

NX Tri Ducer



Installation and Operation Manual
English





Edition: April 2007

Mounting instruction Tri-transducer

- 1 General 3**
 - 1.1 Tools and Materials 3
 - 1.2 Pre-Installation Test 4
 - 1.3 Antifouling Paint 4
 - 1.4 Mounting Location 4
- 2 Installation 6**
 - 2.1 Bedding 6
 - 2.2 Installing 6
 - 2.3 Checking for Leaks 8
 - 2.4 Installation in a Cored Fiberglass Hull 8
- 3 Operation, Maintenance 10**
 - 3.1 How the Valve Works 10
 - 3.2 Servicing the Paddlewheel 10
- 4 Connection to the WSI-box 11**
- 5 Calibration 12**
- 6 Technical Data 12**
- 7 Warranty 13**

1 General

The log/temp/depth transducer with Valve is an impeller and crystal transducer installed through the hull and designed to meet the requirements of owners of sailing crafts and power boats.

IMPORTANT: Please read these 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 may contain strong solvents, such as acetone, which attack many plastics greatly reducing their strength.

1.1 Tools and Materials

Water-based or mineral spirits based antifouling paint (**mandatory in salt water**)

Safety goggles

Dust mask

Electric drill with 10mm (3/8") or larger chuck capacity

Drill bit 3mm or 1/8"

Hole saw 51mm or 2" (plastic or bronze housing)

Sandpaper

Mild household detergent or weak solvent (such as alcohol)

File (installation in a metal hull)

Marine sealant

Additional washer [for aluminum hull less than 6mm (1/4") thick]

Zip-ties

Installation in a cored fiberglass hull (see page 3)

Hole saw for hull interior 60mm or 2-3/8"

Fiberglass cloth and resin or Cylinder, wax, tape, and casting epoxy

1.2 Pre-Installation Test

Connect the sensor to the instrument and spin the paddlewheel. Check for a speed reading (and the approximate air temperature if applicable). If there is no reading or it is inaccurate, return the instrument to the place of purchase.

1.3 Antifouling Paint

Marine growth can accumulate rapidly on the sensor's surface reducing performance within weeks. Surfaces exposed to salt water *must* be coated with antifouling paint. Use **water-based or mineral spirits based** antifouling paint only. *Never* use ketone based paint, since ketones can attack many plastics possibly damaging the sensor. It is easiest to apply antifouling paint before installing the sensor, but allow sufficient drying time. Reapply paint every 6 months or at the beginning of each boating season. Paint the following surfaces (see Figure 1):

- Outside wall of the paddlewheel insert below the lower O-ring
- Paddlewheel cavity
- Paddlewheel
- Exterior lip of the housing and valve assembly
- Bore of the valve assembly up 30mm (1-1/4")
- Blanking plug below the lower O-ring including the exposed end

1.4 Mounting Location

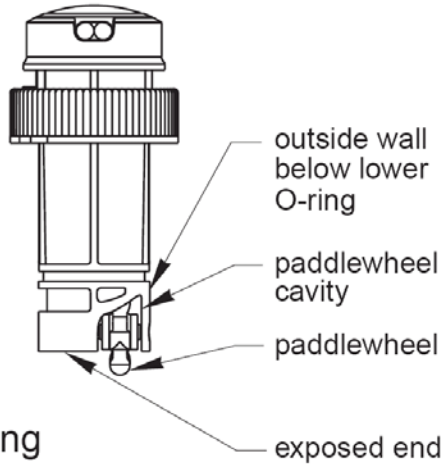
Turbulence-free water *must* flow over the paddlewheel at all speeds. Choose an accessible spot inside the vessel. Allow a minimum of 280mm (11") of headroom for the height of the housing, tightening the nuts, and removing the insert.

- **Displacement hull powerboats**—Locate amidships near the centerline.
- **Planing hull powerboats**—Mount well aft to insure the sensor is in contact with the water at high speeds.
- **Fin keel sailboats**—Mount on or as close as possible to the centerline and forward of the fin keel 300–600mm (1–2').
- **Full keel sailboats**—Locate amidships and away from the keel at the point of minimum deadrise.

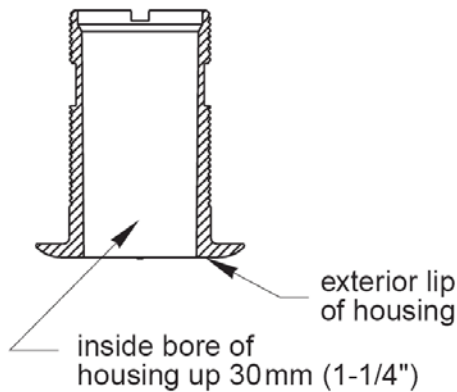
Caution: Do not mount the sensor in an area of turbulence or bubbles: near water intake or discharge openings; behind strakes, fittings or hull irregularities; or behind eroding paint (an indication of turbulence).

Caution: Never mount the sensor directly ahead of a depth transducer, since turbulence generated by the paddlewheel's rotation will adversely affect the transducer's performance, especially at high speeds.

insert



housing



2 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 the hole from outside the hull. **Flush housing**—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.

2.1 Bedding

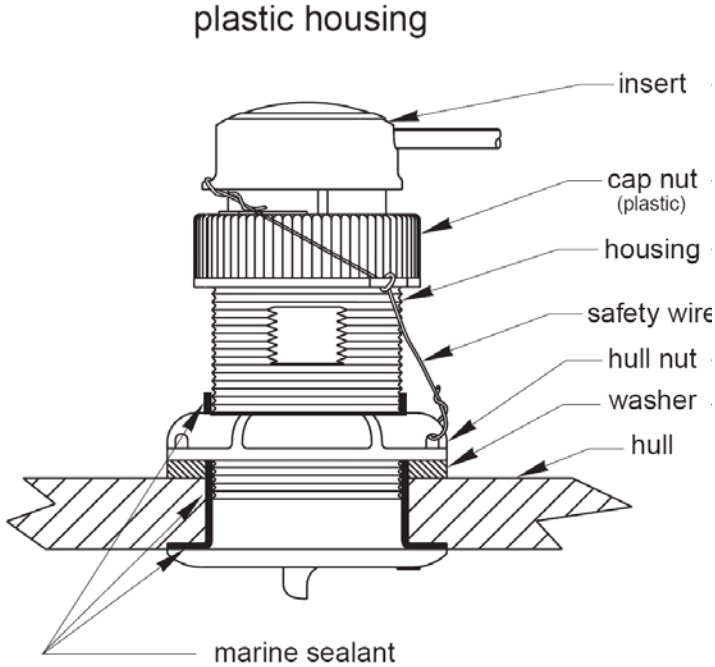
Apply a 2mm (1/16") thick layer of marine sealant around the lip of the housing that contacts the hull and up the sidewall of the housing. The sealant *must* extend 6mm (1/4") higher than the combined thickness of the hull, washer(s), and hull nut (see Figure 2). This will ensure there is sealant in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

2.2 Installing

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

1. From outside the hull, push the housing into the mounting hole using a twisting motion to squeeze out excess sealant (see Figure 2). *Align the arrow on the lip of the housing to point forward toward the bow.* If the sensor is not installed on the centerline, angle the housing slightly toward the centerline to align it with the water flow.
2. From inside the hull, slide the washer onto the housing. **Aluminum hull less than 6mm (1/4") thick**—Use an additional rubber, fiberglass, or plastic washer. *Never* use bronze since electrolytic corrosion will occur. *Never* use wood since it will swell, possibly fracturing the plastic housing.
3. Screw the hull nut in place *being sure* the notch on the upper rim of the housing and the corresponding arrow on the lip are still positioned forward toward the bow. (If your plastic housing has wrenching flats, *do not* clamp tightly, possibly causing the housing to fracture.) **Hand-tighten** only. *Do not* over tighten. **Wood hull**—Allow for the wood to swell.
4. Remove any excess sealant on the outside of the hull to ensure smooth water flow over the paddlewheel. **Warning:** *The O-rings must be intact and well lubricated to make a watertight seal.*

5. After the sealant cures, inspect the O-rings (replace if necessary) and lubricate them with the silicone lubricant supplied (see Figure 3).



6. Inspect the O-rings on the paddlewheel insert (replace if necessary) and lubricate them with the silicone lubricant supplied.
7. Slide the sensor into the housing with the arrow on the top pointing forward toward the bow.
8. Screw the plastic cap nut in place and **hand-tighten** only. *Do not* over tighten. **Warning:** Always attach the safety wire to prevent the insert from backing out in the unlikely event that the cap nut fails or is screwed on incorrectly.
9. Attach the safety wire to one eye in the hull nut. Thread the **short** emergency plug onto the wire. Lead the wire in a counterclockwise direction and thread it through one eye in the cap nut. Thread the wire through the eye a second time. Then lead the wire through the pull ring and the second eye in the cap nut. Twist the wire securely to itself.
10. Route the cable to the WSI-box *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 sensor cable from other electrical wiring and the engine. Coil any excess cable and secure it in place with zip-ties to prevent damage.
11. Connect the sensor to the WSI-box according to chapter 4.

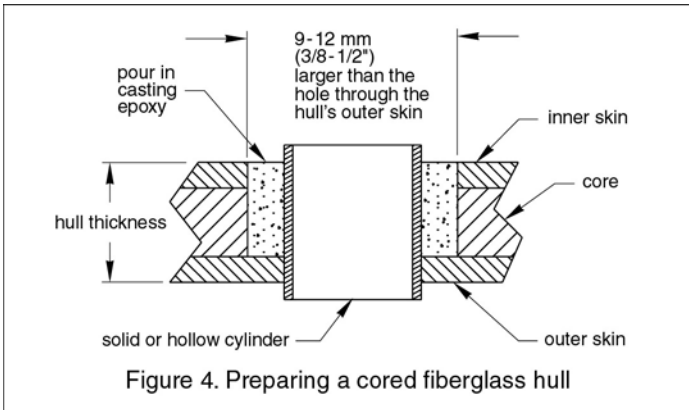
2.3 Checking for Leaks

Warning: Never install a thru-hull sensor 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 sensor 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 hour. If a leak is observed, repeat "Bedding" and "Installing" on page 2 **immediately**.

2.4 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. 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 51mm or 2" hole saw, cut the hole from outside the hull through the *outer* skin only (see Figure 4).
3. From inside the hull, use the 60mm or 2-3/8" hole saw to 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 are 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” and “Installing” on page 2.

3 Operation, Maintenance

3.1 How the Valve Works

The sensor incorporates a self-closing valve which minimizes the flow of water into the vessel when the paddlewheel insert is removed. The curved flap valve is activated by both a spring and water pressure. Water pushes the flap valve upward to block the opening so there is no gush of water into the boat.

WARNING: The valve is not a watertight seal!

Always install the paddlewheel insert or the long blanking plug secured with the retaining pin, safety rings, and safety wire for a watertight seal.

3.2 Servicing the Paddlewheel

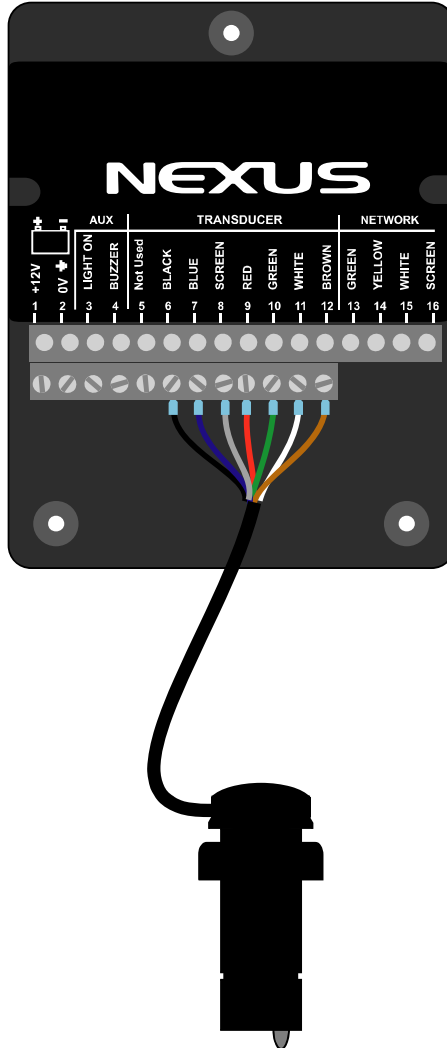
Aquatic growth can impede or freeze the paddlewheel's rotation and *must* be removed. Use a stiff brush or putty knife to remove the growth and clean the surface with mild household detergent. If fouling is severe, push the paddlewheel shaft out using a spare shaft or a 4D finish nail with a flattened point. Then, lightly wet sand the surface with fine grade wet/dry paper. The water lubricated paddlewheel bearings have a life of up to 5 years on low-speed boats [less than 10kn (11MPH)] and 1 year on high-speed vessels. Paddlewheels can fracture and shafts can bend due to impact with water borne objects and mishandling in boat yards. O-rings *must* be free of abrasions and cuts to ensure a watertight seal. A replacement Paddlewheel Kit 33-113 is available.

1. Using the new paddlewheel shaft, push the old shaft out about 6mm (1/4"). With pliers, remove the old shaft (see Figure 5).
2. Place the new paddlewheel in the cavity with the flat side of the blade facing the same direction as the arrows on the top of the insert.
3. Tap the new shaft into place until the ends are flush with the insert.
4. Install two of the small O-rings.
5. To re-install the paddlewheel insert, see "Installing" steps 9 through 12 in chapter 2.2.

4 Connection to the WSI-box

The Tri-ducer connects to the WSI-box.

If the 8 m transducer cable needs to be cut, use the extra cable protectors supplied. Press the protectors on to each wire with a pair of flat pliers.



5 Calibration

Calibration is carried out in the Sea Data instrument or the Wind instrument (see manual).

6 Technical Data

Dimensions:	Through-hull fitting 51 x 86 mm (1 5/8" x 3 3/8") Hull thickness min 6 mm (3/8"), max 42 mm (1 5/8")
Transducer cable:	8 m (26.2 ft)
Power supply:	12V DC (10-16V)
Power consumption:	0.06 W
Accuracy:	± 1%
Speed range	0.2-30 knots
Depth range	0.5m – 70m
Depth range:	0.7 – 70m
Temperature range	Operating -10°C to +70°C Storage -35°C to +70°C

7 Warranty

WARRANTY

GENERAL

All our products are designed and built to comply to the highest class industry standards. If the products are correctly installed, maintained and operated, as described in the installation and operation manual, they will provide long and reliable service. Our international Network of distributors can provide you with the information and assistance you may require virtually anywhere in the world.

Please read through and fill in this warranty card and send it to your national distributor for product registration.

LIMITED WARRANTY

The warranty covers repair of defective parts due to faulty Manufacturing and includes labour when repaired in the country of purchase. The warranty period is stated in the product manual, and commences from the date of purchase. The above warranty is the Manufacturer's only warranty and no other terms, expressed or implied, will apply. The Manufacturer specifically excludes the implied warranty of merchantability and fitness for a particular purpose.

CONDITIONS

- The supplied warranty card and receipt with proof of purchase date, must be shown to validate any warranty claim. Claims are to be made in accordance with the claims procedure outlined below.
- The warranty is non-transferrable and extends only to the original purchaser.
- The warranty does not apply to Products from which serial numbers have been removed, faulty installation or incorrect fusing, to conditions resulting from improper use, external causes, including service or modifications not performed by the Manufacturer or by its national distributors, or operation outside the environmental parameters specified for the Product.
- The Manufacturer will not compensate for consequential damage caused directly or indirectly by the malfunction of its equipment. The Manufacturer is not liable for any personal damage caused as a consequence of using its equipment.
- The Manufacturer, its national distributors or dealers are not liable for charges arising from sea trials, installation surveys or visits to the boat to attend to the equipment, whether under warranty or not. The right is reserved to charge for such services at an appropriate rate.
- The Manufacturer reserves the right to replace any products returned for repair, within the warranty period, with the nearest equivalent, if repair within a reasonable time period should not be possible.
- The terms and conditions of the warranty as described do not affect your statutory rights.

CLAIMS PROCEDURE

Equipment should be returned to the national distributor, or one of its appointed dealers, in the country where it was originally purchased. Valid claims will then be serviced and returned to the sender free of charge.

Alternatively, if the equipment is being used away from the country of purchase, it may be returned to the national distributor, or one of its appointed dealers, in the country where it is being used. In this case valid claims will cover parts only. Labour and return postage will be invoiced to the sender at an appropriate rate.

DISCLAIMER

Common sense must be used at all times when navigating and the Manufacturer's navigation equipment should only be considered as aids to navigation.

The Manufacturers policy of continuous improvement may result in changes to product specification without prior notice.

File id:

WARRANTY CARD TO BE RETURNED TO YOUR NATIONAL DISTRIBUTOR

OWNER:

Name: _____

Street : _____

City/Zip Code : _____

Country: _____

Product name:

Serial number:

	A	B	C	1	2	3	4	5	6	7
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Date of purchase: _____ Date installed: _____

Dealers stamp:

Tick here if you do not wish to receive news about future products

Copyright ©:
Nexus Marine AB
Kuskvägen 4, 191 62 Sollentuna, Sweden
Tel: +46 -(0) 8 – 506 939 00. Fax: +46 -(0) 8 -506 939 01
www.nexusmarine.se