OWNER'S GUIDE & INSTALLATION INSTRUCTIONS

Thru-Hull

Tilted Element™ Transducer

Tilt Angles: 0°, 12°, 20°
with Temperature Sensor

Models: **B60, B117, P19, SS60, SS565**
Chirp Models: **B75L/M/H, B150M, SS75L/M/H**

U.S. Patent No. 7,369,458; 8,582,393. UK Patent No. 2 414 077

03/06/17

17-364-01-rev. 08

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 goggles, 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.

WARNING: **B117**, **B150M**—Do not use the spacer if there is insufficient space to tighten the nut, or it is within 11mm (1/2") of the top of the housing.

WARNING: **Stainless steel housing in a metal hull**—Be sure the washer contacts the hull. Do not tighten the hull nut with the washer against the isolation bushing, as the housing will not be firmly installed. If necessary, sand the isolation bushing until the washer rests against the hull.

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

CAUTION: **Chirp transducer**—Do not install in the engine compartment or other hot place. The transducer may fail if it overheats.

CAUTION: The arrow on the top of the transducer must point toward the keel or centerline of the boat. This will align the angle of the element inside the transducer with the deadrise angle of your hull.

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

CAUTION: **Plastic housing**—Never use a fairing with a plastic housing; the protruding sensor would be vulnerable to damage from impact.

CAUTION: **Metal housing**—Never install a metal housing on a vessel with a positive ground system.

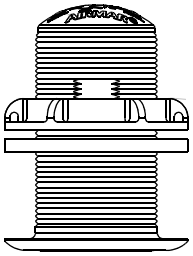
CAUTION: **Stainless steel housing in a metal hull**—The stainless steel housing must be isolated from a metal hull to prevent electrolytic corrosion. Use the isolation bushing supplied.

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

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

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

Part No._____Date_____Frequency_____kHz



P19

Applications

- **Plastic** housing recommended for fiberglass or metal hulls only. *Never install a plastic housing in a wood hull since swelling of the wood can fracture the plastic.*
- **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 *provided the stainless steel housing is isolated from the metal hull.*

Match Tilt Angle of Transducer to Deadrise

Be sure the tilt angle of your transducer model matches the deadrise angle of your hull at the mounting location. The tilt angle is printed on the top of the transducer (see Figure 1). To measure the deadrise angle of your hull at the selected mounting location, use an angle finder or a digital level (see Figure 2).

- **0**° models—For hull deadrise angles from 0° to 7°
- **12**° models—For hull deadrise angles from 8° to 15°
  B75L, SS75L-12°—For hull deadrise angles from 0° to 24°
  B75M, SS75M-12°—For hull deadrise angles from 6° to 15°
  B75H, SS75H-12°—For hull deadrise angles from 6° to 15°
- **20**° models—For hull deadrise angles from 16° to 24°

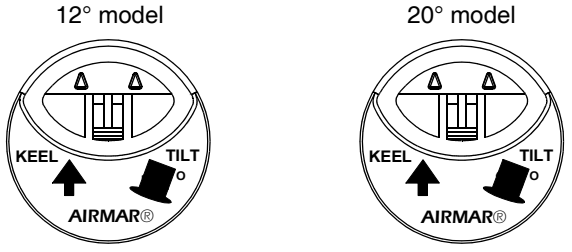


Figure 1. Top of transducer [B117 shown]

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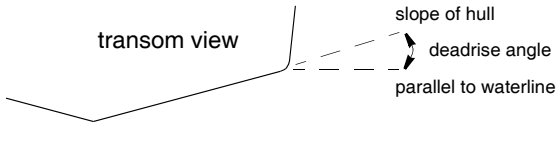


Figure 2. Deadrise angle of the hull

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Identify Your Model

The model name is printed on the cable tag.

Model (Housing)	Hull Material	Outside Hull Hole Saw Size	*Cored Fiberglass Hull* Hull Interior Hole Saw Size
B117 B150M	fiberglass wood	51mm *or* 2"	60mm *or* 2-3/8"
P19	fiberglass metal	51mm *or* 2"	60mm *or* 2-3/8"
B60 SS60 SS565	fiberglass wood	60mm *or* 2-3/8"	80mm *or* 3-1/8"
SS60 SS565	metal	70mm *or* 2-13/16"	NA
B75L/M/H SS75L/M/H	fiberglass wood	70mm *or* 2-13/16"	80mm *or* 3-1/8"
SS75L/M/H	metal	79mm *or* 3-1/8"	NA

Tools & Materials

Safety goggles
Dust mask
Ear protection
Angle finder
Electric drill with 10mm (3/8") or larger chuck capacity
Drill bit: 3mm *or* 1/8"
Hole saw (see table above)
Countersink tool (installing SS565)
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)
Grommet(s) (some installations)
Cable ties
Water-based anti-fouling paint (**mandatory in salt water**)
Installation in a cored fiberglass hull (see page 4):
- Hole saw for hull interior (see table above)
- Fiberglass cloth and resin
- *or* Cylinder, wax, tape, and casting epoxy

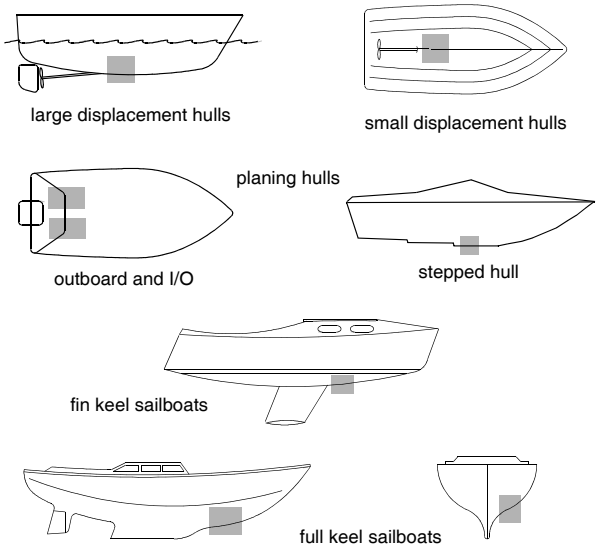


Figure 3. Best location for transducer

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Mounting Location

CAUTION: Do not mount in line with or near water intake or discharge openings or behind strakes, fittings, or other 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), other machinery, other echosounders, and other cables. The lower the noise level, the higher the echosounder gain setting that can be used.
- **Chirp transducer**—Mount in a cool well-ventilated area away from the engine to avoid overheating.

Boat Types (see Figure 3)

- **Displacement hull powerboats**—Locate amidships near the centerline. The starboard side of the hull where the propeller blades are moving downward is preferred.
- **Planing hull powerboats**—Mount well aft, on or near the centerline, and *well inboard of the first set of lifting strakes* to ensure that the transducer will be in contact with the water at high speeds. The starboard side of the hull where the propeller blades are moving downward is preferred.
  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.
  Boat capable of speeds above 25kn (29MPH)—Review the installation location and operating results of similar boats before proceeding.
- **Fin keel sailboats**—Mount on or near the centerline and forward of the fin keel 300–600mm (1–2').
- **Full keel sailboats**—Locate amidships and away from the keel.

Installation

Hole Drilling

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

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 *outside hull* hole saw, cut a hole from outside of the hull perpendicular to the hull surface (see table above).

   SS565—Use a countersink tool 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: Be sure the surfaces to be bedded are clean and dry.

Apply a 2mm (1/16") thick layer of marine sealant around the flange of the housing that contacts the hull and up the sidewall of the housing (see Figure 4 or 5). The sealant must extend 6mm (1/4") higher than the combined thickness of the hull, washer, hull nut, and any spacer. This will ensure there is marine sealant in the threads to seal the hull and to hold the hull nut securely in place.

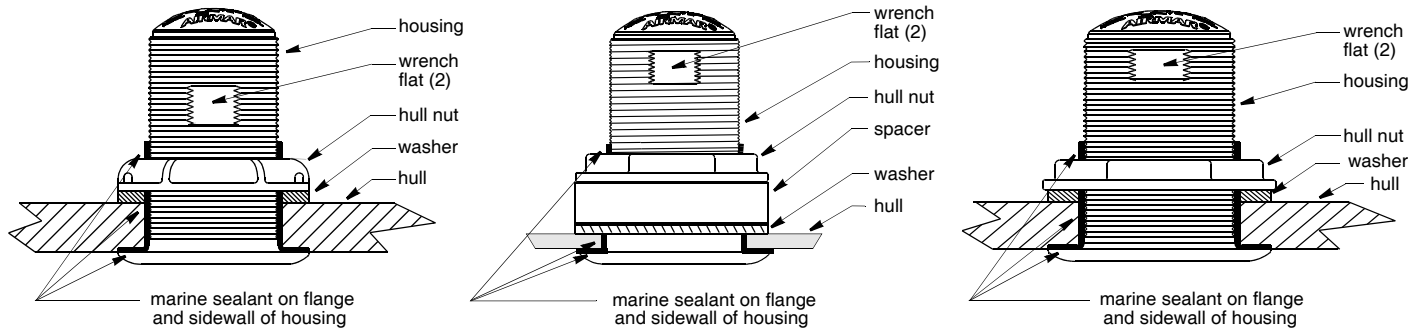


Figure 4. Bedding and installing in solid fiberglass or wood hull

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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 (see Figure 5). Apply *additional* marine sealant to the surfaces of the isolation bushing that will contact the hull, filling any cavities in and around the bushing.

Installing

1. From outside the hull, thread the cable through the mounting hole. Push the housing into the mounting hole using a twisting motion to squeeze out excess sealant.

   12° and 20° models—From inside the hull, point the arrow on the top of the transducer (and the cable exit) toward the KEEL or centerline of the boat (see Figure 1). This will align the angle of the element inside the transducer with the deadrise angle of your hull.

2. From inside the hull, slide the washer onto the housing (see Figure 4 or 5).

   B117, **B150M**—Also slide the spacer onto the housing and rest it against the washer. *Do not use the spacer if there is insufficient space to tighten the nut or it is within 11mm (1/2") of the top of the housing*.

   Stainless steel housing in a metal hull—Be sure the washer contacts the hull. Do not tighten the hull nut with the washer against the isolation bushing, as the housing will not be firmly installed. If necessary, sand the isolation bushing until the washer rests against the hull.

3. Screw the hull nut in place.
   Plastic housing—Do not clamp tightly on the wrench flats to avoid possibly fracturing the housing.
   Plastic hull nut—*Hand-tighten only.* Do not over tighten.
   Metal hull nut—Tighten with slip-joint pliers.
   Metal hull—Use the spacer if there are not enough threads to tighten the hull nut against the hull.
   Cored fiberglass hull—Do not over tighten, crushing the hull.
   Wood hull—Allow the wood to swell before tightening the hull nut.

4. Remove any excess marine sealant on the outside of the hull to ensure smooth water flow under 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 No. 33-035 and follow the instructions provided. 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 chaffing. 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 cable ties to prevent damage.

2. Refer to the echosounder owner's manual to connect the transducer to the instrument.

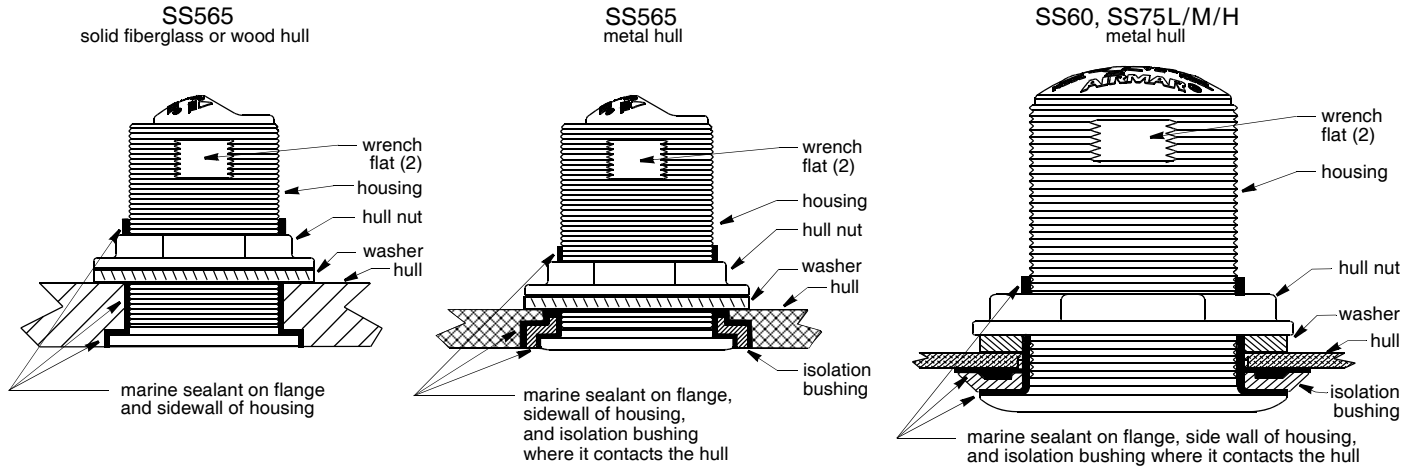


Figure 5. Bedding and installing a stainless steel housing

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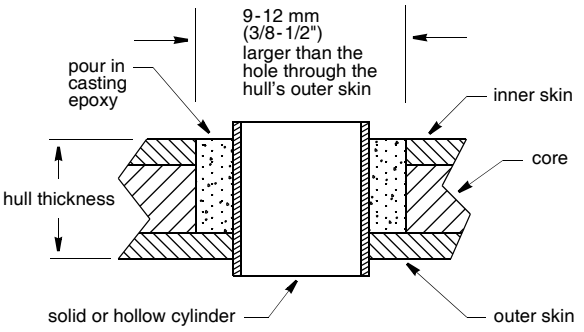


Figure 6. Preparing a cored fiberglass hull

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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** (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.

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

1. Drill a 3mm 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. (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 *outer* skin only (see table on page 2) (see Figure 6).
3. From inside the hull, using the appropriate size *hull interior* hole saw, cut through the *inner* skin and most of the core. 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 *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. 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 marine 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, Parts & Replacement

Anti-fouling Paint

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

Cleaning

Aquatic growth can accumulate rapidly on the transducer's face, 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 Transducer & 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 one.

Lost, broken, and worn parts should be replaced immediately.

Model	Hull Nut	Washer	Spacer	Isolation Bushing
B60	02-133-01	09-813-01	—	—
B75L/M/H	02-143-01	09-1012-01	—	—
B117 B150M	02-030	09-452	04-646-01	—
P19	04-004	09-452	—	—
SS60	02-563-02	09-813-01	—	04-660-01
SS75L/M/H	02-143-02	09-1012-01	—	04-942-01
SS565	02-563-02	09-813-01	—	04-589-01

Obtain parts from your instrument manufacturer or marine dealer.

Gemeco	Tel:	803-693-0777
(USA)	Fax:	803-693-0477
	email:	sales@gemeco.com
Airmar EMEA	Tel:	+33.(0)2.23.52.06.48
(Europe, Middle East, Africa)	Fax:	+33.(0)2.23.52.06.49
	email:	sales@airmar-emea.com

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