

# OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

## Tilted Element Depth Transducer

Models: P19-12°, P19-20°, B22-12°, B22-20°,  
B60-12°, B60-20°, SS565-12°, SS565-20°

04/05  
17-364-01 rev. 02

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

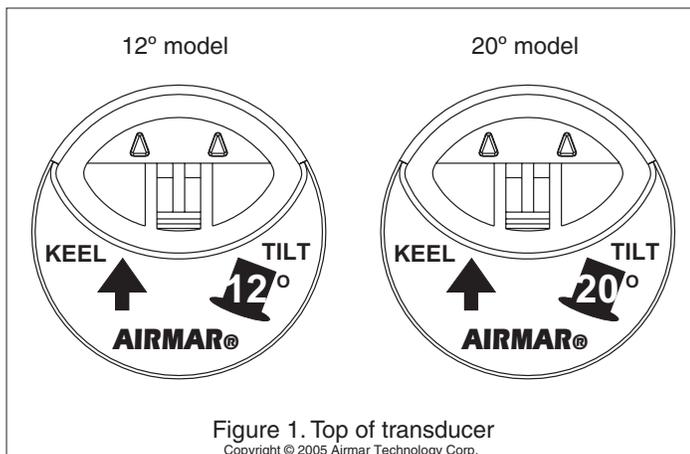
### CAUTION: NEVER USE SOLVENTS

Cleaners, fuel, paint, sealants, and other products can contain strong solvents, such as acetone, which attack many plastics greatly reducing their strength.

### Applications

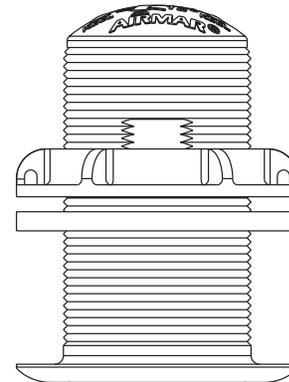
- **Plastic** housing recommended for fiberglass or metal hulls *only*. *Never* install a plastic thru-hull transducer in a wood hull, since swelling of the wood may overstress the plastic causing a fracture.
- **Bronze** housing recommended for fiberglass or wood hulls. *Never* install a bronze housing in a metal hull, because electrolytic corrosion will occur.
- **Stainless steel** housing compatible with all hull materials. Recommended for metal hulls to prevent electrolytic corrosion. *A stainless steel housing must be isolated from a metal hull.*
- *Never* install a metal housing in a vessel with a positive ground system.
- **Be sure your transducer model matches the deadrise angle** of your boat. The top of the transducer is imprinted with the angle (see Figure 1).  
12° models for deadrise angles from 8° to 15°  
20° models for deadrise angles from 16° to 24°

To measure the deadrise angle of your hull at the selected mounting location, use an angle finder or a digital level (see Figure 2).



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

Part No. \_\_\_\_\_ Date \_\_\_\_\_ Frequency \_\_\_\_\_ kHz



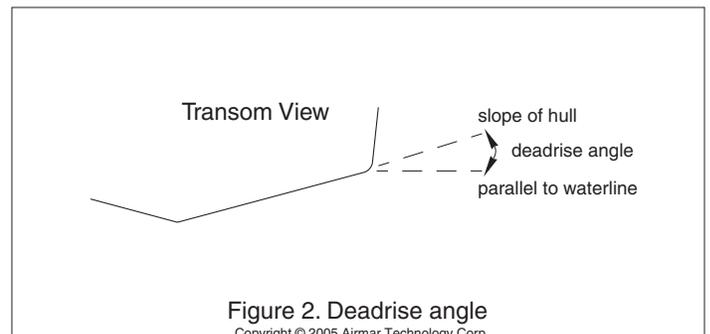
P19-12°

### Identify Your Model

The model name is printed on the cable tag.

### Tools & Materials

- Safety goggles
- Dust mask
- Electric drill with 10mm (3/8") or larger chuck capacity
- Drill bit: 3mm *or* 1/8"
- Hole saw:
  - P19-12°, P19-20°, B22-12°, B22-20°: 51mm *or* 2"
  - B60-12°, B60-20°, SS565-12°, SS565-20°: 60mm *or* 2-3/8"
- Countersink tool (installing stainless steel housing)
- Sandpaper
- Mild household detergent *or* weak solvent (such as alcohol)
- File (installation in a metal hull)
- Marine sealant (suitable for below waterline)
- Slip-joint pliers (installing a metal housing)
- Zip-ties
- Water-based antifouling paint (**mandatory in salt water**)
- Installation in a cored fiberglass hull (see page 3):
  - Hole saw for hull interior:
    - P19-12°, P19-20°, B22-12°, B22-20°: 60mm *or* 2-3/8"
    - B60-12°, B60-20°, SS565-12°, SS565-20°: 69mm *or* 2-3/4"
  - Fiberglass cloth and resin
  - or* Cylinder, wax, tape, and casting epoxy



## Mounting Location Placement

Choose a location:

- Away from interference caused by power and radiation sources such as: the propeller(s) and shaft(s), other machinery, other echosounders, and other cables. The lower the noise level, the higher the echosounder gain setting that can be used.
- Where the transducer will be continuously immersed in water.
- Where the transducer beam will be unobstructed by the keel or propeller shaft(s).
- Where there is a minimum deadrise angle, not exceeding the tilt angle of your transducer.

**Caution:** Do not mount in an area of turbulence or bubbles: Near water intake or discharge openings, Behind strakes, fittings, or hull irregularities.

### Boat Types (see Figure 3)

- **Displacement hull powerboat**—Locate 1/3 aft LWL and 150–300mm (6–12") off the centerline on the side of the hull where the propeller blades are moving downward.
  - **Planing hull powerboat**—Mount well aft, on or near the centerline, and well inboard of the first set of lifting strakes to insure that the transducer is in contact with the water at high speeds. Mount on the side of the hull where the propeller blades are moving downward.
- Outboard and I/O**—Mount just forward of the engine(s).  
**Inboard**—Mount well ahead of the propeller(s) and shaft(s).  
**Stepped hull**—Mount just ahead of the first step.

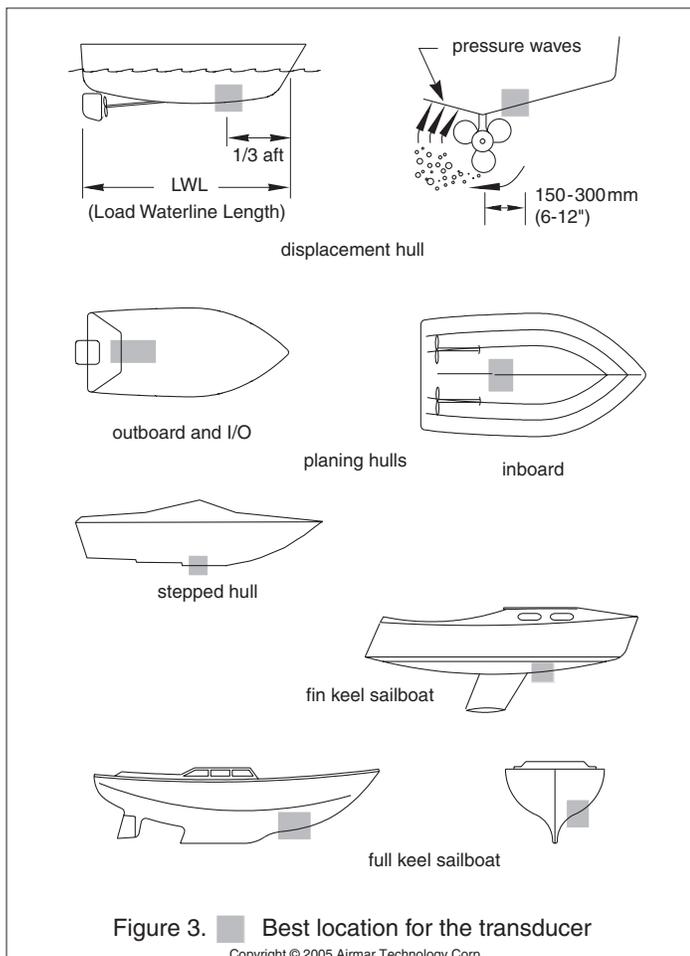


Figure 3. ■ Best location for the transducer

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**Boat capable of speeds above 25kn (29MPH)**—Review the installation 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 300–600mm (1–2').
- **Full keel sailboat**—Locate amidships and away from the keel at the point of minimum deadrise angle.

## Installation

**Cored fiberglass hull**—Follow separate instructions on page 3.

### Hole Drilling

**Warning:** Always wear safety goggles and a dust mask.

1. Drill a 3 mm or 1/8" pilot hole from inside the hull. If there is a rib, strut, or other hull irregularity near the selected mounting location, drill from the outside.
2. Using the appropriate size hole saw, cut a hole from outside of the hull perpendicular to the hull surface (see "Tools & Materials" on page 1).  
**Stainless steel housing**—These models require countersinking the housing to create a "seat" in the hull.
3. 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.  
**Metal hull**—Remove all burrs with a file and sandpaper.

### Bedding

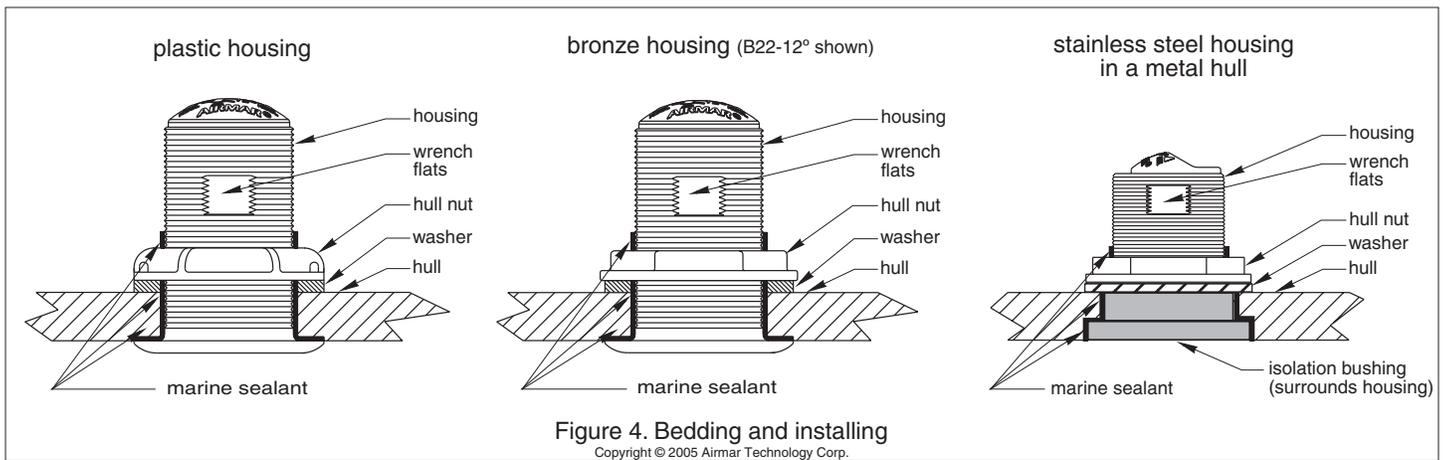
**Caution:** Never pull, carry, or hold the transducer by its cable; this may sever internal connections.

Apply a 2mm (1/16") thick layer of sealant around the lip of the housing that contacts the hull and up the sidewall of the housing (see Figure 4). The sealant *must* extend 6mm (1/4") higher than the combined thickness of the hull, washer(s), and the hull nut. This will ensure there is sealant in the threads to seal the hull and to hold the hull nut securely in place.

**Stainless steel housing in a metal hull**—To prevent electrolytic corrosion, the stainless steel housing *must* be isolated from the metal hull. Slide the isolation bushing onto the housing, then apply *additional* sealant to the surfaces of the bushing that will contact the hull.

### Installing

1. From outside the hull, push the housing into the mounting hole using a twisting motion to squeeze out excess sealant (see Figure 4).  
**Caution:** The arrow on the top of the transducer must point toward the keel.
2. From inside the hull, *point the arrow on the top of the transducer toward the keel* (see Figure 1). This will align the angle of the element inside the transducer with the deadrise angle of your hull.
3. Slide the washer onto the housing (see Figure 4).
4. Screw the hull nut in place.  
**Plastic housing**—Do not clamp the wrench flats tightly, to avoid possibly fracturing the housing.  
**Plastic hull nut**—Hand-tighten only. Do not over-tighten.  
**Bronze hull nut**—Tighten with slip-joint pliers.  
**Wood hull**—Allow the wood to swell before tightening the hull nut.
5. Remove any excess sealant on the outside of the hull to ensure smooth water flow over the transducer.



## Cable Routing & Connecting

**Caution:** If your transducer 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 33-035 and follow the instructions provided. Cutting the cable or removing the connector, except when using Airmar's junction box, will void the transducer 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. To reduce electrical interference, separate the transducer cable from other electrical wiring and the engine. Coil any excess cable and secure it in place using zip-ties to prevent damage.
2. Refer to the echosounder owner's manual to connect the transducer to the instrument.

## Checking for Leaks

**Warning:** Never install a thru-hull transducer and leave the boat in the water unchecked for several days.

When the boat is placed in the water, **immediately** check around the thru-hull transducer for leaks. Note that very small leaks may not be readily observed. It is best not to 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** (see 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 housing to become loose.

**Warning:** Always wear safety goggles and a dust mask.

1. Drill a 3mm or 1/8" pilot hole from inside the hull (see Figure 5). 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 **outside hull** hole saw, cut a hole from outside the hull through the *outerskin* only (see table on page 1).

3. From inside the hull, using the appropriate size **hull interior** hole saw, cut through the *innerskin* and most of the core (see "Tools & Materials" on page 1). The core material can be very soft. Apply only light pressure to the hole saw after cutting through the *inner* skin to avoid accidentally cutting the *outerskin*.

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.

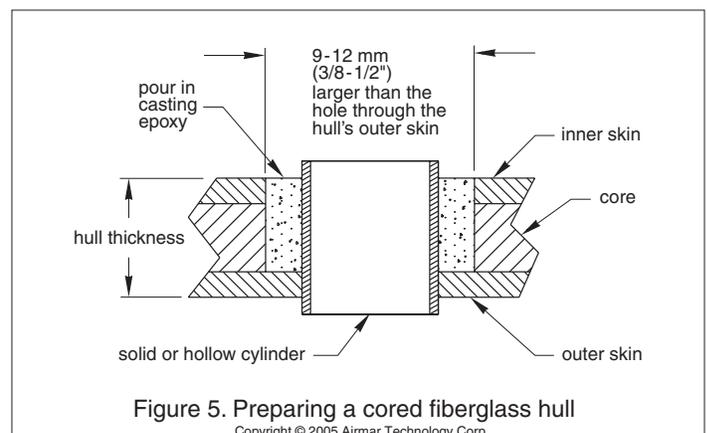
**Caution:** Completely seal the hull to prevent water seepage into the core.

5. If you are skilled with fiberglass, saturate a layer of fiberglass cloth with a suitable resin and lay it inside the hole to seal and strengthen the core. Add layers until the hole is the correct diameter.

Alternatively, a hollow or solid cylinder of the correct diameter can be coated with wax and taped 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" on page 2.



## Maintenance, Repair & Replacement

### Antifouling Paint

Surfaces exposed to salt water *must* be coated with antifouling paint. Use **water-based** antifouling paint only. *Never* use ketone based antifouling paint, since ketones can attack many plastics possibly damaging the transducer. Apply antifouling paint every 6 months or at the beginning of each boating season.

### 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, *being careful* to avoid making scratches. If the fouling is severe, lightly wet sand it with fine grade wet/dry paper.

## Replacement Parts

Lost, broken, and worn parts should be replaced immediately. Airmar is a build-to-order factory and does *not* have parts in stock. Obtain parts from your marine dealer or instrument manufacturer.

Model	Hull Nut	Washer	Isolation Bushing
P19-12° P19-20°	04-004	09-452	—
B22-12° B22-20°	02-030	09-452	—
B60-12° B60-20°	02-133-01	09-813-01	—
SS565-12° SS565-20°	02-563-01	09-813-01	04-589-01

## Transducer Replacement

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 one.



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