OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

Thru-Hull*: Stem, NO Fairing*

06/25/21

Depth Transducer

with Temperature Sensor

Models: **SS422**, **SS502, SS522**

Patent http://www.airmar.com/patent.html

17-008-06-rev.5

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Follow the precautions below for optimal product performance and to reduce the risk of property damage, personal injury, and/or death.

WARNING: Always wear safety glasses, a dust mask, and ear protection when installing.

WARNING: Immediately check for leaks when the boat is placed in the water. Do not leave the boat unchecked for more than three hours. Even a small leak may allow considerable water to accumulate.

CAUTION: Always operate the transducer in water. Operating in air will allow the transducer to overheat possibly resulting in failure.

CAUTION: The stainless steel housing must be isolated from a metal hull to prevent electrolytic corrosion. Use the isolation sleeve and washers supplied.

CAUTION: **SS422, SS522**—The transducer must be oriented properly. The mark on the face must be forward and parallel to the centerline of the boat.

CAUTION: Never install a metal transducer in a vessel with a positive ground system.

CAUTION: Never pull, carry, or hold the transducer by the cable as this may sever internal connections.

CAUTION: Never strike the transducer.

CAUTION: Never use solvents. Cleaner, fuel, sealant, paint, and other products may contain solvents that can damage plastic parts, especially the transducer's face.

CAUTION: Never power sand or pressure wash the sensor. It may weaken the structure or damage the internal parts.

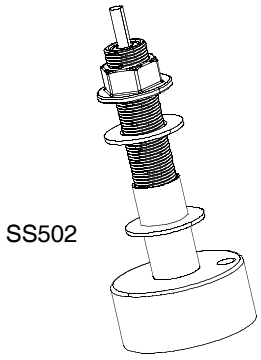
IMPORTANT*:* Read the instructions completely before proceeding with the installation. These instructions supersede any other instructions in your instrument manual if they differ.

Applications

Stainless steel transducer compatible with all hull materials. Recommended for aluminum hulls to prevent electrolytic corrosion *provided* the stainless steel transducer is isolated from the metal hull.

Record the information found on the cable tag for future reference.

Part No._____Date_____Frequency_____kHz



SS502

Tools & Materials

Safety glasses
Dust mask
Ear protection
Permanent marker
Electric drill
Drill bits and hole saws:

Pilot hole	3mm *or* 1/8" Ø
SS502	23mm *or* 15/16" Ø
SS422, SS522	25mm *or* 1" Ø

Sandpaper
Mild household detergent *or* weak solvent (such as alcohol)
File (installation in a metal hull)
Marine sealant (suitable for below waterline)
Knife or scissors (installation in a metal hull)
Slip-joint pliers
Grommet(s) (some installations)
Cable ties
Water-based anti-fouling coating (**mandatory in salt water**)
Installation in a cored fiberglass hull (page 4):

Hole saw for hull interior:	35mm *or* 1-3/8" Ø
Cylinder, wax, tape, and casting epoxy	

Mounting Location

Guidelines

CAUTION: Do not mount in line with or near water intake or discharge openings or behind strakes, struts, fittings, or hull irregularities that will disturb the water flow.

CAUTION: Do not mount the sensor where the boat may be supported during trailering, launching, hauling, or storage to avoid damaging the transducer's face.

- The water flowing under the hull must be smooth with a minimum of bubbles and turbulence (especially at high speeds).
- The transducer must be continuously immersed in water.
- The transducer beam must be unobstructed by the keel or propeller shaft(s).
- Choose a location away from interference caused by power and radiation sources such as: the propeller(s) and shaft(s), machinery, other echosounders, and other cables. The lower the noise level, the higher the echosounder gain setting that can be used.
- Choose a location with a minimal deadrise angle.
- Choose an accessible spot inside the vessel with adequate space for the height of the stem and tightening the nut.

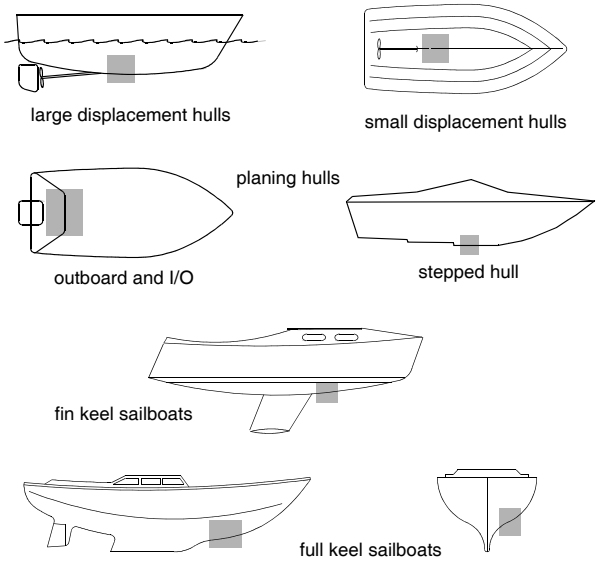


Figure 1. Best location for transducer

Boat Types (Figure 1)

- **Displacement hull powerboat**—Locate amidships near the centerline. The side of the hull where the propeller blades are moving downward is preferred.
- **Planing hull powerboat**—Mount well aft near the centerline and *well inboard of the first set of lifting strake*s to ensure that it is in contact with the water at high speeds. The side of the hull where the propeller blades are moving downward is preferred.
  Outboard and I/O—Mount just forward and to the side of the engine(s).
  Inboard—Mount well ahead of the propeller(s) and shaft(s).
  Stepped hull—Mount just ahead of the first step.
  Boat capable of speeds above 25 kn (29 MPH)—Review transducer location and operating results of similar boats before proceeding.
- **Fin keel sailboat**—Mount to the side of the centerline and forward of the fin keel 300–600 mm (1–2').
- **Full keel sailboat**—Locate amidships and away from the keel at the point of minimum deadrise angle.

Identify Your Model

The model name is printed on the cable tag.

NOTE: SS422, SS522*—To aid orienting the transducer, use a permanent marker to draw a mark on the stem in line with the mark on the face (Figure 2).*

Installation

Hole Drilling

Cored fiberglass hull*—Follow separate instructions on page 4.*

1. Drill a 3mm or 1/8" pilot hole perpendicular to the waterline from inside the hull (Figure 3). If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside.
2. Using the appropriate size drill bit or hole saw, cut a hole from outside the hull. *Be sure to hold the drill plumb, so the hole will be perpendicular to the water surface.*
3. Sand and clean the area around the hole, inside and outside, to ensure the marine sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either a mild household detergent or a weak solvent (alcohol) before sanding.

Metal hull—Remove all burrs with a file and sandpaper.

Bedding

CAUTION: Be sure all surfaces to be bedded are clean and dry.

1. Remove the hull nut (Figure 3).
2. Apply a 2mm (1/16") thick layer of marine sealant to the surface of the transducer that will contact the hull/washer and up the stem. The sealant must extend 6mm (1/4") higher than the combined thickness of the washer, the hull, the second washer, and the hull nut. This will ensure there is marine sealant in the threads to seal the hull and hold the hull nut securely in place.

   Metal hull—The stainless steel housing must be isolated from the metal hull to prevent electrolytic corrosion. Use the isolation sleeve and washers to separate the transducer stem from the hull. *However, the top of the isolation sleeve must be below the hull nut after it is screwed into place, to prevent the sleeve from interfering with tightening the nut.* Slide the isolation sleeve over the bedded transducer stem as far down as possible. Trim the isolation sleeve to length. Apply a 2mm (1/16") thick layer of the marine sealant to the outside of the isolation sleeve.

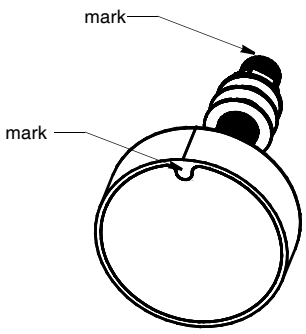
Installing

1. Slide a washer onto the cable and stem of the transducer. Rest the washer against the transducer (Figure 3).
2. From outside the hull, thread the cable through the mounting hole. Then push the stem of the transducer through the hole using a twisting motion to squeeze out excess sealant.

   SS422, SS522—Orient the transducer, so the mark on the face and the corresponding mark on the stem are forward and *parallel* to the centerline of the boat (Figure 2).
3. From inside the hull, slide the second washer and the hull nut onto the cable. Rest the washer against the hull. Screw the hull nut in place against the washer. Tighten the hull nut with slip-joint pliers.

   SS422, SS522—Be careful not to rotate the housing disturbing the alignment. When grasping the stem, be careful not to damage the threads.

   Metal hull—Be sure the isolation sleeve is between the transducer stem and the hull. *However, the top of the isolation sleeve must be below the hull nut to prevent the sleeve from interfering with tightening the hull nut.*
   Cored fiberglass hull—Do not over-tighten, crushing the hull.
   Wood hull—Allow for the wood to swell.
4. Remove any excess marine sealant on the outside of the hull to ensure smooth water flow under the transducer.



NOTE: Orient the mark on the face and the mark you have drawn on the stem forward and parallel to the centerline of the boat.

Figure 2. SS422 and SS522 orientation

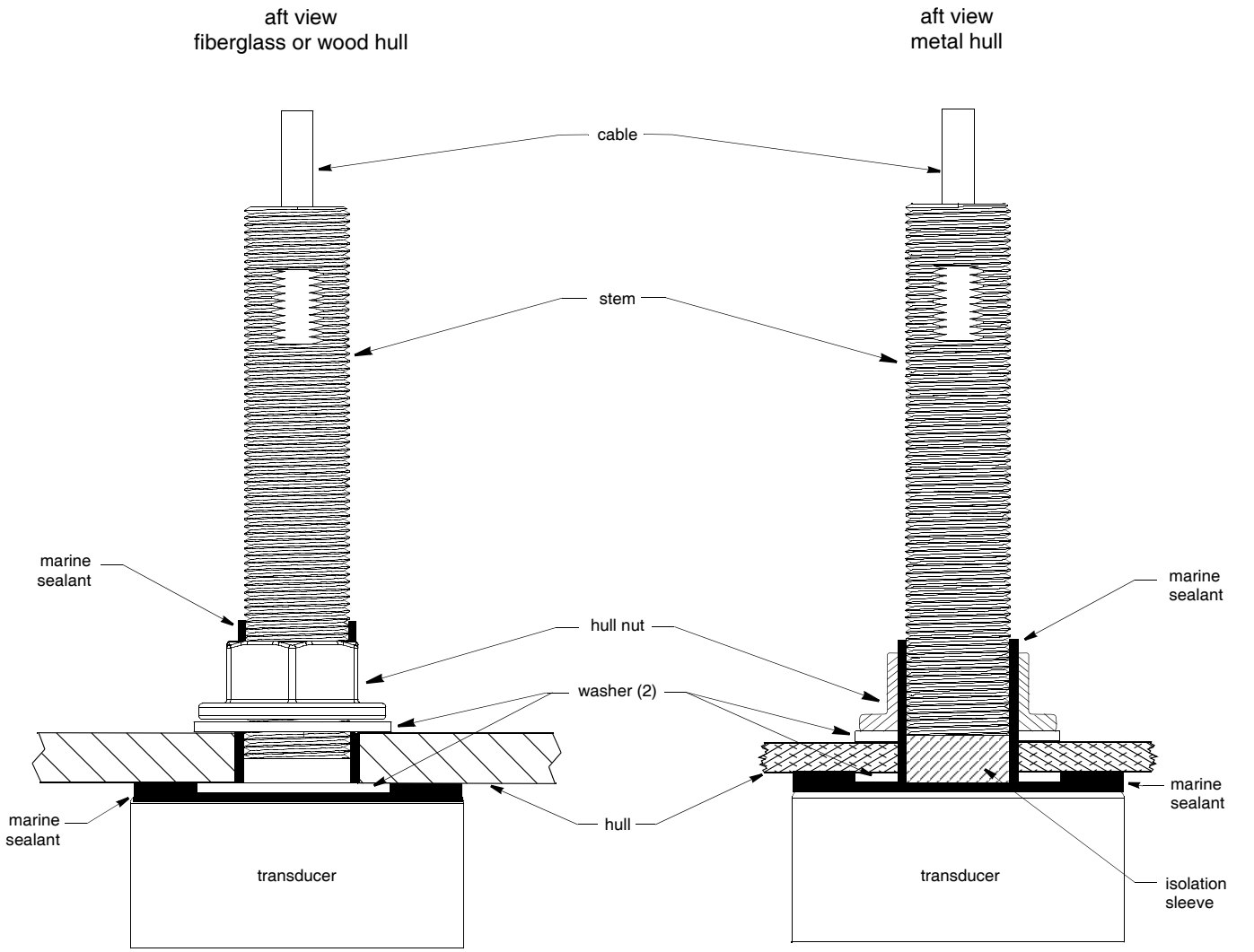


Figure 3. Bedding and installing (SS502 shown)

Cable Routing & Connecting

CAUTION: If the sensor came with a connector, do not remove it to ease cable routing. If the cable must be cut and spliced, use Airmar's splash-proof Junction Box No. 33-035 and follow the instructions supplied. Removing the waterproof connector or cutting the cable, except when using a water-tight junction box, will void the sensor warranty.

1. Route the cable to the instrument being careful not to tear the cable jacket when passing it through the bulkhead(s) and other parts of the boat. Use grommets to prevent chafing. To reduce electrical interference, separate the transducer cable from other electrical wiring and the engine. Coil any excess cable and secure it in place with cable ties to prevent damage.
2. Refer to the instrument owner's manual to connect the transducer to the instrument.

Checking for Leaks

When the boat is placed in the water, **immediately** check around the transducer for leaks. Note that very small leaks may not be readily observed. Do not leave the boat in the water for more than 3 hours before checking it again. If there is a small leak, there may be considerable bilge water accumulation after 24 hours. If a leak is observed, repeat "Bedding" and "Installing" **immediately** (page 2).

Installation in a Cored Fiberglass Hull

The core (wood or foam) must be cut and sealed carefully. The core must be protected from water seepage, and the hull must be reinforced to prevent it from crushing under the hull nut, allowing the transducer to become loose.

CAUTION: Completely seal the hull to prevent water seepage into the core.

1. Drill a 3mm or 1/8" pilot hole perpendicular to the waterline from inside the hull (Figure 4). If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside. (If the hole is drilled in the wrong location, drill a second hole in a better location. Apply masking tape to the outside of the hull over the incorrect hole and fill it with epoxy.)
2. Using the appropriate size drill bit, cut a hole from outside the hull through the *outer* skin only. *Be sure to hold the drill plumb, so the hole will be perpendicular to the water surface.*
3. The optimal interior hole diameter is affected by the hull's thickness and deadrise angle. It must be large enough in diameter to allow the core to be completely sealed.

   Using the appropriate size drill bit for the hull interior, cut through the *inner* skin and most of the core from inside the hull keeping the drill perpendicular to the hull. The core material can be very soft. Apply only light pressure to the drill bit after cutting through the *inner* skin to avoid accidentally cutting the *outer* skin.
4. Remove the plug of core material so the *inside* of the outer skin and the inner core of the hull is fully exposed. Sand and clean the inner skin, core, and the outer skin around the hole.
5. Coat a hollow or solid cylinder of the correct diameter with wax and tape it in place. Fill the gap between the cylinder and hull with casting epoxy. After the epoxy has set, remove the cylinder.
6. Sand and clean the area around the hole, inside and outside, to ensure that the sealant will adhere properly to the hull. If there is any petroleum residue inside the hull, remove it with either mild household detergent or a weak solvent (alcohol) before sanding.
7. Proceed with "Bedding" (page 2).

Anti-fouling Coating

Surfaces exposed to saltwater must be covered with an anti-fouling coating. Use **water-based** anti-fouling coating made for transducers only. Never use ketone-based paint since ketones can attack many plastics possibly damaging the transducer. Reapply anti-fouling coating every 6 months or at the beginning of each boating season.

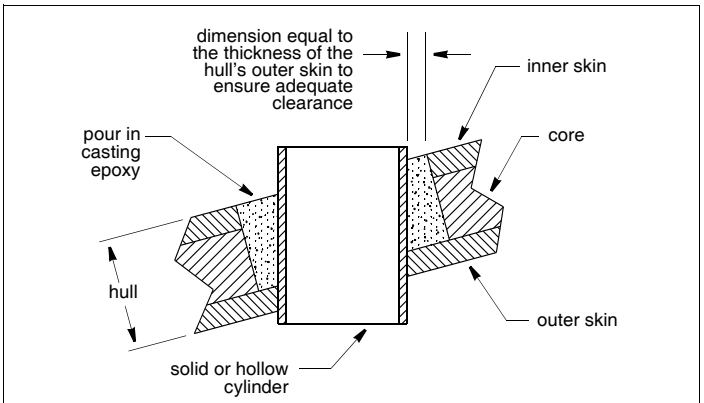


Figure 4. Preparing a cored fiberglass hull

Maintenance, Parts & Replacement

Cleaning

Aquatic growth can accumulate rapidly on the transducer's surface reducing its performance within weeks. Clean the surface with a Scotch-Brite® scour pad and mild household detergent taking care to avoid making scratches. If the fouling is severe, lightly wet sand with fine grade wet/dry paper.

Replacement Parts

The information needed to order a replacement transducer is printed on the cable tag. Do not remove this tag. When ordering, specify the part number, date, and frequency in kHz. For convenient reference, record this information on the top of page 1.

Lost, broken, and worn parts should be replaced immediately. Obtain parts from your instrument manufacturer or marine dealer.

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