or other component may fail under warranty, but the failure may not always be immediately connected back to the moisture environment below deck. There are two common ways moisture creates problems. In some cases, the problem is direct water exposure. Sensitive components such as generators, gyros, thrusters, pumps, brackets, wire connections, or metal hardware may sit low enough in the vessel to touch standing bilge water (to be clear, we have seen bilge water move aft through the boat and physically

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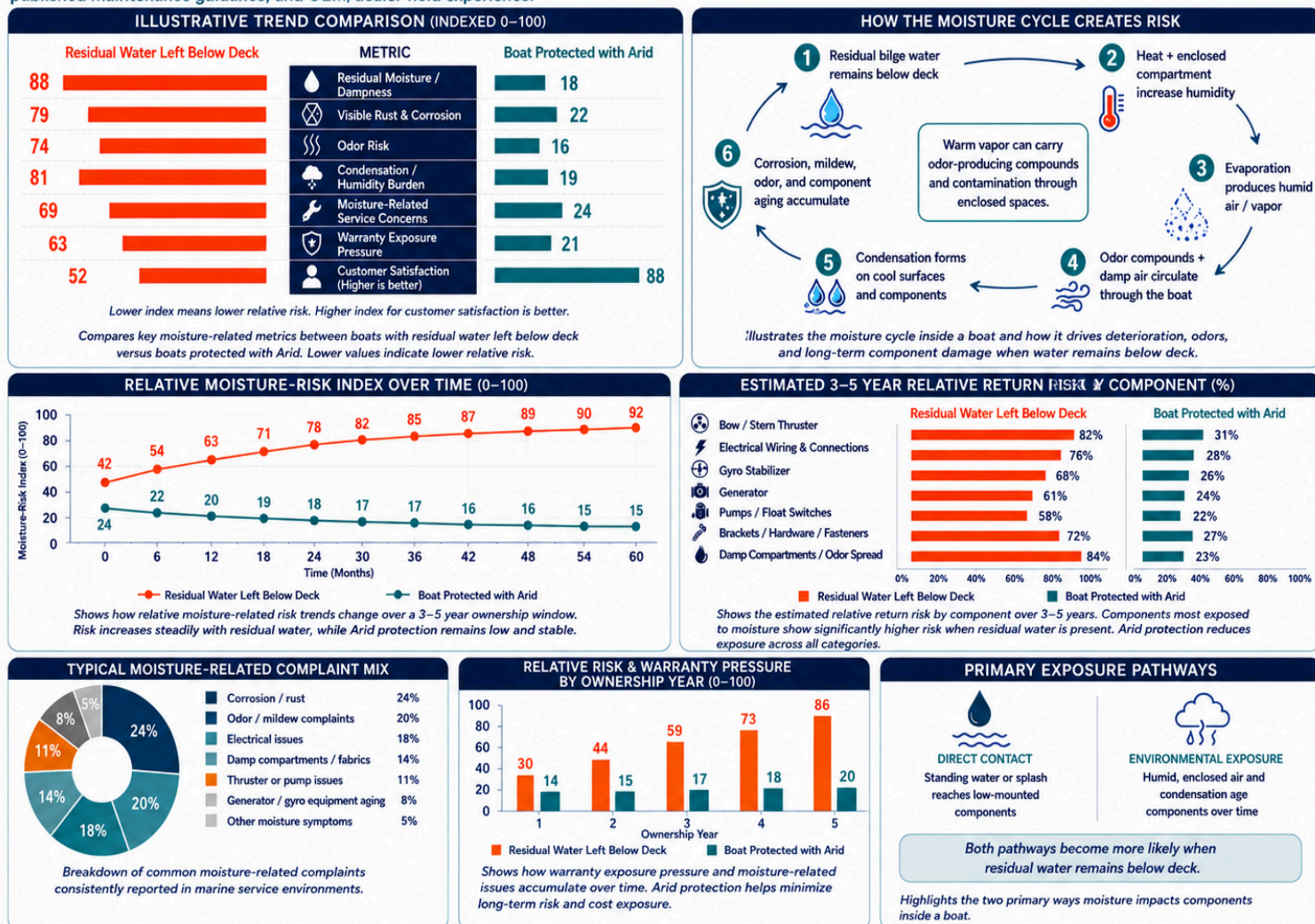


splash onto equipment such as generators located in the aft machinery area). In many other cases, the problem is environmental exposure. Residual water sits below deck, heat builds inside tight compartments, airflow is limited, and moisture turns into humidity and condensation. That damp, corrosive air surrounds expensive equipment day after day, slowly aging components before their time. From our experience working with OEMs and boat builders, these problems are connected to residual bilge water, humidity, and condensation. The challenge is that the root cause is often hidden, while the visible result appears later as rust, corrosion, odor, damp compartments, component deterioration, service concerns, or warranty-related issues. In some of our OEM's, the difference became clear when the same model boats were compared over time.

Figure 2.3 — Moisture below deck: illustrative relative risk comparison.

MOISTURE BELOW DECK: ILLUSTRATIVE RELATIVE RISK COMPARISON

Estimated 3–5 year center-console ownership model based on marine moisture, component exposure pathways, published maintenance guidance, and OEM/dealer field experience.



The relative risk model is informed by published marine maintenance guidance, moisture science, component exposure pathways, comparative field observations, and reviewed with Arid Industries over an estimated 3–5 year operating window.



Disclaimer: Exact values are directional estimates because real-world moisture exposure varies by boat design, climate, usage, maintenance, and service conditions.

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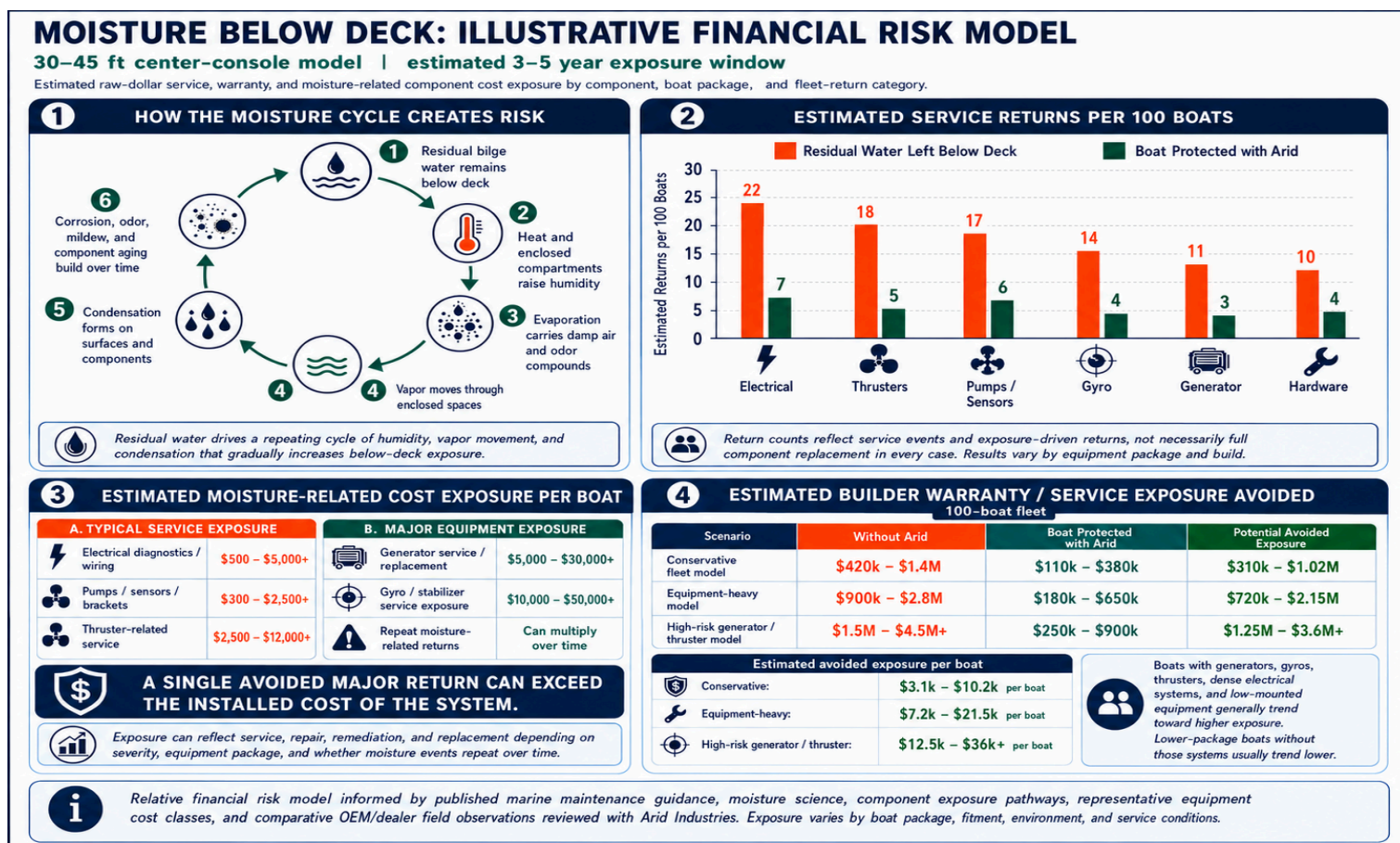


Figure 2.3 continued — Illustrative relative risk model based on marine moisture behavior, component exposure pathways, OEM/dealer field observations, and reviewed service patterns. Values are directional estimates and may vary by vessel design, climate, use, maintenance, and operating conditions.

Boats equipped with Arid maintained a cleaner, drier engine room and bilge environment, with far less visible rust, corrosion, and moisture-related buildup. The same model boat that went out without the system showed noticeably more corrosion, staining, dampness, and environmental deterioration in the same types of spaces. That comparison helped confirm what the science already suggested: when residual bilge water is allowed to remain below deck, the moisture cycle continues. When that water is removed consistently, the environment changes. This is where Arid Bilge Systems creates value before the problem begins. When the system is installed early, it helps protect the generator, gyro, thrusters, electrical components, wiring, pumps, brackets, and surrounding structure by keeping the hidden below-deck environment dry, fresh, and protected.

For builders, the value is not only technical. It can be financial. A small extra investment during the build process can help reduce avoidable moisture-related warranty claims, protect expensive components, lower long-term service exposure, and improve customer satisfaction. In one builder case, the reported value was significant: every dollar invested in Arid Bilge Systems helped offset multiple dollars in potential warranty exposure, service concerns, and component protection.

Figure 2.4 — Builder return: reducing warranty exposure through dry bilge protection.



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Figure 2.4 continued — By helping protect generators, gyros, thrusters, electrical systems, and other high-value components, Arid Bilge Systems can turn a small upfront investment into long-term savings by reducing moisture-related service concerns and warranty exposure.

In some builder applications, the return became clear when the cost of installing Arid Bilge Systems was compared against the reduction in moisture-related component issues, service concerns, and warranty exposure. In those cases, the system did not simply add cost to the boat, it helped protect value already built into the boat.

For dealers, that can mean fewer avoidable service complaints, cleaner boats returning for service, easier customer education, and a stronger product story at the point of sale. The investment is small compared to the equipment it helps protect. By adding Arid Bilge Systems at the factory or dealer level, builders and dealers are not just adding another feature, they are helping protect the boat from the inside out. **Bottom line: The data is clear Arid can help make money back in the long run for all boats.**

Dealer Sales Talking Point

In short when explaining Arid Bilge Systems to a customer, keep the message simple and easy to understand: Your bilge pump removes emergency water. Arid Bilge Systems removes the water your bilge pump leaves behind. Arid is the primary system. That leftover water may look minor, but it is the source of a much larger problem. It creates humidity, condensation, odor, mildew, corrosion, electrical issues, and hidden damage throughout the boat.

Most boat owners spend money protecting the visible parts of their vessel. They wash it, wax it, polish it, detail it, and maintain the exterior. But the long-term health of a boat also depends on what is happening below deck, in the hidden areas most people rarely see. Arid Bilge Systems protects the boat from the inside out by automatically removing residual water from low compartments before it has time to spread through the vessel as vapor, humidity, odor, or corrosion.

For a customer, the value is easy to understand:

A dry bilge means a cleaner boat, a fresher boat, a better-protected boat, and a better ownership experience.

You are not just selling a dry bilge.

You are selling:

- Protection for expensive equipment
- A cleaner below-deck environment

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- Reduced odor and mildew conditions
- Less moisture exposure around wiring and machinery
- Easier leak detection
- Better long-term maintenance
- A more enjoyable boating experience
- Stronger vessel preservation

The final sales message is simple:

Arid Bilge Systems helps keep your boat dry, fresh, and protected — automatically.

Course 3: The Superior Technology Behind Arid Bilge Systems

Why Vacuum-Based Dry Bilge Technology Is Different

Traditional bilge pumps are reactive by design. They wait for water to accumulate high enough to activate a float switch or sensor. Once activated, the pump removes larger amounts of water from the bilge. This is important for emergency water removal, but it does not solve the dry bilge problem. After a traditional bilge pump shuts off, water is still left behind. That remaining water can sit below the pump's pickup point, collect in low compartments, hide inside stringer pockets, or return through discharge backflow.

That leftover water is the beginning of the moisture cycle. Traditional bilge pumps are designed to protect a boat from flooding. Arid Bilge Systems is designed to protect a boat from staying wet. That distinction is one of the most important points a dealer must understand.

Arid Bilge Systems Is Proactive. Arid doesn't need to wait for the water to rise, instead the system operates on an automatic timing cycle and checks designated pickup zones throughout the boat. Using small-diameter tubing, vacuum, controlled cycling, and strategic pickup placement, Arid removes residual water from low areas before it has time to sit, evaporate, smell, corrode, or spread moisture through the vessel. This makes Arid proactive rather than reactive. A traditional bilge pump responds after water builds up. Arid helps prevent residual water from becoming a long-term moisture problem in the first place. That is why Arid becomes the primary daily dry bilge management system, while traditional bilge pumps remain the emergency backup system for high-water conditions.

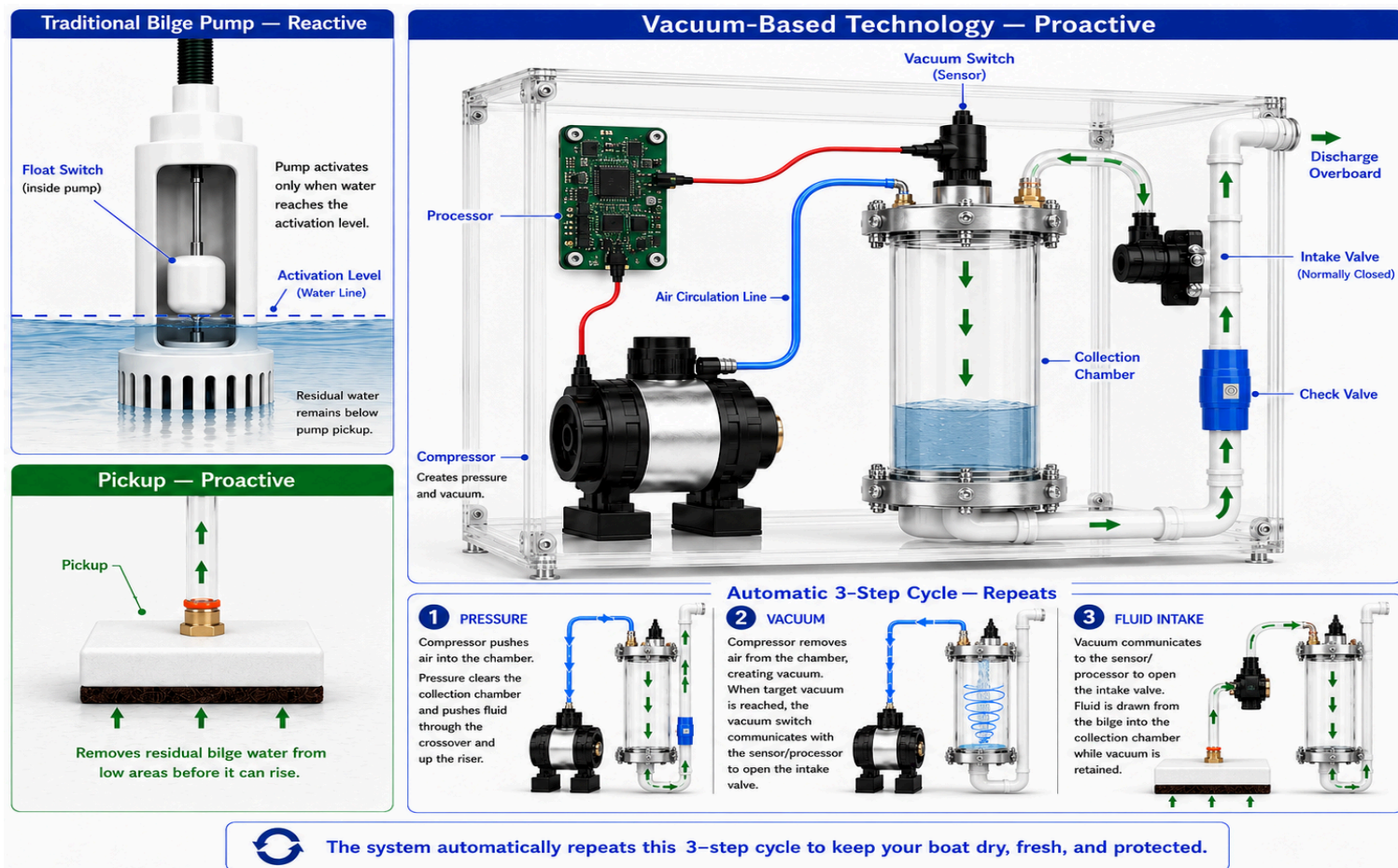
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The Core Technology: Pressure, Vacuum, and Controlled Fluid Movement

Arid Bilge Systems uses a controlled combination of pressure and vacuum to move fluid. The sequence begins with pressure. When the system starts its automatic cycle, the processor first activates the compressor to pressurize the collection chamber. This clears the chamber by forcing any collected fluid through the crossover, up the discharge riser, past the check valve, and out through the approved discharge pathway. Once the collection chamber has been cleared, the system transitions into the vacuum phase. The compressor then creates negative pressure inside the collection chamber. On multi-zone systems such as the Series 2 and Series 4, the system uses vacuum sensing to confirm that the proper internal vacuum level has been reached before opening the intake valves. In simple terms, the system first clears the chamber, then builds vacuum. Once the correct vacuum condition is established, the processor opens an intake valve. That allows the stored vacuum inside the collection chamber to pull fluid from the selected pickup zone through the small-diameter tubing and into the system.

This controlled sequence is what makes Arid different from both traditional bilge pumps and many dry-pump alternatives. Arid is not simply pumping water. It is using pressure to discharge fluid, vacuum to pull fluid from low areas, and processor-controlled sequencing to manage residual water automatically. [Figure 3.1 — Traditional bilge pump vs. Arid vacuum-based technology.](#)



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The basic concept is straightforward:

Pressure clears the collection chamber.

Vacuum pulls fluid from the bilge zones.

Pressure discharges the collected fluid out of the system.

This air-driven pressure-and-vacuum process allows Arid Bilge Systems to remove residual water from low, hard-to-reach areas without placing a pump, float switch, or fragile mechanical pump mechanism directly in dirty bilge water. The system's sensitive parts are never in contact with fluid, only moving the fluid by air.

Why “Dry Pumps” Are Not the Same as Arid Bilge Systems

Not every product marketed as a “dry bilge pump” is the same as Arid Bilge Systems. Over the years, several low-cost dry-pump products have appeared in the market using small mechanical pumps, peristaltic pump technology (we did our research: they are all the same), sponge-style pickups, inline filters, and simple timer-based controls. Some of these products were originally promoted as simple dry bilge solutions, but they are not true vacuum-based dry bilge systems. A pump in a box is not the same as Arid Bilge Systems. All of these dry-pump products rely on peristaltic pump technology. A peristaltic pump moves fluid by squeezing flexible tubing with rollers. This type of pump can work well in clean, controlled applications, such as beverage dispensing, laboratory use, medical dosing, or other situations where the fluid is predictable and relatively clean. A real boat bilge is the opposite of that environment. Bilge fluid can contain saltwater, oil residue, fuel traces, detergents, cleaning chemicals, soap, sludge, debris, biological buildup, and acidic contamination. Even small traces of oil, fuel, cleaner, or acidic bilge fluid can create a harsh environment for pump tubing, seals, rollers, sponges, filters, and small internal passages. That is where these simple dry-pump products struggle. They may move clean water during a short demonstration, but that does not mean they are engineered for years of exposure to contaminated bilge conditions.

In all of these designs, the first contact point is a sponge or absorbent pickup material placed in the bilge (versus us, we just have a filter to stop sediment). The second contact point is an inline filter intended to catch oil, residue, or contamination before the fluid reaches the pump. In theory, those parts are meant to protect the pump and extend its service life. In real bilge conditions, they are weak points. A sponge can clog, saturate, absorb oil, trap debris, restrict flow, and become contaminated. An inline filter can load up quickly when exposed to oil film, fuel residue, soap, sludge, acidic bilge fluid, or general contamination. Once either part becomes saturated or restricted, the pump will no longer move fluid properly. These extra components are added to help a small pump survive longer in a harsh environment, but they do not change the fundamental limitation: the pump-based product still depends on small direct contact mechanical parts, absorbent materials, and restricted fluid pathways to handle dirty bilge water.



TYPICAL STOCK DRY BILGE PUMP

FLOW PATH & CONTAMINATION CYCLE

1 SPONGE PICKUP (INTAKE)

Bilge water is absorbed through the sponge.

2A IN-LINE FILTER (OUTER VIEW)

Captures larger debris and particulates, but oil and hydrocarbons continue through.

2B IN-LINE FILTER – CROSS SECTION

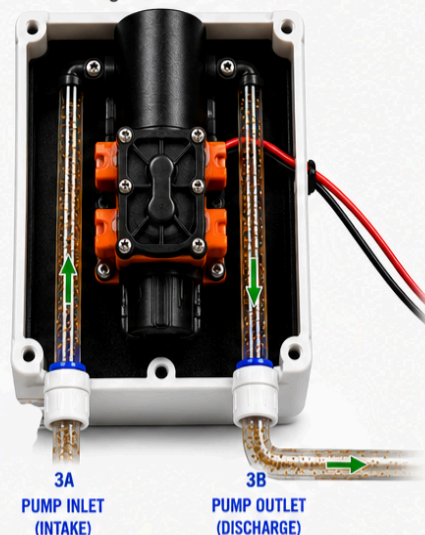
Larger debris and particulates are trapped by the screen. Oil and hydrocarbons continue through.

3 DRY BILGE PUMP (INSIDE ENCLOSURE)

Contaminated fluid is drawn into the pump, routed through the peristaltic head, and discharged overboard.

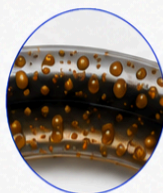
MANUAL TIMER CONTROL

System uses a manual timer that must be set by the customer. It **never** fully clears the oil and residue.



PERISTALTIC PUMP – INTERNAL FUNCTION & CONTAMINATION DAMAGE

The peristaltic pump uses rollers to squeeze the tubing in sequence, creating a vacuum on the intake side and pushing fluid out the discharge side.



Oil and hydrocarbons coat the inside of the tubing over time, reducing flexibility, increasing friction, and causing wear on the tubing and rollers.

The tubing is never fully cleaned out – residue always remains.

PUMP CONTAMINATION FAILURE



Oil and sludge inside the pump head prevent proper sealing and roller movement, causing leaks, reduced flow, loss of suction, and ultimately pump failure.

Figure 3.2 — Typical pump-based dry bilge product flow path and contamination cycle.

Arid Bilge Systems takes a different approach. It does not depend on a sponge or inline oil filter to protect a fragile pump mechanism. Instead, Arid's pickup uses filtration to stop sediment and debris, then uses vacuum, pressure, tubing, valve logic, and a centralized collection chamber to move the dirty fluid through a system designed for real marine bilge conditions.

That difference matters.

Real boats do not provide laboratory conditions. They provide heat, vibration, salt, oil film, cleaner residue, sludge, inconsistent fluid conditions, acidic contamination, and long periods of neglect between service intervals. Field feedback has repeatedly shown the difference between a simple pump-based dry bilge product and our vacuum-based dry bilge system. In some customer cases, owners tried lower-cost dry-pump alternatives on center consoles and similar boats, only to find that the pump failed to pick up fluid consistently, stopped working after limited use, or could not handle normal bilge contamination. One customer field example that stood out for us involved a new 28-foot Grady-White-style center console that had been fitted with two of these pump-based

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alternatives (we heard many many such similar examples). According to the customer, the product did not last more than a week, even after repeated attempts to make it work properly. What made this example especially interesting was the operating environment. We asked the customer whether the pump had been exposed to oil, fuel, heavy contamination, or harsh bilge chemicals. He confirmed that the boat was essentially only exposed to normal fresh water and saltwater conditions, with no hydrocarbon exposure. That is important because fresh water and saltwater should represent a relatively mild bilge environment compared to boats with oil residue, fuel traces, bilge cleaner, sludge, or acidic contamination. If a pump-based product struggles under those lighter conditions, it raises serious concerns about how it will perform in a harsher real-world bilge. We tried these pumps in our own 5- 10 year stress test model, and they failed to last 24 hours after repeated fidgeting (the very first Arid is still running to this day 22 years going on strong). Arid Bilge Systems is engineered for years of marine service, not short-term demonstration performance. In real bilge conditions (not controlled clean environments), pump-based alternatives will struggle or fail quickly when exposed to contamination, while Arid systems are designed to operate long-term in the harsh environment boats actually created below deck.

Zone Control, Tubing Distance, and Fluid Detection. Another major difference is how each Arid reaches the fluid. All pump-based dry bilge products are limited by the pump, the tubing, and the basic timer logic that controls them. In many cases, the pump is designed to move fluid through a relatively short run of tubing. If the fluid is farther away, behind a bulkhead, inside a separate compartment, or located in multiple low areas throughout the vessel, the installation becomes more limited. The owner may need additional pumps, additional wiring, or separate pickup locations to cover the same areas. Arid uses small-diameter polyethylene tubing to reach multiple wet zones throughout the boat and bring that fluid back to one centralized system. This allows the system to reach low areas in the bow, midship, stern, machinery spaces, stringer pockets, and other hidden compartments without needing a separate pump in every location. Arid's tubing is built for the marine environment. It is designed to handle long runs, chemical exposure, heat, moisture, and real bilge conditions over time. In long-term field use, Arid tubing has proven capable of lasting for decades without the type of breakdown commonly associated with softer, more fragile pump tubing exposed to heat, chemicals, and bilge contamination.

The control logic is also completely different. Many pump-based dry bilge products operate on a simple timer. The pump turns on, runs for a set amount of time, and shuts off. It does not truly know whether the pickup area is wet, dry, restricted, contaminated, or failing to move fluid properly. If the pickup is dry, the pump still runs. If the filter is clogged, the pump may still run. If the pump is exposed to contamination, it may continue trying to operate until performance drops or the pump fails. Arid Bilge Systems uses a more intelligent vacuum-based approach. When Arid creates a vacuum and opens a zone, the system can detect the difference between pulling fluid and pulling air by the resistance and vacuum behavior inside the system. If fluid is present, the system continues pulling until the zone clears. When the fluid is removed and clean air draws back through the pickup line, the system recognizes that the zone has been serviced and moves on in the cycle. That means Arid is not simply running blindly on a timer.



It is checking the bilge zones, pulling from the wet areas, and using vacuum behavior to determine when a zone has cleared. This matters because boats are not built with one simple puddle in one simple location. Water can collect in multiple low spots across the vessel. It may be far from the system. It may be behind structure. It may be under equipment. It may be in places that are difficult to see/ reach by hand.

A pump-based product may need to be installed near the water it is trying to remove. Arid Bilge Systems can bring fluid from multiple pickup locations back to one centralized system. That is the difference between a local pump and a true multi-zone dry bilge platform.

The lesson is simple: a dry-pump product may appear to work in theory, but the real question is how it performs over time in actual bilge conditions.

Why Dehumidifiers, Ozone Machines, and Odor Products Are Not Enough

Dehumidifiers, ozone machines, odor eliminators, air filtration systems, bilge cleaners, rust treatments, and protective coatings may help manage symptoms, but they do not remove the source of the problem. **They are Band-Aid solutions.** A dehumidifier treats moisture in the air, but it does not remove the residual water sitting in the lowest areas of the bilge.

An ozone machine may attack odor, but it does not remove the contaminated fluid, mold conditions, bacteria, or moisture source that allowed the odor to develop.

An odor product may mask the smell, but it does not stop the biological and chemical activity happening below deck.

A bilge cleaner may help break down contamination, but it does not keep the bilge dry after the cleaning process is finished.

A rust remover, corrosion inhibitor, or protective coating may help protect a surface, but it does not stop the moisture cycle that caused the corrosion risk in the first place.

These products may temporarily improve the environment, but if water is still sitting in the bilge, the problem will return. Heat will still cause evaporation. Vapor will move through compartments. Odor, mildew conditions, corrosion exposure, and contamination will still come back caused by a source culprit. Arid takes a different approach. It targets the source of these problems by removing residual fluid before it becomes vapor, humidity, odor, mildew, corrosion, and hidden damage. Instead of masking the symptoms with a temporary Band-Aid solution, Arid addresses the problem where it begins. It is a true source-control system.



Why Zone Control and Pickup Placement Matter

Arid Bilge Systems works because it is designed around the actual shape of a boat, not a simple flat-bottom container. Every boat has its own internal contours. Water can follow stringers, settle in low/ high pockets, collect beneath machinery, sit in gutters, gather around through-hull areas, remain in air-conditioning drain pans, sit in shower sumps, or become trapped in compartments that are difficult to see or reach by hand. Instead of treating the bilge as one general puddle, the system can service individual wet zones throughout the vessel. That is why one central pickup location is usually not enough. Residual fluid does not always collect where a traditional bilge pump is located. It collects wherever the boat's structure, slope, compartments, and drainage paths allow it to settle. Arid uses zone control to manage those different odd collection areas. The system can handle runs of more than 100 feet away from the central unit.

Pickup placement is what makes zone control effective. The pickups are installed in the low areas where fluid naturally collects. Depending on the boat and the application, different pickup styles may be used to match the shape and access limitations of the bilge. Standard pickups, mini pickups, offset pickups, and pickup wands each help reach different types of low spots, compartments, and tight areas. Every style pick-up's objective is to get every last drop of fluid out.

The detailed differences between pickup styles are covered later in the product education section.

Course 4: Internal Function Overview

How the Arid Bilge System Operates Internally

Smart Fluid Detection Through Vacuum Behavior- Arid operates through a proactive, controlled pressure-and-vacuum sequence. Course 3 introduced this concept briefly; Course 4 explains the internal operating sequence in greater detail. One of the most important parts of this process is how the system detects fluid in remote areas of the boat without placing electronic sensors directly in the bilge water. Instead of using sensors at each pickup point, Arid uses vacuum behavior, airflow resistance, and air draw-back to determine what is happening inside each intake line. When a selected zone contains fluid, that fluid creates resistance in the pickup tubing as the system pulls against it. The vacuum behaves differently because the system is moving fluid, not just air. Once the fluid has been removed and the pickup begins drawing clean air, the system recognizes the air draw-back condition and knows that the zone has cleared. This allows Arid Bilge Systems to check distant pickup locations throughout the vessel without needing electrical sensors submerged in dirty bilge fluid. The system is designed to activate automatically on a timed schedule, every three hours. During each cycle, the processor coordinates the compressor, air valves, vacuum sensors, intake valves, and collection chamber safety input in the proper order. The processor is the command unit of the system. It does not simply turn the system on and off. It manages the full operating sequence: pressure discharge, vacuum creation, vacuum confirmation, intake valve

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sequencing, fluid removal, air draw-back detection, safety monitoring, and return to standby. The sequence begins with the compressor. The processor first communicates with the compressor and air-valve system to create pressure inside the collection chamber. During this pressure phase, the system uses the pressure/ discharge side of one of the three way air-valves to pressurize the chamber and evacuate any collected fluid. That fluid is pushed through the crossover, up the discharge riser, past the check valve, and out through the approved discharge pathway. Once the pressure-discharge timing sequence is complete, the system transitions to the vacuum side. The air-valve circuit shifts so the compressor can pull air from the collection chamber and create vacuum. On multi-zone systems, the system goes from zone to zone until it senses air from all of them (For series 4-9 it can open up to x3 intake valves at once).

On Series 2, Series 4, and Series 9 systems, the high vacuum sensor confirms when the collection chamber reaches the proper vacuum condition, at 18 inches of vacuum. Once that vacuum level is reached, the processor opens the intake valve for the selected zone. That allows the stored vacuum inside the collection chamber to pull fluid through the pickup tubing and waterfalls into the chamber. The low vacuum sensor (7.75 inches) helps support the cycling behavior as the system pulls through the intake line. As fluid moves through the tubing, the system monitors vacuum behavior and resistance. When the zone clears and the pickup begins drawing air, the system recognizes the air draw-back and moves through the cycle. The system then continues zone by zone, checking each wet area according to the Arid model (All arid systems do the same cycling sequence). If the zone is dry, it moves on. We don't actually detect fluid, we detect the resistance coming from the fluid.

The collection chamber float switch is a safety feature. It is not part of normal fluid detection during every cycle. Its purpose is to help protect the system if abnormal fluid accumulation occurs inside the collection chamber. This could happen if the discharge side of the air-valve circuit fails to shift properly, if the boat's discharge pathway becomes blocked, or if an added restriction, such as an unnecessary check valve installed in the discharge line, creates back pressure or vapor lock that prevents the chamber from evacuating correctly.

The basic sequence is:

1. **The processor starts the automatic cycle.**
2. **The compressor and air-valve circuit create pressure.**
3. **Pressure clears the collection chamber through the discharge pathway.**
4. **The air-valve circuit shifts to the vacuum side.**
5. **The compressor creates vacuum inside the collection chamber.**
6. **The high vacuum sensor confirms the proper vacuum level.**
7. **The processor opens the selected intake valve.**
8. **Stored vacuum pulls fluid from the pickup zone into the collection chamber.**
9. **The low vacuum sensor and air draw-back behavior help confirm cycle response.**
10. **The system moves zone by zone until the cycle is complete.**
11. **The system returns to standby until the next scheduled cycle.**



This is what makes the Arid Bilge System a controlled internal process, not just a pump running on a timer. It's all an elegant application of fluid dynamics and vacuum motion: using negative pressure to "seek out" and eliminate moisture, even without contact or visibility.

Fluid Path, Collection Chamber, and Discharge Logic

Once the system begins pulling from a selected zone, fluid travels from the pickup location through the intake tubing and toward the collection chamber. On multi-zone systems, the intake valve is the controlled entry point into the system. When the processor opens a selected intake valve, the vacuum stored inside the collection chamber is applied to that pickup line. Fluid is then pulled from the bilge zone, through the tubing, through the intake valve, and into the collection chamber assembly. The system is designed to move dirty bilge fluid, and the compressor is designed to move air, not liquid. The collection chamber, fittings, internal flow path, crossover, check valve, and discharge riser are all designed to direct fluid through the proper route while keeping fluid away from the air-circulation side of the system to give it the longest lifespan.

On Series 2, 4, and 9 systems, fluid enters through fittings located at the top of the collection chamber cap (Series 1 uses an entry arrangement on the side instead of the top without an intake valve). From there, the internal chamber geometry helps guide the incoming fluid downward into the chamber. This "waterfall" effect helps direct fluid into the collection area instead of allowing it to remain trapped near the cap or migrate toward the air line. The internal shape of the collection chamber matters. Fluid needs a clear path of least resistance. This helps prevent fluid from staying on the underside of the cap or entering areas intended for air movement. On the underside of the cap there are long shafts for all the fittings, and a dome shaped dimple pattern to cause the fluid to become hydrophobic, giving it surface tension and causing it to create water droplets in the case of fluid potentially collecting there. During the pressure phase, air pressure forces the collected fluid down the bottom of the collection chamber's funnel and through the crossover, up through the discharge riser, past the check valve, and out through the approved discharge pathway. The check valve is a critical part of the discharge logic. It helps maintain one-way flow, prevents backflow from returning into the collection chamber, and helps preserve the seal needed for proper vacuum operation. The calibrated spring tension inside the check valve allows fluid to discharge during the pressure phase, allowing it to reseal appropriately, and preventing unwanted reverse flow during the vacuum phase. Because the blue Brady check valve helps maintain the system seal, it must remain clean and functional. If sediment, debris, or contamination prevents the check valve from sealing properly, the system may struggle to build or hold vacuum. In rare cases, if the seal is broken or the check valve is disturbed, the system may need to be re-primed or inspected to restore proper operation.

It is also important that the discharge pathway is not restricted. A blocked discharge line, improper plumbing, or an unnecessary additional check valve installed on the boat's discharge side can create back pressure, restriction, or vapor lock. If the system cannot push fluid out of the collection



chamber during the pressure phase, fluid may accumulate abnormally inside the chamber. That is where the collection chamber float switch becomes important. The float switch is not the normal method for detecting water in each bilge zone. It is a safety feature inside the collection chamber. If abnormal fluid accumulation occurs because of a discharge restriction, blocked discharge pathway, discharge-side air-valve issue, or another condition preventing the chamber from evacuating properly, the float switch moves into the activated position and sends the system into alarm. This alerts the user that the collection chamber is not clearing as intended and that the discharge path needs to be inspected, or the system needs to come in for service.

In simple terms:

The intake valve allows fluid into the system.

The collection chamber gathers the fluid.

The internal flow path keeps fluid away from the air side.

Pressure pushes the fluid through the crossover and riser.

The check valve maintains one-way flow and helps preserve vacuum integrity.

The float switch protects the system if discharge is blocked.

Manual Override / Reset Operation

Although Arid Bilge Systems operates automatically, there are times when a manual cycle may be useful. **A manual cycle may be used after: Heavy washing, Cleaning the bilge, Accidental spillage, Sudden water intrusion, Service work, or Preparing the boat before departure.**

Depending on the installation, the system may be wired through a breaker panel switch, a removable plug near the unit, or both. When power is reset, the system begins a new cycle. The compressor activates, the system clears the collection chamber and builds vacuum, the intake sequence begins, and the system performs its normal fluid-removal operation. After the manual cycle is complete, the system returns to its automatic schedule.

In short, Arid Bilge Systems isn't just a mechanical solution, its physics-driven, processor-guided platform that brings true automation and intelligence to one of the most overlooked areas of boat ownership.



Arid Bilge Systems



Product Education

[Lecture 2: Pages 35–75~9 courses](#)

Arid Bilge Systems - Dry, Fresh, & Protected



Course 1: Which Arid Bilge System is Right for Your Boat?

Matching the System to the Boat's Wet Zones: Arid Bilge Systems are available in four primary model sizes, each designed to remove residual bilge water from the hard-to-reach areas that traditional bilge pumps leave behind.



One of the most common questions dealers and customers ask is:

“Which Arid Bilge System is the right fit for this boat?”

The answer depends less on boat length alone and more on the boat's actual bilge layout. Boat length matters, but it is not the only factor. The internal structure of the boat matters more.

The most important question is:

“How many wet zones does this boat have, and how far are they from the unit?”

Wet zones are the individual areas where residual water collects. These may include trapped-fluid pockets, low compartments, stringer pockets, gutters, shower sumps, air-conditioning drain areas, machinery spaces, areas beneath equipment, or other hidden spaces where water naturally settles. Two boats of the same length may require completely different systems depending on their layout. One boat may have one simple aft bilge area. Another boat of the same size may have several isolated compartments and multiple hidden areas where water collects. For example, a 32-foot center console with several isolated hull compartments may require a Series 2 or even a Series 4. Meanwhile, a larger express cruiser with only two clear wet zones may only require a Series 2. That is why dealers should inspect the boat before recommending a system. The correct system depends on where the water collects, how many pickup locations are needed, how far those pickup locations are from the unit, what power source is available, and how the system will be installed.

Arid Bilge Systems - Dry, Fresh, & Protected



The goal is simple: Match the Arid system to the boat's wet zones, not just the boat's length.

Key Factors When Selecting a System- When evaluating a boat, dealers and installers should consider several important factors before recommending a model.

The first factor is **zone count**. Count the number of individual areas where residual water collects. Each separate wet area may require its own pickup zone.

The second factor is **tubing distance**. The distance between the Arid unit and each pickup location matters. Different models are designed for different tubing run requirements, so the installer should estimate each run before selecting the system.

The third factor is **installation space**. The system must be installed in a location that allows proper service access, tubing routing, discharge routing, and electrical connection.

The fourth factor is **power source**. Confirm whether the vessel has the appropriate DC or AC power source available for the model being installed.

The fifth factor is **environmental exposure**. Some boats are exposed to saltwater, oil residue, fuel traces, hydrocarbons, battery acid, bilge cleaner, sludge, or other contamination. These conditions may influence system selection, pickup placement, service expectations, and whether an Eco-Drain product should be considered.

The sixth factor is **customer expectations**. Some customers may want a simple single-zone solution, while others may want a more complete multi-zone dry bilge system with diagnostics, hour tracking, or future Bluetooth/app monitoring capability.

Before selecting a system, dealers should inspect the bilge layout, identify the wet zones, take photos, estimate tubing runs, confirm power availability, and determine where the unit and discharge path will be located.

Dealer Evaluation Checklist

Before recommending a system, dealers and installers should evaluate the boat carefully.

Use this checklist during inspection:

- Identify each area where residual water collects.
- Count the number of wet zones.
- Determine whether the zones are located in the bow, midship, stern, machinery space, sump, drain pan, shower sump, or other compartment.
- Estimate tubing distance from the system location to each pickup.



- Confirm available installation space for the unit.
- Confirm whether the boat has the correct DC or AC power source.
- Determine the discharge routing location.
- Take photos of each wet zone.
- Note any oil, fuel, hydrocarbons, battery acid, or chemical exposure where an Eco-Drain add-on product may be needed.
- Confirm whether the boat needs a simple system or a more complete multi-zone configuration.

This evaluation helps prevent undersizing the system and ensures the selected model matches the actual boat.

Course 2: Series 1 Product Explanation

The Series 1 is designed for single-zone applications. It is commonly used on smaller boats, compact center consoles, day boats, or installations where one primary bilge area needs to be dried. The Series 1 is typically used when there is one clear wet area, often in an aft bilge compartment or compact hull space where residual water collects after normal operation, washing, rain, or use.

Typical applications: Small outboards, compact day boats, small center consoles, single aft bilge areas

Tubing range: 20-foot fixed run

System role: Single-zone residual water removal. The Series 1 is a good fit when the boat does not require multi-zone control and the installer can clearly identify one main collection point.

Installation Note: Any extra tubing should be neatly coiled secured with zip ties, and hidden near the pickup and/ or unit as needed. The pickup should be positioned at the lowest practical point of fluid accumulation so the system can remove as much residual water as possible.



Arid Bilge Systems - Dry, Fresh, & Protected



Product Development History Note: The Series 1 was first developed in 2015 as Arid Bilge Systems' compact single-zone solution. Before the current molded design, the earliest Series 1 units were built around a larger control layout using a Direct Logic processor (we'll call that version 1.1). The Series 1 became an important stepping stone in Arid's product development because it pushed the company toward custom processor technology. By developing a smaller custom processor and redesigning the internal layout around that processor, Arid was able to shrink the system into a cleaner, more compact legacy box, known as Version 1.2. That design path eventually led to the current molded Series 1. Compared with the earliest legacy Series 1, Version 1.1, the current molded model is roughly 14% smaller. Compared with the later legacy Series 1, Version 1.2, the molded model is approximately 8% smaller. This makes the current molded Series 1 easier to install in tight spaces and more refined internally, while still maintaining the same core single-zone dry bilge function. This evolution is an important part of the Series 1 story: the system did not simply become smaller by changing the box. It became smaller because Arid redesigned the electronics, internal layout, and housing around a more compact custom processor platform. It was developed in response to the demand for an even smaller solution than our Series 2, particularly from owners of compact center consoles, day cruisers, and small cabin boats where space is at an absolute premium.

Legacy Model vs. New Molded Model

The Series 1 has evolved from the original legacy model into the newer molded Series 1. The newer molded version improves the exterior design, service visibility, installation fit, and future diagnostic capability.

Legacy Model vs. New Molded Model (Side-by-Side Overview)

Feature	Legacy Series 1 Model	New Molded Series 1 Model
Dimensions	Height: 7.94 in / 20.15 cm Width: 5.5 in / 13.9 cm Depth: 4.25 in / 10.7 cm	Height: ~6.85 in / 17.4 cm Width: ~4.65 in / 11.8 cm Depth: 4.25 in / 10.7 cm
Weight	4 lbs / 1.9 kg	~3.5 lbs
Discharge Port	1/2" barbed fitting	1/2" barbed fitting
Intake Ports	One	One
Compressor	Schwarzer Precision vacuum pump	Same
Processor	Proprietary software processor	Same
Power Draw	0.022A standby / 0.26A run @ 12V DC	Same
Flow Rate	5 liters/hour	~5.5 liters/hour
Tubing	5/32" dia, 20 ft fixed (cannot be cut)	Same
Material	Air-injected white PVC	Molded white resin
Voltage	Accepts 12V through 24V DC	Same



Warranty	1 year parts and labor	Same
Visual Indicators	Lights on side of unit	Lights on front face for easier visibility
Size & Installation	Slightly bulkier	~8% smaller, easier to install in tight compartments
Connectivity	None	None
Performance Enhancements	Standard base	Improved flow ratio from molded collection chamber funnel design
Operating Temperature	Above Freezing	Above Freezing

Both the legacy and molded Series 1 units are designed to deliver the same proven dry bilge performance. The molded Series 1 features a refined front-facing indicator light that allows the owner or technician to quickly confirm system status (Version 1.2 had the lights on the side). Its smaller footprint also makes it easier to install in tight or awkward bilge compartments.

Course 3: Series 2 Product Explanation

The Series 2 is designed for boats with two to three individual wet zones. It is commonly used on mid-sized center consoles, larger outboards, and boats with multiple isolated compartments that collect water in more than one area. The Series 2 is often the correct choice when a boat has separate bow, midship, and stern areas that need to be dried, or when water collects in multiple pockets that cannot be serviced properly by one pickup location.

Best fit: Two to three wet zones

Typical applications: Mid-sized center consoles, larger outboards, compact multi-zone layouts, boats with multiple trapped-fluid pockets

Tubing range: Minimum 20 feet, maximum 50 feet per zone

System role: Multi-zone dry bilge management for smaller and mid-sized boats

The Series 2 gives dealers a strong solution for boats that need more than one pickup location but do not require the larger capacity or zone count of a Series 4.

Installation Note: Any extra tubing for any of the zones should be neatly coiled secured with zip ties, and hidden near the pickup and/ or unit as needed. The pickup should be positioned at the lowest practical point of fluid accumulation so the system can remove as much residual water as possible.





Product Development History Note: The Series 2 was developed in 2009 in response to customer demand for a smaller multi-zone system than the Series 4. At boat shows and customer demonstrations, many owners wanted Arid's multi-zone dry bilge performance but needed a unit that could fit into smaller boats, tighter compartments, and center console applications. The result was the Series 2: a compact multi-zone system designed for boats that need two to three pickup zones but do not require the size, capacity, or zone count of a Series 4. The legacy Series 2 gave center consoles and smaller multi-zone vessels a more practical option while maintaining the core Arid pressure-and-vacuum technology. The newer molded Series 2 advanced that design even further. It is approximately 33% smaller than the legacy Series 2 and improves installation fit, appearance, service visibility, and optional Bluetooth diagnostic capability. The Series 2 is commonly used on mid-sized center consoles, larger outboards, cabin cruisers, and other boats where water collects in more than one location but where space is still limited.

The updated molded Series 2 offers several important improvements:

- A more compact molded enclosure for tighter installations
- Front-facing indicator lights for easier visibility
- Optional Bluetooth upgrade for mobile diagnostics
- Real-time fault monitoring and alarm code support through the app

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- Zone-based visibility to help identify which wet zone may need attention
- Improved service access and a more refined exterior design

With the optional Bluetooth upgrade, users can view hour meter data, receive alarm code notifications on which pick-up is clogged, better understanding which zone or parameter may be triggering a service condition. This helps reduce guesswork and supports faster troubleshooting.

Legacy vs. Molded Model Comparison

Feature	Legacy Series 2 Model	New Molded Series 2 Model
Dimensions	Height: 9.44 in / 24 cm	Height: ~7.71 in / 19.6 cm
	Width: 6.29 in / 16 cm Depth: ~3.7 in / 9.4 cm	Width: ~6.11 in / 15.53 cm Depth: 5.51 in / 14 cm
Weight	5 lbs / 2.26 kg	~4.5 lbs
Discharge Port	1/2" barbed fitting	1/2" barbed fitting
Intake Ports	2-3	2-3
Power Draw	0.024A standby / 0.31A run @ 12V/ 24V DC	0.024A standby / 0.31A run @ 12/24V DC
Flow Rate	Up to 6.5 liters/hour	~7.25 liters/hour
Tubing	5/32" dia, 20 ft fixed (cannot be cut)	Same
Material	Air-injected white PVC	Molded white plastic with Arid branding
Voltage	Accepts 12V through 24V DC	Same
Warranty	1 year parts and labor	Same
Visual Indicators	Lights on side of unit	Lights on front face for easier visibility
Size & Installation	Slightly bulkier	~33% smaller, easier to install
Connectivity	None	Optional Bluetooth app support for diagnostics
Performance Enhancements	Standard base	Improved funnel and cap flow dynamics for longer lifespan
Operating Temperature	Above Freezing	Above Freezing



Course 4: Series 4 Product Explanation

The Series 4 is designed for larger or more complex boats with four to eight wet zones. It is commonly used on larger center consoles, express cruisers, sportfish boats, yachts, mega yachts, and vessels with multiple compartments that trap water throughout the hull. The Series 4 is a good fit when the boat has several independent wet areas that need to be managed from one centralized system. This may include water collecting in the bow, midship, stern, machinery spaces, stringer pockets, air-conditioning drain areas, shower sumps, or compartments beneath equipment.

Best fit: Four to eight wet zones

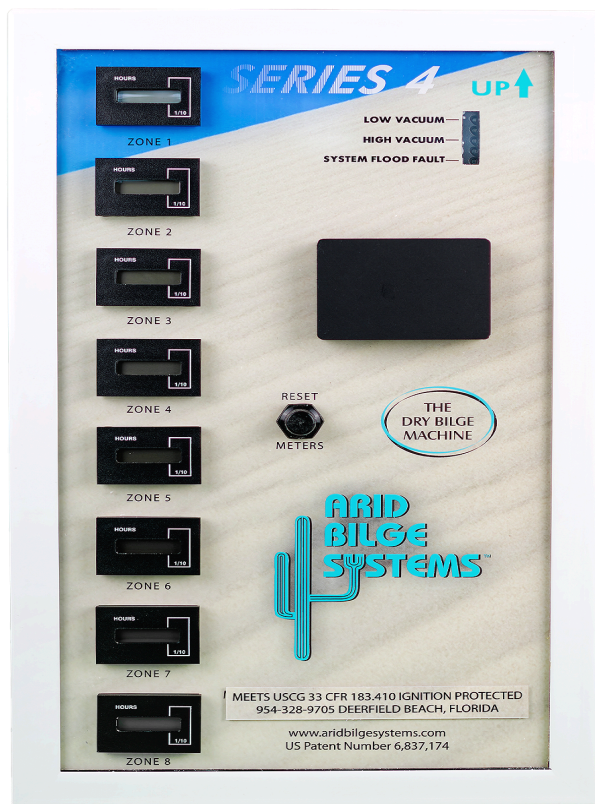
Typical applications: Larger center consoles, express cruisers, sportfish boats, yachts, complex bilge layouts

Tubing range: Minimum 20 feet, maximum 75 feet per zone

System role: Larger multi-zone dry bilge management

The Series 4 is especially useful when a vessel has too many wet areas for a Series 2 but does not require the larger yacht-level capacity of a Series 9.

Installation Note: The Series 4 includes zone hour meters, which can help identify areas that are running longer than expected. Longer run times on a specific zone may help indicate a leak, unusual water activity, or a compartment that requires additional inspection.



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Product Development History Note: The Series 4 was introduced and developed in 2007 as a smaller, more installation-friendly version of the larger Series 9 platform. After the early large-format systems and Series 9 foundation were developed around 2004, Arid saw the need for a compact multi-zone system that could serve yachts, sportfish boats, cruisers, and larger recreational vessels without requiring the full size or capacity of a Series 9. The Series 4 preserved the core pressure-and-vacuum technology, multi-zone control, and rugged construction of the larger platform while adapting it into a smaller footprint for vessels that needed four to eight pickup zones.

Specifications: Series 4

Specification	Details
Height	15 inches / 38 centimeters
Box Width	9 inches / 23 centimeters
Depth	7.5 inches / 19 centimeters
Box Dry Weight	15 pounds / 7 kilograms (base unit)
Intake Tubing	3/16" Polyethylene tubing 200 ft for 4 zone +100 ft for 5–6 zone +200 ft for 7–8 zone
Max Expected Flow Rate	11 US gallons / 39 liters per hour
Power Options	12 or 24 volt DC
Power Draw	0.09 amp standby / 0.8 amps run (12V DC, one active zone)
Discharge Port	1/2" barbed fitting
Control	PLC Direct Logic 05 Koyo D0-05 processor, proprietary software
Compressor / Vacuum Pump	Schwarzer Precision
Main Unit Material	Air-injected white PVC plastic
Face	Clear Lexan with back-applied graphics, LED indicator lights
Warranty	1 year parts and labor
Available Upgrades	Hour Meters and Pinch Valves
Pickups	Recommended or Custom Selection

Series Four Lineage

The Series 4 holds an important place in the Arid Bilge Systems product family. It became the bridge between the large-vessel Series 9 platform and the smaller systems that followed. By bringing multi-zone dry bilge technology into a more compact format, the Series 4 made Arid's pressure-and-vacuum system practical for a wider range of recreational and yacht applications. It

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maintained the durability and operating principles of the larger systems while becoming easier to install in vessels that needed serious multi-zone coverage without the full scale of a Series 9. From the Series 4 platform, Arid later continued scaling the technology down into the Series 2 and eventually the Series 1. Each step preserved the same core idea: match the system to the number of wet zones and the layout of the boat. For dealers, the Series 4 is often the correct recommendation when a vessel has several independent wet zones, a more complex bilge layout, or a need for stronger multi-zone monitoring. When equipped with hour meters, the Series 4 can also help identify zones that run longer than expected. Longer run time on a specific zone may indicate a leak, unusual water activity, or a compartment that needs inspection. The Series 4 offers the right mix of size, scale, and strength for many larger recreational vessels, sportfish boats, express cruisers, and yacht applications.

Course 5: Series 9 Product Overview

The Series 9 is the largest Arid Bilge System model and is designed for large yachts, mega yachts, commercial vessels, and complex multi-zone installations requiring long tubing runs and higher capacity. The Series 9 is used when the vessel has many wet zones, large machinery spaces, long runs, and a more complex bilge layout that requires broader coverage.



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Best fit: Nine to eleven zones, or larger custom applications

Typical applications: Large yachts, mega yachts, commercial vessels, specialty applications, high-zone-count vessels

Tubing range: Minimum 20 feet, maximum 100 feet per zone

System role: Large-vessel and high-capacity dry bilge management

The Series 9 is intended for vessels where multiple compartments must be managed from one centralized system. It is the best fit when a boat has numerous wet zones spread across a large footprint.

Installation Note: The Series 9 should be selected when zone count, distance, vessel size, and system capacity require the largest Arid Bilge System platform.

Product Development History Note: The Series 9 represents the large-vessel foundation of the Arid Bilge Systems product line. The first working pilot model was built around 2002 aboard *Thirsty Lady V*. That early pilot system was simple and experimental compared to today's models. It was essentially a collection chamber without a finished enclosure or production-style housing. This early prototype stage is explained in more detail on page 12, "**From Idea to First Prototype.**" That pilot model was not yet a finished Series 9-style product. After the pilot stage, Arid built a small number of very large Series 9-style units. Roughly four of these early large-format systems were made. They were much closer in concept and function to the Series 9 used today, but they were larger than the current production model. From there, the design was refined into the standard Series 9 production model used today. The current Series 9 is roughly 20% smaller than those early large-format units while maintaining the same core purpose: high-capacity dry bilge protection for large vessels with complex multi-zone layouts.

The Series 9 remains the flagship model for large yachts, mega yachts, commercial vessels, and installations requiring long tubing runs, high capacity, and multiple independent pickup zones.

Specifications: Series 9

Specification	Details
Height	24 inches / 61 centimeters
Width	17 inches / 43.5 centimeters
Depth	6 inches / 15.25 centimeters
Dry Weight	35 pounds / 16 kilograms (base unit)
Intake Ports	Soft Overlapping Tube Connection
Intake Tubing	1/4" polyethylene, 20 to 100 foot lengths
Single Discharge Port	1/2 inch barbed
Air Discharge Port	1/8 inch pipe thread
Main Unit Material	1/2" PVC plastic, finished in Awlgrip Matterhorn White

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Main Unit Face Options	Show model - Clear Lexan; Premium model - Aluminum (finished in Awl grip Matterhorn White)
Power Requirements	120 VAC (Standard U.S. house power)
Operating Temperature	Above freezing

Course 6: Which Pickup is Right for Your Bilge?

Choosing and Placing the Correct Arid Pickup: The Arid Bilge System can remove fluid from hard-to-reach areas throughout a vessel, depending on the model, tubing distance, and installation layout. Pickups may be placed in the bow, midship, stern, machinery spaces, air-conditioning drip pans, shower sumps, limber holes, and other problem areas where fluid naturally accumulates. For best performance, the system itself is typically installed in a secure, serviceable location such as the engine room or another protected area on a bulkhead. From there, intake tubing is routed to the individual wet zones throughout the vessel. The pickup is the first contact point between the wet bilge area and the Arid system. Because of that, pickup selection and placement are extremely important. The system can only remove water effectively if the pickup is placed where the water actually collects.

Why Pickup Selection Matters: Every boat is shaped differently. Water does not always collect in one simple, flat location. It may settle in a flat bilge area, follow a V-shaped channel, collect in an air-conditioning drip pan, sit inside a shower sump, gather in a limber hole, or remain trapped in a deep pocket that is difficult to reach by hand. That is why Arid offers different pickup styles. Each pickup is designed to help reach a specific type of wet area. The correct pickup depends on the shape of the compartment, the amount of space available, and where gravity naturally sends the fluid. A pickup should not be selected only because it fits physically. It should be selected because it can sit correctly in the wet zone and allow fluid to enter freely.

The Four Pickup Options

Mini Pickup — 2 x 3 inches

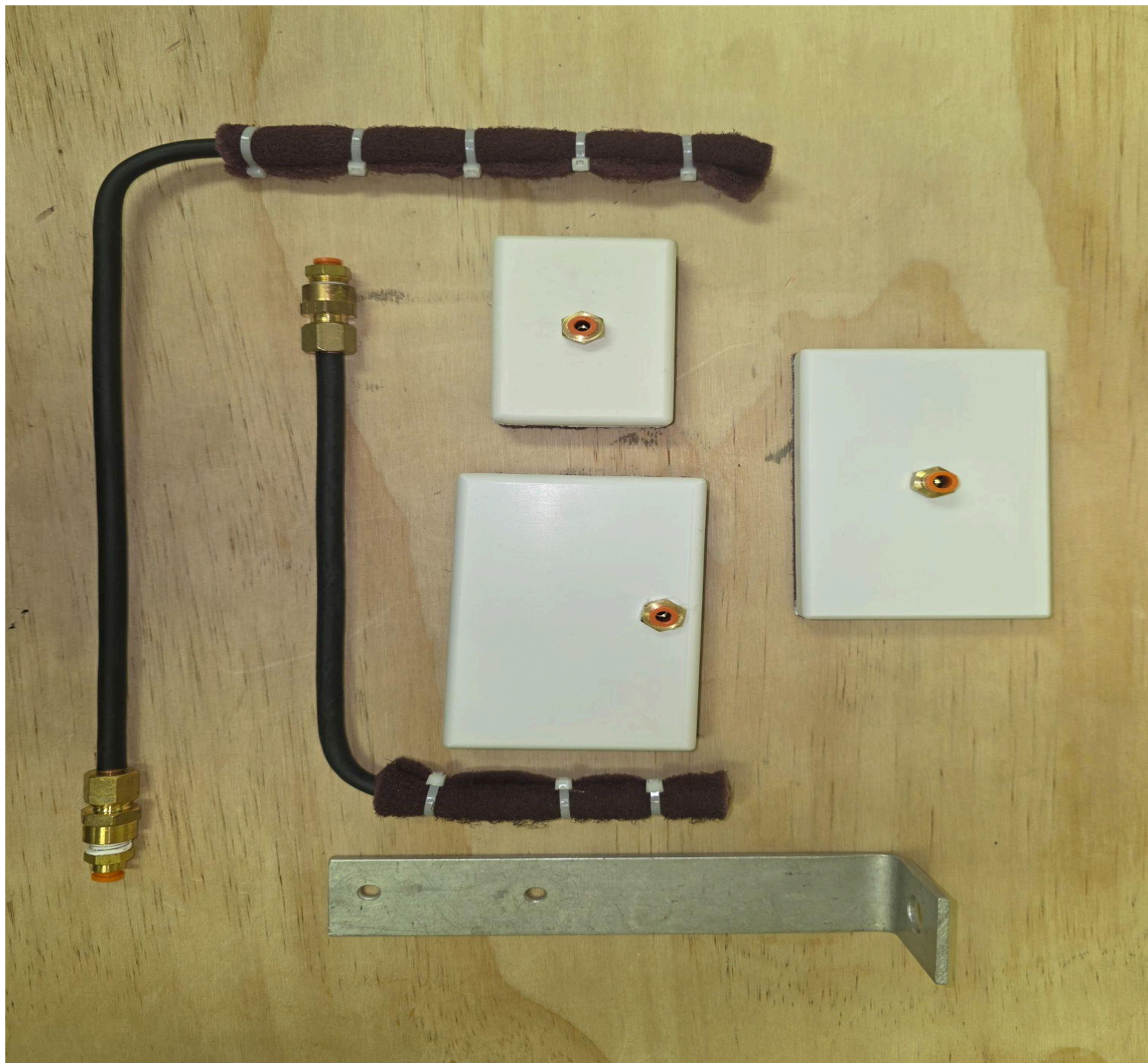
The Mini Pickup is a compact flat pickup with an H-groove channel that allows fluid to settle evenly for efficient collection. Best used for compact flat bilge areas, large air-conditioning drip pans, smaller compartments, and tight spaces where fluid naturally accumulates.

Placement:

The Mini Pickup may be placed forward or aft of bilge pumps, inside AC drip pans, or in flat bilge areas where water collects. The Mini Pickup is useful when space is limited but a stable flat pickup is still needed.



Figure 6.1-Arid pickup options and securing bracket for different bilge applications.



Clockwise from left: flexible pickup wand (Large and Small), mini pickup, standard pickup, offset pickup, and securing bracket. The mini and offset pickups are used across all Arid systems, while the standard pickup and larger pickup wand are used for larger Series 4 and Series 9 installations only. The bracket may be used to help hold a pickup in place without drilling into the pickup or restricting its ability to breathe.

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Standard Pickup — 2.7 x 4.5 inches

The Standard Pickup is similar in function to the Mini Pickup, but with a larger footprint for broader surface coverage.

Placement:

Larger vessels with flat bilge areas or wider collection points. The Standard Pickup should be positioned at the lowest practical point where fluid naturally settles in flat surfaces.

Note:

The Standard Pickup is only used for Series 4 and 9 applications. It is not offered for Series 1 or Series 2 systems because its larger footprint and larger H-groove area require greater vacuum reserve to pull fluid efficiently across the full underside of the pickup surface. On smaller systems, such as Series 1 and Series 2, the collection chamber has less vacuum reserve. A larger pickup can draw air back too quickly, which may reduce pulling force back in the low vacuum sensor and processor's algorithm too quickly, leaving a small amount of fluid beneath the pickup. The Mini Pickup is better matched to Series 1 and Series 2 because its smaller footprint allows the system to maintain more effective suction at the pickup point.

Offset Pickup — 2.7 x 4.5 inches

The Offset Pickup is designed for V-style bilges and angled bilge compartments where fluid collects along a groove, channel, or lower edge.

Placement:

V-bottom bilges, forward bow areas, twin-V engine bilges, linear groove compartments, and areas where water naturally follows the shape of the hull. Placement depends on the hull design and structural bilge layout. In many cases, water will collect toward the aft end of each bilge location unless the compartment is uneven.

Flexible Pickup Wand

The Flexible Pickup Wand is designed for narrow, deep, or awkward spaces where a flat pickup may not fit properly.

Placement:

The wand can be adjusted or positioned to reach confined areas where other pickups would not sit correctly. The Flexible Pickup Wand is especially useful when the wet area is narrow, deep, or



difficult to access. AC drip pans, limber holes, deep bilge pockets, hard-to-reach compartments, and unusual bilge layouts.

Note:

The Flexible Pickup Wand is available in smaller and larger configurations depending on the system (larger for series 4, and only 9). The smaller wand uses fewer intake holes, while the larger wand uses additional intake holes to support higher-capacity systems. This matters because pickup size and intake-hole pattern must match the vacuum reserve and cycling behavior of the system. On smaller systems, a pickup or wand that draws too much air too quickly can cause the system to sense air draw-back too soon. When that happens, the system may think the zone has cleared before all the fluid has been removed. For this reason, smaller wand configurations are matched to smaller series 1, 2 systems, while larger wand configurations are intended for higher-capacity systems with greater vacuum reserve.

Why Proper Pickup Placement Matters

The pickup must be placed where fluid actually collects. The best pickup in the wrong location will not dry the bilge properly. The pickup should sit at the lowest practical point of accumulation, where gravity naturally brings the water. A common mistake is placing the pickup only near a bilge pump (sometimes that's not the very lowest point of fluid accumulation). That may work in some boats, but the correct location is not always the bilge pump location. The correct location is wherever residual fluid remains after the boat settles.

Dealers and installers should look for:

- The very lowest points where fluid naturally settles
- Flat pockets that hold water after the bilge pump shuts off
- Hidden compartments/ locations that could be sealed off without a hatch designed by the builder
- AC drip pans and shower sumps
- Limber holes and deep pockets
- Compartments beneath machinery or equipment
- Areas that are difficult to reach by hand

The pickup should be positioned so fluid can enter freely and the system can pull the zone completely dry.



Do Not Drill Into the Pickup

Drilling into the pickup can damage the pickup body, screen, filter area, and internal flow path. It can also create an opening that allows dirt, debris, fiberglass dust, bilge contamination, or drilled material from the pickup itself to be pulled directly into the vacuum intake line. Once the system cycles, that loose material can travel from the pickup into the intake tubing and eventually into the system. Over time, this can restrict the tubing, reduce vacuum performance, clog the intake valve, or create avoidable service issues. The pickup is designed to collect fluid through its intended grooves, screen, filter, and flow path. It should not be modified by drilling, cutting, or adding fasteners through the pickup body. If a pickup needs to be secured, use proper tubing tension or an approved bracket method that is not clamping the pickup, instead of drilling into it.

Avoid Over-Clamping the Pickup

Installers sometimes ask:

“Shouldn’t the pickup be clamped down?”

The answer is usually no. The pickup does not need to be crushed, drilled, or clamped tightly to work properly. In fact, over-clamping can create problems. The pickup must be able to breathe. Fluid and air need to enter the pickup freely so the system can complete its cycle. If the pickup is squeezed too tightly, the grooves or intake area can become restricted. When that happens, the system may not pull fluid efficiently, the zone may not clear properly, and water may remain in the bilge.

Over-clamping can cause:

- Restricted fluid entry
- Reduced vacuum efficiency
- Incomplete zone clearing
- False dry-zone behavior
- Dirt and debris restriction
- Poor long-term pickup performance

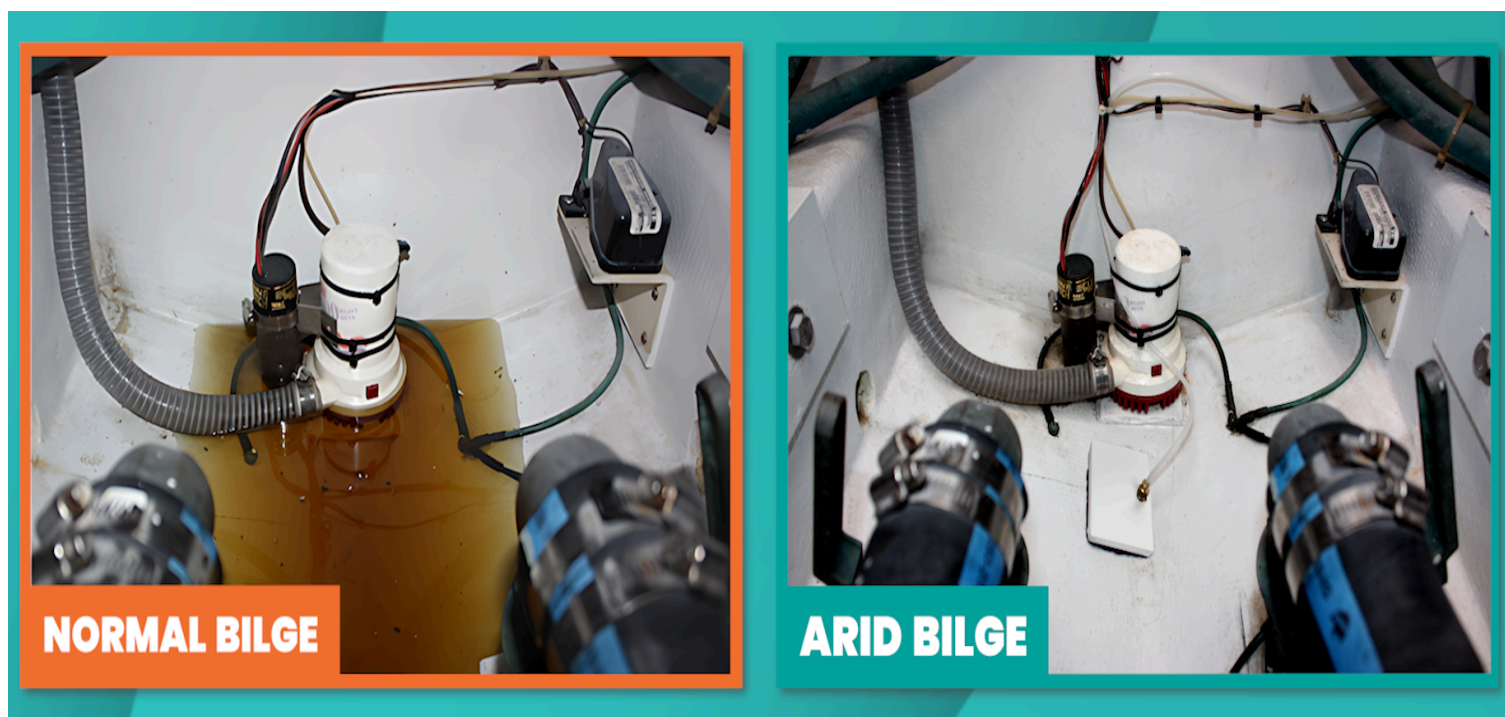
The pickup should be held in place without blocking its ability to breathe.



Recommended Securing Method

The best method is to use the intake tubing itself to apply gentle downward pressure. Route the tubing so it creates slight downward tension on the pickup. This helps hold the pickup in position without crushing or restricting it. The pickup's weight, center of gravity, built-in friction, and tubing tension usually provide enough stability to keep it in place.

Figure 6.2 — Proper pickup placement using light downward tubing tension.



This comparison shows a normal wet bilge beside an Arid-protected bilge. In the Arid Bilge image, the offset pickup is positioned at the low point and held in place with gentle downward pressure from the tie-wrapped bilge pump tubing route.

A simple demonstration helps explain the concept: Place a pickup in the palm of your hand with a short piece of tubing attached. Apply slight downward pressure through the tubing. Turn your hand upside down, and the pickup will remain firmly in place. This shows that the pickup does not need heavy clamping to stay positioned. If additional support is needed, use a bracket that holds from the fitting of the pickup in place without compressing the pickup body.

Development Note: Arid continues to develop many future technologies, one future small component will be the bracket options for each specific pickup model. The goal of any bracket design should be to hold the bracket securely in the bilge while allowing the pickup itself to breathe, and easily slide in and out for service, cleaning, or new replacement. In this type of design, the bracket would secure the pickup location without drilling into the pickup body or compressing the



pickup. The bracket's main purpose is to just stabilize it, without restricting airflow, fluid entry, or pickup performance.

Maintaining Your Pickups

Arid Bilge Systems require minimal maintenance, but pickups should be inspected and cleaned periodically. A good general practice is to clean pickups every six months, or sooner if the boat operates in a dirty bilge environment.

Pickups may need cleaning after:

- New boat construction debris
- Fiberglass dust
- Paint chips
- Heavy bilge contamination
- Dirt buildup from older boats
- Alarm conditions related to restricted pickup flow
- Excessive sediment or debris accumulation

If an alarm sounds because of a clogged pickup or restricted intake, remove the pickup and clear the debris. Pickups can be rinsed at the dock or in a sink. The pickup acts as the system's first-stage filter point. Dirt and debris that might normally clog a bilge pump can instead collect around the pickup screen or filter area. This is intentional and service-friendly because the pickup is easier to inspect, remove, and clean than a clogged intake tube or internal system component. Over time, dirt naturally moves toward the lowest point in the bilge because bilge water carries debris as it flows. Since the pickup is installed at the low point where water collects, debris may also collect there. When this happens, the system may trigger an alarm or service condition because the pickup cannot breathe freely. This does not mean the system has failed. In many cases, it simply means the pickup is doing its job by stopping debris before it enters the intake tubing. Cleaning the pickup restores proper airflow, fluid entry, and vacuum performance.

Preventing Corrosion and Chemical Damage

A rare issue that can occur is damage to the pickup's Scotch Brite screen, brass fitting, from harsh chemical exposure. One example is heavy-duty AC coil cleaner or similar corrosive maintenance chemicals. These chemicals can be aggressive enough to damage or break down the Scotch-Brite-style filter pad on the bottom of the pickup if they are allowed to sit in the pickup area or pass through the system repeatedly. Fuel or other harsh bilge contaminants may also damage the pickup's 5200 material in certain situations. In one observed case the system was shut off with



hydrocarbons standing in the bilge, a pickup was exposed to a strong contaminant in the bilge area. The filter pads sealing area deteriorated, allowing debris to pass through the pickup and enter the intake path. Once that happens, debris can travel into the intake tubing or intake valve and create a service issue. While Arid pickups are designed for real bilge environments, installers and service technicians should avoid unnecessary exposure to harsh acids, aggressive cleaners, concentrated chemicals, fuel, or unknown bilge contaminants whenever possible. If a boat has been exposed to strong chemicals or fuel contamination, inspect the pickup, screen, fitting, filter pad, seal area, and intake tubing to make sure the pickup is still clean, intact, and functioning properly. If the filter pad is damaged, melted, loose, or separated from the pickup, replace the pickup before operating the system again.

Course 7: Eco-Friendly Product Line

Eco-Drain Hydrocarbon Separation Systems

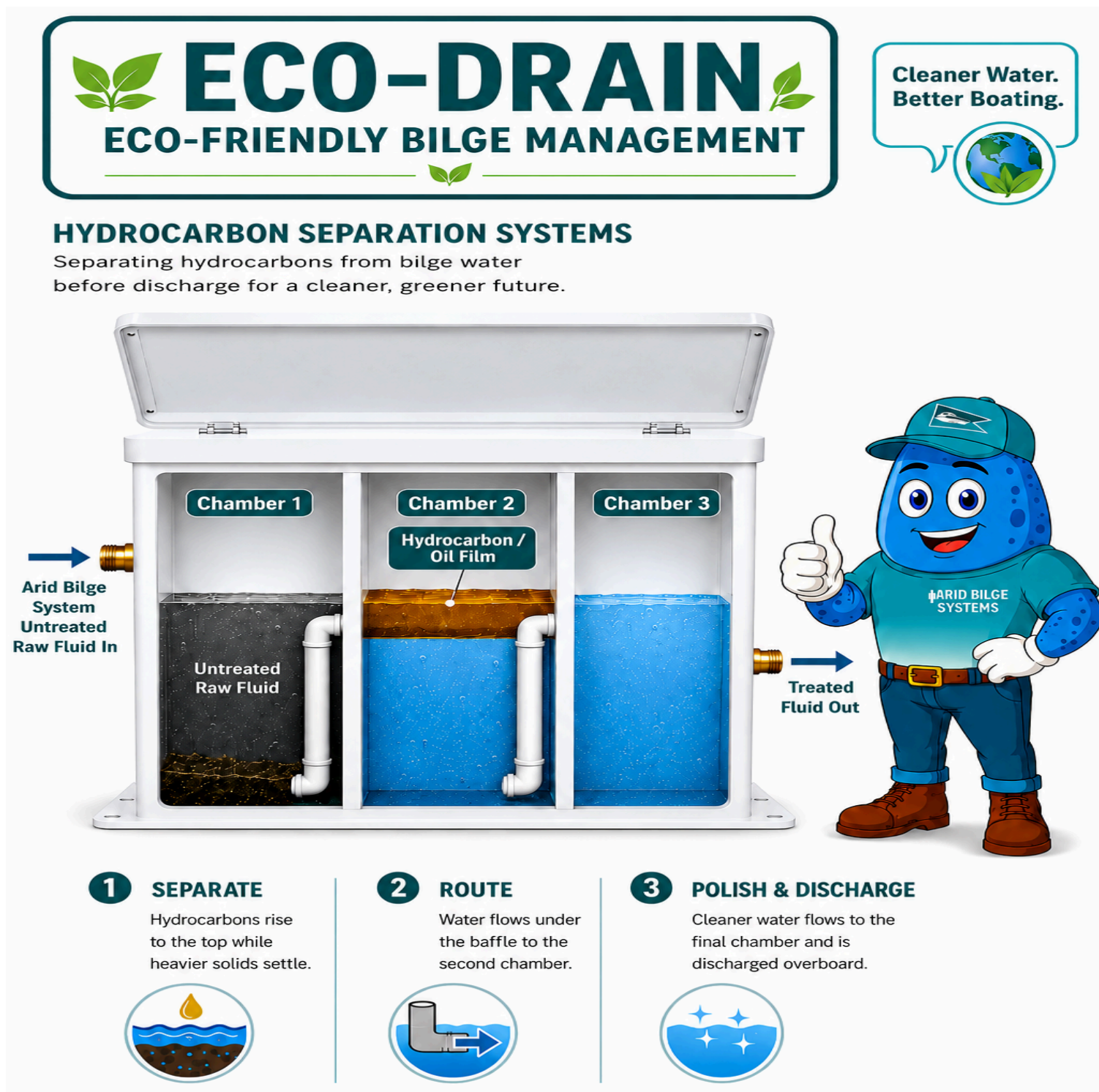
The Arid Bilge System is designed to remove residual bilge fluid from low points throughout the vessel. In some installations, that bilge fluid may contain hydrocarbons such as oil, diesel fuel, hydraulic fluid, or other contaminants. For those applications, Arid offers the Eco-Drain line of products. Eco-Drain is designed to receive untreated bilge fluid discharged from the Arid Bilge System and help separate lighter hydrocarbons from water before the separated water is discharged overboard or routed to an approved discharge location. The purpose of Eco-Drain is simple: reduce hydrocarbon discharge risk, reduce potential fines, and support more environmentally responsible bilge management.

Product Development History Note

The Eco-Drain product line was developed as a companion solution to the Arid Bilge System. After Arid Bilge Systems proved that residual bilge fluid could be automatically removed from low points throughout the vessel, another need became clear: some boats also needed a simple way to manage untreated bilge fluid that may contain oil, diesel fuel, hydraulic fluid, or other hydrocarbon residue before discharge. Unlike a traditional bilge pump, which may discharge whatever fluid reaches the pump, Eco-Drain gives contaminated bilge fluid a separation step before discharge.



Figure 7.1 — Eco-Drain hydrocarbon separation process.



This figure shows how Eco-Drain receives untreated bilge fluid from the Arid Bilge System, allows hydrocarbons to rise through gravity-based separation, routes fluid beneath the pipe flow route, and discharges cleaner water through the final chamber.

Arid Bilge Systems - Dry, Fresh, & Protected



One of the early projects that helped drive this need was “**Bolder Won**,” a 75-foot custom catamaran built in 2007. The vessel received an extensive Arid installation package, including multiple Arid systems and many bilge zones. Because the Arid systems could automatically remove and discharge bilge fluid, the project also created a need for a companion product that could help separate hydrocarbons before discharge. Around 2007, Arid began developing the Eco-Drain concept to address that need.

The concept was inspired by larger oil-water separation and wastewater-treatment principles, where contaminated water is given time and chamber space to separate naturally. In those larger systems, lighter hydrocarbons rise above the heavier water layer so they can be contained, removed, or managed before discharge. Arid adapted that same basic separation idea into a smaller onboard marine format. Instead of using large industrial equipment, Eco-Drain uses a compact chamber-based design that allows raw bilge fluid discharged from the Arid system to settle before water continues through the discharge path. Eco-Drain is not a replacement for the Arid Bilge System. It is an optional companion product installed downstream from the Arid discharge path. The Arid system removes and discharges bilge fluid from the vessel’s wet zones. Eco-Drain receives that discharge and gives the fluid a controlled chamber area where hydrocarbons can separate from water before discharge.

Each Eco-Drain model is matched to different Arid system sizes and vessel applications:

-Eco-Drain 1 — Designed for smaller Arid applications, including Series 1 and Series 2 systems.

-Eco-Drain 2 — Designed for mid-size applications, including Series 2 and Series 4 systems.

-Eco-Drain 3 Premium Aluminum — Designed for larger Arid applications, including Series 4 and Series 9 systems.

This gives dealers and installers a simple way to match the Eco-Drain model to the correct Arid system already being installed. Over time, the Eco-Drain line evolved into these different sizes and configurations so customers could add environmental discharge support to smaller boats, mid-size vessels, larger yachts, and commercial/ military vessel applications.

How Eco-Drain Works with the Arid Bilge System

The Arid Bilge System uses controlled pressure and vacuum inside its centralized collection chamber. Raw untreated fluid is pulled from wet zones throughout the vessel and vacuumed into the Arid system. Once fluid is collected inside the Arid system, the system enters its discharge phase. Without an Eco-Drain, that untreated discharged fluid would follow the vessel’s normal discharge routing. With an Eco-Drain installed, the Arid system discharges untreated bilge fluid into the Eco-Drain first. Eco-Drain then gives the fluid time and chamber space to separate before fluid exits the unit.



Stage 1: Raw Fluid Entry

Untreated bilge fluid enters the Eco-Drain through the inlet side of the unit and flows into the first chamber. This is the raw fluid entry stage.

The first chamber receives the discharged bilge fluid from the Arid Bilge System and begins the settling process. Heavier water begins to settle lower in the chamber, while lighter hydrocarbons begin to rise toward the top. Inside the first chamber, the fluid level is controlled by the relationship between the inlet height, internal transfer piping, and discharge outlet height. The inlet path is positioned slightly higher than the discharge path (on the other side of the unit), where the discharge line establishes the operating waterline inside all the Eco-Drain models.

Stage 2: Hydrocarbon Separation

From the first chamber, untreated fluid moves through a lower internal piping positioned near the lower part right of the chamber. This lower transfer path moves fluid forward into the second chamber. Inside the second chamber, separation begins. Lighter hydrocarbons such as oil, diesel fuel, antifreeze, or hydraulic fluid rise above the water layer. This process occurs naturally through gravity separation. Eco-Drain does not chemically treat the fluid, or use any kind of filtration. Instead, it creates a still, controlled chamber environment where hydrocarbons can form a separate layer and collect above the water. Depending on the Eco-Drain model, separation may occur through a two-chamber (Eco 1) or three-chamber design (Eco 2, and 3). In a three-chamber design, the second chamber provides the primary hydrocarbon separation area.

Stage 3: Water Discharge

After the primary separation occurs in the second chamber, water moves into the third chamber through another lower internal transfer pipe. This transfer pipe is positioned near the bottom of the second chamber, similar to the transfer design between the first and second chambers. Because hydrocarbons are lighter than water, oil, diesel fuel, hydraulic fluid, antifreeze, and other hydrocarbons, they remain floating near the top of the second chamber. The lower transfer pipe allows water from beneath the hydrocarbon layer to move into the third chamber while helping keep the floating hydrocarbons contained in the second chamber. Once the water enters the third chamber, it continues toward the discharge pathway. The third chamber provides the final discharge path before water exits overboard. The intake line is positioned slightly higher than the discharge line, and the discharge line effectively establishes the operating water level inside all the units. If hydrocarbons are allowed to build up too high inside the second separation chamber, they may eventually reach the transfer point or overflow into the third chamber, reducing the effectiveness of the system. This is why periodic inspection and hydrocarbon removal are important.

When hydrocarbons are removed from the Eco-Drain, they should be collected in an empty approved container, such as an empty gallon container, and then taken to a proper disposal location.



Eco-Drain 1



The Small Eco-Drain is designed for smaller Arid applications, including Series 1 and Series 2 systems. It is compact and intended for installations where space is limited but hydrocarbon separation is still desired.

Specification: Eco- Drain 1	Details
Product Type	Eco-Drain hydrocarbon separation companion
Recommended Arid Systems	Series 1 and Series 2
Dimensions	14 × 14 × 10 inches
Height	15 inches / 38 centimeters with stainless steel hinged lid
Required Lid Clearance	Additional 7 inches / 18 centimeters of vertical clearance recommended
Width	15.75 inches / 40 centimeters to end of fittings
Depth	9.5 inches / 24 centimeters
Dry Weight	11.5 pounds / 5.25 kilograms
Main Unit Material	Lexan-type plastic, 1/4 inch thick
Power Requirements	None

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Eco-Drain 2



The Standard Eco-Drain is designed for mid-size applications and may be used with larger small-boat or multi-zone installations where additional separation capacity is needed.

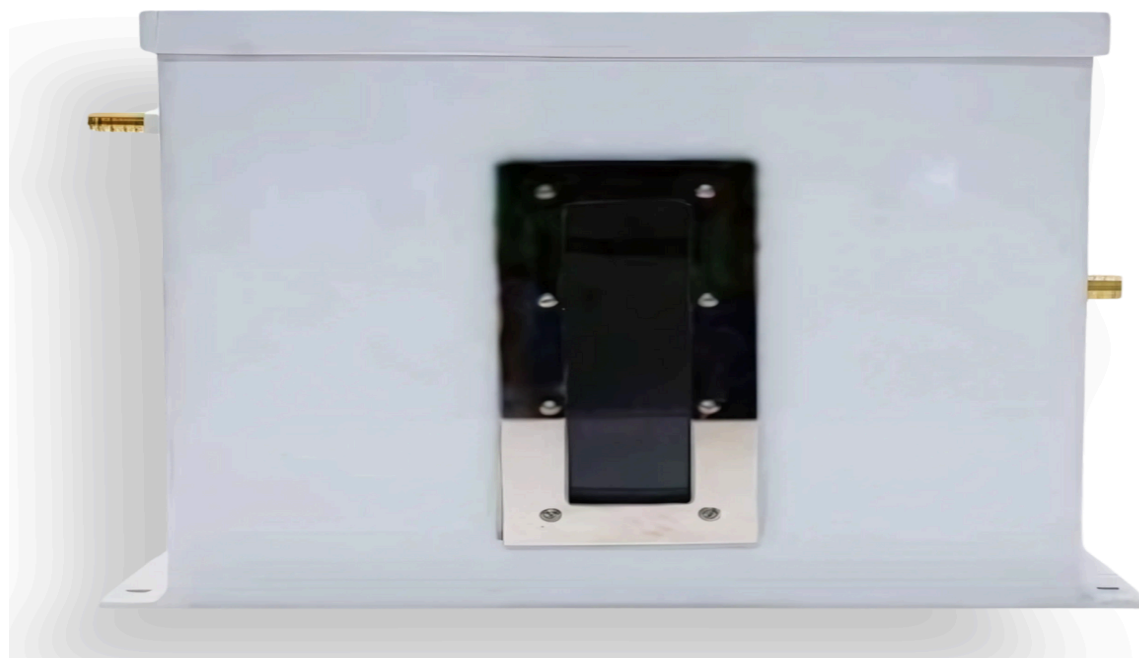
Specification: Eco- Drain 2	Details
Product Type	Eco-Drain hydrocarbon separation companion
Recommended Arid Systems	Series 2 and Series 4
Dimensions	20 × 18 × 12 inches
Height	15 inches / 38 centimeters with stainless steel hinged lid
Required Lid Clearance	Additional 7 inches / 18 centimeters of vertical clearance recommended
Width	15.75 inches / 40 centimeters to end of fittings
Depth	9.5 inches / 24 centimeters
Dry Weight	12.8 pounds / 5.8 kilograms

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Power Requirements	None
Intake Port	1/2 inch barbed
Water Discharge Port	1/2 inch barbed
Oil Discharge Port	1/2 inch barbed

Premium Eco-Drain 3



The **Premium Eco-Drain 3** is the larger aluminum Eco-Drain model designed for higher-capacity Arid Bilge System applications, including Series 4 and Series 9 installations. This model is intended for larger vessels, yacht applications, and installations where greater separation capacity and more durable construction are needed.

Specification: Premium Eco-Drain 3	Details
Product Type	Eco-Drain hydrocarbon separation companion
Recommended Arid Systems	Series 4 and Series 9
Dimensions	22 × 20 × 14 inches

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Height	15 inches / 38 centimeters with stainless steel hinged lid
Required Lid Clearance	Additional 7 inches / 18 centimeters of vertical clearance recommended
Width	15.75 inches / 40 centimeters to end of fittings
Depth	9.5 inches / 24 centimeters
Dry Weight	32 pounds / 14.5 kilograms
Main Unit Material	Aluminum with Awlgrip Matterhorn White finish
Intake Port	1/2 inch barbed
Water Discharge Port	3/4 inch barbed
Oil Discharge Port	3/8 inch barbed

Mounting and Drainage

Eco-Drain must be mounted so it can drain properly by gravity. Unlike the Arid Bilge System, the Eco-Drains do not use pressure, vacuum, a check valve, or a pump to force fluid overboard. The Arid Bilge System actively collects bilge fluid and discharges it under pressure. Eco-Drain does not. Eco-Drain receives untreated fluid discharged from the Arid system, allows separation to occur, and then relies on gravity for separated water to exit the unit.

For this reason, Eco-Drain should be mounted higher than the final overboard discharge point if possible. In most installations, the unit should be mounted on a shelf or platform secured to the bulkhead. The shelf must support the dry weight of the unit plus the added weight of fluid inside the unit during operation. Eco-Drain should not be mounted flat against the bulkhead. The unit must be supported from underneath, maintain the correct gravity-fed drainage path, and provide enough clearance above the unit to open the hinged lid or service hatch. The installer must also allow enough space around the unit for inspection, hydrocarbon removal, cleaning, and future service. The Eco-Drain outlet must be positioned so separated water can flow by gravity through the approved discharge route or into an approved collection point, such as a shower sump.

Drainage Option 1: Gravity Drain to an Approved Discharge Point

If the vessel layout allows the Eco-Drain to be mounted high enough, the unit may gravity drain directly to a discharge point. In this setup, the outlet must be positioned so separated water can flow downhill through the discharge route without needing upward force.

Drainage Option 2: Gravity Drain into a Shower Sump

For installations, where the Eco-Drain cannot be mounted high enough for gravity to drain directly overboard. When the discharge path requires upward force, Eco-Drain may drain into a shower



sump instead. The shower sump can then pump the separated treated water overboard through the vessel's existing discharge system.

Maintenance and Hydrocarbon Removal

Eco-Drain must be inspected periodically. Hydrocarbons should be removed from the separation chamber before the hydrocarbon layer reaches approximately halfway up the chamber. If the chamber is allowed to overfill, hydrocarbons may reach the lower transfer pipe or enter the discharge side, reducing separation performance. Depending on the Eco-Drain model, hydrocarbons may be removed with a drain valve, suction pump, baster, or reversible transfer pump. Only the Eco-Drain 2 model includes a drain valve. Other Eco-Drain models require hydrocarbons to be removed manually using a baster, suction pump, or similar service tool. Removed hydrocarbons should be collected in an approved container, such as a clean gallon container, and taken to a proper disposal location. Do not discharge collected hydrocarbons into the water, storm drains, or onto the ground. That defeats the purpose of the Eco-Drain product line. Always follow local marina, boatyard, and environmental disposal requirements.

Eco-Alarm Note: The Eco-Alarm is covered in the next course. Eco-Drain is a passive gravity-separation product. It does not automatically remove hydrocarbons from the chamber. The Eco-Alarm can be used as an additional monitoring device to notify the user when hydrocarbon accumulation may require attention. In oily vessels, older boats, or boats with known oil seepage, Eco-Drain should still be inspected and serviced on a regular schedule. The Eco-Alarm simply adds an extra layer of notification before the hydrocarbon level becomes high enough to reduce separation performance.

Eco-Drain Chamber Cleaning

In the event that the Eco-Drain viewing window or clear panel becomes difficult to see through, cleaning may be needed. In normal use, the Eco-Drain chamber does not need constant cleaning. However, over time, oil film, organic buildup, or residue may collect on the inside walls and viewing panels, making it difficult to see the hydrocarbon layer and waterline. If the chamber becomes difficult to inspect visually, it should be cleaned so the separation area can be seen clearly. Before cleaning, the Eco-Drain should first be drained and the collected hydrocarbons should be removed into an approved container for proper disposal. Once the hydrocarbons have been removed, the chamber may be cleaned with mild dish soap and fresh water. A small amount of hydrogen peroxide may also be used to help break down organic buildup, depending on the service condition.

For light cleaning between service intervals, a magnetic aquarium-style cleaning tool may be used on compatible clear viewing panels to help wipe the inside surface without fully disassembling the unit. A thorough cleaning may be performed every few years, or sooner if buildup makes the viewing panel unclear.



Pickup Maintenance in Oily Bilges

Pickup maintenance was covered in Course 6 on page 53, but it is worth noting again in relation to Eco-Drain applications. In older boats, oily bilge environments, or vessels with heavy sludge contamination, the Scotch-Brite-style filter pads on the bottom of the pickups may collect oil, dirt, and debris more quickly than they would in a cleaner bilge. This is not common in normal clean bilge conditions, but it can happen when a vessel has ongoing grease or oil seepage, diesel residue, hydraulic fluid residue, organic buildup, or years of accumulated bilge contamination. For these applications, dealers should recommend more frequent inspection of the pickup area. The pickup pad and the perimeter 5200 seal should be checked to make sure there is no lifting, softening, separation, or breakage around the pickup body. The customer should understand that pickup pads may need to be rinsed more often in very oily or heavily contaminated bilges until the bilge condition improves. Oils, fuels, antifreeze, drip fluids, or other bilge contaminants may not always damage the pickup, but they can leave residue, saturate the pad, weaken the 5200 bond over time, or make the pickup harder to clean if they are allowed to accumulate. Regular rinsing can help reduce buildup and extend the service life of the pickup pad. If the pickup pad or pickup body becomes damaged, heavily saturated, separated at the perimeter, or difficult to clean, the pickup should be replaced.

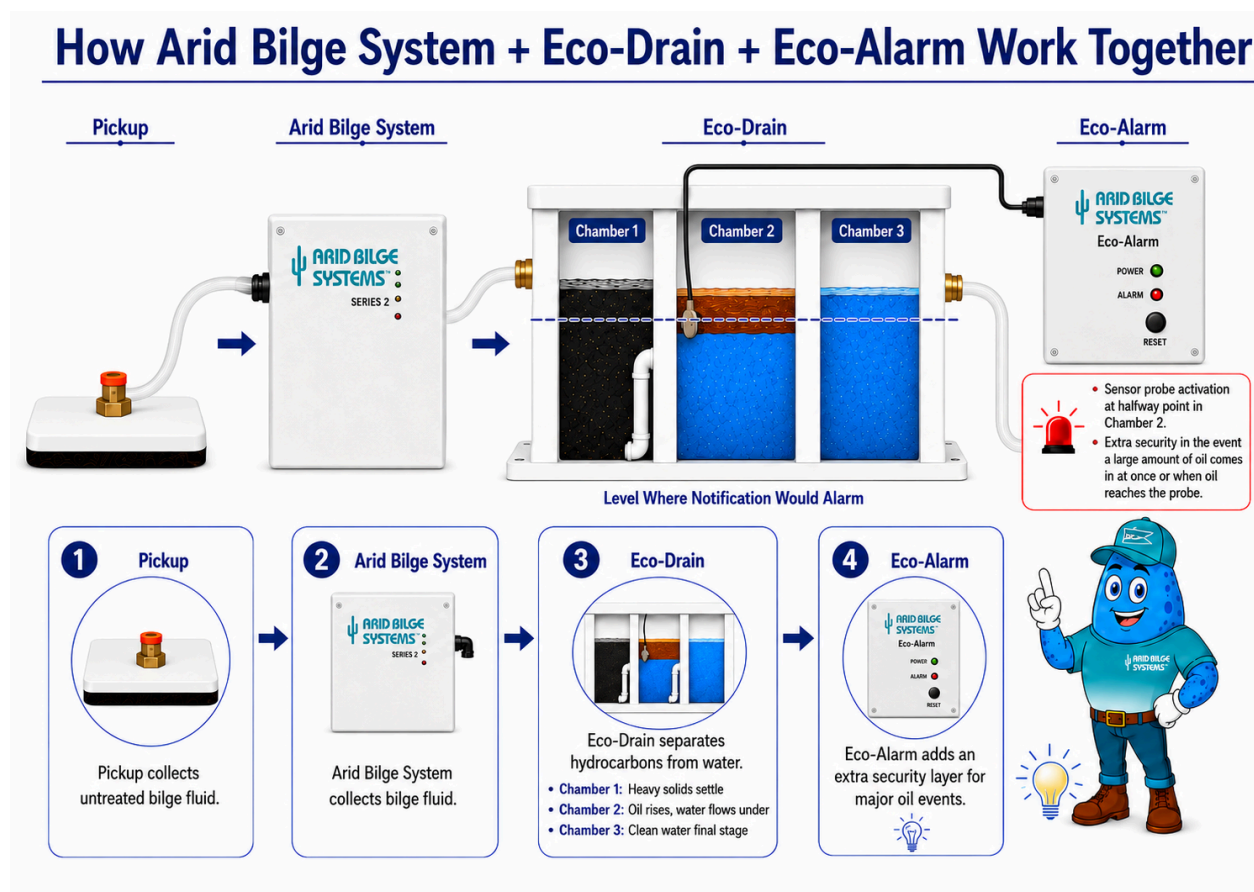
Course 8: Eco-Alarm System

Smart Hydrocarbon Monitoring for Eco-Drain Applications

The Arid Eco-Alarm System was developed as part of Arid's Eco-Friendly Product Line to work alongside Eco-Drain hydrocarbon separation products. Eco-Drain gives untreated bilge fluid a controlled chamber area where hydrocarbons can separate from water before discharge. The Eco-Alarm adds another layer of protection as an optional companion upgrade to Eco-Drain. The Eco-Alarm monitors hydrocarbon accumulation inside the Eco-Drain and alerts the captain, owner, or engineer when a rapid leak or buildup may require inspection. The user can then inspect the Eco-Drain, identify which Arid zone collected the fluid, and trace the issue back to the source. In simple terms: **Eco-Drain separates. Eco-Alarm notifies.**



Figure 8.1 — Eco-Friendly product line flow: pickup, Arid system, Eco-Drain, and Eco-Alarm.



This diagram shows how untreated bilge fluid is collected by the pickup, moved through the Arid Bilge System, discharged into the Eco-Drain for hydrocarbon separation, and monitored by the Eco-Alarm for notification when hydrocarbon accumulation reaches the sensor level.

Product Development History Note

The Eco-Alarm was developed around the same time as the Eco-Drain system as part of Arid's Eco-Friendly Product Line. As explained in the previous course, one of the early projects that helped drive the Eco-Friendly Product Line was "**Bolder Won**," a 75-foot custom catamaran built in 2007. That vessel received an extensive Arid installation package with multiple Arid systems and many bilge zones. The project created a need for two related solutions. First, Eco-Drain was developed to help separate hydrocarbons from bilge fluid before discharge. Second, Eco-Alarm was developed to add a notification layer when rapid hydrocarbon accumulation inside the Eco-Drain required attention.



Eco-Alarm Model Options and Smart Monitoring Function

Arid offers two Eco-Alarm models:

-Eco-Alarm 1 — Hydrocarbon notifier for Eco-Drain applications

-Eco-Alarm 2 — Hydrocarbon notifier with Arid Bilge shutdown capability

Both Eco-Alarm models are designed to work with Eco-Drain. As the Arid Bilge System removes fluid from the bow, midship, stern, machinery spaces, or other wet zones, the collected bilge fluid is pulled into the Arid system and then discharged into the Eco-Drain. Inside the Eco-Drain, hydrocarbons such as oil, diesel fuel, hydraulic fluid, or other petroleum-based residue rise above the water layer through gravity separation. The Eco-Alarm sensor probe is positioned inside the Eco-Drain chamber to monitor for hydrocarbon accumulation or a hydrocarbon event. If hydrocarbons accumulate high enough to reach the probe, the Eco-Alarm alerts the captain, owner, or engineer so the system can be inspected. The user can then inspect the Eco-Drain, check the hydrocarbon level, identify which Arid zone from the unit collected the contaminated fluid (easier to trace the system's zones when labeled), and trace the issue back to the source.

The Eco-Alarm may notify the user in two common situations:

-Sudden hydrocarbon event — such as a major oil, diesel, or hydraulic leak entering the Eco-Drain.

-Gradual hydrocarbon buildup — such as small recurring leaks slowly accumulating inside the Eco-Drain over time. Eco-Alarm does not replace regular inspection, cleaning, or hydrocarbon removal. Instead, it supports those maintenance practices by notifying the user when the Eco-Drain may need attention.

Eco-Alarm 1: Notification

Eco-Alarm 1 provides hydrocarbon notification for Eco-Drain applications. It alerts the user when hydrocarbon accumulation inside the Eco-Drain may require inspection, service, or hydrocarbon removal. In simple terms: **Eco-Alarm 1 notifies.**

Eco-Alarm 2: Notification and Arid Bilge Shutdown

Eco-Alarm 2 provides hydrocarbon notification and adds Arid Bilge shutdown capability. If the alarm condition continues for an extended period, Eco-Alarm 2 can disconnect power to the Arid Bilge System. This helps prevent the Arid system from continuing to pump additional contaminated fluid into the Eco-Drain while the condition is unresolved. In simple terms: **Eco-Alarm 2 notifies and can shut down the Arid Bilge System.** For oily vessels, older boats, or boats with known oil seepage, the Eco-Drain should still be inspected and serviced on a regular schedule. Eco-Alarm simply gives the user an added warning before hydrocarbon accumulation becomes high enough to reduce separation performance or create a larger bilge issue.

Arid Bilge Systems - Dry, Fresh, & Protected



Eco-Alarm 1



Eco-Alarm 1 is the compact hydrocarbon notifier used with Eco-Drain installations. It is designed for applications where the main goal is simple hydrocarbon notification.

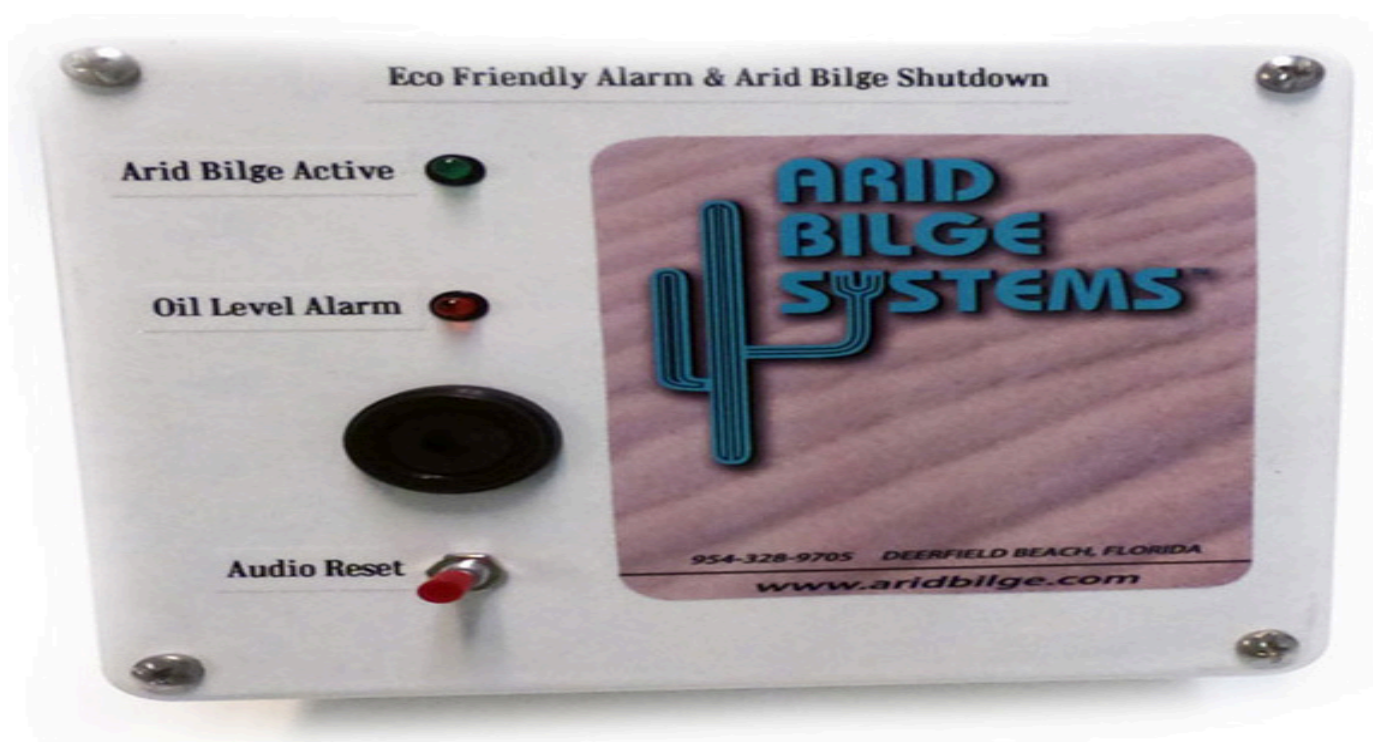
Specification: Eco-Alarm 1	Details
Product Type	Hydrocarbon notifier for Eco-Drain applications
Compatible Eco- Drain Models	Eco-Drain 1, Eco-Drain 2, and Eco-Drain 3
Dimensions	7 × 6 × 6 inches
Height	2.25 inches / 6 centimeters
Width	5.1 inches / 13 centimeters
Depth	5 inches / 12 centimeters
Weight	Less than 1 pound
Main Unit Material	Plastic

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Power Requirements	12V or 24V versions
Normal Operation	Green alarm power-on light remains lit
Alarm Operation	Audio piezo buzzer sounds; pressing the red button silences the buzzer and lights the large red indicator light
Standards and Certifications	None as a stand-alone system

Eco-Alarm 2



Hydrocarbon Notifier with Arid Bilge Shutdown Capability

Eco-Alarm 2 is the larger hydrocarbon notifier model. It performs the same basic alarm function as Eco-Alarm 1, but adds the ability to shut off the Arid Bilge System during an extended alarm condition.

Specification: Eco-Alarm 2	Details
Product Type	Hydrocarbon notifier with Arid Bilge shutdown capability
Compatible Eco- Drain	Eco-Drain 1, Eco-Drain 2, and Eco-Drain 3

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Models	
Dimensions	10 × 10 × 8 inches
Height	8.0 inches / 20.5 centimeters
Width	7.5 inches / 19.25 centimeters
Depth	5.5 inches / 13.5 centimeters
Weight	1.6 pounds
Main Unit Material	Plastic
Power Requirements	12V DC, 24V DC, or 120V AC versions
Probe Function	Alarms when the probe contacts oil or air, depending on probe position and adjustment
Time Delay	20-minute time delay to help prevent false triggering
Audio Reset	Audio reset button silences the alarm for 20 minutes
Shutdown Function	Green Arid Bilge Active light goes out after extended alarm activity, disconnecting power to the Arid Bilge System
Remote Display Capability	Supports duplicate remote display panel, commonly mounted at the helm

Sensor Placement, Adjustment, and Monitoring Value

The Eco-Alarm sensor must be positioned correctly inside the Eco-Drain chamber. The sensor should be installed at the proper height, secured in place, and adjusted to the intended monitoring level. If the sensor is too high, too low, loose, or exposed to air incorrectly, the alarm may activate even when there is not a true hydrocarbon event. For this reason, the first troubleshooting step for an unexpected Eco-Alarm condition is to inspect the sensor position, fluid level, and wiring connection. Once sensor placement is confirmed, the user should inspect the Eco-Drain chamber for hydrocarbon buildup, contamination, or an active leak condition.

Hydrocarbon monitoring matters because small leaks can hide in a wet bilge. Oil, diesel fuel, hydraulic fluid, coolant, or other contaminants may spread through standing water without being noticed right away.

The Arid Bilge System helps keep bilge areas dry, making leaks easier to identify. Eco-Drain gives hydrocarbons a controlled place to separate and collect. Eco-Alarm adds notification when hydrocarbon accumulation may require attention. This combination helps the user identify hydrocarbon events earlier, inspect the Eco-Drain before separation performance is reduced, respond to leaks before they spread through the bilge, and protect machinery spaces, equipment, and vessel cleanliness. The Eco-Alarm does not remove hydrocarbons automatically. It alerts the user so the Eco-Drain can be inspected, serviced, or drained as needed.

Arid Bilge Systems - Dry, Fresh, & Protected



Field Example 1: Hydraulic Leak Detection on an 81-Foot Sculley, “*Divine Intervention*”

While underway during a fishing tournament in Bermuda, the 81-foot Sculley *Divine Intervention* experienced a hydraulic leak from the bow thruster system. The vessel was traveling at speed, and red hydraulic fluid began entering the bilge. Instead of the fluid spreading unnoticed through a wet bilge, the Arid Bilge System collected the contaminated fluid and moved it into the Eco-Drain. The Eco-Alarm then detected the hydrocarbon condition and alerted the captain and crew.

The crew inspected the Eco-Drain and saw hydraulic fluid inside the unit. They then checked the Arid system and identified the labeled zone that had collected the contaminated fluid. Because the bilge was clean and dry, they were able to follow the red hydraulic fluid trail back to the bow thruster area and locate the source of the leak.

In a normal wet bilge, this type of leak could have spread throughout the compartment and become much harder to trace. The crew may not have known about the issue until the bow thruster failed, the vessel returned to port, or additional damage occurred.

In this case, the Arid system, Eco-Drain, and Eco-Alarm worked together as an early warning and containment system. The leak was detected, traced, and repaired before it became a larger service problem.

This example shows how the system can turn a hidden bilge leak into a traceable service event. The Arid system removes and reveals the fluid, Eco-Drain contains and separates it, and Eco-Alarm notifies the crew when immediate inspection may be needed.

Field Example 2: Stabilizer Fin Issue on “*Blue Guitar*”

During transit from Fort Lauderdale to New York Harbor, the captain of *Blue Guitar*, a classic 103-foot Camper & Nicholson's yacht, received an alert from the Eco-Alarm System.

A stabilizer fin had locked up, causing hydraulic fluid from the stabilizer system to enter the bilge. The Arid Bilge System collected the contaminated fluid and discharged it into the Eco-Drain. When hydrocarbons were detected, the Eco-Alarm notified the crew that the system needed inspection. The crew inspected the Eco-Drain and traced the issue back to the stabilizer system before the problem became more severe. This early notification was especially important because *Blue Guitar* was traveling offshore and preparing to enter New York Harbor, where a stabilizer failure could have required emergency service, a specialist, and expensive repairs. Because the system notified the crew early, the issue was located and addressed before it became a larger problem. This example



shows how the Arid system, Eco-Drain, and Eco-Alarm can work together to protect classic vessels, reduce service risk, and give captains early warning before a hidden mechanical issue becomes a costly failure.

Course 9: Bluetooth Diagnostics Integration

Future Smart Diagnostics for Arid Bilge Systems

The Arid Bluetooth Diagnostics platform is a future development feature designed to bring Arid Bilge System monitoring, runtime data, fault codes, service history, and diagnostic alerts directly to a mobile device. As of this writing/training version, Bluetooth diagnostics are not yet a standard mass-production feature across all Arid models. Arid has developed working concepts and planned functionality, but full production integration is still part of future product development. This course explains the intended purpose of Bluetooth diagnostics, how the system is expected to function, and why mobile diagnostics will add value for owners, captains, dealers, and service technicians.



Why Bluetooth Diagnostics Matter

Traditional bilge pumps give the user very little information. A bilge pump may run frequently, but the owner may not know why. In many cases, the owner may not know the pump has been running often until there is already a larger problem. A hidden leak can continue for weeks or months before it becomes obvious. A bilge pump may simply cycle on and off without explaining which area of the boat is wet, how often the pump is running, or whether one compartment is behaving differently from another. If the pump fails, the owner may not receive meaningful warning until water has already accumulated, potentially sinking the vessel.

Arid Bilge Systems already provide a smarter foundation because the system operates by individual zones. On models Series 4 and Series 9, systems equipped with hour meters, users can already see runtime activity by zone on the faceplate itself. This helps identify which areas of the boat may be staying wet longer than expected. Bluetooth diagnostics builds on that same concept by bringing zone runtime information, compressor hours, fault codes, and service alerts directly to the user's phone. This is especially valuable for systems that do not have physical hour meters on the unit, such as many Series 1 and Series 2 applications. With app-based diagnostics, the user can see which zone is running more often, which zone may be triggering an alert, and whether the system is showing an abnormal runtime pattern. For example, if Zone 1 and Zone 2 show normal runtime but Zone 3 has significantly higher runtime, the app can notify the user that Zone 3 should be inspected. This does not automatically prove there is a leak, but it gives the owner or technician a clear starting point. The user can then check Zone 3 in the app, identify the matching label on the Arid Bilge System, inspect the corresponding pickup area, and look for a leak, clogged pickup, or abnormal water source.

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Dealers should recommend that each zone be clearly labeled in three places:

- Inside the app
- On the physical Arid Bilge System
- At or near the pickup location

Matching these labels makes troubleshooting much faster. When the app indicates that a specific zone needs attention, the user can immediately trace that zone from the app, to the system, to the correct area of the boat.

App Overview

When the app is launched, it is designed to scan for nearby Arid Bilge System units with Bluetooth enabled. Once a unit is detected, the app may display:

- Series model, such as Series 1, Series 2, Series 4, or Series 9
- Photo image of the unit
- Serial number
- System status
- Zone information
- Compressor runtime information

Users would then be taken to a main dashboard view showing the Arid Bilge Systems logo, system status, notification alerts, and diagnostic information.

Home Dashboard Features

The main dashboard is intended to give the user a quick overview of system health and runtime behavior.

Planned dashboard features include:

- Runtime hours per bilge zone
- Total compressor hours
- Zone-specific service indicators
- System fault alerts
- Compressor lifetime runtime tracking
- Resettable service-hour logs

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- Lifetime hour history for long-term tracking
- Captain's Log entries for service notes and maintenance records

For example, a Series 2 system with three active zones may show separate runtime information for Zone 1, Zone 2, and Zone 3. This allows the user or technician to compare zone behavior and identify patterns that may not be obvious during normal operation.

Example: Zone Runtime Leak Detection

A major future benefit of the app is zone-based leak detection.

For example, a Series 2 system may have three active bilge zones:

- Zone 1 has logged 100 runtime hours
- Zone 2 has logged 100 runtime hours
- Zone 3 has logged 500 runtime hours

If Zone 3 has significantly higher runtime than the other zones, the app may flag that behavior as abnormal. This does not automatically prove there is a leak, but it tells the user that Zone 3 should be inspected.

A high-runtime zone may indicate:

- Slow leak
- Poorly sealed fitting
- Abnormal moisture accumulation
- Water entering from a specific compartment
- Pickup area staying wet longer than expected
- Tubing, zone, or installation issue requiring inspection

This type of diagnostic feedback gives the owner or technician a starting point. Instead of guessing where the issue may be, they can inspect the labeled zone with abnormal runtime.

In simple terms:

If one zone runs much longer than the others, the app can help point the user toward that specific area of the boat.

Fault Codes and Service Alerts

The Bluetooth Diagnostics platform is also intended to support fault-code alerts and service guidance.



Possible alerts may include:

- Clogged pickup
- Restricted intake path
- Clogged or restricted discharge line
- Float switch alarm condition
- Abnormal compressor runtime
- Zone timing issue
- System runtime imbalance
- Compressor lifetime service threshold
- Sensor or monitoring condition requiring inspection

When a fault is detected, the app may notify the user and direct them to the appropriate troubleshooting information.

This may include articles, diagrams, or videos connected to the Arid Bilge Systems training series. For example, if a clogged pickup alert appears, the app may link to a pickup cleaning guide or troubleshooting video explaining what to inspect first.

The purpose is to reduce guesswork and help the user or technician respond correctly.

Captain's Log: Built-In Service Tracker

The app is also planned to include a Captain's Log feature.

The Captain's Log would allow users to manually record service events and maintenance notes. This turns the app into a simple digital service record for the vessel.

Possible Captain's Log uses include:

- Logging pickup cleaning
- Recording abnormal runtime patterns
- Recording compressor service
- Tracking oil changes
- Tracking blower motor hours
- Tracking bilge pump service
- Recording general boat maintenance
- Adding notes after inspections
- Documenting service visits

This feature would help owners, captains, and service technicians build a history of what happened, when it happened, and what was done.



Bluetooth Range and Future Wi-Fi Capability

Bluetooth diagnostics are intended for nearby access. This means the user generally needs to be within Bluetooth range of the vessel or system.

Bluetooth may be useful when the owner, captain, or technician is onboard, at the dock, or near the boat. However, Bluetooth alone is not the same as full remote monitoring over the internet.

Future Wi-Fi or cloud-based integration could allow users to receive system information from a much greater distance. For example, if a boat is docked in Florida and the owner is away, Wi-Fi or internet-connected monitoring could allow alerts to appear on the user's phone remotely.

Future remote-monitoring development may include:

- Wi-Fi-connected system alerts
- Remote notification access
- Geolocation-based vessel information
- Remote bilge pump activation alerts
- Eco-Alarm integration
- Emergency bilge pump monitoring
- Expanded service notifications

Bluetooth is the first step toward smarter diagnostics. Wi-Fi and remote connectivity would expand that into true off-vessel monitoring.

Future Integration Possibilities

The Bluetooth Diagnostics platform may eventually expand beyond Arid system runtime data.

Future development may include:

- Eco-Alarm monitoring
- Bilge pump activation alerts
- Emergency bilge pump runtime tracking
- Blower motor hour tracking
- Compressor lifetime service tracking
- Garmin display integration
- LUNAR or other remote notification integration
- Dealer service dashboard tools
- Expanded fault-code library
- Mobile troubleshooting videos and articles
- Service reminders based on runtime or calendar schedule



These future features would help transform the Arid Bilge System from a dry bilge product into a broader vessel monitoring and maintenance platform.

Important Note: Bluetooth diagnostics should be presented as a future development and planned product direction unless the specific system being sold or installed includes active Bluetooth functionality. Dealers should avoid promising app features unless they are confirmed for that model, production version, and installation package.

The correct way to explain it is:

Arid is developing Bluetooth and smart diagnostic capability to give users better visibility into zone runtime, compressor hours, service alerts, and system behavior. Full availability depends on the model, production version, and installed options.



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Course 1: Where to Mount, Power, and Discharge

Mounting, powering, and discharging your Arid Bilge System can be simple, challenging, or even complex depending on your vessel's layout. Ideally, you should mount the system close to the drainage point for convenience. While Arid Bilge Systems have no backflow capability once the fluid passes through the riser and check valve, proper drainage placement is key to ensuring efficient and hassle-free operation.

Best Practices for Discharging to a Bilge Pump (a last resort method) If you are discharging into a bilge pump, be certain that it will not backflow.

- If discharging into the bilge pump's line, T into the entry point from the top down at the side of the vessel bulkhead.
- Do not install a check valve into your bilge pump discharge line, as this can cause a vapor lock effect, preventing the bilge pump from clearing air and functioning properly.
- If the bilge pump has a siphon loop, discharge on the other end of the loop, so once the bilge pump pushes over the loop, the water exits overboard without risk of backflow.

Discharging Into a New Through-Hull

For optimal installation, a new through-hull discharge is highly recommended:

- Ensure the discharge is above the waterline, as improper placement below the waterline could cause the boat to sink.
- For retrofits, confirm the placement is above the waterline.
- For new builds, it is highly recommended to have an independent through-hull discharge dedicated to the Arid Bilge System. Avoid discharging into a shared drain such as a shower sump if possible.
- An independent through-hull allows full discharge force to push fluid out more efficiently, reducing the chance of smudge lines forming along the hull.
- In retrofit scenarios, teeing into existing drainage points is acceptable and convenient. However, if the vessel is already out of the water and a dedicated through-hull is desired, ensure it is mounted safely above the waterline.

Convenient and Simple Discharge Locations

To simplify installation and operation, consider mounting the system near an existing drainage point, such as:

- Deck drain
- Sink drain
- Shower sump



- Gray water drain
- Oily waste sump (common on larger vessels)
- T into these drains from the top down to ensure smooth discharge.

Winterization Considerations

To protect the system during colder months, follow these winterization steps:

- Keep the half-inch 90-degree discharge elbow oriented downward. This prevents fluid from collecting and becoming trapped in the riser during freezing conditions.
- If you are using a different type of discharge fitting, ensure that it is also positioned in a way that prevents fluid from flowing back into the riser.
- If water becomes trapped in the riser and freezes, it can cause the riser to crack. In worst-case scenarios, this can allow water to backtrack into the inside of the unit, damaging internal components and preventing the system from functioning properly.
- Run antifreeze through the system until it is fully discharged through the discharge line.
- Shut off the system once antifreeze has completely cycled through.

Powering Your Arid Bilge System

The Arid Bilge System operates on different power requirements depending on the model:

- Series 1 & 2: Operates on 12V or 24V DC automatically.
- Series 4: Requires a 12V or 24V DC configuration requested from the factory.

Recommended Power Source

- The system is best powered through an open breaker panel labeled as “Arid Bilge System.”
- If necessary, power can be sourced from an existing bilge pump circuit, ensuring compatibility with 12V or 24V DC setups.

Course 2: Series 1 Install / Troubleshooting Guide

This is our Arid Bilge System Series 1, and we're going to show you how to install and troubleshoot it. This is a single-zone system, so it requires just one dedicated pickup location.

Installation Guidelines

1. Mounting the Unit

- Always mount the unit upright.
- Use a Sharpie to mark your mounting point on the bulkhead.

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- Drill and tap that first marked point.
- Mount the unit temporarily using one screw.
- Use a leveler to ensure the system is perfectly level.
- Mark the remaining screw holes with a Sharpie.
- Dismount the unit and drill/tap the remaining holes.
- Remount the system securely on the bulkhead using all screws.
- Ensure the tubing remains at its pre-set length of 20 feet. Do not cut the tubing. Instead, coil any slack at both the pick-up end and the unit's end.
- Ensure the tubing is fully inserted on both ends.
- Secure the unit using the four mounting screws, two on each side of its backplate. Install it on a flat, open bulkhead, preferably closer to the drainage point.
- Install it on an open bulkhead, but never on the bilge floor to avoid potential submersion. Ensure the unit is at least one inch above the surface to prevent water from entering the system.

2. Discharge Setup

- Use the ½-inch elbow drainage for discharge.
- The drainage can be routed to a deck drain or sink drain, but not into a bilge pump, as this may cause backflow unless it's on the far side of the drain or equipped with a siphon loop.
- Avoid using a check valve in the discharge line, as it can cause a vapor lock effect, preventing proper drainage.

Indicator Lights and Alarms

- **Green Light (Solid):** Indicates the system is in standby mode.
- **Green Light (Blinking):** Indicates the system is running a vacuum cycle.
- **Red Light (Solid):** Indicates a discharge problem due to the float switch being in the up position—often caused by improper drainage or discharge blockage.
 - This will trigger a continuous alarm for 90 seconds.
 - Disconnect the discharge hose and place it into a cup or bucket to confirm proper discharge.
 - Power cycle the unit to restart.
 - If water discharges, check for discharge line blockages (e.g., a closed discharge ball valve).
 - If no water discharges, inspect the internal system.
- **Red Light (Blinking):** Suggests a vacuum issue such as a clogged pickup, kinked tubing, or blocked intake.
 - Check the pickup in the bilge for submersion in water or debris. Clean thoroughly.
 - Inspect tubing for kinks or blockages.
 - Replace tubing if needed.



4. No Indicator Lights or Pump Activity

- Verify power by inspecting the two indicator lights.
- If no lights are on, remove the back cover to check the terminal block.
- Use a multimeter to test for power at the terminal block.
- Inspect the fuse (Eaton Bussmann GMA-1-R) and replace it if necessary.

Additional Tips

Slow Leak Detection

- If the pump runs intermittently, check for slow leaks in the bilge.
- Follow the trail to identify the source and address it promptly.
- The Arid Bilge System is also an excellent leak detector!

Maintenance Reminders

- Replace pick-ups every few years for optimal performance.
- Keep the unit and tubing clean and free of obstructions.

Conclusion

With proper installation and maintenance, your Series 1 Arid Bilge System will provide years of reliable performance. If you have further questions or need assistance, don't hesitate to reach out to us.

Course 3: Series 2 Install / Troubleshooting Guide

Mounting the System

- Mount the system upright, following the arrow in the upper right corner.
- The system must be upright for vacuum functionality. Unlike pumps, Arid's vacuum technology is long-lasting because it operates under vacuum rather than mechanical pumping.
- Secure the unit using the six mounting screws (three on each side).
- - Mark and drill the first hole (top-left or top-right).
- - Temporarily mount the unit, level it, then mark and drill the remaining holes.
- - Tap all six holes, then fully secure the unit.
- Ensure intake tubing does not kink during installation.

Intake Tubing Setup

- Maintain at least 20 feet for all zone, leave slack for zones close to the unit. This allows the built-in vacuum sensors to calibrate and lock onto wet zones.
- The system detects fluid resistance and will not stop vacuuming a zone until it senses a drawback of air.
- Curl and secure slack near both the pick-up and unit ends using zip ties to ensure proper operation.
- Fully insert tubing into the pick-up and unit.

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- If using soft-walled tubing, lubricate the end before inserting a fingernail's distance into the fitting.
- For 5/32 polyethylene tubing, ensure no kinks during routing.

Discharge Setup

- The unit uses a 1/2-inch elbow fitting for discharge.
- For retrofits, use an adjustable connector (e.g., 1/2" to 1") from a local plumbing store.
- For new builds, a direct overboard discharge is recommended for maximum efficiency and to prevent potential marking on the boat's hull.

Power Connection

- The Arid Bilge System operates on 12V or 24V DC automatically.
- It is recommended to install the system on a breaker panel, clearly labeled "Arid Bilge Systems."
- If a breaker panel is unavailable, the system can be wired to an existing bilge pump circuit or another available power source on the boat.
- Direct connection to the house power is also an option, but using a dedicated breaker is preferred for easier maintenance and control.
- Hook the power directly to a breaker (12-24V automatic detection).
- Label the breaker panel "Arid Bilge System" for easy identification.

Zone Labeling

- Label both the unit end and pick-up end with the respective bilge location (e.g., "Bow Thruster Compartment" or "Engine Room Aft").
- Secure the labels with electrical tape.

System Testing & Operation

- Run the system through full cycles to confirm functionality.
- It is recommended to place a bilge pick-up at every bilge pump location.
- Some boats accumulate water both forward and aft of the bilge pump area, meaning water may only be dried in one spot. Ensure pick-ups are placed where water naturally accumulates.
- Additional pick-ups can be placed in AC drip pans or hard-to-reach compartments where fluid may collect.
- Test your system with fresh water by lightly flooding the bilge.
- - This is an opportunity to rinse the engine room from salt and dirt buildup.
- - Hose down all areas where water exposure is safe.
- - Avoid harsh bilge cleaners; if used, dilute them. Avoid "Simple Green" as it may impact system longevity.
- - If cleaning top decks, flush bilges with fresh water, allowing bilge pumps to remove soapy water before refilling with clean water for the Arid system to dry.

Troubleshooting Alarms

90-Second Alarm with Compressor Running

- Indicates collection chamber is full and cannot discharge.
- Disconnect the discharge hose and place a bucket under the fitting.



- If water discharges, check the external discharge ball valve (ensure it is open after winterization).
- If no water discharges, inspect the unit internally.

Indicator Lights & Alarm Codes

- Blue Light Flashing: System is actively running.
- Green Light: Standby mode.
- Red Light & Audible Alarm: System fault detected.
- Alarm Patterns & Meaning:
 - - Fast Repeats: Float switch in the collection chamber is stuck.
 - - Slow Repeats: Vacuum error with the compressor.
 - - Short & Long Alarm Patterns (indicate clogged zones):
 - - 1 short, 3 long: Zone 1 clogged.
 - - 2 short, 3 long: Zone 2 clogged.
 - - 3 short, 3 long: Zone 3 clogged.

Clogged Intakes

- Potential Causes:
 - - Clogged Pick-up: Clean or replace the pick-up.
 - - Blocked Tubing: Check for kinks or blockages. Replace tubing if necessary by taping a new line to the old one and pulling it through.
 - - Faulty Intake Valve: Requires servicing.

Compressor Issues

- If the alarm sounds without the compressor running, the compressor may be faulty, and the unit should be serviced.

Post-Cleaning Checks

- After flooding the bilge, allow the system to dry completely.
- Monitor for leaks or installation issues.

Final Thoughts

With proper installation and maintenance, your Series 2 Arid Bilge System will ensure a dry, clean, and odor-free bilge for years to come. If you need further assistance, contact us!

Course 4: Series 4 Install / Troubleshooting Guide

This is the Arid Bilge System Series 4 model. It comes with four to eight individual intake zones, each capable of spanning 20 to 75 feet. It is recommended to install the unit in the engine room, though it can be placed virtually anywhere on the vessel. While it is preferable to install it near the drainage point, the unit has no backflow, allowing for discharge at a distance. However, ensure that the discharge line is looped upward to prevent damage during winterization.

Installation Process

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1. Mounting the System

- Mount the system upright on a flat bulkhead.
- Options for mounting:
 - Drill directly into the unit from inside.
 - Use two brackets (top/bottom or left/right) and secure with three screws per bracket.
- Secure the unit at least an inch above the surface to prevent exposure to water.
- Leave a small gap between the unit and the bulkhead to reduce vibration and noise.

2. Routing the Intake Tubing

- Identify all wet zones and map the tubing routes.
- Ensure minimum run length of 20 feet. If the zone is close to the unit, extend the tubing to at least 25 feet by coiling slack on either the unit's end or the pick-up's end (or both).
- Avoid kinking or bending the tubing, as this can obstruct vacuuming.
- Cut the tubing straight and insert it fully into the unit fitting and pick-up.
- If using soft-walled tubing, insert at least a fingernail's depth.
- Use a snake tool or coil snake to push tubing through bulkheads.
- Secure intake tubing using tie wraps or wire covers for a neat appearance.
- Ensure the tubing is coiled and secured properly to maintain sensor calibration.

3. Pick-Up Installation

- Use the appropriate pick-up for each bilge type:
 - Flat bilge: Use a mini or standard pick-up.
 - V-shaped bilge: Use an offset pick-up.
 - Tight/awkward areas: Use a pick-up wand (e.g., AC drip pans, limber holes).
- Install pick-ups at the lowest point of accumulation.
- Ensure the pick-up is not obstructed by debris or dirt.

4. Discharge Setup

- The system includes a ½" elbow fitting.
- Adjust fitting size as needed or use a multi-T connector.
- Ensure the drain line is oriented downward to prevent fluid retention during winterization.
- Do not add a check valve to the discharge line, as it can cause a vapor lock effect.
- Avoid discharging into a bilge pump, unless it's on the far end of the discharge line to prevent backflow, or a siphon loop.

5. Power Connection

- The system operates on 12V or 24V.
- Connect power to the breaker panel and label it "Arid Bilge System".
- If no breaker is available, power can be sourced from an existing bilge pump circuit or house power, ensuring compatibility with 12V or 24V DC setups.
- Ensure the system is correctly fused and check the fuse holder if power issues arise.

6. Final Touches

- Label each intake zone at both the unit and tubing ends, securing labels with electrical tape.



- Ensure tie wraps are flush-cut and all intake lines are neatly strapped.
- Double-check for kinks, bends, or tubing cuts before powering on.
- Conduct a final leak check and monitor system startup cycles.

Troubleshooting Guide

1. Clogged Pick-Ups

- Symptoms: System alarm sounds, indicating a clogged zone.
- Solution:
 - o Inspect pick-ups for trapped dirt or debris.
 - o Clean pick-ups in a sink or at the dock, then reinstall.
 - o New boats may have fiberglass debris from construction; older boats may have dirt buildup over time.
 - o If clogging is frequent, consider installing a secondary filtration mesh.

2. Flooded Collection Chamber

- Symptoms: Immediate alarm when power is applied.
- Solution:
 - o Inspect the discharge line for clogs or if it could have been caused by an added check valve.
 - o Dismount and drain the system to restore air volume.
 - o Restart the unit to resume normal operation.
 - o If flooding reoccurs, ensure no siphon effect is pulling water back into the system.

3. Clogged Tubing or Intake Valve

- Symptoms: Alarm signals a specific zone with no visible pick-up blockage.
- Solution:
 - o Inspect tubing for kinks or blockages.
 - o Replace damaged tubing by taping a new line to the old one and pulling it through.
 - o If the intake valve is faulty, servicing may be required.
 - o If debris frequently clogs the intake tubing, consider periodic flushing with clean water.

4. Compressor Issues

- Symptoms: Alarm sounds but compressor does not run.
- Solution: The compressor may be faulty, requiring service.
- If the system is cycling too frequently, check for slow leaks in the bilge.

Maintenance Tips

- Regularly inspect and clean pick-ups to prevent clogging.
- Flush bilges with fresh water during routine cleaning to help the system remove accumulated dirt and salt.
- Avoid harsh cleaning solutions like “Simple Green,” as they can affect system longevity.
- Check for slow leaks: If the system is running more often than usual, inspect bilge fittings and plumbing connections.



- Ensure electrical connections are secure, especially in marine environments where corrosion can occur.

Final Thoughts: With proper installation and maintenance, the Arid Bilge System Series 4 ensures a completely dry, clean, and odor-free bilge, providing reliable performance for years to come. Enjoy the benefits of an “arid” boating experience!

Course 5: How to Maintain Your Arid Bilge System

We're frequently asked by captains, boat owners, and crew members, "How can I ensure my Arid Bilge System lasts as long as possible?" The good news is that Arid Bilge Systems are inherently durable, self-maintaining solutions, designed explicitly by founder Al Baurley III to last decades, even in harsh marine environments. Al recognized the critical importance of keeping modern boats dry and clean, especially given the sensitive, high-value electronic and mechanical equipment located within bilge compartments. His vision resulted in a vacuum-based system that reliably and automatically manages bilge water, humidity, and contaminants. Although Arid Bilge Systems require minimal maintenance, adhering to simple guidelines can significantly enhance their longevity and performance.

Here's how you can easily keep your system performing at its best:

Previous Arid Bilge System models used larger mounting boxes, compressors, and intake valves, such as the retired U8256. These earlier models were exceptionally reliable but have evolved into smaller, more compact, and more durable designs. Modern systems use advanced intake valves optimized for prolonged service life and minimal upkeep. The system operates by detecting air drawback from individual bilge zones, systematically vacuuming each zone before entering standby mode for three hours and then reactivating to maintain optimal dryness.

Advanced Intake Valve Technologies

Arid Bilge Systems employ two types of intake valves at the entry point where bilge water meets the unit:

Pinch Valve (upgraded Version)

The pinch valve features a durable soft-wall tube that opens when activated by the processor. The only routine maintenance required (possibly after 7-10 years) is repositioning the soft-wall tube to refresh its striker position, ensuring long-term durability and minimal direct exposure to hazardous bilge fluid.

Solenoid Valve (standard Version)

The solenoid valve utilizes an internal mechanism that opens and closes in direct contact with hazardous bilge water. Although it requires slightly more maintenance than the pinch valve, its robust rubber seal effectively prevents fluid leakage, ensuring reliability.

Simplifying Boat Maintenance

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Traditionally, boat maintenance involved tedious and labor-intensive processes, like manually vacuuming bilge water after rinsing down engine rooms. While time-consuming, this practice was essential for boat hygiene, especially to remove salt and dirt buildup. With Arid Bilge Systems, maintenance becomes remarkably simple:

- Hose down your engine room regularly to dissolve and remove salt deposits and dirt.
- Allow water and debris to collect around the Arid Bilge System pickup, where it is automatically vacuumed up.
- The system conveniently gathers debris at the pickup point. If excessive debris accumulates, the system will trigger an alarm, prompting timely cleaning.
- Reduce premature aging and corrosion of critical metal components, such as bolts and wiring, by minimizing moisture and humidity.

Unlike traditional bilge pumps, which often become clogged or fail prematurely due to dirt and debris, the Arid Bilge System significantly streamlines and improves this essential maintenance task.

Avoiding High Concentrations of Soap During Deck Cleaning

Boat owners naturally prefer maintaining a spotless, clean top deck. However, during cleaning, soapy water can inadvertently drain into the bilge and potentially damage the Arid Bilge System by creating excessive bubbles inside the collection chamber. To prevent damage and ensure optimal system performance, follow these guidelines:

1. Turn off the Arid Bilge System at the breaker panel before cleaning.
2. Rinse thoroughly with fresh water, allowing traditional bilge pumps to remove most of the soapy water initially.
3. After rinsing, turn the Arid Bilge System back on to complete the drying process.

Following this practice protects your system's internal air circulation components and extends its overall lifespan. **Eco-Friendly Bilge Cleaning Practices.** Traditionally, boaters used harsh chemical bilge cleaners, pouring them directly into the bilge to manage odors and cleanliness. This approach is both costly and unnecessary with an Arid Bilge System and can even cause damage, as soapy or chemically treated water leads to bubbles rising inside the collection chamber. These bubbles can enter the system's air circuitry, potentially damaging internal components.

For the health of your Arid Bilge System and the environment, it is recommended to use natural cleaning alternatives:

- Mix hydrogen peroxide and lemon juice for a pleasant-smelling, effective cleaning solution.
- Baking soda combined with vinegar provides another safe and eco-friendly cleaning option.
- Allow the solution to sit in your bilge area briefly before activating the vacuum function.

This eco-friendly method is not only safer for the environment but also helps maintain your Arid Bilge System in optimal condition for years to come.

Stop Wasting Money on Temporary Solutions

Stop wasting your money on expensive temporary solutions like dehumidifiers, odor eliminators, air filtration systems, or counterfeit "dry pumps." These costly band-aid products merely mask

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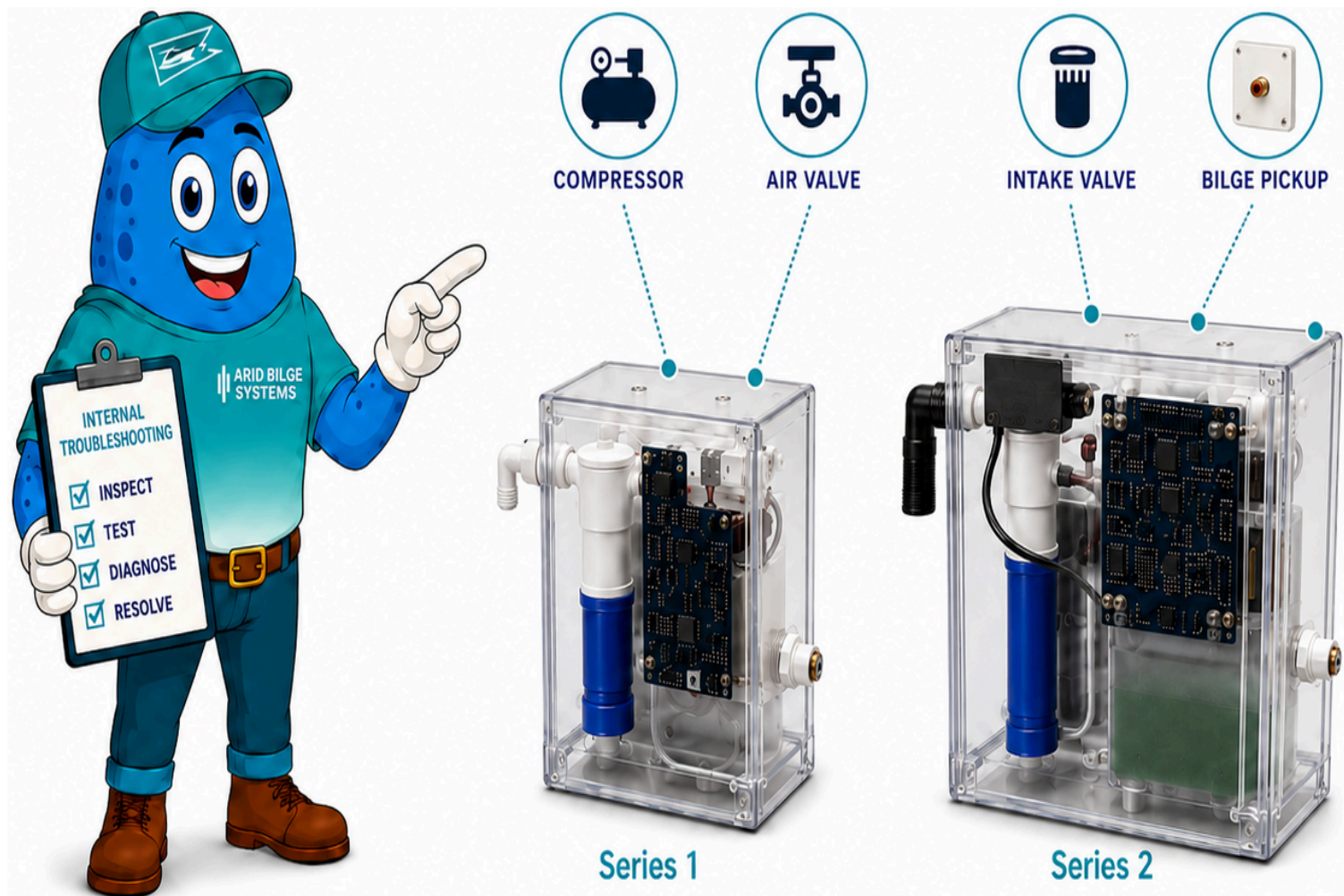
symptoms rather than tackling the root cause of corrosion, mold, odor, and premature equipment failure—moisture.

The Arid Bilge System is the ultimate solution, effectively addressing these issues at their source. It reliably eliminates water, humidity, and contaminants, automatically ensuring your boating experience remains clean, dry, fresh, and effortless.

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Internal Troubleshooting Guide

[Lecture 4: Pages 89–106~4 courses + supplemental form](#)

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Course 1: Series 1- Internal Troubleshooting Guide

We're going to walk through how to properly service a Series 1 Arid Bilge System unit in the field. We'll review both the Series 1 Legacy Model (1.1) and Series 1 Molded Model (2.0). While they operate almost identically, the Molded Model is approximately 8% smaller and slightly more efficient. Internally, both models use the same core system components, though the molded version includes updated part measurements and refined internal layouts. Since the Legacy Model has been in the field longer, we'll go over it briefly for comparison, but our primary focus will be the Molded Model, which is the version currently in production and most relevant to our dealer network.

STEP 1: Initial Diagnosis While Installed

Power on the system and carefully observe its behavior. If the unit immediately enters alarm mode, the float switch in the collection chamber may be in the up position. This is typically caused by a clogged discharge line causing fluid to build up in the chamber. Alternatively, the three-way air valve on the discharge side may be stuck and not firing correctly. The Series 1 has only a single intake zone and no intake valves. If the pickup is clogged or the intake line is kinked or clogged, the system may remain locked in a vacuum cycle. Intake lines are 20ft in length and must not be shortened.

If the green light on the flat processor card stays on and the system remains stuck in its cycle, it is likely due to one of the following:

- Clogged pickup
- Kinked or clogged intake line
- Clogged discharge line
- Discharge three-way valve stuck or failed

The vacuum sensor sends constant feedback to the processor. If it senses fluid resistance (rather than a clean drawback of air), the system will remain in vacuum mode and fail to advance. If unresolved after **70 seconds, the system will enter alarm mode**. During normal function, the unit performs a vacuum-discharge cycle. If the system remains locked in vacuum mode due to unresolved resistance, it will not discharge properly and will eventually alarm.

The processor indicator light behavior:

- Green flashing light = system actively vacuuming (normal operation)
- Red solid light = float switch in the up position (collection chamber full)
- Red flashing light = clogged pickup, kinked or blocked intake tubing
- If the compressor is running but does not speed up:
- This may indicate a vacuum leak, fluid in the air circuit, or a cut intake line.



- Check the air circulation system for fluid contamination.
- Use a vacuum gauge on the 5/32" intake fitting to confirm vacuum performance.
- If you suspect discharge failure:
 - Check for blockages in the discharge line.
 - If blocked, the float switch may remain triggered.
 - Clear the discharge line on the vessel.
- Drain the unit's collection chamber dockside:
 - Legacy Model: Tilt right (discharge port is on the right side).
 - Molded Model: Tilt left (discharge port is on the left side).
- Hold upright, then tilt repeatedly to ensure full drainage.
- Re-test the system with discharge reconnected or into a bucket. This confirms the system is fully emptied and discharge flow is restored.

STEP 2: Removing and Draining the Unit

Do NOT open the system while still mounted on the boat. Opening the unit in the field may void the warranty or expose internal trade secrets. Only certified dealers with proper authorization should open the system.

- Remove the Series 1 unit from its mounting while keeping it upright.
- If not installed, add a quick-disconnect plug on the power cable.
- Disconnect intake and discharge lines.
- Fully drain the collection chamber before bringing to the shop:
 - Legacy Model (1.1): Drain to the right (discharge is on the right side).
 - Molded Model (2.0): Drain to the left (discharge is on the left side).
- Use upright/tilt motions until fluid is fully removed.
- At the bench, place the unit face-down on a towel to begin servicing.

STEP 3: Opening the Unit – Backplate & Air Circuit Inspection

- Use a Phillips head screw gun:

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- **Legacy Model (1.1):** 4 mounting screws on the backplate. These are longer wind screws and safe to remove using a power tool.

- **Molded Model (2.0):** 2 small machine-head screws on the bottom left (near the intake) and 2 on the top right panel. These are smaller and should be removed using a hand screwdriver to avoid damaging the threads.

- The Legacy Model includes a rear backplate. The Molded Model uses a slide-track cover design.

- Internal Inspection:

- No intake valves are used.

- First, inspect the compressor and the air circuit.

If fluid contamination is found:

Replace full air circulation system using an Arid Bilge Service Kit

- Pre-wired compressor

- Plug-and-play harness

- Match reference photos

- Tie wires as per original layout

- Wiring Terminal Reference:

- Y1 – Discharge (Three-way air valve)

- Y2 – Breather

- Y3 – Compressor

STEP 4: Processor Diagnosis & Replacement

Legacy Model (1.1):

The processor is mounted inside the right side of the box when the unit is on its face, facing away from you. It is secured with two small wood screws:

- Top left

- Bottom right (important to reattach in this location as it aligns with the fuse block)

- Wires route freely from the bottom (where the air circulation system sits), across the base, then up the left side of the unit, back across the top to the processor.

- The processor is mounted high inside the box, and removal must account for internal layout and clearance.

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Molded Model (2.0):

- The processor is mounted directly to the inner faceplate.
- It is secured with two small machine-head screws on the top and bottom, identical to those used on the unit's housing.
- Requires a small machine-head screwdriver.
- Wire loom and lengths are pre-measured and routed across the top of the collection chamber, under the air sensor, and around toward the air circulation system, which is seated just behind the riser.
- This version allows for quicker, easier processor service due to molded guides and pre-cut paths.

FINAL REMINDERS

- Series 1 has one intake zone. Intake and discharge ports are both located on the lower left (facing the unit).
- Green flashing light = vacuum active
- Red solid light = float switch triggered
- Red flashing light = alarm condition due to clogged intake or discharge
- System stays in cycle for 70 seconds before entering alarm mode.
- Clean pickups every few months
- Take reference photos before and during disassembly
- Match wire/tube placements during reassembly

Only certified dealers may perform repairs—unauthorized service voids warranty

Course 2: Series 2 Internal Troubleshooting Guide

Let's walk through how to properly service a Series 2 Arid Bilge System unit in the field. This unit is designed for boats with two or three intake zones and comes in both the Legacy Model and the Molded Model. We're now phasing out the Legacy Model in favor of the Molded Model, which is approximately 33% smaller and more efficient. While we'll reference both versions, the Molded Model is our focus moving forward.

The Series 2 is a major step up from the Series 1, it's significantly more powerful and can vacuum intake lines ranging from 20 to 50 feet in length. Each zone must have a minimum tubing length of

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20 feet. If any intake zone falls below this minimum, the processor automatically disables that zone due to improper vacuum calibration.

The processor on the Series 2 model includes three indicator lights:

- Green = vacuum active (green flashing light = system actively vacuuming; normal operation)
- Red = float switch triggered or alarm condition
- Red solid light = float switch in the up position (collection chamber full)
- Red flashing light = clogged pickup, kinked or blocked intake tubing, or stuck intake valve
- Blue = zone indicator

The blue light will blink to indicate the current zone:

- One blink = Zone 1
- Two blinks = Zone 2
- Three blinks = Zone 3

Each blink is followed by a pause, helping identify the active or problematic zone.

STEP 1: Initial Diagnosis While Installed

Power on the system and carefully observe its behavior. If the unit immediately enters alarm mode, the float switch in the collection chamber may be in the up position. This is typically caused by a clogged discharge line or fluid buildup in the chamber. Alternatively, the three-way air valve on the discharge side may not be firing correctly, potentially due to soapy water or contamination interfering with the air circulation system.

If a zone remains locked in vacuum mode: It may be due to a clogged pickup, kinked or clogged intake line, or a stuck intake valve. The vacuum sensor sends feedback to the processor. If it senses fluid resistance (instead of a clean drawback of air), the system will remain in vacuum cycle mode. After **approximately 100 seconds**, the system will enter alarm mode. During normal function, the unit performs a pressure-vacuum cycle. If a zone remains locked in vacuum mode due to unresolved resistance, it will not discharge properly and will eventually alarm.

If the compressor is running but does not speed up: This may indicate a vacuum leak or fluid in the air circuit. A cut intake line on the external side would cause that zone to shut off entirely and would not result in abnormal compressor rhythm. Use a vacuum gauge on any 5/32" intake fitting to confirm vacuum performance.

If you suspect discharge failure: Check for blockages in the discharge line. If blocked, the float switch may remain triggered. Clear the discharge line on the vessel.



- Drain the unit's collection chamber dockside:
- Legacy Model: Tilt right (discharge port is on the right side).
- Molded Model: Tilt left (discharge port is on the left side).
- Hold upright, then tilt repeatedly to ensure full drainage.
- Re-test the system with discharge reconnected or into a bucket.

Jumper Testing: To diagnose a stuck intake valve, use short pieces of 5/32" tubing as jumpers and connect them to two intake valves at a time. If the leak stops while using the jumper and the compressor resumes a normal rhythm, the issue is likely a stuck intake valve.

- This issue typically occurs in solenoid valves, not pinch valves.
- A stuck valve may result from debris that entered through a damaged pickup—replace both the intake valve and pickup in this case.

Check Valve Testing: After the system completes its pressure mode and transitions to vacuum mode, place your thumb over the check valve at the discharge line. If you feel a vacuum at this point, it indicates a loss of vacuum through the check valve. This failure may be caused by solid material passing through the pinch valve's softwall tubing, through the collection chamber, across the crossover pipe, and into the check valve, preventing it from sealing.

STEP 2: Removing and Draining the Unit

Do NOT open the system while still mounted on the boat. We strongly advise against this because it may expose internal trade secrets. Only certified dealers with proper authorization are permitted to open the system. Remove the Series 2 unit from its mounting while keeping it upright. If not already installed, add a quick-disconnect plug on the power cable for future ease of service. Disconnect all intake and discharge lines.

Fully drain the collection chamber before bringing to the shop:

- Legacy Model: Drain to the right (discharge is on the right side).
- Molded Model: Drain to the left (discharge is on the left side).

Use an upright/tilt motion repeatedly to ensure all fluid is removed.

At the bench, place the unit face-down on a towel to begin servicing.



STEP 3: Opening the Unit – Backplate & Air Circuit Inspection

Use a Phillips head screw gun:

Legacy Model: 8 mounting screws on the backplate. These are longer wind screws and safe to remove using a power tool.

Molded Model: 2 small machine-head screws on the bottom left (near the intake) and 2 on the top right panel. These are smaller and should be removed using a hand screwdriver to avoid damaging the threads. The Legacy Model includes a rear backplate. The Molded Model uses a slide-track cover design.

Internal Inspection:

- Intake valves ARE used in Series 2.
- Begin by inspecting the compressor and the air circuit.

If fluid contamination is found:

- Replace full air circulation system using an Arid Bilge Service Kit:
- Pre-wired compressor
- Plug-and-play harness
- Match reference photos
- Tie wires as per original layout

Wiring Terminal Reference (Series 2):

- Y7 – Compressor
- Y5 – Discharge Air Valve (Sharpie marked)
- Y6 – Intake Valve (Breather)

STEP 4: Processor Diagnosis & Replacement

Legacy Model: The processor is mounted inside the top right side of the box when the unit is placed face-down. It is secured with three screws. Unlike the Series 1, there is no sensitivity related to the fuse block because the Series 2 includes a cutout in the backplate for clearance. Wiring routes from the compressor and intake valves across the internal cavity and up into the processor. Components are mounted to an internal aluminum electronics rail and bracket assembly.

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Molded Model: The compressor, air circulation system, and intake valves are mounted directly onto the molded backplate using machine-head screws. The compressor uses a slightly larger machine-head screw than the other components. All the machine-head screws are flat and sit flush with the interior surface. All wiring is neatly routed together, looping above the collection chamber and connecting directly to the processor mounted on the raw faceplate with three machine screws.

Processor Troubleshooting: The processor is mounted directly to the box, not to any bracket. If the processor appears burnt or damaged, it can be quickly replaced using standard procedures. This could've been caused by a lightning strike or power surge. If the issue involves an internal vacuum leak or severe contamination of the air circulation system, we recommend sending the system back for full inspection and servicing. For minor processor failures, we can send a replacement board. If the air circulation system is compromised, we can ship a replacement air circulation service kit.

Additional Notes: On all Series 2 units, soapy water from bilge cleaning can be drawn into the system. This fluid can enter the air circuit and disrupt vacuum integrity. The Molded Model features improved drainage through its redesigned internal crossover path, allowing residual fluid to evacuate more cleanly through the riser.

FINAL REMINDERS

- Green flashing light = vacuum active
- Red solid light = float switch triggered
- Red flashing light = alarm condition due to clogged intake or discharge
- Blue blinking light = zone identification (1, 2, or 3 blinks)
- System stays in vacuum cycle for 100 seconds before entering alarm mode
- Clean pickups and inspect tubing every few months
- Take reference photos before and during disassembly
- Match all wiring and tubing exactly during reassembly

Only certified dealers may perform repairs—unauthorized service voids warranty

Course 3: Series 4 Internal Troubleshooting Guide

The Series 4 system unit is one of the most powerful models in our lineup, capable of processing up to 25 gallons per hour and supporting 4 to 8 intake zones. These are the troubleshooting step scenarios that we recommend you perform first while the system is still installed on the boat. If the space is too tight or bench servicing is preferred, you may remove the unit and perform these steps at the workbench. In either case, be sure to first empty the unit's collection chamber. This can be

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done dockside before bringing the system into your shop.

STEP 1: Initial Diagnosis Before Removing the Unit

Power on the system and observe its behavior: If the unit goes into alarm immediately, the float switch inside the collection chamber is likely in the up position. This occurs because either the discharge line is clogged and fluid has backed up into the chamber, or the three-way discharge valve has failed due to fluid (often soapy water) entering the air circulation system, preventing the valve from discharging properly.

If the system goes into alarm after attempting its startup cycle and remains locked on one of the zones, it may indicate a clogged pickup, kinked line, or clogged intake valve. A cut line would prevent the fluid from being picked up at all and typically wouldn't trigger an alarm.

The system will try to push air through the intake valve to clear the obstruction all the way to the pickup. If it cannot complete its cycle, it may remain locked on that zone. The system will technically be vacuuming down, and the X2 light will stay on—indicating its holding vacuum—but the system won't complete its zone rotation.

If the X2 light stays on for more than two minutes on a single zone and doesn't complete to the next, the system will eventually enter alarm mode. If it is the final zone in the cycle, it will go to alarm immediately. If no vacuum cycle is occurring and the zone is completely inactive, it may be due to a cut intake line or a zone that is under 20 feet in length—either of which would prevent fluid from being pulled in and would likely be the explanation of why the zone is still wet and all the other zones are not.

The vacuum switch inside the system is calibrated with the processor and requires a minimum intake line length of 20 feet to activate properly. If the tubing is shorter than 20 feet, the processor will detect improper vacuum draw and automatically disable that zone's cycle.

In the event of a cut line, the system recognizes the loss of seal and also shuts off that zone, as no fluid can be pulled through.

If the discharge line is clogged: Disconnect the unit from the bulkhead or place of mounting. Keep the unit upright. Drain the unit's collection chamber by gently tilting it upright, then to the right, into a disposal bucket. Once the chamber is empty and the discharge line has been cleared, reinstall the unit and re-test.

Check the Discharge Check Valve: On the discharge riser, there is a half-inch black 90-degree elbow fitting provided from the factory.

If the boat uses this fitting: Be sure to empty the system before doing this step, place your thumb over the discharge check valve and run the system. Initially, you may feel pressure. If you feel vacuum at any point, the Blue Brady 1/8" check valve may be leaking and causing vacuum loss. When you suspect a vacuum loss, immediately attach a vacuum gauge to any one of the intake valves to verify proper vacuum levels. If vacuum cannot be maintained, this is a critical leak, and the Blue



Brady check valve may need to be swapped out. You can test this at your shop by adding water to the system to detect where the failure occurs. Ultimately, if no resolution is found, we recommend sending the unit in for servicing.

Vacuum Seal Test – Intake Valves: Disconnect the intake lines. Attach short jumper pieces of 3/16" tubing to the intake valves. Power on the system. The collection chamber typically takes about 30 seconds to vacuum down. If the X2 light does not illuminate after that time, the system is not reaching a proper vacuum. Causes could include a leaky intake valve, faulty Blue Brady check valve, or internal leak within the unit. If none of these solve the issue, the system should be returned for service. These procedures can be performed either on the boat or on a bench, depending on available space. Always ensure the unit is properly handled and drained before any bench testing.

STEP 2: Removing and Preparing the Unit for Service

Remove the Series 4 unit from its mounting.

Ideally, a quick-disconnect plug is installed on the power cable. If not, we recommend installing one.

Drain the system by tilting upright, then to the right into a bucket.

Keep the unit upright to avoid fluid entering the air circulation system.

Bring the unit to a workbench.

Place a towel down and rest the unit face-down.

STEP 3: Opening the Unit

The Series 4 model includes a removable faceplate which opens from the bottom up. No screws or Phillips head tools are required—there is no Velcro on the bottom.

The faceplate can be opened on the boat or on a bench to inspect the air circulation system.

Air Circuit Inspection:

Examine the clear tubing for signs of discoloration or fluid.

The air circulation system sits in the center of the unit. The compressor is located at the very bottom.

To inspect the compressor, you must remove the electronics rail, as the compressor is partially behind it and is mounted on the side of the unit.

Replace the full air circulation system:

Remove the electronics rail by gently bringing it down.

Take reference photos or videos to ensure proper reinstallation.

Cut the small tie-wraps securing the wiring.

Disconnect the compressor (via jumper connected to the back of the yellow transistor block).

Replace the compressor.

Replace all three air valves. The three-way air valves connect to both vacuum and pressure sides.

Match up the breather end of the three-way air valve to the marked vacuum side of the compressor (use Sharpie marks for guidance).

DO NOT disconnect the coils from the yellow transistor block—only replace the valve components.



Use a pre-assembled air circulation service kit for faster installation.

Series 4 Processor Connections:

Y1–Y4 = Intake Valves

Y2 = Breather Valve (connected via jumper to yellow block)

Y3 = Discharge Valve (connected via jumper to yellow block)

Compressor is connected via a jumper on the yellow transistor block (no direct terminal)

Check the processor if necessary:

If the vacuum failure is not due to the compressor or valves, inspect the collection chamber and processor.

Smell for burning, check for corrosion or visible damage.

Confirm with the client if the boat experienced a power surge or lightning strike.

If the processor is damaged, the system must be returned for full service due to complexity.

STEP 4: Valve Types and Testing

Series 4 units may be equipped with either:

Solenoid valves

Pinch valves

Solenoid Valve:

Power the unit on the bench.

Connect a 3/16" jumper line to the intake port.

If the compressor speeds up during this test, the valve may be stuck open.

Open the solenoid valve housing and carefully remove the coil using a small Phillips head screwdriver (counterclockwise).

Check for dirt or small debris inside the solenoid valve.

The valve responsible will be the zone that held vacuum with the jumper test.

The debris is often caused by a compromised pickup—likely due to acid or environmental damage degrading the pickup filter.

Pinch Valve:

Inspect the softwall tubing.

If deteriorated or discolored, replace with new tubing.

One at a time, remove and replace the old softwall tubing from the pinch valve groove.

Remove the polyethylene tubing from inside.

Apply lubrication (such as WD-40) using a long screwdriver to the inside of the new softwall tubing.

Insert the 3/16" polyethylene tubing into the new softwall tube to a depth of at least a fingernail.

Reinsert the new softwall tube back into the pinch valve groove. Pull upward, then slide left and right to confirm secure seating inside the Neptune Research pinch valve track. The striker joint



inside the valve will hold it firmly in place.

Air Circulation Installation Notes:

During re-wiring, ensure all wires are neatly packed together as they were before. Use your reference photos to replicate placement.

Use tie-wraps in the same locations to restore the clean layout.

After completing installation, remount the electronics rail securely in its original location.

Ensure the compressor, valves, and tubing are installed precisely.

Vacuum test the unit with the faceplate on. Once passed you can remount the system.

FINAL REMINDERS:

Remind the customer to clean the pickups every few months.

Take reference photos before disassembly and of internal wiring layout.

Reconnect wiring and tubing exactly as it was.

Only certified dealers may service or operate a Series 4 unit. Unauthorized servicing voids the warranty.

We source only the highest quality parts and expect the highest level of professionalism and care when servicing an Arid Bilge System unit. If you need help, don't hesitate to reach out. We're here to support you—so your customer has the best possible experience.

Course 4: Service Call Procedure

Standard Dealer Service Process for Arid Bilge Systems

This course outlines the standard procedure for responding to service calls involving Arid Bilge Systems. The goal is to keep service calls professional, organized, and properly documented. Dealers should be able to collect the right information, inspect the system, attempt basic field troubleshooting, and know when a unit should be returned to Arid Bilge Systems for factory evaluation.

This course is not meant to replace the full troubleshooting guide. Instead, it gives dealers a simple service-call process to follow in the field.



1. Start with Documentation

Before beginning a service call, collect the basic customer, vessel, and system information.

Dealers should document:

- Customer name and contact information
- Boat name, model, and location
- Arid system model
- Serial number
- Number of installed zones
- Date of installation, if known
- Description of the reported issue
- Whether the issue appears to be warranty or non-warranty
- Photos or videos of the system, installation, and alarm condition if available



Good documentation helps prevent confusion and speeds up support if the issue needs to be escalated.

2. Use the Online Repair Request Form

Dealers should complete the **Arid Bilge Systems Repair Request Form** online (<https://aridbilgesystems.com/repair-request-form/>) whenever a system is being evaluated, removed, or returned for service. The online form helps Arid understand what happened before the unit arrives. It also helps the factory team diagnose the system faster by collecting the customer information, boat information, system model, serial number, reported issue, and service details in one place.

If a unit is being shipped back to Arid, dealers should submit the online Repair Request Form before shipping the unit. A printed copy of the submitted information, or a written note with the customer name, dealer name, system model, serial number, and reported issue, should also be included inside the return box when possible. Clear documentation helps reduce delays, improves communication, and supports faster service turnaround.

If the official form is not available via printed out, just include a written note with:

- Dealer name
- Customer name
- Boat name
- System model
- Serial number
- Reported issue
- Troubleshooting steps already performed

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If a unit is returned without this information, service may take longer because the factory must spend more time identifying the system, customer, and issue.

3. Initial Customer Communication

When a service call is reported, ask the customer what they observed.

Useful questions include:

- Is the system powered on?
- Is there an audible alarm?
- Is there a red light or flashing light?
- Is the system running constantly?
- Is the system not pulling vacuum?
- Is fluid remaining in the collection chamber?
- Are one or more zones not drying?
- Has the boat recently had maintenance, cleaning, construction, or bilge contamination?
- Was soap, detergent, AC cleaner, fuel, oil, or other contamination present in the bilge?
- Was there a lighting strike or power surge?

Set expectations clearly. Some issues may be solved in the field, while others may require factory inspection or repair.

4. Prepare Before Visiting the Boat

Before visiting the vessel, review the system model and bring basic tools.

Recommended service items include:

- Phillips and flathead screwdrivers
- Small wrench set
- Extra tubing
- Extra pickups
- Portable vacuum gauge
- Clean rags or towels
- Flashlight
- Phone or camera for photos and videos
- Dealer Service Form
- Basic replacement fittings if available

Dealers should also review the appropriate troubleshooting guide or video before the visit when possible.

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5. Onboard Inspection

Begin with a basic visual inspection.

Check the following:

- Confirm the unit has power
- Check the breaker, fuse, and green power light
- Listen for normal system operation
- Confirm whether the system enters pressure and vacuum cycles
- Look for alarm lights or audible alarms
- Inspect the collection chamber for abnormal fluid level
- Check the discharge path for restriction
- Inspect pickups for debris, sludge, or clogging
- Inspect intake tubing for cuts, cracks, kinks, or loose connections
- Confirm the pickup is still located at the intended low point
- Check whether recent cleaning chemicals, soap, fuel, oil, or debris may have entered the system

Dealers should avoid opening the system enclosure unless necessary. If the issue appears internal and cannot be safely resolved in the field, the unit should be returned for factory evaluation.

6. Basic Field Troubleshooting

Many service issues can be narrowed down with simple checks.

Common field checks include:

- Clean and rinse pickups
- Check tubing for cuts, cracks, or clogs
- Confirm pickup placement
- Check for clogged or restricted discharge line
- Confirm the collection chamber is not overfilled
- Check whether the float switch has been triggered
- Verify that the system is building vacuum
- Listen for weak or abnormal compressor behavior
- Inspect the check valve area if accessible
- Confirm that intake valves are not stuck or restricted

If the system has a zone-specific issue, inspect that zone first.

If the system has app diagnostics, hour meters, or clearly labeled zones, use that information to determine which zone may need attention.



7. When to Stop Field Service

Dealers should stop field troubleshooting and contact Arid Bilge Systems if:

- The unit cannot build vacuum after basic external checks
- The compressor sounds weak or abnormal
- Fluid remains in the collection chamber and will not discharge
- The float switch continues to trigger
- The system repeatedly alarms after pickups and tubing are checked
- Internal air valves, sensors, compressor, or wiring may be involved
- The dealer is unsure whether the repair is safe or appropriate in the field

When in doubt, document the issue and contact factory support.

8. Returning a Unit for Service

If a unit must be returned to Arid Bilge Systems, complete the Dealer Service Form and include it inside the return box.

Before shipping, make sure:

- The unit is drained (discharge well taped off)
- The unit is clean enough to handle safely
- The mounting screws are included, if required
- A quick-disconnect plug is installed, if applicable
- The completed Dealer Service Form is included
- Photos or videos have been sent to Arid, if requested
- The dealer has included notes about all troubleshooting steps already performed

Including clear information helps reduce turnaround time.

9. Service Call Follow-Up

After the service call, the dealer should explain the result to the customer.

The follow-up should include:

- What issue was found
- What was cleaned, adjusted, or replaced
- Whether the system is operating normally
- Whether any parts need replacement
- Whether the unit must be returned to Arid
- Any recommended customer maintenance
- Any future inspection schedule

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The dealer should also keep internal notes for future reference.

10. Warranty Reference Summary

Arid Bilge Systems include limited warranty coverage for eligible parts and labor within the warranty period.

Warranty coverage does not typically include:

- Shipping to or from the factory
- Labor for removal or reinstallation
- Damage from improper installation
- Damage from misuse or submersion
- Damage from contamination, soap, detergents, or harsh chemicals
- Wear items such as tubing, pickups, or check valves

Final warranty determination should be made by Arid Bilge Systems after inspection.



Arid Bilge Systems



Sales Training

[Lecture 5: Pages 107-131~7 courses](#)

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Course 1: Dealer Sales Course Script

Here at Arid Bilge Systems we're here to help you become an expert in selling one of the most advanced marine equipment technologies on the market. Whether you're a seasoned marine dealer or just starting out, this course will equip you with everything you need to confidently sell Arid Bilge Systems to your customers. Let's dive into how to sell and hit all the selling points.

HOW THE SYSTEM WORKS

The Arid Bilge System uses smart, standalone vacuum technology that cycles between pressure and vacuum. It starts when the processor comes on (every 3 hours), communicating with our air sensor it detects fluid in a bilge zone. The system then opens the intake valve and begins a vacuum cycle to extract fluid from the zone into a centralized chamber. Once the fluid is collected, the pressure cycle kicks in, pushing the fluid out through a riser pipe and safely discharging it overboard. The system continuously repeats this vacuum-pressure cycle to ensure the chamber stays completely empty.

It's a fully automatic, low-maintenance system built for extreme durability.

It tees overboard into an existing discharge, so for retrofits, there's no need to install a new through-hull fitting. For new builds, we recommend a dedicated discharge line, but our goal is always to minimize installation complexity.

This is not a bilge pump. Traditional bilge pumps are emergency devices that activate during high-water events. Arid Bilge Systems are proactive. They remove moisture before it becomes a problem, complementing—not replacing—your bilge pumps.

IDENTIFYING CUSTOMER NEEDS

Here are some great questions to ask when identifying whether a customer is a good candidate:

- Is your bilge ever wet or damp?
- Do you smell mildew or mustiness onboard?
- Are you seeing rust or corrosion on wiring, engines, generators, gyro stabilizers, bow or stern thrusters?
- Do you use dehumidifiers, odor absorbers, or airflow systems?
- Have you experienced moisture buildup under floorboards or in hidden compartments?

If the answer to any of these is yes, they need the Arid Bilge System.

MODEL OVERVIEW

Choose the right model based on the number of wet zones—not necessarily the size of the boat. A large vessel might have only one wet zone, while a small boat could have multiple.

- Series 1: For small boats with 1 bilge zone (vacuum range: 20 ft min / 20 ft max)
- Series 2: For mid-size boats with 2–3 zones (vacuum range: 20 ft min / 50 ft max)

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- Series 4: For larger vessels with 4–8 zones (vacuum range: 20 ft min / 75 ft max)
- Series 9: For mega yachts with 9–11 zones (vacuum range: 20 ft min/ up to 100 ft per zone)

Our technology can vacuum up to 100 feet per zone.

All units are installed above the waterline and teed into an (existing) overboard discharge.

SELLING POINTS & FEATURES

- Fully automatic operation
- Quiet, efficient, and long-lasting
- Removes the last inch of standing water
- Eliminates mildew, odors, and rust
- Protects resale value
- No need for additional bilge pumps or through-hull fittings
- Optional Eco-Friendly Oil/Water Separator
- Oil Alarm alerts captain if hydrocarbons are detected
- Explosion tested and compliant with ABYC, USCG, and NMMA standards

COST & VALUE ADVANTAGE

Retrofitting a bilge pump requires new through-hulls, haul-outs, and multiple pumps—adding time, labor, and cost. Arid Bilge Systems install quickly and cost-effectively. One system manages multiple compartments, reducing complexity.

A drier boat lasts longer, needs less maintenance, and retains higher value. The Arid Bilge System pays for itself over time.

Real-World Endorsements

Arid Bilge Systems works with boat builders, dealers, and marine professionals across the industry. In addition to written training material, dealers are encouraged to watch the full boat builder testimonial playlist on the Arid Bilge Systems YouTube channel [\(Boat Builder Testimonials: why they choose Arid Bilge Systems\)](#). These videos feature real-world feedback from builders and marine brands that have worked with Arid Bilge Systems, including:

- Phenom Yachts
- Bahama Boat Works
- Regulator Marine
- Albemarle Boats
- Everglades Boats
- Scout Boats
- HCB Yachts
- Midnight Express
- Hylas Yachts

Arid Bilge Systems - Dry, Fresh, & Protected



Expert testimonials include:

- Captain Chris Zasky (81' tournament sportfish Sculley)
- Jim Moores (wooden boat restoration legend)

They've all experienced the transformation that comes with a dry, protected bilge.

Course 2: Protecting Wooden Boats - The Power of a Dry Bilge

Wooden boats are admired for their elegance, craftsmanship, and timeless appeal. However, they come with a hidden enemy—bilge water. As wooden boat expert Jim Moores explains, persistent moisture is one of the greatest threats to these classic vessels. The warm waters in coastal environments accelerate rot, mold, and decay, jeopardizing both the structural integrity and the overall experience of owning a wooden boat.

A Firsthand Testimonial from Jim Moores

Jim Moores, the founder of Moores Marine in Beaufort, North Carolina, was a revered figure in the world of classic wooden yacht restoration.

With a career spanning nearly four decades, Jim dedicated his life to preserving maritime history, restoring over 100 antique and classic yachts—including a third of the remaining Trumpy yachts and even the presidential yacht *Honey Fitz*, which served five U.S. presidents.

Jim's passion for wooden boats began when he was a young boy, growing into a lifelong commitment to restoring and maintaining some of the most iconic vessels in American history. His expertise made him the go-to authority in the field, widely respected across the marine industry.

One of Jim's personal experiences underscored just how critical maintaining a dry bilge is for wooden boats.

He owned a **1947 Trumpy wooden yacht** that had been moored for years in the warm waters of Florida. Over time, trapped moisture caused massive mildew buildup, leading to major damage: Jim had to throw away all the mattresses, spend thousands of dollars on professional cleaning, and repaint the entire interior to restore the boat's condition.

Seeking a permanent solution, Jim installed an **Arid Bilge System** onboard. The transformation was immediate:

- The persistent mildew smell disappeared.
- The boat's interior remained dry, preventing future deterioration.
- The wooden framework stopped warping from excess moisture.
- Life onboard dramatically improved, with consistently fresh, clean air throughout the vessel.

Jim even noted that during a period when the Arid Bilge System temporarily lost power due to an unrelated electrical issue, he could instantly tell the difference—the mildew smell returned within weeks. Once power was restored, the boat quickly returned to its dry, healthy state.

Arid Bilge Systems - Dry, Fresh, & Protected



Over the years, Jim **personally recommended and sold many Arid Bilge Systems** to his clients, recognizing it as a critical safeguard for preserving wooden yachts.

He also recorded a **video testimonial** giving **high praise** to the Arid Bilge System, emphasizing its importance in wooden yacht preservation and maintenance.

Jim's firsthand experience and strong endorsement of the Arid Bilge System helped educate countless owners about the invisible but devastating effects of stagnant bilge water. His legacy continues to inspire boat owners today to protect their investments by keeping their bilges clean, dry, and protected.

Why Moisture is a Wooden Boat's Worst Enemy

Water is relentless. It exists as a liquid, gas, and solid, meaning it will always find a way into places you don't want. For wooden boats, constant exposure to water accelerates rot and structural degradation. Over time, moisture seeps into the wooden framework, weakening the backbone of the vessel.

Key Problems Caused by Bilge Water in Wooden Boats:

- - Rotting Structural Components – Moisture breaks down the wooden ribs and hull planks, causing warping and weakening.
- - Mold and Mildew Growth – Spores infiltrate the cabin, leading to poor air quality and that notorious “wooden boat smell.”
- - Increased Maintenance and Costs – Frequent repairs, repainting, and refinishing are needed to fight moisture damage.
- - Toxic Health Risks – Mold and mildew contribute to allergies, respiratory issues, and an unhealthy onboard environment.

How the Arid Bilge System Stops Wooden Boat Decay

Unlike traditional bilge pumps that only activate when large amounts of water accumulate, the Arid Bilge System works continuously to remove even the smallest traces of moisture. This prevents standing water from evaporating into the wood and eliminates the breeding ground for mold and bacteria.

Key Benefits of an Arid Bilge System for Wooden Boats:

- - Prevents Structural Rot – Keeps wooden components strong and in shape.
- - Eliminates Mold and Odors – Removes musty, unhealthy air inside the cabin.
- - Reduces Maintenance Costs – Extends material lifespan and minimizes repairs.
- - Enhances Onboard Comfort – Creates a fresher, cleaner living environment.

A Game-Changer for Wooden Boat Owners

For those who cherish their wooden boats, an Arid Bilge System is more than an upgrade—it's a necessity. Instead of constantly battling rot, mildew, and odors, boat owners can enjoy their vessels the way they were meant to be—strong, elegant, and fresh.

Whether you own a classic wooden yacht or a newly built wooden boat, the Arid Bilge System protects your investment. Older boats are saved from decay, while new ones stay pristine. This system ensures your vessel remains dry, structurally sound, and odor-free for years to come.

Arid Bilge Systems - Dry, Fresh, & Protected



“Every person I’ve recommended an Arid Bilge System to has thanked me for it. Once you experience the difference of a dry bilge, you’ll never go back.”

— Jim Morris

Invest in the longevity and health of your wooden boat. Let the Arid Bilge System do the work, so you can focus on enjoying life on the water.

Course 3: Preserving Metal-Hulled Yachts: The Critical Role of a Dry Bilge System

Metal-hulled boats are known for their strength, durability, and resilience against harsh marine environments. However, they are also highly vulnerable to a silent but destructive force—bilge water. The accumulation of stagnant bilge water in metal boats leads to corrosion, electrolysis, and severe calcification, ultimately compromising the vessel’s structural integrity.

Arid Bilge Systems has been installed on numerous metal-hulled vessels, helping owners and captains combat corrosion and deterioration caused by persistent bilge water. However, one extreme case that truly stands out is that of Buckpasser, a 120-foot (36.6-meter) Japanese-built aluminum motor yacht constructed in 1985 by Hitachi Zosen.

Real-World Example: Buckpasser Yacht Service Call

We received a call from the captain of the yacht Buckpasser regarding serious pitting issues on the aluminum hull. The captain explained that stagnant bilge water had collected unnoticed in multiple compartments, causing severe internal corrosion.

We went out to inspect the vessel at Bradford Marine. After reviewing the situation, we quoted the installation of an Arid Bilge Systems Series 9, combined with an Eco-Friendly Discharge Companion and an Eco Alarm System. Once the quote was approved, the captain and his crew personally completed the installation.

The system was configured with nine pickup zones and included a clear-view collection chamber, allowing the captain to visibly watch water being drawn into the system—flowing from the top of the chamber, down through the crossover manifold, and rising through the discharge riser. It immediately gave the captain and crew real-time confirmation that trapped moisture was being properly removed.

During deeper inspection, the captain discovered a fist-sized pitted cavity on the starboard midship side of the vessel.

The corrosion had eaten its way from inside the sealed bilge compartment outward, eventually protruding through the hull plating.

This damage was directly caused by stagnant bilge water trapped under an inaccessible, sealed hatch area.

The repairs required full plate replacement and professional welding at an estimated cost between \$40,000–\$50,000—an expensive and avoidable situation had the compartments stayed dry.

Additionally, widespread corrosion, rust bloom, and a persistent musty odor were present throughout the lower Lazarette areas. After installation of the Arid Bilge System, the captain was extremely pleased with the results. The system immediately stabilized the boat’s environment, eliminating standing water, odor issues, and halting further internal corrosion. All of these

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persistent problems were solved automatically, helping extend the life of the vessel's structure significantly.

The Hidden Dangers of Bilge Water in Metal Boats

- Electrolysis & Galvanic Corrosion – Stagnant water in contact with the metal hull accelerates electrolysis, leading to rapid deterioration and pitting in the structure.
- Calcification Buildup – Minerals and debris in bilge water solidify over time, forming hardened deposits that compromise the hull's integrity.
- Structural Weakening & Metal Fatigue – Constant exposure to moisture weakens the hull, bulkheads, and stringers, leading to costly repairs.
- Hidden Deterioration in Sealed Compartments – Many metal boats have sealed bilge compartments that remain inaccessible for inspection, allowing hidden water accumulation to cause undetected long-term damage.

How Buckpasser Solved the Problem with an Arid Bilge System

- The Arid Bilge System continuously vacuums moisture from every bilge zone, eliminating stagnant water before it can contribute to corrosion.
- The Eco-Friendly Oil/Water Separator ensures that only clean water is discharged overboard, keeping the bilge free from contamination.
- The Alarm System alerts the crew to any unexpected moisture accumulation, allowing for proactive maintenance and preventing water from reaching critical levels.

A Cost-Saving Investment for Metal Boat Owners

- Extended hull longevity – Eliminating moisture prevents electrolysis and premature hull fatigue.
- Lower maintenance costs – Reducing corrosion means fewer costly repairs and part replacements.
- Better onboard air quality – Removing stagnant water eliminates odors and harmful airborne particles.
- Increased vessel value – A well-maintained dry bilge system ensures the longevity and resale value of the boat.

A Game-Changer for Metal-Hulled Vessels

Maintaining a dry bilge is critical for the longevity of metal-hulled vessels like Buckpasser. With a range of over 4,000 nautical miles, this yacht, like many others, relies on a structurally sound hull to ensure long-term performance. Eliminating bilge water not only prevents corrosion but also enhances safety, efficiency, and overall vessel health.

Whether it's a commercial fishing vessel, a military ship, or a luxury yacht, the Arid Bilge System is a critical investment for any metal-hulled boat. The long-term cost savings, reduction in corrosion, and overall improvement in vessel health make it an essential upgrade for boat owners serious about preserving their investment.

Don't let hidden moisture compromise the integrity of your vessel. Keep your boat dry, strong, and corrosion-free with an Arid Bilge System.

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Course 4: Cost Advantage of an Arid Bilge System vs. Traditional Bilge Pumps

It's important to clarify from the start that an Arid Bilge System and traditional bilge pumps are fundamentally different technologies serving distinct purposes. Traditional bilge pumps activate primarily during emergencies when significant water flooding occurs. In contrast, the Arid Bilge System is a sophisticated, durable, and smart technology designed to continuously and automatically manage even small amounts of bilge water, providing comprehensive and proactive vessel protection.

Despite their different roles, boaters frequently ask about cost comparisons between these two technologies. Let's explore how, even from a purely financial and installation perspective, the Arid Bilge System can be price-competitive with traditional bilge pumps, especially in retrofit scenarios.

Initial Cost vs. Retrofit Expenses

While a bilge pump itself is relatively inexpensive, especially when performing a simple swap-out of a failed unit, the real cost becomes apparent when considering a full retrofit. If you're simply replacing a malfunctioning bilge pump, the cost remains low. However, when installing a new bilge pump in a compartment that previously didn't have one, the installation process becomes far more expensive.

Each traditional bilge pump requires an individual through-hull fitting drilled above the waterline. This process often necessitates hauling the boat out of the water, incurring additional expenses.

Labor costs, specialty materials, and plumbing required for this installation can quickly escalate, potentially adding several hundred dollars per pump.

These additional factors make retrofitting a traditional bilge pump considerably more expensive than initially anticipated, bringing the overall cost closer to that of an Arid Bilge System.

In contrast, installing an Arid Bilge System is straightforward, cost-effective, and far simpler:

- No new through-hull fittings or boat hauling is required, significantly reducing installation costs.
- Installation simply involves mounting the system on an accessible bulkhead, routing intake tubing, placing pickups at the lowest point where fluid accumulates, and teeing into an existing overboard discharge (deck drain, sink drain, hatch drain, etc.).
- This streamlined installation process dramatically reduces labor, complexity, and overall costs.

One System, Multiple Compartments

Traditional setups typically necessitate separate pumps for each compartment, increasing both complexity and cost. The Arid Bilge System, however, efficiently covers multiple compartments—bow, midship, and stern—through one centralized system, reducing both upfront and ongoing expenses. At approximately \$1,000 per compartment, the Arid system ensures centralized water removal and simplified maintenance.



Minimizing Bilge Pump Failures

Multiple bilge pumps are often installed per compartment to safeguard against pump failures, which are common due to submersion and exposure to corrosive conditions. Unfortunately, pump failures are often discovered too late, risking significant damage—including the potential of the boat taking on excessive water.

The Arid Bilge System eliminates this concern by continuously removing moisture before it accumulates, reducing reliance on multiple emergency pumps. Instead of needing four pumps in a compartment (we've seen more for a single compartment), a builder may only require two or three, ensuring better performance and reduced maintenance.

Advanced Technology and Continuous Protection

Featuring hundreds of precision-engineered components and advanced computerized technology, the Arid Bilge System provides continuous, proactive protection. Unlike traditional bilge pumps designed solely for emergency drainage, the Arid system ensures complete dryness, effectively protecting onboard electronics, reducing corrosion, and preventing mold and unpleasant odors.

Simplified Maintenance

- Easy installation without boat removal.
- No repeated drilling or complex plumbing.
- Consolidation of bilge water removal in one reliable, centralized system.

Protect Your Investment

While basic bilge pumps seem cheaper initially, the actual retrofit costs quickly match or even exceed the price of installing an Arid Bilge System, especially when multiple compartments are involved. Many bilge pumps fail prematurely due to constant exposure to water, which wears out the float switch and causes the pump to run continuously. With the Arid Bilge System, bilge pumps no longer have to run frequently, reducing strain and extending their lifespan significantly. Additionally, when mold, rust, odor, corrosion, and humidity are completely eliminated by an Arid Bilge System, boat owners save even more money in maintenance and repair costs.

The Smart and Cost-Effective Solution

Stop wasting your money on expensive dehumidifiers, odor eliminators, and other costly devices that only treat symptoms. The Arid Bilge System is the only true solution that automatically and effortlessly removes moisture before it can cause damage. Choosing the Arid Bilge System means protecting your vessel, streamlining maintenance, and investing in peace of mind by ensuring water stays outside your boat, where it belongs.

Course 5: Dealer Quotation Essentials

System Selection, Retail Pricing, and Dealer Wholesale Pricing (2026)

This course explains how dealers should use the official Arid Bilge Systems quotation materials when presenting a system recommendation to a customer.

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Two-Sided Customer Quote Packet

- **Front:** System Quote & Selection Form (Retail)

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SYSTEM QUOTE & SELECTION FORM

CONTACT INFORMATION

NAME: _____
 COMPANY: _____
 CITY: _____
 STATE: _____ ZIP: _____
 CONTACT: _____
 EMAIL: _____

ARID SERIES:

- SERIES 1 — SINGLE-ZONE COMPACT SYSTEM ☐
- SERIES 2 — MIDSIZE- MULTI-ZONE SYSTEMS ☐
- SERIES 4 — LARGE VESSEL SYSTEMS ☐
- SERIES 9 — ELITE YACHT SYSTEMS ☐

ECO-FRIENDLY UNITS: (COMPACT OILY WATER SEPARATOR)

- EcoDrain 1 — Standard Compact Unit ☐
- EcoDrain 2 — Pro ☐
- EcoDrain 3 — Premium "Show-Grade" Unit ☐

OIL AND ALARM SYSTEMS: (OPTIONAL SAFETY / MONITORING ACCESSORIES)

- ECO ALARM 1 — HYDROCARBON NOTIFIER (AUDIO/VISUAL ALERT ONLY) ☐
- ECO ALARM 2 — OIL-IN-WATER ALARM (AUTO SYSTEM SHUTDOWN) ☐

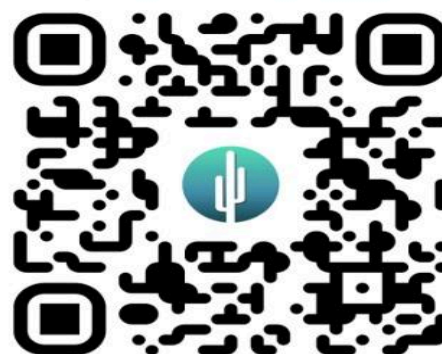
INSTALLATION & QUOTE SUMMARY

DEALER / PROJECT MANAGER: _____
 DEALER LABOR HOURS / INSTALL HOURS: _____ HRS X \$ = _____
 DEALER-SUPPLIED INSTALL MATERIALS : (NOT IN A.B.S.KIT) _____
 ARID UNIT SYSTEM COST: _____
 AUTHORIZED DEALER SIGNATURE: _____ DATE: _____
 TOTAL: _____

PROJECT INFORMATION

YACHT NAME/PROJECT NO: _____
 PROJECT MANAGER: _____
 HAULING DATE: _____
 BOAT TYPE: ☐ POWER ☐ SAIL ☐ WOODEN ☐ METAL
 PROJECT TYPE: ☐ NEW BUILD ☐ REFIT

Product Info Version 2026.1



SCAN TO SEE
HOW IT WORKS



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Back: Retail Product & Price Guide (Retail)

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2026 PRODUCT & PRICE GUIDE

Arid Model (Series & Zone)	Voltage	Base Price	Add Pinch Valves	Add Hour Meters	Add Pinch Valve + Hour Meters
SERIES 1:					
SER. 1x1	12-24 Volt	\$1,095.00	N/A	N/A	N/A
Series 1 cannot be upgraded with pinch valves or hour meters					
SERIES 2:					
SER. 2x2	12-24 Volt	\$1,995.00	\$2,295.00	N/A	N/A
SER. 2x3	12-24 Volt	\$2,595.00	\$2,995.00	N/A	N/A
Series 2 can be upgraded with pinch valves but not hour meters					
SERIES 4:					
SER. 4x4	12 or 24 Volt	\$3,795.00	\$4,345.00	\$4,795.00	\$5,345.00
SER. 4x5	12 or 24 Volt	\$4,595.00	\$5,345.00	\$5,595.00	\$6,345.00
SER. 4x6	12 or 24 Volt	\$5,095.00	\$5,995.00	\$6,095.00	\$6,995.00
SER. 4X7	12 or 24 Volt	\$7,295.00	>	>	\$7,295.00
SER. 4X8	12 or 24 Volt	\$7,895.00	>	>	\$7,895.00
Series 4 with zones 4,5, & 6 can add pinch valves, hour meters or both, zones 7&8 comes by default with pinch valves and hour meters					
SERIES 9:					
SER. 9X9	24 VDC or 120 VAC	\$10,695.00	>	>	\$10,695.00
SER. 9X10	24 VDC or 120 VAC	\$11,695.00	>	>	\$11,695.00
SER. 9X11	24 VDC or 120 VAC	\$12,695.00	>	>	\$12,695.00
Series 9 comes with pinch valves and hour meters by default					

Eco-Friendly Discharge Companions

MODEL	DESCRIPTION	PRICE	MODEL	DESCRIPTION	MODEL
ECO-DRAIN 1	STANDARD, COMPACT DISCHARGE COMPANION	\$1,795.00	ECO-ALARM 1	ALERTS WHEN HYDROCARBONS DETECTED (NON-SHUTDOWN ALERT UNIT)	\$725.00
ECO-DRAIN 2 PRO	IMPROVED FILTRATION & FLOW, DESIGNED FOR SERIES 4-8	\$3,095.00	ECO-ALARM 2	DETECTS OIL AND AUTOMATICALLY SHUTS DOWN ARID BILGE SYSTEM	\$1,695.00
ECO-DRAIN 3 PREMIUM	FULL ALUMINUM - INTEGRATED SEPARATOR CHAMBER, "SHOW GRADE" BUILD	\$7,295.00	FOR ALL ECO-DRAIN UNITS		

NOTE: PLEASE REFER TO THIS SHEET FOR MSRP VALUES. FINAL INSTALLATION COST WILL BE DETERMINED BY DEALER LABOR ESTIMATE ON FRONT.

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The quotation packet is designed to make the sales process clearer, more professional, and better documented. It helps the dealer show the customer what system is being recommended, what options are included, how many zones are needed, what accessories are being added, and how the final estimate is being calculated. The goal is simple: **Show the customer exactly what their total cost is.**

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How Dealers Should Use the Quote Sheet

Dealers should use the quote sheet during boat inspections, walkthroughs, and customer consultations. The sheet is designed to help the dealer build a clear, written estimate while standing with the customer at the boat. The **front side** works as the project worksheet. Dealers can fill in the customer information, boat information, project details, selected Arid system, Eco-Drain option, Eco-Alarm option, installation notes, labor hours, labor rate, additional installation parts, and final total. The **back side** works as the retail pricing reference. Dealers can use the 2026 Product & Price Guide to look up the retail price for the selected Arid system, available upgrades, Eco-Drain model, Eco-Alarm model, and related accessories. For example, if a customer needs an **8-zone Series 4 system** with an **Eco-Drain 2 Pro** and **Eco-Alarm 2**, the dealer can mark those selections on the front sheet, use the back price guide to calculate the product cost, add any estimated installation materials, and then add the estimated installation labor.

Sample Quote Calculation Selected Products:

- Series 4 — 8 Zone System: **\$7,895**
- Eco-Drain 2 Pro: **\$3,095**
- Eco-Alarm 2: **\$1,695**

Product Subtotal:

$\$7,895 + \$3,095 + \$1,695 = \mathbf{\$12,685}$

Additional Installation Materials Example:

- Discharge hose, fittings, clamps, mounting materials, or other external parts: **\$100**

Installation Labor Example:

- Estimated labor: **15 hours**
- Dealer labor rate: **\$125 per hour**

Labor Subtotal:

$15 \text{ hours} \times \$125 = \mathbf{\$1,875}$

Total Estimated Project Cost:

$\$12,685 + \$100 + \$1,875 = \mathbf{\$14,660}$

This helps the customer clearly understand how the final number was created:

System cost + selected accessories + additional installation materials + installation labor = total estimate.

This also helps prevent confusion later. If a customer asks why the total is higher than the base system price, the dealer can point to the written quote and show the selected system, add-on products, external parts, installation hours, labor rate, and total estimated cost.



Printable and Field-Ready

The official quote sheet is designed to be simple, printable, **modern+old-school**, and easy to use in the field. Dealers can download the PDF from the dealer portal, print the form, and bring it to boat inspections, walkthroughs, and customer consultations. The form is meant to be filled out by hand while reviewing the boat and discussing the project with the customer. The front side gives the dealer a simple place to mark the selected box system, zones, accessories, installation materials, labor estimate, and total project estimate. The back side provides the retail price sheet so the dealer can quickly reference MSRP pricing while building the quote. Once the quote sheet is completed, the customer should receive the paper copy along with an Arid brochure and the dealer's business card. The dealer should then take a photo or digital copy of the completed form with their phone for their own records. This gives the customer a clear written estimate to take with them, while giving the dealer a simple paper trail and a professional record of what was recommended, what was selected, and how the project estimate was calculated during the sales follow-up.

This makes the quote process simple, professional, and ready to use on the go.

QR Code and Landing Page Note

The QR code on the quotation material is designed to make it easy for the customer to learn more after the walkthrough. The QR code may direct the customer back to the main Arid Bilge Systems website. This gives the customer a simple place to review the company, product information, videos, brochures, testimonials, and other educational material. The QR code can also be changed to direct customers to a dedicated product or quotation dealer landing page website. That landing page could include video testimonials, product education, quote support material, dealer follow-up resources, quote request forms, service request forms, and dealer contact information. Arid Bilge Systems provides the art elements and marketing assets needed to help dealers build a clean, professional landing page.

These materials are available through the Arid Bilge Systems dealer portal and the Art pack includes product artwork, logos, brochures, photos, video assets, testimonial content, approved product descriptions, and other sales-support materials.

Dealer Wholesale Pricing, Profit Example, and Volume Incentives

The Dealer Wholesale Pricing Sheet is an internal dealer-only document used to help approved Arid Bilge Systems dealers understand product cost, retail price, wholesale price, product margin, and potential profit. This sheet is not customer-facing. It should only be used by approved Arid Bilge Systems dealers for internal quoting, purchase order planning, and profit review.

The wholesale packet includes two main sides:

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- **Front:** Dealer Profit and Quote Summary

ARID BILGE SYSTEMS™

DEALER PROFIT AND QUOTE SUMMARY

Dealer Name: _____

Dealer/Company Name: _____

Date: _____

Selected SKU(s): _____

Quantity: _____

Pickup SKU(s): _____

Quantity: _____

DEALER QUOTE & PROFIT CALCULATION

Line Item	Amount
Retail Price (MSRP):	\$ _____
Dealer Cost (Wholesale):	\$ _____
Dealer Gross Profit:	\$ _____
Estimated Install Labor (hrs): _____	\$ _____
Labor Rate (\$/hr): _____	\$ _____
DEALER LABOR REVENUE:	\$ _____
TOTAL DEALER PROFIT (SYSTEM + LABOR)	\$ _____

DEALER VOLUME INCENTIVES

- Purchase **5+** units in **bulk order**
→ Additional **5%** Wholesale Discount
- Purchase **10+** units in **bulk order**
→ Additional **10%** Wholesale Discount
- * Volume discounts are applied at order confirmation

DEALER ORDER & SUPPORT



- 📄 Submit PO Order Forms
- 🔒 Confirm Wholesale Pricing
- 📖 Access training courses & manuals
- 📄 Download Arid Marketing Materials
- 🌐 Update your dealer landing page

You may also submit purchase orders directly by email.

Questions? Contact us at admin@aridbilge.com or call us at 954-478-7066

*Margins shown exclude dealer labor & materials. Dealer controls final installed price.



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FOR DEALER INTERNAL
USE ONLY

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Back: 2026 Product Variations & Prices — Wholesale

ARID BILGE SYSTEMS™

PRODUCT VARIATIONS & PRICES 2026 - WHOLESALE

MODEL	SKU	RETAIL PRICE	WHOLE PRICE	PROFIT / MARGIN
SERIES 1				
SER. 1x1	S1	\$ 1,095.00	\$ 824.25	\$ 270.75 (24.7%)
SERIES 2				
SER. 2x2 STANDARD VALVES	S22SV	\$ 1,995.00	\$ 1,496.25	\$ 498.75 (25%)
SER. 2x2 PINCH VALVES	S22PV	\$ 2,295.00	\$ 1,704.75	\$ 590.25 (25.7%)
SER. 2x3 STANDARD VALVES	S23SV	\$ 2,595.00	\$ 1,912.50	\$ 682.50 (25.7%)
SER. 2x3 PINCH VALVES	S23PV	\$ 2,995.00	\$ 2,225.25	\$ 769.75 (25.7%)
SERIES 4				
SER. 4x4 STANDARD VALVES	S44SV	\$ 3,795.00	\$ 2,831.25	\$ 963.75 (25.4%)
SER. 4x4 PINCH VALVES	S44PV	\$ 4,345.00	\$ 3,248.25	\$ 1,096.75 (25.2%)
SER. 4x4 STANDARD VALVES HOUR METERS	S44SVHM	\$ 4,795.00	\$ 3,540.00	\$ 1,255.00 (26.2%)
SER. 4x4 PINCH VALVES HOUR METERS	S44PVHM	\$ 5,345.00	\$ 3,957.00	\$ 1,388.00 (26%)
SER. 4x5 STANDARD VALVES	S45SV	\$ 4,595.00	\$ 3,427.50	\$ 1,167.50 (25.4%)
SER. 4x5 PINCH VALVES	S45PV	\$ 5,345.00	\$ 3,948.75	\$ 1,396.25 (26.1%)
SER. 4x5 STANDARD VALVES HOUR METERS	S45SVHM	\$ 5,595.00	\$ 4,136.25	\$ 1,458.75 (26.1%)
SER. 4x5 PINCH VALVES HOUR METERS	S45PVHM	\$ 6,345.00	\$ 4,657.50	\$ 1,687.50 (25.6%)
SER. 4x6 STANDARD VALVES	S46SV	\$ 5,095.00	\$ 3,817.50	\$ 1,277.50 (25.1%)
SER. 4x6 PINCH VALVES	S46PV	\$ 5,995.00	\$ 4,443.00	\$ 1,552.00 (25.8%)
SER. 4x6 STANDARD VALVES HOUR METERS	S46SVHM	\$ 6,095.00	\$ 4,526.25	\$ 1,568.75 (25.7%)
SER. 4x6 PINCH VALVES HOUR METERS	S46PVHM	\$ 6,995.00	\$ 5,151.75	\$ 1,843.25 (26.3%)
SER. 4x7 PINCH VALVES HOUR METERS	S47PVHM	\$ 7,295.00	\$ 5,475.00	\$ 1,820.00 (25%)
SER. 4x8 PINCH VALVES HOUR METERS	S48PVHM	\$ 7,895.00	\$ 5,872.50	\$ 2,022.50 (25.6%)
SERIES 9				
SER. 9x9 PINCH VALVES HOUR METERS	S99PVHM	\$ 10,695.00	\$ 8,019.00	\$ 2,676.00 (25%)
SER. 9x10 PINCH VALVES HOUR METERS	S910PVHM	\$ 11,695.00	\$ 8,748.00	\$ 2,947.00 (25.1%)
SER. 9x11 PINCH VALVES HOUR METERS	S911PVHM	\$ 12,695.00	\$ 9,477.00	\$ 3,218.00 (25.3%)
ECO-FRIENDLY PRODUCTS				
ECO-DRAIN 1	ED 1	\$ 1,795.00	\$ 1,346.25	\$ 448.75 (25%)
ECO-DRAIN 2	ED 2	\$ 3,095.00	\$ 2,321.25	\$ 773.75 (25%)
ECO-DRAIN 3	ED 3	\$ 7,295.00	\$ 5,471.25	\$ 1,823.75 (25%)
ECO-ALARM 1	EA 1	\$ 725.00	\$ 543.75	\$ 181.25 (25%)
ECO-ALARM 2	EA 2	\$ 1,695.00	\$ 1,271.25	\$ 423.75 (25%)



VISIT: ARIDBILGESYSTEMS.COM

DRY, FRESH, & PROTECTEDFOR DEALER INTERNAL
USE ONLY

Arid Bilge Systems - Dry, Fresh, & Protected



The **front side** is used as a dealer profit worksheet. It gives the dealer a place to list the selected SKU numbers, quantities, retail price, dealer wholesale cost, dealer gross profit, estimated installation labor, labor rate, dealer labor revenue, and total dealer profit estimate.

The **back side** provides the wholesale pricing reference. It lists Arid system models, SKU numbers, retail MSRP pricing, dealer wholesale pricing, and estimated profit margin for each system and accessory product. Together, these two sides help the dealer understand the business side of the quote.

The customer-facing quote sheet explains what the customer is buying and what the installed estimate may be. The dealer-only wholesale sheet helps the dealer understand what the product costs the dealer, what the expected margin is, and what the total profit opportunity may look like when product margin and labor revenue are combined. The dealer can use this sheet after completing the customer-facing quote. Once the customer selections are known, the dealer can reference the wholesale sheet, calculate dealer product cost, estimate labor revenue, and prepare the purchase order.

This document should remain internal. Dealer wholesale pricing, dealer margins, and portal access information should not be printed in customer-facing documents or shared with retail customers.

Using the same sample project from the previous retail section:

Customer-Facing Retail Product Subtotal:

- Series 4 — 8 Zone System: **\$7,895**
- Eco-Drain 2 Pro: **\$3,095**
- Eco-Alarm 2: **\$1,695**

Retail Product Subtotal:

$\$7,895 + \$3,095 + \$1,695 = \mathbf{\$12,685}$

Using the dealer wholesale price sheet, the dealer cost and product profit would be calculated separately.

Dealer Wholesale Cost Example:

- Series 4 — 8 Zone System wholesale cost: **\$5,872.50**
- Eco-Drain 2 Pro wholesale cost: **\$2,321.25**
- Eco-Alarm 2 wholesale cost: **\$1,271.25**

Dealer Wholesale Product Cost:

$\$5,872.50 + \$2,321.25 + \$1,271.25 = \mathbf{\$9,465.00}$

Dealer Product Gross Profit:

$\$12,685 \text{ retail product subtotal} - \$9,465 \text{ dealer wholesale cost} = \mathbf{\$3,220.00}$

Dealer Labor Revenue:

$15 \text{ hours} \times \$125 \text{ per hour} = \mathbf{\$1,875}$



Total Dealer Gross Profit Before Materials and Expenses:

\$3,220 product gross profit + \$1,875 labor revenue = **\$5,095**

Dealer profit varies on labor rate, actual installation time, material cost, dealer overhead, shipping, taxes, discounts, and any additional parts or services required for the project.

Dealer Discounts and Volume Incentives

Approved dealers automatically receive wholesale pricing off the retail MSRP price. The wholesale price sheet shows the dealer cost, retail price, and profit margin for each system and accessory product.

Additional volume incentives may also be available when dealers purchase multiple units in one qualified bulk order.

Dealer Volume Incentive

Due to inflation and increased parts costs, the previous 10% volume incentive is no longer active (referring to the front of 26' Wholesale price sheet). Arid Bilge Systems currently offers a **5% wholesale discount** on approved qualifying bulk orders. Dealers may qualify for the additional **5% wholesale discount** when purchasing **10 or more units in one bulk order**.

To qualify, the order must be submitted as one complete bulk order. The discount cannot be applied retroactively to separate orders that were placed individually throughout the month. Dealers should contact Arid Bilge Systems by phone or email before submitting a bulk order to confirm current eligibility, pricing, and order terms. Once the dealer has reviewed the wholesale pricing and confirmed the order details, the completed purchase order or dealer order form can be submitted through the Arid Bilge Systems dealer portal, sent directly by email, or confirmed by phone if needed.

Dealers should contact Arid Bilge Systems before submitting a qualifying bulk order to confirm current pricing, eligibility, order timing, shipment details, and any approved volume incentive terms.

Course 6: Dealer Benefits Overview

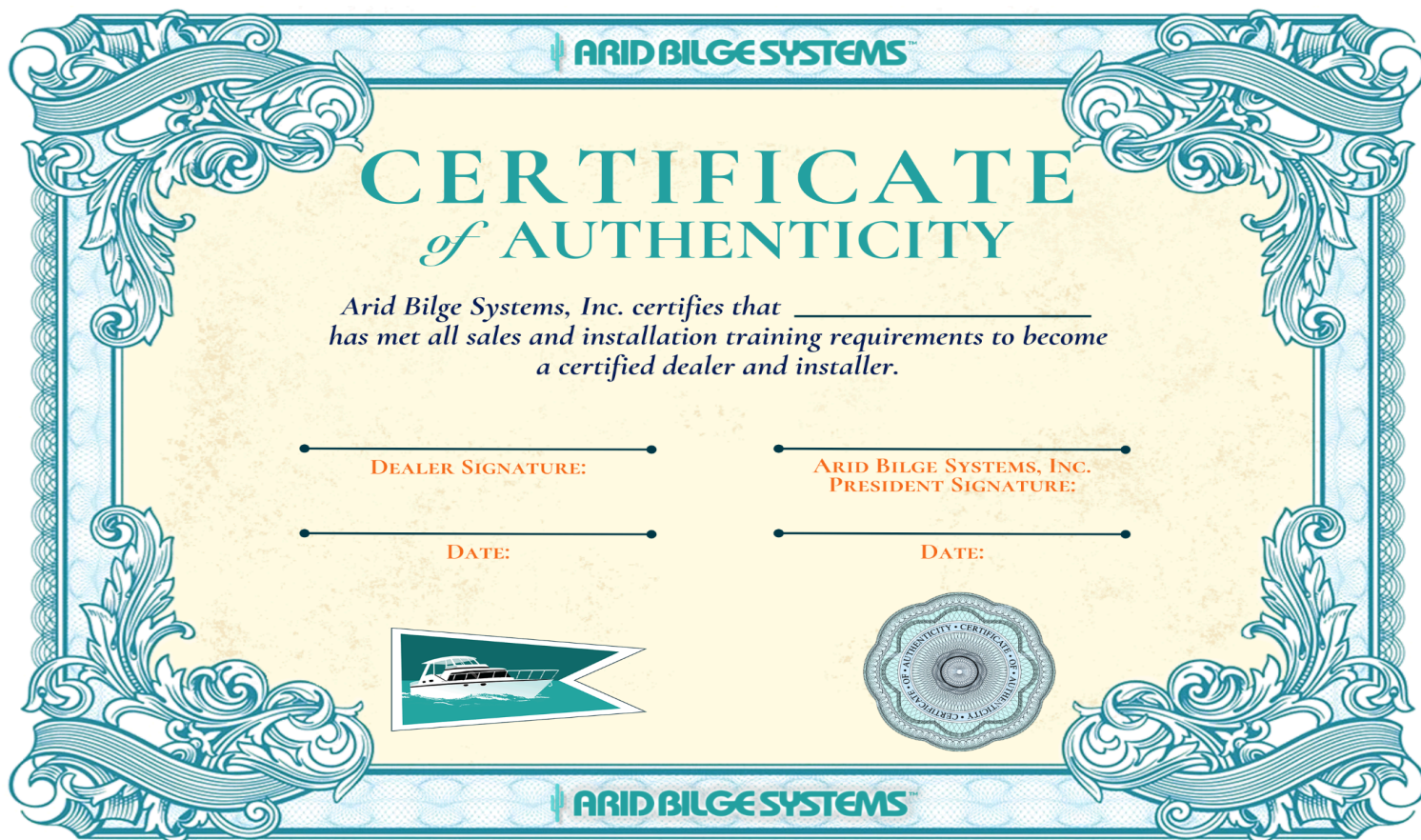
Support, Sales Tools, and Certification Resources

This final course explains the benefits, resources, and support materials available to certified Arid Bilge Systems dealers. After completing the training series, dealers should understand not only how Arid Bilge Systems work, but also how to present the product professionally, support customers in the field, access dealer materials, and use the tools provided to help grow their business. This section reviews the key resources available to dealers, including certification materials, product literature, sales support, marketing assets, display options, training access, and dealer support tools.

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1. Certificate of Authenticity



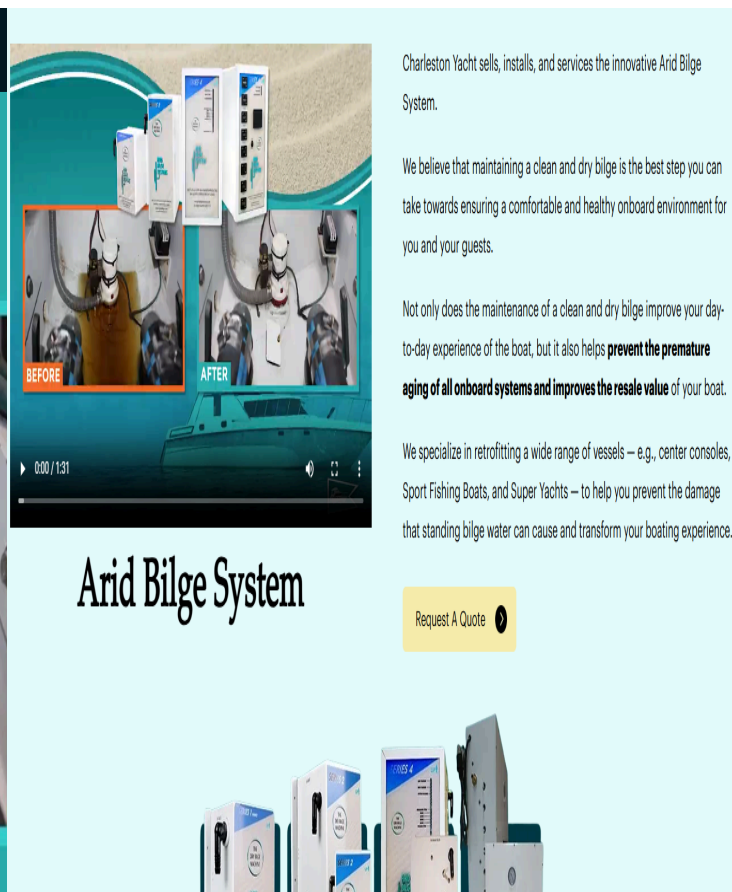
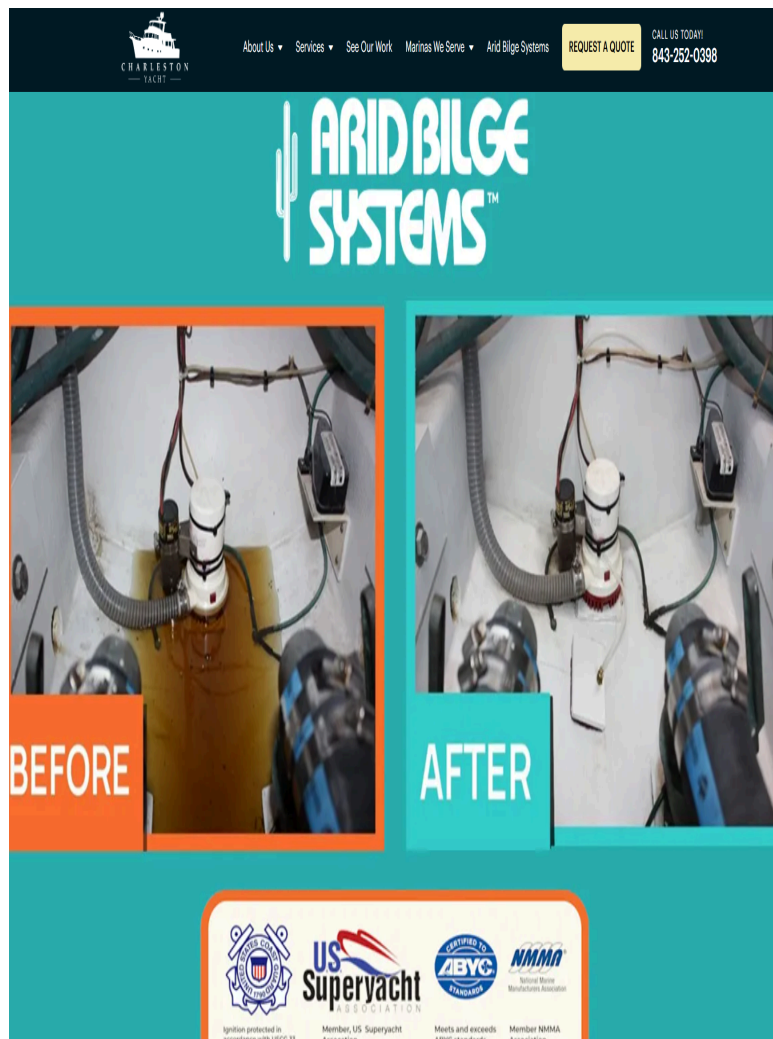
After completing the required Arid Academy training and passing the final quiz, approved dealers will receive an Arid Bilge Systems Certificate of Authenticity. This certificate confirms that the dealer has completed the official training program and is recognized as a trained Arid Bilge Systems dealer (we recommend you have this next to your dummy display). The certificate is more than a completion document. It is a professional credibility tool. It shows customers that the dealer has taken the time to learn the product, understand the system, and represent the Arid Bilge Systems brand properly.

This art piece gives the dealer added confidence when explaining the product, quoting systems, and representing Arid Bilge Systems in the field.

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2. Custom Landing Page



One of the strongest dealer benefits is the ability to create a custom Arid Bilge Systems landing page for your dealership or marine service business. A dealer landing page gives customers one clean, professional place to learn about Arid Bilge Systems after a walkthrough, quote, boat show conversation, or referral. Instead of sending customers to scattered links, the landing page becomes a simple sales hub that supports the dealer and keeps the customer focused on the product.

A strong dealer landing page may include:

- Dealer/ Arid logo
- Arid Bilge Systems product information
- Product explanation videos
- Boat builder testimonials
- Before-and-after bilge examples
- Installation photos or project examples
- Customer quote request button

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- Dealer contact form

This page helps build credibility because customers can see that the dealer is connected with Arid Bilge Systems, understands the product, and has the tools to explain it professionally. Arid provides dealers with the digital assets needed to help build a clean landing page, including product artwork, logos, brochures, photos, videos, testimonial content, approved descriptions, and other sales-support materials. These assets are available through the Arid Bilge Systems dealer portal. Dealers can use these materials to build a landing page on their own website, and Arid will feature approved dealers through our dealer locator listing. A dealer landing page can also support local search visibility. When customers search for Arid Bilge Systems, dry bilge solutions, or marine service providers in their area, a well-built landing page helps the dealer look more professional and easier to contact.

The following dealer landing pages can be used as examples of how Arid Bilge Systems may be presented on a dealer website:

- [Charleston Yacht: https://charlestonyacht.com/arid-bilge-systems/](https://charlestonyacht.com/arid-bilge-systems/)
- [Thomas Marine Systems: https://www.thomasmarinesystems.com/arid-bilge](https://www.thomasmarinesystems.com/arid-bilge)
- [TB Yacht: https://tbyacht.com/arid-bilge-systems/](https://tbyacht.com/arid-bilge-systems/)
- [E.C. Ruff Marine: https://ecruffmarine.com/arid-bilge-systems/](https://ecruffmarine.com/arid-bilge-systems/)

These pages show how a dealer can combine Arid product education, videos, before-and-after visuals, quote requests, dealer contact information, and customer-facing sales support into one clean page. Arid Bilge Systems may also support dealer visibility through blog collaborations. These collaborations can help both Arid and the dealer improve online search presence, educate customers, and build local credibility. For dealers who are actively moving strong sales volume, Arid may also consider additional marketing support, including Google Ads or other promotional campaigns, depending on dealer performance, and approved marketing terms.

Arid Bilge Systems may also recommend helping qualified dealers set up a mass email campaign once the proper sales assets are in place. Before sending a mass email campaign, the dealer should have their marketing foundation ready. This includes a clean dealer landing page, product videos, brochures, testimonial content, quote request information, contact forms, and approved Arid product descriptions on their landing page.

The dealer landing page is especially important. When customers receive the email and click through, they should land on a professional page that clearly explains the product, shows proof, provides visuals, and makes it easy to request a quote or contact the dealer. In other words, dealers should have their ducks in a row before sending a campaign. The email should not send customers to a blank page, confusing website, or scattered information. It should send them to a clean, organized landing page that supports the sale. Once those pieces are ready, the dealer can send a mass email campaign to existing customers. This gives the dealer a professional way to introduce Arid Bilge Systems to their network and drive customers back to a page built specifically to support the conversation.



3. Dealer Trifecta QR Graphic

ARID BILGE SYSTEMS™



 **NORMAL
BILGE**



 **ARID
BILGE**

DRY, FRESH, & PROTECTED

The original automated dry bilge system trusted by leading American boat builders.

- ✓ Eliminates bilge odor at the source
- ✓ Stops mold and mildew before it starts
- ✓ Removes hidden moisture throughout the vessel
- ✓ Protects wiring, equipment, and metal corrosion
- ✓ Lowers long-term maintenance and service costs
- ✓ Preserves resale value
- ✓ Detects small leaks before they become major repairs

Moisture is the hidden enemy of every boat...
Arid automatically removes it, protecting your boat from the inside out.

Scan to see
how it works!



Made in USA 



ignition protection in accordance with USCG 33 CFR 183.410



Powered by Arid Industries™



Arid Bilge Systems provides dealers with the same full-page marketing graphic used in Arid's full-page magazine advertising. This graphic is part of the dealer marketing trifecta because it is simple, professional, and ready to use. Dealers can print it out (we normally give it along with the display stand when purchasing the dummy display), and place it in a showroom next to the dummy display.

The graphic is designed to make the Arid Bilge Systems value proposition clear at a glance. It shows the before-and-after difference between a normal wet bilge and an Arid-protected bilge, highlights key customer benefits, and includes a QR code so customers can quickly access more information. If the dealer has a custom Arid Bilge Systems landing page, we can direct the QR code to that page. If the dealer does not yet have a landing page, the QR code will direct customers to the main Arid Bilge Systems website.

4. Dealer Starter Display Package

Arid Bilge Systems offers an official Dealer Starter Package for dealers to present the product professionally in their showroom display area.



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The Dealer Starter Display Package is available for **\$695** and is designed to give dealers the basic physical materials needed to represent Arid Bilge Systems properly.

This package includes:

- Branded Arid Bilge Systems display stand
- Pickup and tubing for interactive display use
- Arid Academy booklets
- Brochure packets
- Brochure holders
- Dealer full-page QR code graphic
- Display stand for dealer full-page graphic
- QR code linked to the dealer landing page (if applicable)

This package is not intended to be a profit center for Arid Bilge Systems. It is offered to dealers at our raw cost so they have the right materials to present the product correctly and professionally. The purpose of the starter package is to give dealers a branded, organized, customer-facing setup that supports real sales conversations. Instead of explaining the system with loose papers, scattered links, or verbal descriptions only, the dealer has a physical display, brochures, QR code support, and printed product information ready to go. This is similar to how a strong franchise or professional dealer network provides its representatives with the right branded materials. If a dealer wants to represent the product seriously, they need the tools, display pieces, and customer-facing materials that make the presentation clear and consistent.

5. In-Store Video Loop Package

If you have a TV at your location, we recommend placing the display nearby. We'll send you a looping media reel that plays product videos, builder testimonials, and your custom commercial (if applicable).

This loop is designed to do the selling for you. The same commercial will also appear at the top of your custom landing page, followed by our product overview and various builder testimonials — all optimized for SEO and local engagement.

6. Custom Dealer Commercial (Optional)

If you have good customer traffic (and if you want), we'll work with you to produce a dealer-specific commercial. You can film on-site or let us help capture the footage. We handle editing, narration, music, and branding. You'll end up with a commercial ready to be boosted in your local area for social media, Google ads, and YouTube professionally made, fully owned by you. This is the same video that will run in your store, be placed on the top of your landing page, and used for digital marketing. We cover the production. You keep the content. It's that simple.

Check out our Youtube page and you'll see dealer video examples.

7. Priority Dealer Support

You get top-tier support. We'll call you back the same day. You'll get direct phone access, WhatsApp or video chat for live install help/ troubleshooting or sales guidance. We want you to feel confident in the sale, the install, and the service. We treat our dealers like family. You're never alone in this.

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Course 7: Warranty and Terms of Service Overview

Warranty Certificate and Customer Record

Arid Bilge Systems provides a printed warranty certificate with each qualifying system. This certificate gives the customer a professional record of their Arid Bilge Systems warranty coverage and reinforces the quality, reliability, and support behind the product.



Certificate of Warranty

Arid Bilge System, Inc. Proudly guarantees the quality and reliability of the **Multi-Zone Dry Bilge System**. We stand behind our craftsmanship with a 12-month limited warranty from the date of purchase by the original owner.

This warranty covers parts and factory labor only. It does not include shipping to or from our facility, nor labor for removal or reinstallation of the system. Any travel, dispatch, or on-site technician costs are not covered.

Our system is the heart of your bilge management solution—designed for durability, reliability, and long-term performance. Proper installation and maintenance are required. The unit is not intended or designed for floatation purposes.

WARRANTY HIGHLIGHTS

- 12 months of confidence - Our system is backed by one year of reliable protection.
- Covers central unit only - Factory will test the functioning of the unit
- Built for tough conditions - Designed to function in harsh boating environments.
- Smart technology - Advanced logic system ensures performance and diagnostics.

EXCLUSIONS & MAINTENANCE

- Pick-ups and filter mesh clogging on the lower side are considered normal wear-and-tear items. It is the customer's responsibility to ensure they are cleaned and reused as long as the filter mesh remains intact. Pick-ups and tubing are not covered under this warranty. If they become damaged, it is recommended to replace them to ensure optimal performance.
- Cosmetic imperfections - are a normal part of the manufacturing process & not warranty issued
- The unit is designed to handle oil, acid, and harsh bilge environments. However, chronic exposure to soapy agents can degrade system performance over time.
- Use of foaming agents or detergents that cause soapy buildup in the air circulation system will void this warranty. If a returned unit is found with soapy residue, the warranty will be considered void. Customers must follow the instructions in the manual to avoid foaming agents.
- Considering that this unit is of a secondary nature, and that normal bilge pumps provided by others are to be maintained as the primary system, no consequential damages are to be considered as part of a warranty claim.

Series



Serial #

Arid Bilge Systems completes the system series and serial number on the warranty certificate before it is provided with the product documentation. The serial number on the certificate will match the serial number placed on the Arid Bilge System itself. Dealers should make sure the customer receives the warranty certificate with the owner's manual, invoice documentation, or installation paperwork.

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The warranty certificate should be treated as a professional customer record and presentation piece, not just a loose paper. It should be presented in a clean, organized, and professional manner so the customer understands which system they received, where the series and serial number are recorded, and how the warranty record is tied to that specific Arid Bilge System.

Arid Bilge Systems recommends that dealers present the warranty certificate as part of the full customer handoff packet whenever a system is sold or installed. This helps create a more professional customer experience and reinforces pride of ownership in the system. At Arid Bilge Systems, we take pride in the products we build, and we want customers to take pride in the system installed on their boat. Many customers have shared how much they love their Arid systems once they experience the difference of a cleaner, drier, fresher bilge.

Dealers should also use this moment to remind customers that proper use and maintenance help support long-term system performance. Customers should follow the owner's manual, avoid excessive use of foaming bilge soaps or harsh cleaning agents, keep pickups clean from sediment, and maintain the system according to Arid Bilge Systems guidelines. When properly installed, used, and maintained, Arid Bilge Systems are designed for many years of reliable service. Following the recommended guidelines helps protect the system, extend service life, and preserve the dry bilge performance customers expect.

CLOSING - NEXT STEPS — Final Message Before Test

This is not just a bilge product. It is a meaningful upgrade to the entire boating experience. Most boats have some form of hidden moisture, residual bilge water, odor, condensation, or hard-to-reach wet zones below deck. Arid Bilge Systems gives dealers a way to solve one of the most overlooked problems in boating. You are not just learning how to sell a product. We are here to help you become your region's go-to expert for dry bilge technology. Together, we can build stronger dealer businesses, serve more customers, and bring the next generation of bilge technology to the marine industry.



Alfred V. Baurley

President, Arid Bilge Systems



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Arid Bilge Systems

Final Dealer Certification Test

Arid Academy Certified Dealer Training Program

Instructions

Choose the best answer for each multiple-choice question. After completing the multiple-choice section, answer the written-response questions clearly and professionally. Written responses should demonstrate that the dealer can explain Arid Bilge Systems in practical, real-world terms to customers, captains, service managers, and boat builders. This test may be submitted through the Arid Bilge Systems Dealer Portal, emailed to Arid Bilge Systems, or delivered in person for evaluation.

Dealer Information

Dealer Name: _____

Company Name: _____

Dealer Location: _____

Email: _____

Phone: _____

Date Completed: _____

Reviewed By: _____

Review Date: _____



Multiple Choice Section

30 Questions

1. What is the primary purpose of Arid Bilge Systems?

- A. To replace all emergency bilge pumps
 - B. To remove the residual water traditional bilge pumps leave behind
 - C. To add more water storage inside the bilge
 - D. To clean fuel tanks automatically
-

2. What problem helped inspire the original development of Arid Bilge Systems?

- A. Lack of marine lighting systems
- B. Hidden moisture and trapped bilge water causing odor and long-term damage
- C. Shortage of fiberglass repair materials
- D. Need for larger fuel tanks

3. Why is residual bilge water a long-term problem?

- A. It only affects the outside of the boat
 - B. It evaporates, creates humidity, causes condensation, and can contribute to odor, corrosion, mildew, and hidden damage
 - C. It improves cooling below deck
 - D. It prevents electrical corrosion
-

4. What phrase best describes the Arid Bilge Systems approach?

- A. Reactive emergency pumping
- B. Manual sponge maintenance
- C. Proactive dry bilge management
- D. Fuel transfer monitoring



5. What component creates the pressure and vacuum used by Arid Bilge Systems?

- A. Hydraulic ram
 - B. Schwarzer Precision compressor / vacuum pump
 - C. Fuel transfer pump
 - D. Manual diaphragm pump
-

6. What does the Arid system use to determine whether a zone has cleared?

- A. A camera inside each bilge zone
 - B. Water sensors mounted under every pickup
 - C. Vacuum switch readings, resistance, and air draw-back
 - D. Fuel tank level readings
-

7. What is the smallest and most compact model in the Arid Bilge Systems lineup?

- A. Series 1
 - B. Series 2
 - C. Series 4
 - D. Series 9
-

8. How many zones does the Series 1 support?

- A. One
 - B. Two
 - C. Four
 - D. Nine
-

9. Which system is designed for two-to-three-zone applications?

- A. Series 1
- B. Series 2
- C. Series 4
- D. Series 9



10. Which system is designed for four-to-eight-zone applications?

- A. Series 1
 - B. Series 2
 - C. Series 4
 - D. Eco-Alarm 1
-

11. Which system is the largest Arid model and is designed for large yachts, mega yachts, commercial vessels, and high-zone-count applications?

- A. Series 1
- B. Series 2
- C. Series 4
- D. Series 9

12. What is the fixed intake tubing length for the Series 1?

- A. 10 feet
 - B. 15 feet
 - C. 20 feet
 - D. 50 feet
-

13. Why should extra tubing on smaller systems be coiled and secured instead of cut?

- A. To preserve proper system calibration and operation
 - B. To make the system heavier
 - C. To increase fuel efficiency
 - D. To block airflow
-

14. What is the recommended discharge port size used across most Arid Bilge Systems?

- A. 1/4 inch NPT
- B. 3/8 inch threaded
- C. 1/2 inch barbed
- D. 1 inch threaded



15. Why should installers avoid adding an unnecessary check valve to the Arid discharge line?

- A. It may create restriction, back pressure, or vapor lock
 - B. It increases suction power
 - C. It removes the need for a collection chamber
 - D. It improves Bluetooth diagnostics
-

16. What is the main purpose of the collection chamber float switch?

- A. Normal zone-by-zone water detection
 - B. Safety monitoring if the collection chamber is not clearing properly
 - C. Dealer pricing calculation
 - D. Bluetooth pairing
-

17. Why is pickup placement important?

- A. The pickup must be placed where fluid actually collects
 - B. The pickup should always be placed at the highest point
 - C. The pickup should be installed only for appearance
 - D. Pickup placement does not matter
-

18. Why should installers not drill into an Arid pickup?

- A. It makes the pickup too heavy
 - B. It can damage the pickup body, screen, filter area, and internal flow path
 - C. It improves airflow
 - D. It increases the warranty period
-

19. Why should pickups not be over-clamped?

- A. They need to breathe so fluid and air can enter properly
- B. They must float freely in the bilge
- C. They should always be crushed flat
- D. They are only decorative



20. Which pickup is best suited for narrow, deep, or hard-to-reach areas?

- A. Flexible Pickup Wand
 - B. Standard flat pickup only
 - C. Eco-Alarm probe
 - D. Discharge elbow
-

21. What is Eco-Drain designed to do?

- A. Chemically treat bilge water
 - B. Receive untreated bilge fluid from the Arid system and help separate hydrocarbons from water through gravity separation
 - C. Replace the Arid Bilge System
 - D. Pump fuel out of the tank
-

22. Does Eco-Drain use chemical treatment or filtration to separate hydrocarbons?

- A. Yes, it chemically treats the water
 - B. Yes, it uses a fuel filter cartridge
 - C. No, it uses chamber-based gravity separation
 - D. No, it only stores water permanently
-

23. Which Eco-Drain model is the premium larger-vessel option commonly used for Series 4 and Series 9 applications?

- A. Eco-Drain 1
- B. Eco-Drain 2
- C. Eco-Drain 3 Premium Aluminum
- D. Eco-Alarm 1



24. What is the main function of Eco-Alarm 1?

- A. Hydrocarbon notification for Eco-Drain applications
 - B. Automatic bilge cleaning
 - C. Full system replacement
 - D. Fuel tank monitoring
-

25. What additional capability does Eco-Alarm 2 provide?

- A. It can add more bilge zones
 - B. It can notify and may shut down the Arid Bilge System during an extended alarm condition
 - C. It replaces the Eco-Drain
 - D. It acts as a GPS tracker
-

26. What is the main purpose of future Bluetooth diagnostics?

- A. To play music through the Arid system
 - B. To give users better visibility into system status, zone runtime, compressor hours, service alerts, and fault conditions
 - C. To control boat speed
 - D. To monitor fuel economy only
-

27. If one zone shows much higher runtime than the others, what should the owner or technician do?

- A. Ignore it
- B. Inspect that zone for a leak, clogged pickup, abnormal water source, or installation issue
- C. Replace the entire boat battery immediately
- D. Disconnect all bilge pumps



28. What should dealers use the official quote sheet for?

- A. Building a clear written estimate during inspections, walkthroughs, and customer consultations
 - B. Replacing the invoice system completely
 - C. Hiding pricing from the customer
 - D. Recording engine oil pressure only
-

29. What is the difference between the customer-facing retail sheet and the dealer-only wholesale sheet?

- A. They are the same document
 - B. The retail sheet shows customer MSRP pricing, while the dealer-only wholesale sheet shows dealer cost, product margin, and internal profit planning information
 - C. The wholesale sheet should be given to every customer
 - D. The retail sheet is only for factory use
-

30. What is one major benefit of becoming a certified Arid Bilge Systems dealer?

- A. Access to dealer training, product support, sales materials, and certification resources
- B. Access to unrelated marine product discounts
- C. Lifetime free installations
- D. Permission to remove all emergency bilge pumps from every boat



Written Response Section

Written Response 1

Explain the Value of Arid Bilge Systems

Briefly explain how Arid Bilge Systems can improve a boat's longevity, cleanliness, and reliability.

Include at least three technical reasons based on the training material. **Response:**

Written Response 2

Service and Diagnostics Scenario

Describe a potential service scenario where zone runtime, Series 4 hour meters, or future Bluetooth diagnostics could help identify a problem before it becomes larger.

Your answer should explain how abnormal runtime data may help point the owner, captain, or technician toward a specific zone for inspection. **Response:**



Written Response 3

Dealer Sales and Quotation Scenario

A customer is interested in adding Arid Bilge Systems to their boat but does not understand why the total quote is higher than the base system price. Explain how a certified dealer should use the quote sheet, retail price guide, accessories, installation labor estimate, and customer-facing materials to explain the final estimate professionally. **Response:**

Written Response 4

Customer Elevator Pitch

Briefly explain how you would sell or present Arid Bilge Systems to a customer during a short conversation. Your answer should sound like a simple elevator pitch. Explain what the system does, why it matters, and how it helps protect the customer's boat. A strong answer should mention:

- Arid removes the water traditional bilge pumps leave behind.
- Residual bilge water can cause odor, mildew, corrosion, condensation, and hidden damage.
- The system helps keep the boat dry, fresh, and protected automatically.
- A dry bilge can make leaks easier to identify and the boat easier to maintain.

Arid Bilge Systems - Dry, Fresh, & Protected



Response:

End of Final Dealer Certification Test

Please complete the test clearly and legibly. Dealers may complete the test in one of two ways:

Online: Complete and submit the test directly through the Arid Bilge Systems Dealer Portal.

- **Printed:** Complete the test directly in the printed booklet or on a printed copy of the test section.

If completing the printed version, the test may be submitted in one of the following ways:

- **Hand delivered** during dealer training, a factory visit, or an in-person review
- **Photographed or scanned** and sent by email to Alfred@AridBilge.com
- **Uploaded through the Arid Bilge Systems Dealer Portal**

If submitting photos or scans, make sure each page is clear and readable. The dealer information section at the beginning of the test must be completed so Arid Bilge Systems can properly identify and review the submission.

