

FURUNO

OPERATOR'S MANUAL

NETWORK SOUNDER

MODEL ETR-6/10N

NAVnet



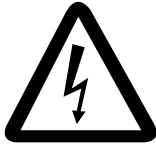
FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN



SAFETY INSTRUCTIONS



WARNING



ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Do not install the equipment where it may get wet from rain or water splash.

Water in the equipment can result in fire, electrical shock or equipment damage.

Be sure no water leaks in at the transducer mounting location.

Water leakage can sink the vessel. Also, confirm that the transducer will not loosen by ship's vibration. The installer of the equipment is solely responsible for the proper installation of the equipment. FURUNO will assume no responsibility for any damage associated with improper installation.

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or equipment damage. The voltage rating of the equipment appears on the label above the power connector.



WARNING

Install the transducer according to the installation instructions.

Failure to install the transducer correctly may result in water leakage and damage to the ship's hull.

⚠ CAUTION



Ground the equipment to prevent mutual interference.

Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
Network Sounder	0.80 m	0.55 m

Do not allow warm water or any liquid other than seawater or freshwater to contact the transducer.

Damage to the transducer may result.

Do not install the transducer where noise or air bubbles is present.

Performance will be affected.

- Turn off the power at the switchboard when will not be used for a long period.
- Turn off the power at the switchboard or detach the power cable from the connector to turn off the equipment when trouble occurs.

⚠ CAUTION

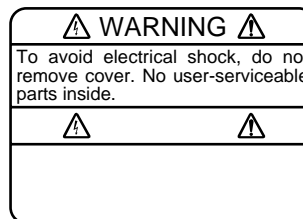
The transducer cable must be handled carefully, following the guidelines below.

- Keep fuels and oils away from the cable.
- Locate the cable where it will not be damaged.
- The cable sheath is made of chlorophrene or polychloride vinyl, which is easily by damaged plastic solvents such as toulene. Locate the cable well away from plastic solvents.

Use the correct fuse.

Use of a wrong fuse can cause fire or equipment damage.

A warning label is attached to the equipment. Do not remove the label. If the label is missing or illegible, contact a FURUNO agent or dealer.

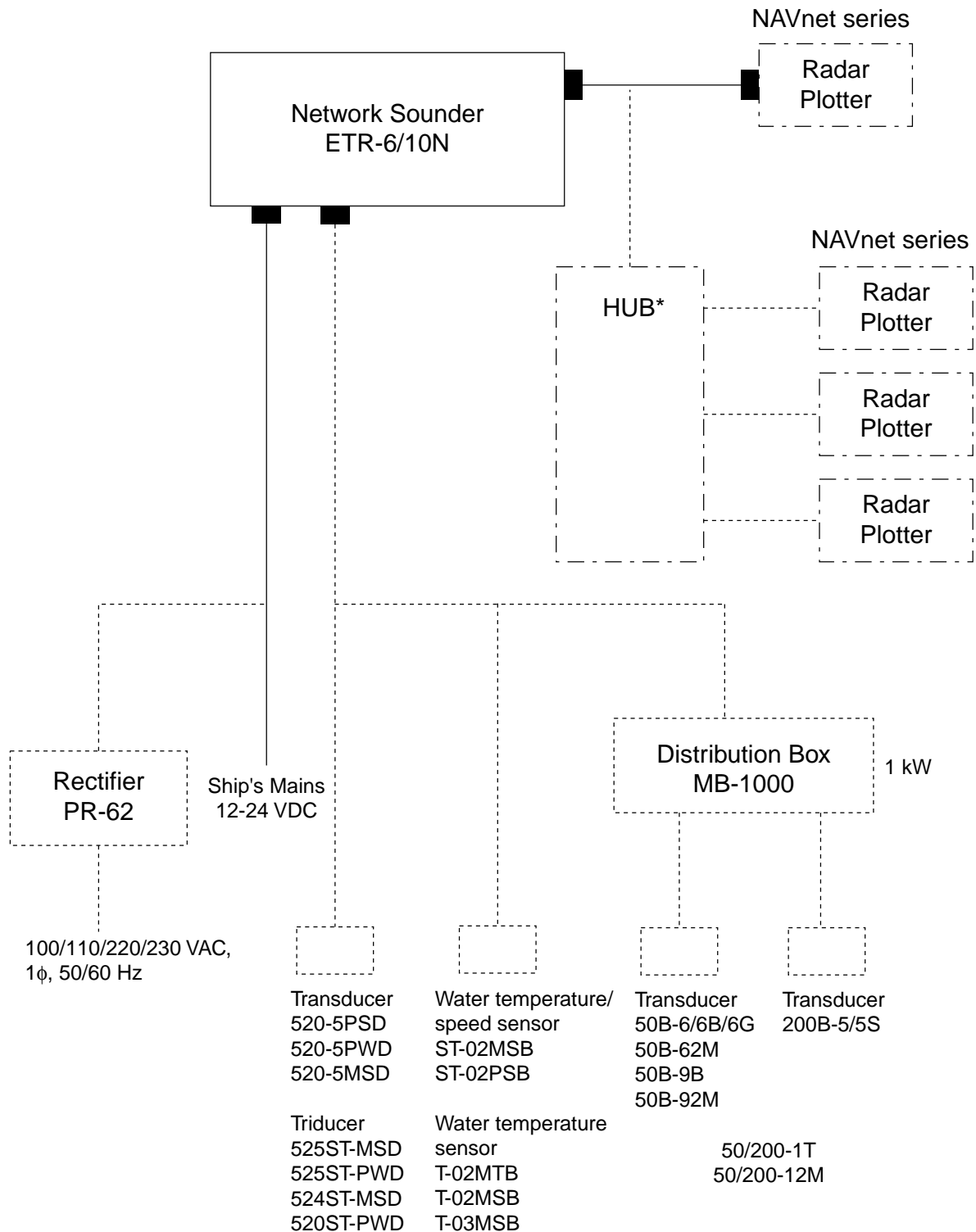


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Type: 86-003-1011-0
Code No.: 100-236-230

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SYSTEM CONFIGURATION



*: HUB may be connected to 3 sets of NAVnet radar or plotter.

————— : Standard

----- : Option

- - - - - : External Equipment

EQUIPMENT LISTS

Standard supply

No.	Name	Type	Code No.	Qty	Remarks
1	Network Sounder	ETR-6/10N	-	1	
2	Spare Parts	SP02-04301	-	1 set	
3	Installation Materials	CP02-06800	000-027-897	1 set	MJ-A3SPF0013-035 (3 A) MJ-A6SPF0014-050C (5 m) +Tapping screw
		CP02-06810	000-027-898		MJ-A3SPF0013-035 (3 A) +Tapping screw

Optional supply

No.	Name	Type	Code No.	Remarks
1	Distribution Box	MB-1000	000-040-809	For 1 kW
2	Cable Assy.	02S4089	000-133-622	10P-8P, For MB-1000
		MJ-A6SPF0014-010C	000-154-027-10	6P-6P, 1 m, For NAVnet
		MJ-A6SPF0014-050C	000-154-049-10	6P-6P, 5 m, For NAVnet
		MJ-A6SPF0014-100C	000-154-050-10	6P-6P, 10 m, For NAVnet
		MJ-A6SPF0014-200C	000-154-051-10	6P-6P, 20 m, For NAVnet
		MJ-A6SPF0014-300C	000-154-052-10	6P-6P, 30 m, For NAVnet
		MJ-A6SRMD/TM11AP8-005	000-144-463	For HUB
3	Inside Hull Kit S	22S0191	000-802-598	
4	Triducer	524ST-MSD	000-015-224	
		520ST-PWD	000-015-128	
		525ST-MSD	000-144-528	
		525ST-PWD	000-144-526	
5	Transducer	520-5PSD	000-015-204	
		520-5PWD	000-015-126	
		520-5MSD	000-015-127	
		50B-6	000-015-042	10 m, For 1 kW
		50B-6B	000-015-043	15 m, For 1 kW
			000-015-018	30 m, For 1 kW
			000-015-255	40 m, For 1 kW
		50B-6G	000-015-016	10 m
		50B-9B	000-015-065	15 m, For 1 kW
		50B-62M	000-015-251	For 1 kW
		50B-92M	000-015-252	For 1 kW
		200B-5	000-015-027	10 m, For 1 kW
		200B-5S	000-015-029	10 m, For 1 kW
		50/200-1T	000-015-170	10 m, For 1 kW
50/200-12M	000-015-171	10 m		
6	ST Sensor	ST-02MSB	000-137-986	Speed/Temperature sensor
		ST-02PSB	000-137-987	
7	Temperature Sensor	T-02MTB	000-040-026	
		T-02MSB	000-040-040	
		T-03MSB	000-040-027	
8	Cable Assy.	02S4147	000-141-082	10P-10, 6P For the water temperature/speed sensor
9	Rectifier	PR-62	000-013-484	100 VAC
			000-013-485	110 VAC
			000-013-486	220 VAC
			000-013-487	230 VAC

1. MOUNTING

1.1 Network Sounder

Mounting considerations

The network sounder can be installed on the deck or on the bulkhead. When selecting a mounting location for the network sounder, keep the following in mind:

- The temperature and humidity should be moderate and stable.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field-generating equipment such as motors and generators.
- Leave slack in cables for maintenance and servicing ease.
- A magnetic compass will be affected if the network sounder is placed too close to the magnetic compass. Observe the following compass safe distances to prevent disturbance to the magnetic compass:
 - a) Standard compass: 0.80 meters
 - b) Steering compass: 0.55 meters

Mounting procedure

Fasten the network sounder to the mounting location with four tapping screws (4 x 16).

Note: Do not install the equipment where it may get wet from rain or water splash.
Waterproof level is IPX2 (IEC 60529).

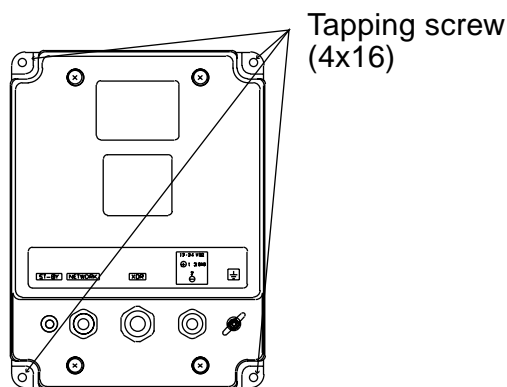


Figure 1-1 Mounting the network sounder

1.2 Thru-hull Mount Transducer 520-5PSD, 520-5MSD

Transducer mounting location

This type of mounting provides the best performance of all, since the transducer protrudes from the hull and the effect of air bubbles and turbulence near the hull skin is reduced. When the boat has a keel, the transducer should be at least 30 cm away from it. Typical thru-hull mountings are shown in the figure on the next page.

The performance of this sounder is directly related to the mounting location of the transducer, especially for high-speed cruising. The installation should be planned in advance, keeping the standard cable length (8 m) and the following factors in mind:

- Air bubbles and turbulence caused by movement of the boat seriously degrade the sounding capability of the transducer. The transducer should, therefore, be located in a position where water flow is the smoothest. Noise from the propellers also adversely affects performance and the transducer should not be mounted nearby. The lifting strakes are notorious for creating acoustic noise, and these must be avoided by keeping the transducer inboard of them.
- The transducer must always remain submerged, even when the boat is rolling, pitching or up on a plane at high speed.
- A practical choice would be somewhere between 1/3 and 1/2 of the boat's length from the stern. For planing hulls, a practical location is generally rather far astern, so that the transducer is always in water regardless of the planing attitude.

Transducer outline drawings

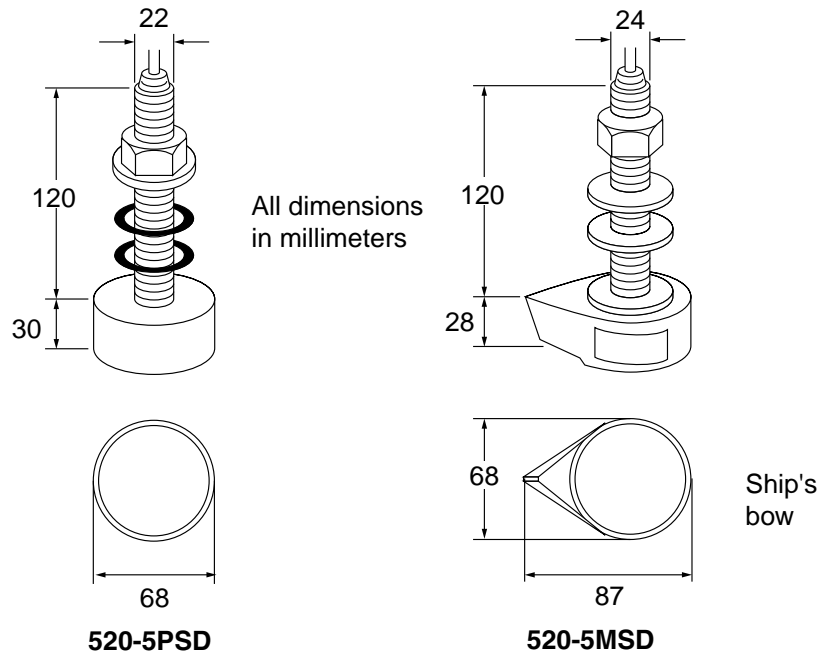
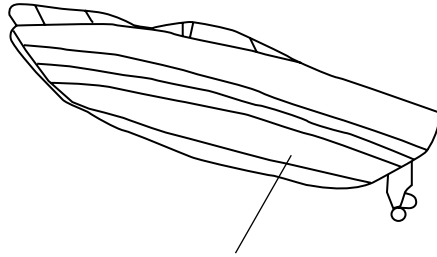


Figure 1-2 Dimensions of transducers 520-5PSD, 520-5MSD

Acceptable transducer mounting locations

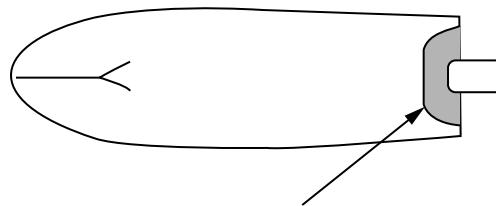
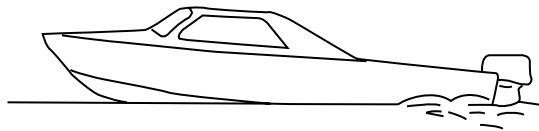
Deep-V hull



- * Position 1/2 to 1/3 length of the hull from stern.
- * 15 to 30 cm from center line (inside first lifting strakes).

Figure 1-3 Transducer mounting location on deep-V hull

High speed V-planing hull



- * Within the wetted bottom area
- * Deadrise angle within 15°

Figure 1-4 Transducer mounting location on high speed V-planing hull

Typical thru-hull mount transducer installations

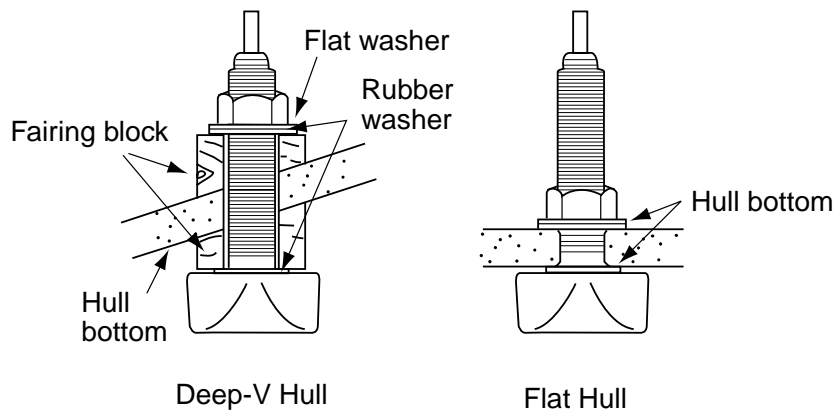


Figure 1-5 Typical thru-hull mount transducer installations

Procedure for installing the thru-hull mount transducer

1. With the boat hauled out of the water, mark the location selected for mounting the transducer on the bottom of the hull.
2. If the hull is not level within 15° in any direction, fairing blocks made out of teak should be used between the transducer and hull, both inside and outside, to keep the transducer face parallel with the water line. Fabricate the fairing block as shown below and make the entire surface as smooth as possible to provide an undisturbed flow of water around the transducer.

The fairing block should be smaller than the transducer itself to provide a channel to divert turbulent water around the sides of the transducer rather than over its face.

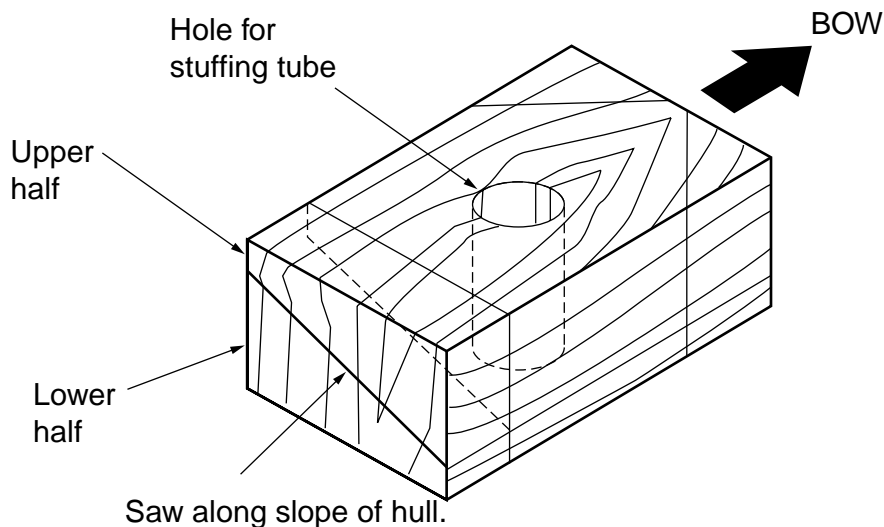


Figure 1-6 Construction of fairing block

3. Drill a hole just large enough to pass the threaded stuffing tube of the transducer through the hull, making sure it is drilled vertically.
4. Apply a sufficient amount of high quality caulking compound to the top surface of the transducer, around the threads of the stuffing tube and inside the mounting hole (and fairing blocks if used) to ensure watertight mounting.
5. Mount the transducer and fairing blocks and tighten the locking nuts. Be sure that the transducer is properly oriented and its working face is parallel to the water line.

Note: Do not over-stress the stuffing tube and locking nuts through excessive tightening, since the wood block will swell when the boat is placed in the water. It is suggested that the nut be tightened lightly at installation and retightened several days after the boat has been launched.

1.3 Transom Mount Transducer 520-5PWD, Optional Transom Mount Triducer 520ST-PWD

This type of mounting is very commonly employed for outboard motor boats. Do not use this method on an inboard motor boat because turbulence is created by the propeller ahead of the transducer.

There are two methods of installation: flush with hull (for flat hulls) and projecting from hull (for deep V-hulls).

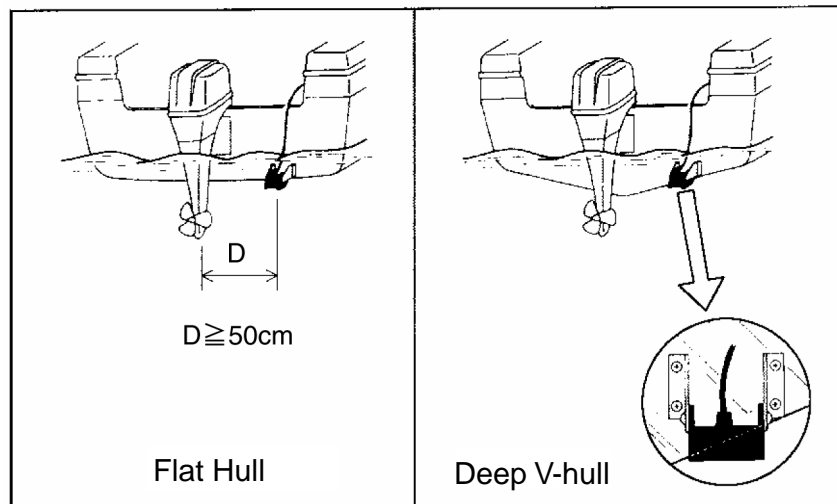


Figure 1-7 Transom mount transducer mounting locations

Installing the transom mount transducer flush with hull (for flat hulls)

A suitable mounting location is at least 50 cm away from the engine and where the water flow is smooth.

1. Drill four pilot holes in the mounting location.
2. Attach the transducer to the bracket with tapping screws (supplied).
3. Adjust the transducer position so the transducer faces right to the seabed.

Note: If necessary, to improve water flow and minimize air bubbles staying on the transducer face, incline the transducer about 5° at the rear. This may require a certain amount of experimentation for fine tuning at high cruising speeds.

4. Fill the gap between the wedge front of the transducer and transom with epoxy material to eliminate any air spaces.

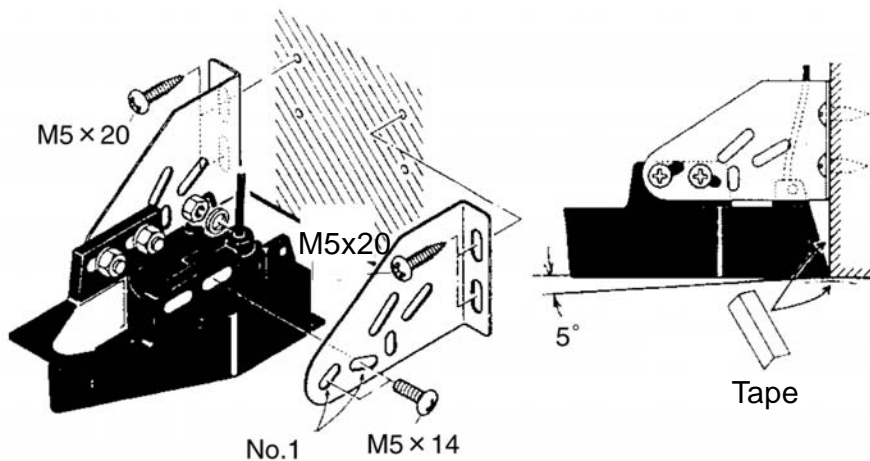


Figure 1-8 Transom mount transducer, mounting flush with hull

Installing the transom mount transducer projecting from hull (for deep-V hulls)

This method is employed on deep-V hulls and provides good performance because the effects of air bubbles are minimal. Install the transducer parallel with water surface; not flush with hull. If the boat is placed on a trailer care must be taken not to damage the transducer when the boat is hauled out of the water and put on the trailer.

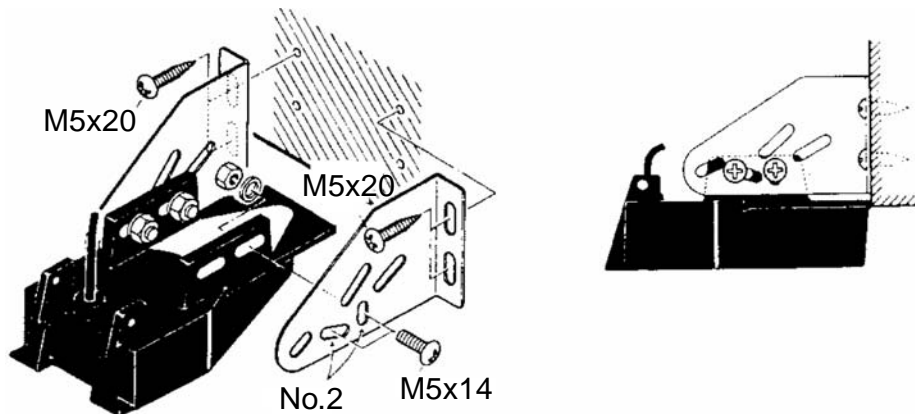


Figure 1-9 Transom mount transducer, projecting from hull

Transducer preparation

Before putting the boat in water, wipe the face of the transducer thoroughly with a detergent liquid soap. This will lessen the time necessary for the transducer to have good contact with the water. Otherwise the time required for complete “saturation” will be lengthened and performance will be reduced.

Note: Do not paint the transducer. Performance will be affected.

1.4 Inside-hull Mount Transducer 520-5PSD, 520-5MSD

Necessary tools

You will need the following tools:

- Sandpaper (#100)
- Silicone sealant
- Silicone grease

Remarks on installation

- Turn off the engine and anchor the boat while installing the equipment.
- Install the transducer in the engine room.

Selecting the mounting location

Keep the following points in mind when selecting a mounting location:

- The mounting location should be where the hull is of single-hull thickness and is void of air or flotation materials other than solid fiberglass between the transducer face and the water.
- Do not place the transducer over hull struts or ribs which run under the hull.
- Avoid a location where the rising angle of the hull exceeds 15°, to minimize the effect of the boat's rolling.
- You will finalize the mounting location through some trial and error. The procedure for this is shown later.

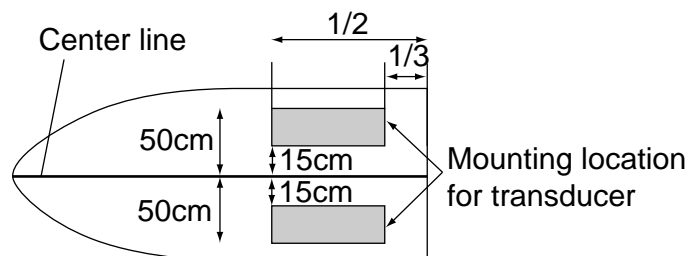


Figure 1-10 Inside-hull transducer mounting location

Attaching the inside-hull mount transducer

1. Clean the transducer face to remove any foreign material. Lightly roughen the transducer face with #100 sandpaper. Also, roughen the inside of the hull where the transducer is to be mounted.
2. Warm the silicone sealant to 40°C before usage to soften it. Coat the transducer face and mounting location with silicone sealant.

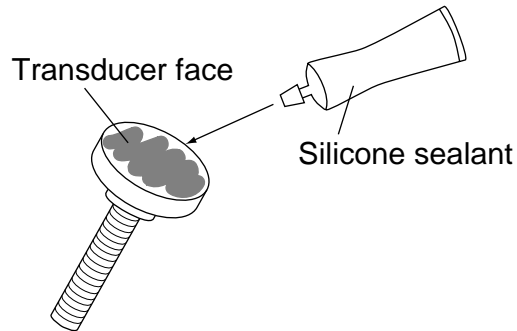


Figure 1-11 Coating the transducer face with silicone sealant

3. Press the transducer firmly down on the hull and gently twist it back and forth to remove any air which may be trapped in the silicone sealant.

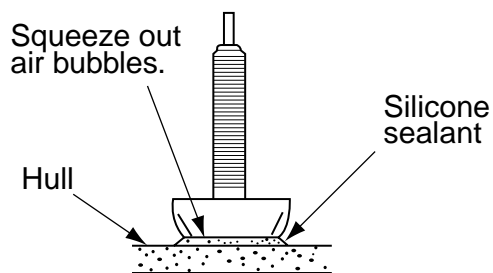


Figure 1-12 Attaching transducer to hull with silicone sealant

1.5 Optional Water Temperature/Speed Sensors

Through-hull mount water temperature/speed sensor ST-02MSB, ST-02PSB

Select a suitable mounting location considering the following:

- Select a mid-boat flat position. The sensor does not have to be installed perfectly perpendicular. The sensor must not be damaged in dry-docking operation.
- Select a place apart from equipment generating heat.
- Select a place in the forward direction viewing from the drain hole, to allow for circulation of cooling water.
- Select a place free from vibration.

1. Dry-dock the boat.
2. Make a hole of approx. 51 mm in diameter.
3. Unfasten locknut and remove the sensor section.
4. Apply high-grade sealant to the flange of the sensor.
5. Pass the sensor casing through the hole.
6. Face the notch on the sensor toward boat's bow and tighten the flange.
7. Set the sensor section to the sensor casing and tighten the locknut.
8. Launch the boat and check for water leakage around the sensor.

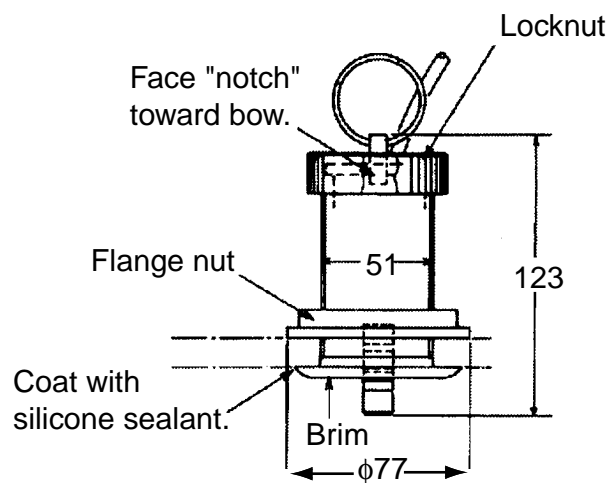


Figure 1-13 Water temperature/speed sensor ST-02MSB, ST-02PSB

1.6 Optional Water Temperature Sensors

Transom mount water temperature sensor T-02MTB

- Fix the cable at a convenient location with cable clamp.
- When the cable is led in through the transom board, make a hole of approx. 17 mm in diameter to pass the connector. After passing the cable, fill the hole with a sealing compound.

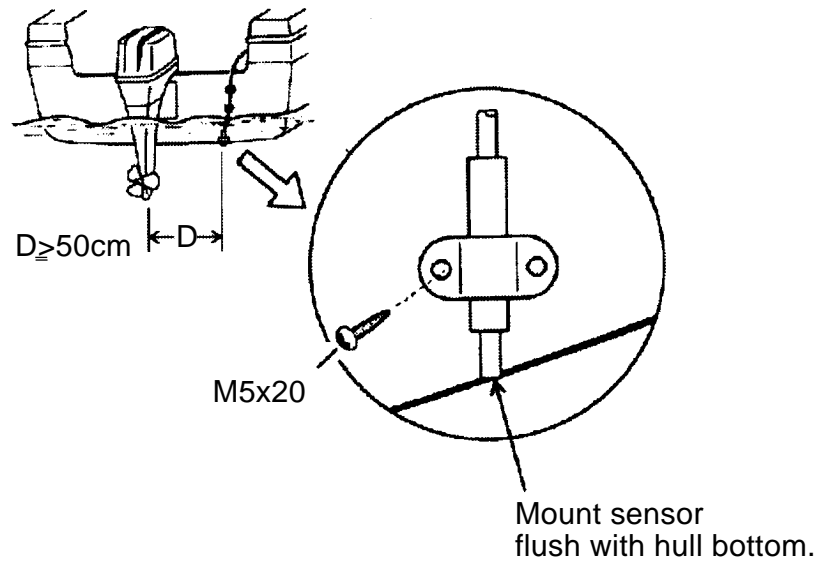


Figure 1-14 How to install transom mount water temperature sensor T-02MTB

Thru-hull mount water temperature sensor T-02MSB, T-03MSB

Select a suitable mounting location considering the following points:

- Select a mid-boat flat position. The sensor does not have to be installed perfectly perpendicular. However, the location should not be such that the transducer may be damaged when the boat is dry-docked.
- Locate away from equipment which gives off heat.
- Locate away from drain pipes.
- Select a location where vibration is minimal.

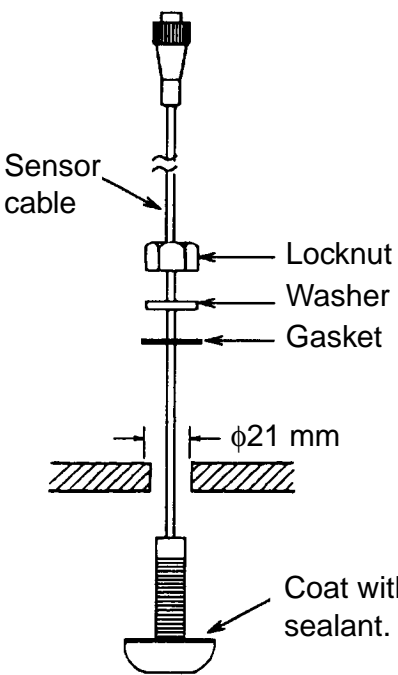
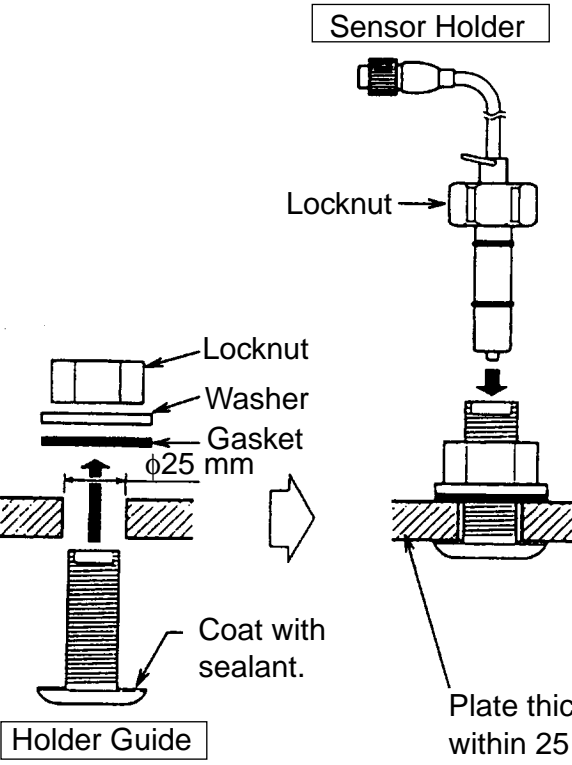
T-02MSB	T-03MSB
 <p>The diagram shows the T-02MSB sensor assembly. A sensor cable passes through a hole in a mounting plate. The hole has a diameter of $\phi 21$ mm. The cable is secured with a locknut, washer, and gasket. The sensor flange is coated with sealant. Labels include: Sensor cable, Locknut, Washer, Gasket, $\phi 21$ mm, Coat with sealant.</p> <p>Mounting procedure</p> <ol style="list-style-type: none"> 1. Drill a hole of 21 mm in diameter in the mounting location. 2. Pass the sensor cable through the hole. 3. Pass gasket, washer and locknut onto cable in that order. 4. Coat the sensor flange with high quality sealant and then fasten the sensor with the locknut. (Torque: max. 59N·m) 5. Launch the boat to check for water leakage around the sensor. 	 <p>The diagram shows the T-03MSB sensor assembly. It involves a sensor holder, locknut, washer, and gasket. A holder guide is used to align the sensor holder. The holder guide hole has a diameter of $\phi 25$ mm. The holder guide is coated with sealant. The sensor holder is then inserted from the inside of the boat. Labels include: Sensor Holder, Locknut, Washer, Gasket, $\phi 25$ mm, Coat with sealant, Holder Guide, Plate thickness within 25 mm.</p> <p>Mounting procedure</p> <ol style="list-style-type: none"> 1. Drill a hole of 25 mm in diameter in the mounting location. 2. Coat holder guide with high quality sealant, and pass gasket, washer and locknut onto holder guide in that order and then tighten the locknut. 3. Set the sensor holder to the holder guide from inside the boat and then tighten the locknut. 4. Launch the boat to check for water leakage around the sensor.

Figure 1-15 Assembling thru-hull water temperature sensor T-02MSB, T-03MSB

1.7 Optional Triducer 524ST-MSD, 525ST-MSD

The triducer is designed for thru-hull mounting.

Mounting considerations

When selecting a mounting location keep the following points in mind:

- Air bubbles and turbulence caused by movement of the boat seriously degrade the sounding capability of the transducer. The transducer should, therefore, be located in a position where water flow is the smoothest. Noise from the propellers also adversely affects performance and the transducer should not be mounted nearby. The lifting strakes are notorious for creating acoustic noise, and these must be avoided by keeping the transducer inboard of them.
- The transducer must always remain submerged, even when the boat is rolling, pitching or up on a plane at high speed.
- A practical choice would be somewhere between 1/3 and 1/2 of the boat's length from the stern. For planing hulls, a practical location is generally rather far astern, so that the transducer is always in water regardless of the planing attitude.

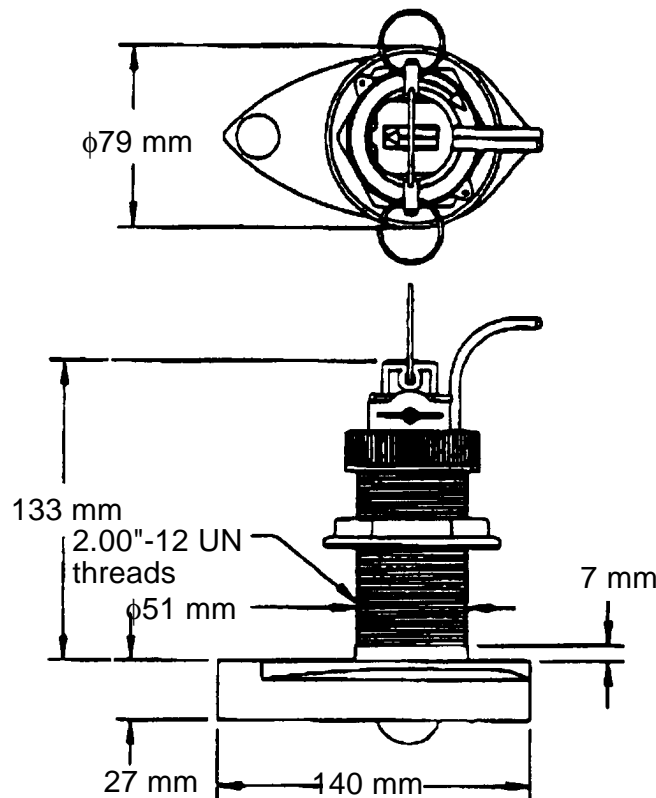


Figure 1-16 Dimensions of triducer 524ST-MSD/525ST-MSD

2. WIRING

2.1 Wiring

All wiring is terminated at the network sounder.

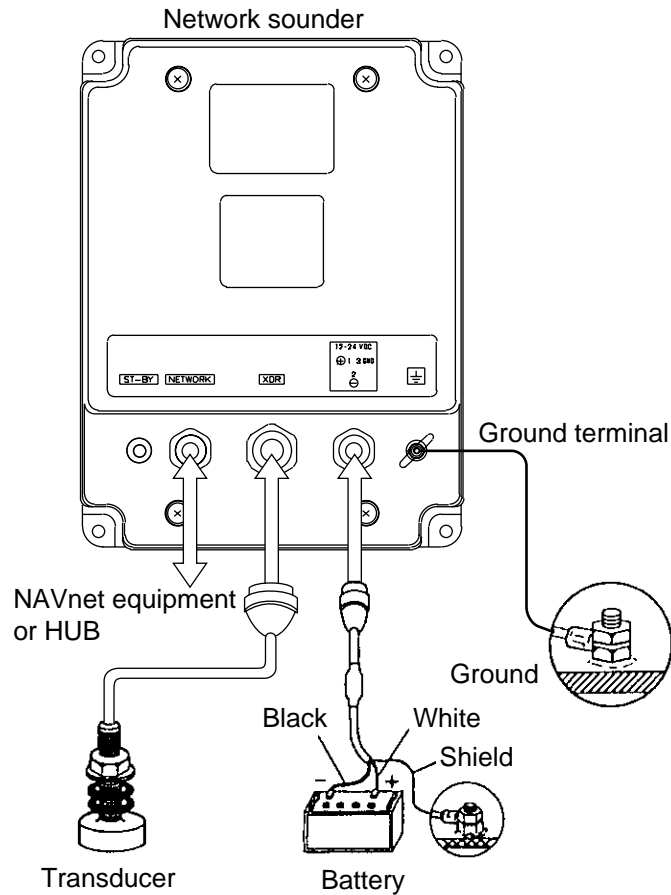


Figure 2-1 Network sounder

Power cable

Connect the power cable to the power connector. Connect the leads to the battery (12-24 VDC); white to plus (+) terminal and black to minus (-) terminal.

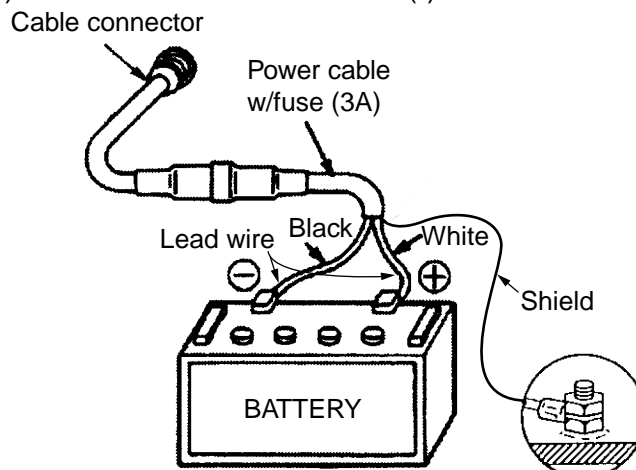


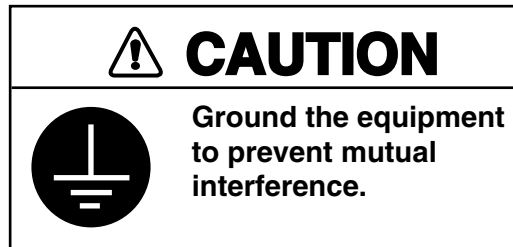
Figure 2-2 Connecting the power cable to the battery


Transducer, optional triducer

Connect the transducer cable to the XDR connector.

Ground

Connect the ground wire (2.0sq) to ship's ground to prevent interference to the picture. Shorten the ground wire as much as possible. For FRP vessels, install a ground plate that measures about 20 cm by 30 cm on the outside of the hull bottom to provide a ground point.



Note: Use a "closed" lug to make the ground connection at the network sounder. Do not use an "open-type" lug (.

2.2 Optional Sensors

Water temperature sensor

Connect the water temperature sensor (option) or water temperature/speed sensor (option) to the XDR port with the converter connector (Type: 02S4147, Code No.: 000-141-082, option).

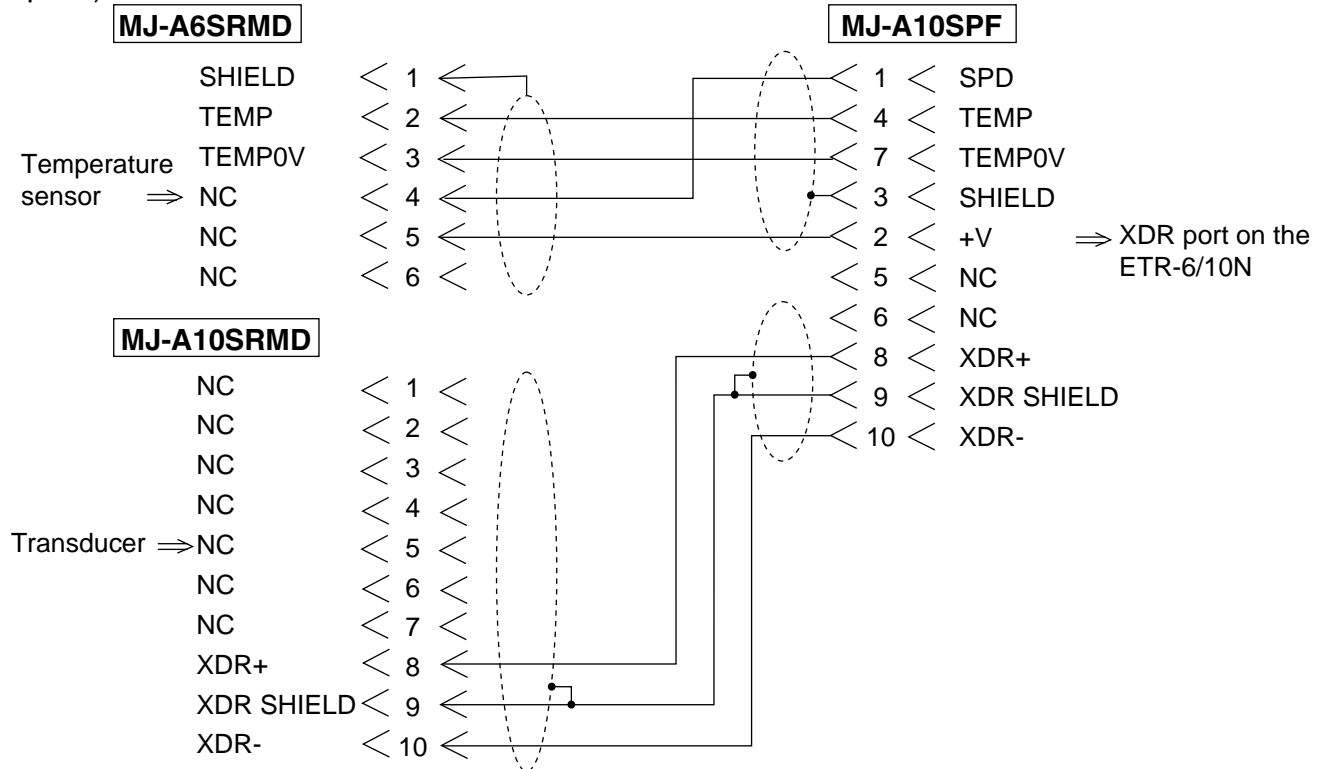


Figure 2-3 Connection of water temperature speed sensor

Connection of water temperature/speed sensor

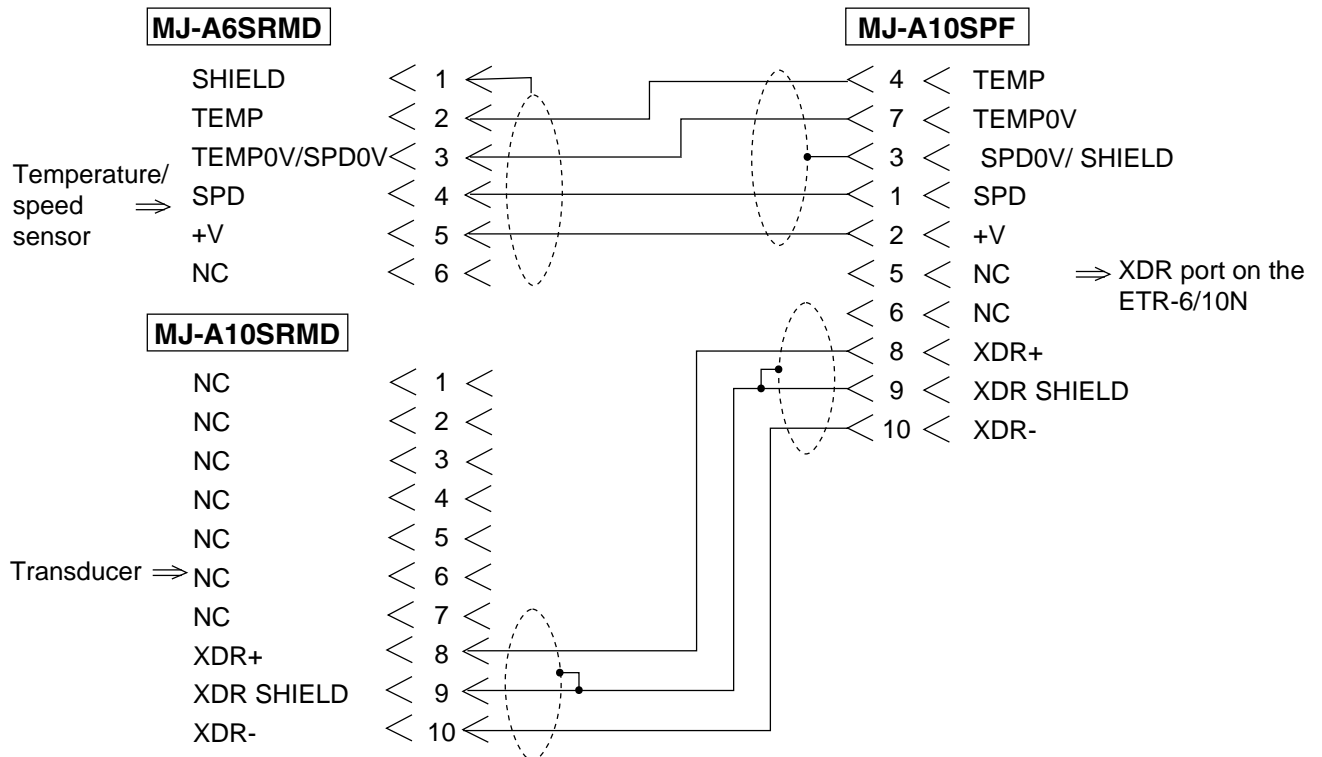


Figure 2-4 Connection of water temperature/speed sensor

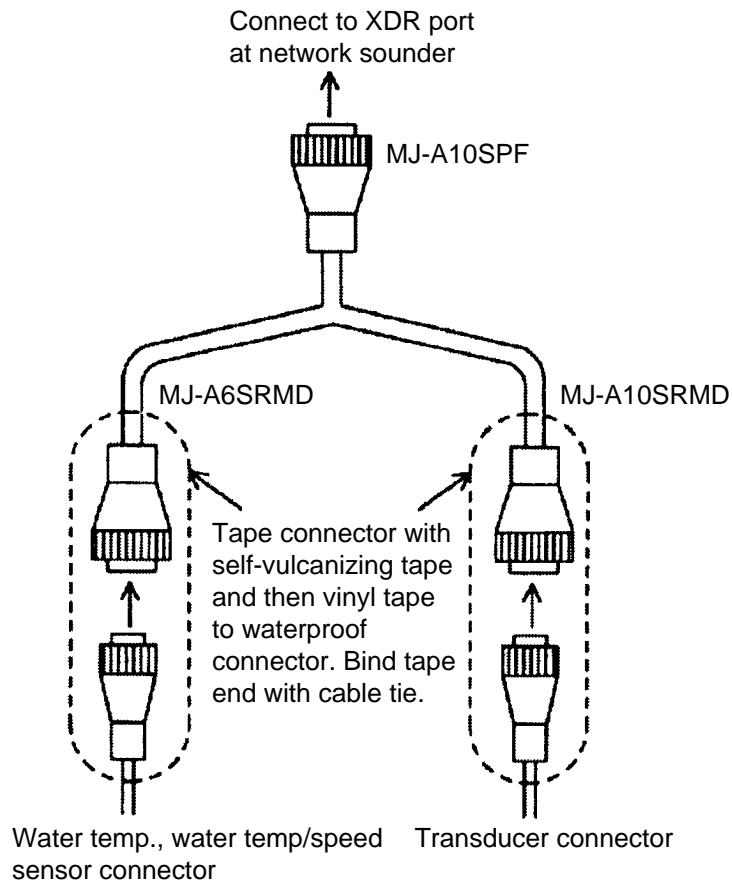


Figure 2-5 Connection of transducer, water temperature sensor, water temperature/speed sensor

2.3 Optional 50 kHz and 200 kHz Transducers

To connect optional transducer 50B-6, 50B-6B, 50B-6G, 50B-62M, 50B-9B, 50B-92M, 200B-5, 200B-5S, 50/200-1T or 50/200-12M, the optional Distribution Box (MB-1000, code no. 000-040-809) is required. Additionally, a cable assembly (02S4089, code no. 000-133-622) is required to connect to the network sounder. Fasten the cable from the Distribution Box to the XDR connector on the network sounder.

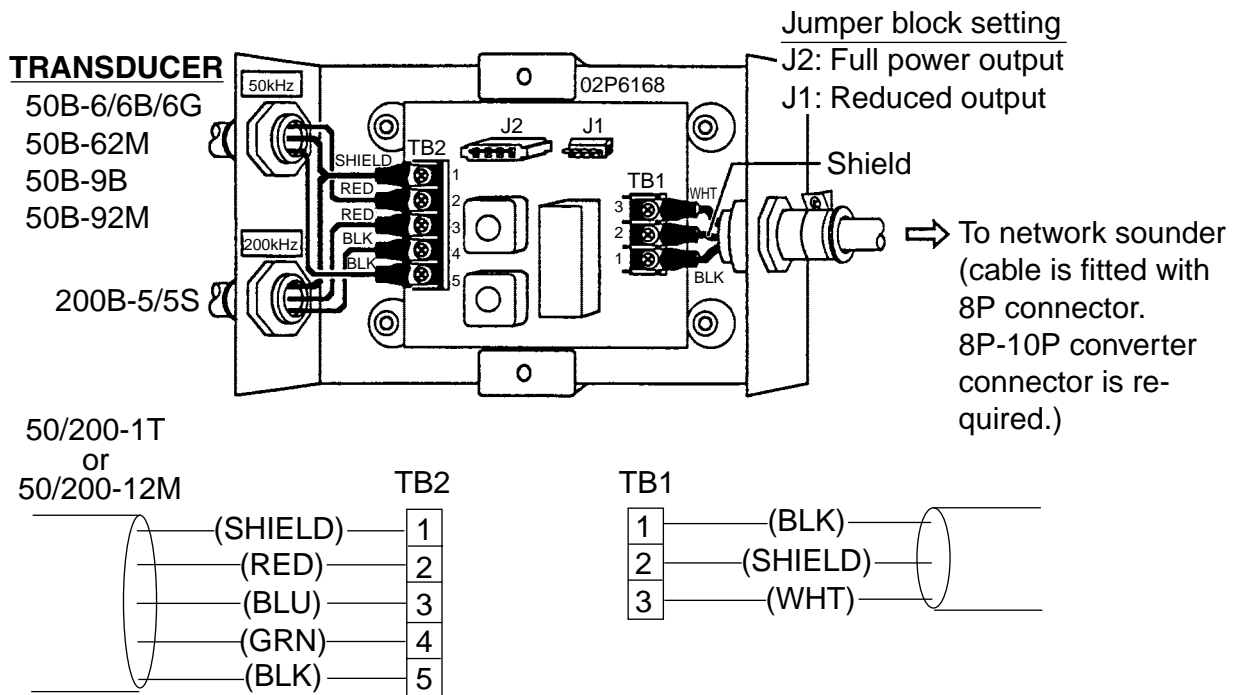


Figure 2-6 Distributor MB-1000

Distribution Box (Type: MB-1000, Code No.: 000-040-809)

Name	Type	Code No.	Qty	Remarks
Distribution Box	MB-1000	000-040-805	1	Cable w/8P connector supplied for connection to network sounder
Crimp-on Lug	FV1.25-3 Red	000-538-113	6	
Cord Lock	NC-1	000-516-650	1	For use with separate transducer

Fabrication of transducer cable

Fabricate the transducer cable as illustrated below to connect it to the Distribution Box.

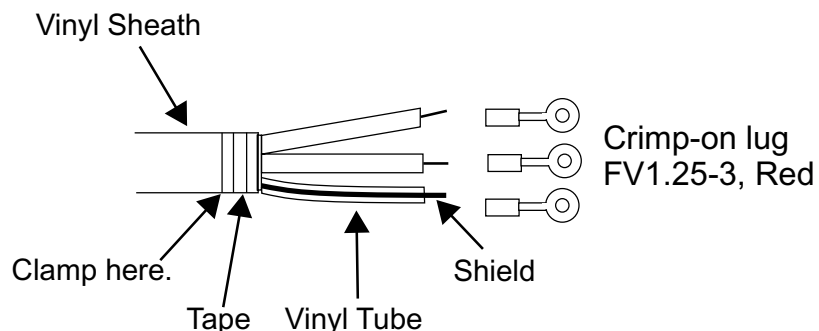


Figure 2-7 Fabrication of transducer cable

3. INITIAL SETTINGS

WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment unless totally familiar with electrical circuits and service manual.

Only qualified personnel should work inside the equipment.

3.1 Selecting the Transmission Power

The default transmission power is 600 W. If you install the 1 kW transducer, change the jumper connector to #3-4 from #1-2 on J12 as follows:.

1. Detach the power cable from the connector.
2. Open the cover of the ETR-6/10N.
3. Remove the jumper connector on J12 by using long-nose pliers.
4. Insert it to #3-4 pins of the J12 for 1 kW transducer.

Note: Do not insert the jumper connector upside down.

5. Close the cover.

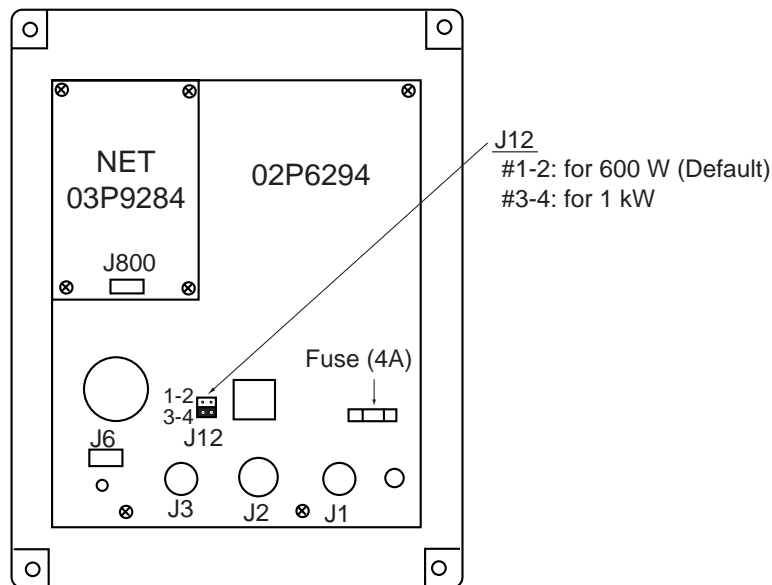


Figure 3-1 Location of parts inside ETR-6/10N

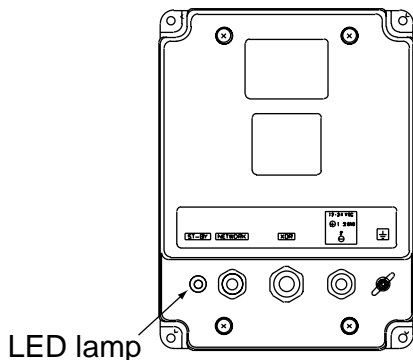
3.2 Replacing the Fuse

The 3 A fuse in the snap-in fuse holder on the power cable protects the equipment from equipment fault and reverse polarity of the ship's mains. If the fuse blows find out the cause before replacing it. If the fuse blows again after replacement, contact a FURUNO agent or dealer for advice. If the LED lamp on the front panel does not light, the 4 A fuse inside the network sounder may have blown. In this case, contact a FURUNO agent or dealer for advice.



3.3 LED Lamp

The green LED lamp on the front panel lights or flashes according to equipment status. When a radar or plotter is OFF, or the network sounder is not connected to a radar or plotter, the LED lamp flashes for 3 minutes and then lights continuously. When a radar or plotter is ON, the LED lamp flashes continuously.



LED lamp

Lighting (after flashing 3 minutes):

A radar or plotter is OFF or the net cable is disconnected or damaged.

Flashing:

The network sounder works with a radar or plotter.

Figure 3-2 LED lamp

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APPENDIX

TRIDUCER 525ST-PWC/PWD

This appendix provides a copy of the installation instructions for AIRMAR triducer. If you lose the original supplied with the triducer, use this appendix.

INSTALLATION INSTRUCTIONS

Transom Mount Transducer or TRIDUCER® Multisensor with Integral Release Bracket

Model P66

U.S. Patents: 4,555,938; 4,644,787; 5,606,253; Des. 334,335
Canadian Patent 1,233,341

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



Applications

- Powerboats with outboard, inboard, inboard/outboard, or jet drive.
Not recommended for boats with large or twin screw inboard motor.
- Bracket protects the sensor from frontal impact only
- Good operation up to 44kn (50MPH)
- Orients the sound beam vertically on hulls with a deadrise angle up to 30°
- Adjusts to transom angles from 2-22°

Tools and Materials Needed

- Scissors
- Masking tape
- Safety goggles
- Dust mask
- Electric drill
- Drill bit for:
 - Bracket holes 4mm, #23, or 9/64"
 - Fiberglass hull chamfer bit (preferred), 6mm, or 1/4"
 - Transom hole 19mm or 3/4" (optional)
 - Cable clamp holes 3mm or 1/8"
- Screwdrivers
- Straight edge
- Marine sealant
- Pencil
- Zip-ties
- Water-based antifouling paint (**mandatory in salt water**).

Pre-test for Speed and Temperature

Connect the sensor to the instrument and spin the paddlewheel. Check for a speed reading and the approximate air temperature. If there is no reading, return the sensor to your place of purchase.

Mounting Location

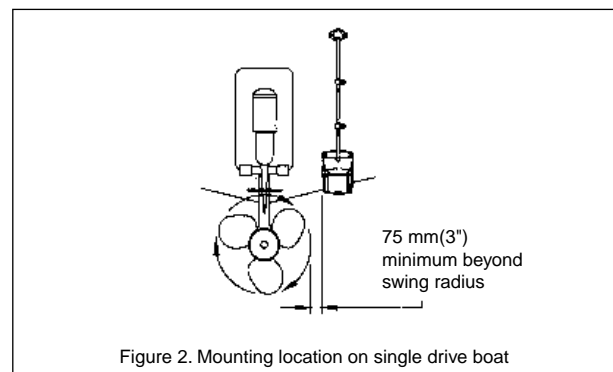
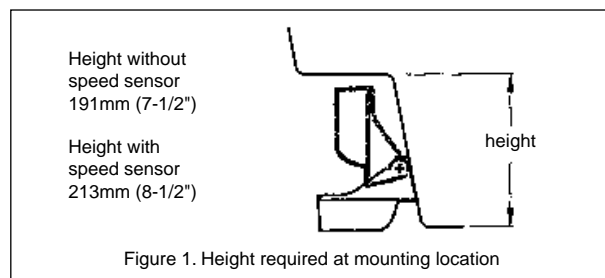
To ensure the best performance, the sensor *must* be submerged in aeration-free and turbulence-free water. Mount the sensor close to the centerline of the boat. On slower heavier displacement hulls, positioning it farther from the centerline is acceptable.

Allow adequate space above the bracket for it to release and rotate the sensor upward (see Figure 1).

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

Caution: Avoid mounting the sensor where the boat may be supported during trailering, launching, hauling, and storage.

- **Single drive boat**—Mount on the starboard side at least 75mm (3") beyond the swing radius of the propeller (see Figure 2).
- **Twin drive boat**—Mount between the drives.



P66 Installation template
for starboard side of boat

Drill at locations labeled "B"
for the following transom angles:
16° through 22°



Drill at locations labeled "A"
for the following transom angles:
2° through 15°

Align arrow with bottom of transom

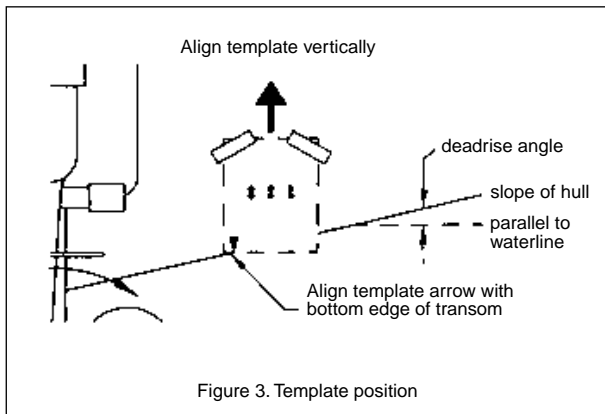


Figure 3. Template position

Caution: Never Use Solvents!

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

Installation

Bracket

1. Cut out the installation template shown on the left.
2. At the selected location, position the template, so the arrow at the bottom is aligned with the bottom edge of the transom. *Being sure* the template is parallel to the waterline, tape it in place (see Figure 3).

Warning: Always wear safety goggles and a dust mask.

3. Using a 4mm, #23, or 9/64" bit, drill three holes 22mm (7/8") deep at the locations indicated. To prevent drilling too deeply, wrap masking tape around the bit 22mm (7/8") from the point.
Fiberglass hull—Minimize surface cracking by chamfering the gelcoat. If a chamfer bit or countersink bit is not available, start drilling with a 6mm or 1/4" bit to a depth of 1mm (1/16").
4. **If you know your transom angle**—The bracket is designed for a standard 13° transom angle.
11°-18° angle—No shim is required. Skip to "Adjusting", step 3.
Other angles—The shim is required. Skip to "Adjusting", step 2.

If you do not know the transom angle—Temporarily attach the bracket and sensor to the transom to determine if the plastic shim is needed.

5. Using the two #10 x 1-1/4" self-tapping screws, temporarily screw the bracket to the hull. *Do not* tighten the screws completely at this time. Follow the instructions for "Attaching the Sensor to the Bracket", steps 1-4 before proceeding with "Adjusting".

Adjusting

1. Using a straight edge, sight the underside of the sensor relative to the underside of the hull. The stern of the sensor should be 1-3mm (1/16-1/8") below the bow of the sensor or parallel to the bottom of the hull (see Figure 5).

Caution: Do not position the bow of the sensor lower than the stern because aeration will occur.

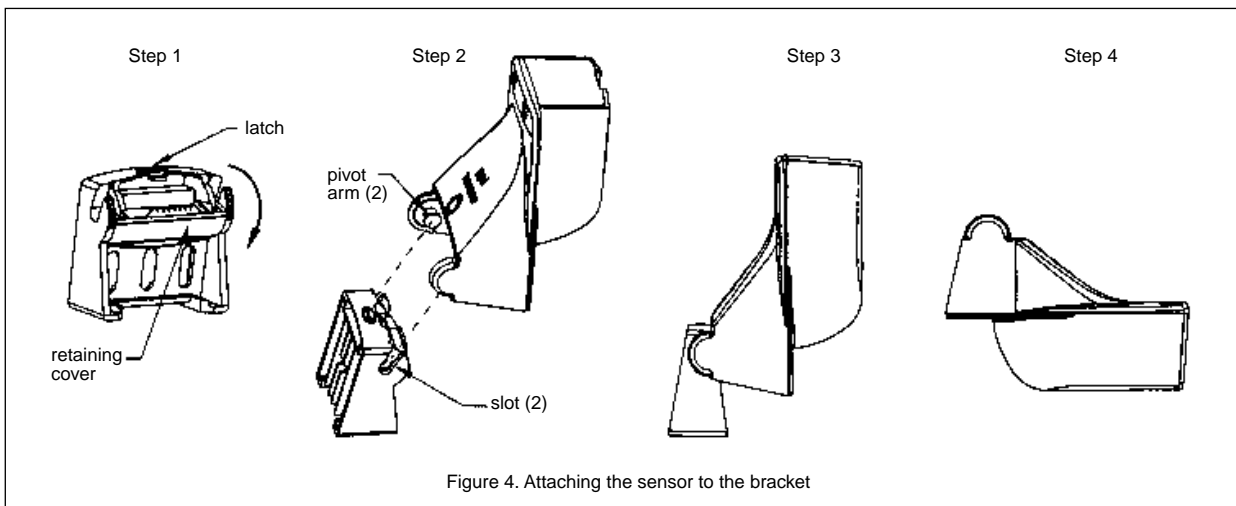


Figure 4. Attaching the sensor to the bracket

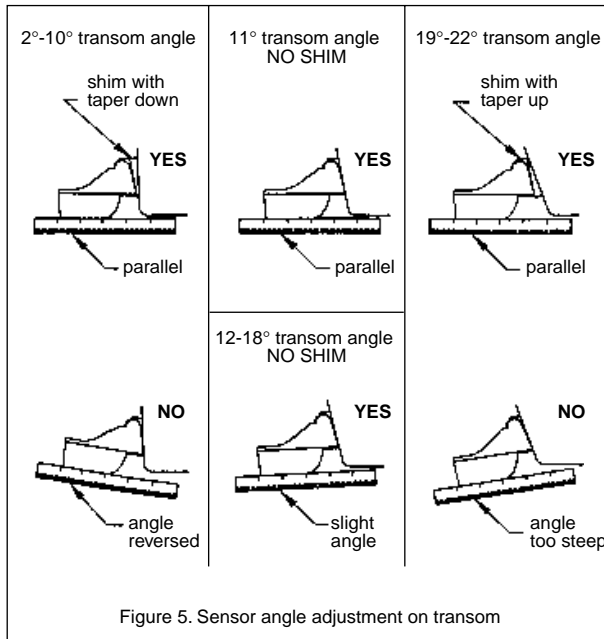


Figure 5. Sensor angle adjustment on transom

- To adjust the sensor's angle relative to the hull, use the tapered plastic shim provided. If the bracket has been temporarily fastened to the transom, remove it. Key the shim in place on the back of the bracket.
 - 2°-10° transom angle** (stepped transom and jet boats)—Position the shim with the tapered end down.
 - 19°-22° transom angle** (small aluminum and fiberglass boats)—Position the shim with the tapered end up.
- If the bracket has been temporarily fastened to the transom, remove it. Apply a marine sealant to the threads of the two #10 x 1-1/4" self tapping screws to prevent water seeping into the transom. Screw the bracket to the hull. *Do not* tighten the screws completely at this time.

- Repeat step 1 to ensure that the angle of the sensor is correct.

Caution: Do not position the sensor farther into the water than necessary to avoid increasing drag, spray, and water noise and reducing boat speed.

- Using the vertical adjustment space on the bracket slots, slide the sensor up or down to provide a projection of 3mm (1/8"). Tighten the screws (see Figure 6).

Attaching the Sensor to the Bracket

- If the retaining cover near the top of the bracket is closed, open it by depressing the latch and rotating the cover downward (see Figure 4).
- Insert the sensor's pivot arms into the slots near the top of the bracket.
- Maintain pressure until the pivot arms click into place.
- Rotate the sensor downward until the bottom snaps into the bracket.
- Close the retaining cover to prevent the accidental release of the sensor when the boat is underway.

Cable Routing

Route the sensor cable over the transom, through a drain hole, or through a new hole drilled in the transom **above the waterline**.

Caution: Never cut the cable or remove the connector; this will void the warranty.

Warning: Always wear safety goggles and a dust mask.

- If a hole must be drilled, choose a location well above the waterline. Check for obstructions such as trim tabs, pumps, or wiring inside the hull. Mark the location with a pencil. Drill a hole through the transom using a 19mm or 3/4" bit (to accommodate the connector).
- Route the cable over or through the transom.
- On the outside of the hull secure the cable against the transom using the cable clamps. Position a cable clamp 50mm(2") above the bracket and mark the mounting hole with a pencil (see Figure 6).
- Position the second cable clamp halfway between the first clamp and the cable hole. Mark this mounting hole.
- If a hole has been drilled in the transom, open the appropriate slot in the transom cable cover. Position the cover over the cable where it enters the hull. Mark the two mounting holes.
- At each of the marked locations, use a 3mm or 1/8" bit to drill a hole 10mm (3/8") deep. The prevent drilling too deeply, wrap masking tape around the bit 10mm (3/8") from the point.
- Apply marine sealant to the threads of the #6 x 1/2" self-tapping screw to prevent water from seeping into the transom. If you have drilled a hole through the transom, apply marine sealant to the space around the cable where it passes through the transom.
- Position the two cable clamps and fasten them in place. If used, push the cable cover over the cable and screw it in place.
- 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 sensor cable from other electrical wiring and "noise" sources. Coil any excess cable and secure it in place with zip-ties to prevent damage.
- Refer to your echosounder owner's manual to connect the sensor to the instrument.

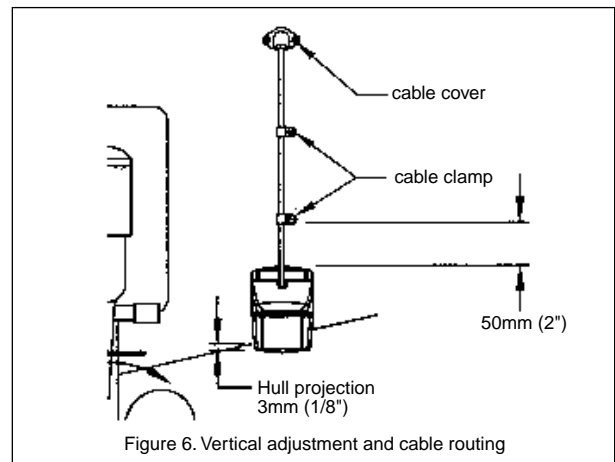


Figure 6. Vertical adjustment and cable routing

SPECIFICATIONS OF THE NETWORK SOUNDER ETR-6/10N

1. GENERAL

- 1.1. Output Power 600 W/ 1 kW rms nominal, 1 kW requires optional MB-1000
- 1.2. TX Frequency 50 kHz or 200 kHz, 50/200 kHz exchangeable
- 1.3. Amplifier type Log amplifier
- 1.4. Network protocol Ethernet 10BASE-T
- 1.5. Depth Range and Pulse Repetition Rate

Range (m)	PRR (/min.)
2	1500
5	1500
10	750
40	375
100	150
200	75
400	41
1200	12

2. POWER SUPPLY

- 2.1. Main Unit 12-24 VDC: 1.0-0.5 A, 12.0 VA max. (at 1 kW output)
Stand-by: 1.0 VA or less

3. ENVIRONMENTAL CONDITION

- 3.1. Ambient Temperature -15°C to +55°C
- 3.2. Relative Humidity 95% at 40°C
- 3.3. Water proofing IPX2
- 3.4. Vibration IEC 60945

4. COATING COLOR

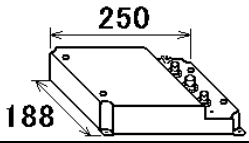
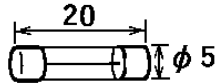
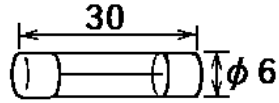
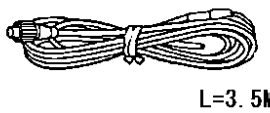
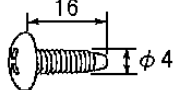
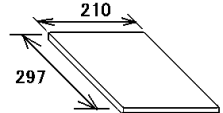
- 4.1. Main Unit N3.0

PACKING LIST

02FK-X-9851 -6 1/1

ETR-6/10N-E-N, ETR-6/10N-J-N

A-1

NAME	OUTLINE	DESCRIPTION/CODE	Q'TY
ユニット UNIT			
魚採用送受信器 NETWORK SOUNDER		ETR-6/10N 000-027-899-00	1
予備品 SPARE PARTS		SP02-04301	
ヒューズ FUSE		FGMB 125V 4A PBF 000-157-482-10	3
管入りヒューズ FUSE		FGBO-A 125V 3A PBF FGBO-A 3A AC125V 000-155-850-10 000-130-323-00	3
工事材料 INSTALLATION MATERIALS		CP02-06810	
ケーブル組品MJ POWER CABLE		MJ-A3SPF0013-035(3A) 000-135-397-00	1
+トラスタップ 1ヶ SELF-TAPPING SCREW		4X16 SUS304 000-162-605-10	4
図書 DOCUMENT			
取扱説明書 OPERATOR'S MANUAL		OM* -20240-* 000-809-172-0* **	1

コード番号末尾の[**]は、選択品の代表コードを表します。
CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.

型式/コード番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

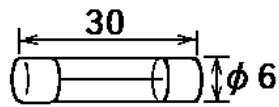
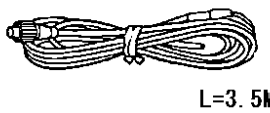
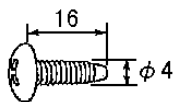
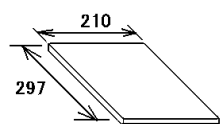
02FK-X-9851

PACKING LIST

02FK-X-9852 -5 1/1

ETR-6/10N-E-A, ETR-6/10N-J-A

A-2

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ユニット UNIT			
魚採用送受信器 NETWORK SOUNDER		ETR-6/10N 000-027-899-00	1
予備品 SPARE PARTS		SP02-04301	
ヒューズ FUSE		FGMB 125V 4A PBF 000-157-482-10	3
管入りヒューズ FUSE		FGB0-A 125V 3A PBF FGB0-A 3A AC125V 000-155-850-10 000-130-323-00	3
工事材料 INSTALLATION MATERIALS		CP02-06800	
ケーブル組品MJ POWER CABLE		MJ-A3SPF0013-035(3A) 000-135-397-00	1
ケーブル組品MJ CABLE ASSY.		MJ-A6SPF0014-050C 000-154-049-10	1
+トラスタップ 1ヶ SELF-TAPPING SCREW		4X16 SUS304 000-162-605-10	4
図書 DOCUMENT			
取扱説明書 OPERATOR'S MANUAL		OM* -20240-* 000-809-172-0* **	1

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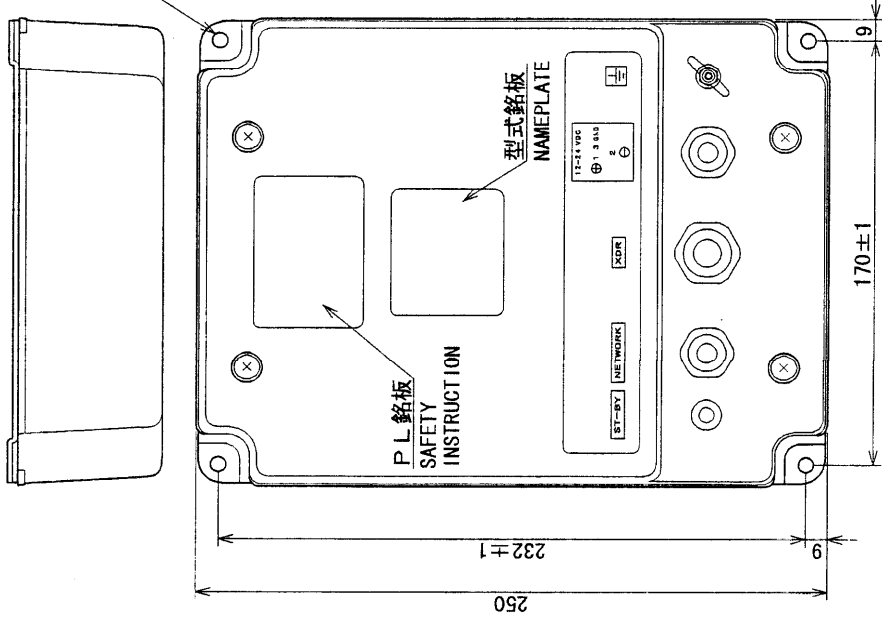
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(略図の寸法は、参考値です。DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

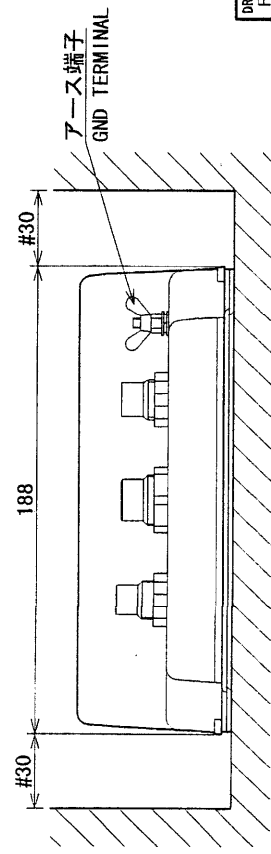
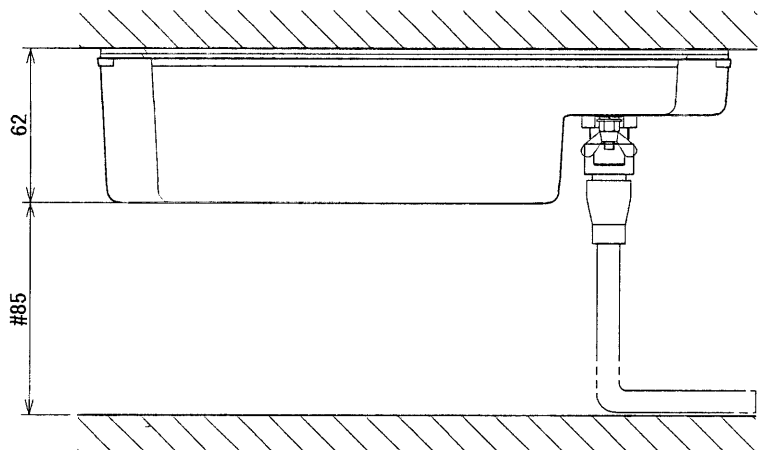
02FK-X-9852

4-φ6 取付穴
FIXING HOLES



寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
0 < L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3

表 1 TABLE 1



- 注 記
- 1) #印寸法は最小サージ空間寸法とする。
 - 2) 指定外の寸法公差は表 1 による。
 - 3) 取付は+トラスタップピンネジ4x16とする
- NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
 3. USE TAPPING SCREWS 4x16 FOR FIXING THE UNIT.

DRAWN FEB. 26 '01 CHECKED FEB 26 '01 APPROVED FEB 26 '01	T. YAMASAKI I. Y. King S. Yoshida	TITLE 名称 名称	ETR-6/10N 魚探用送受信器 外寸図
SCALE 1/3	MASS 1.5 ±10% KG	NAME NETWORK SOUNDER	
DWG. No. C2024-601-A	02-131-1006-2	OUTLINE DRAWING	

4

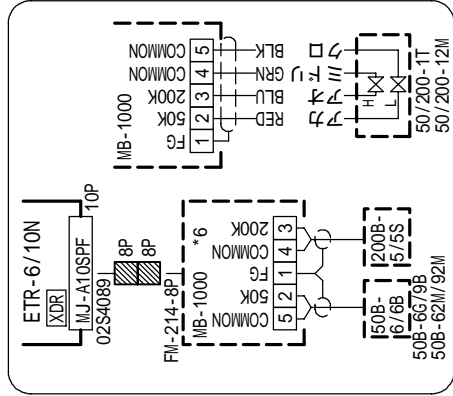
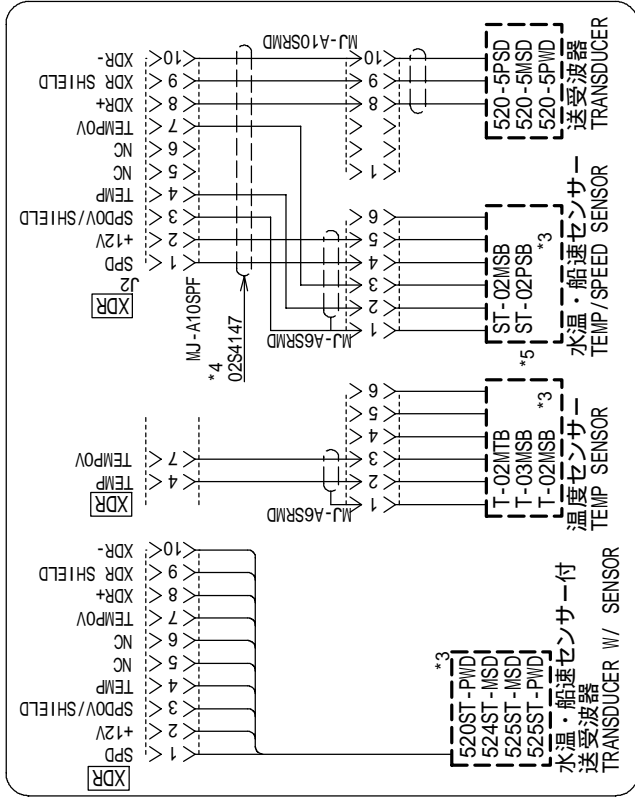
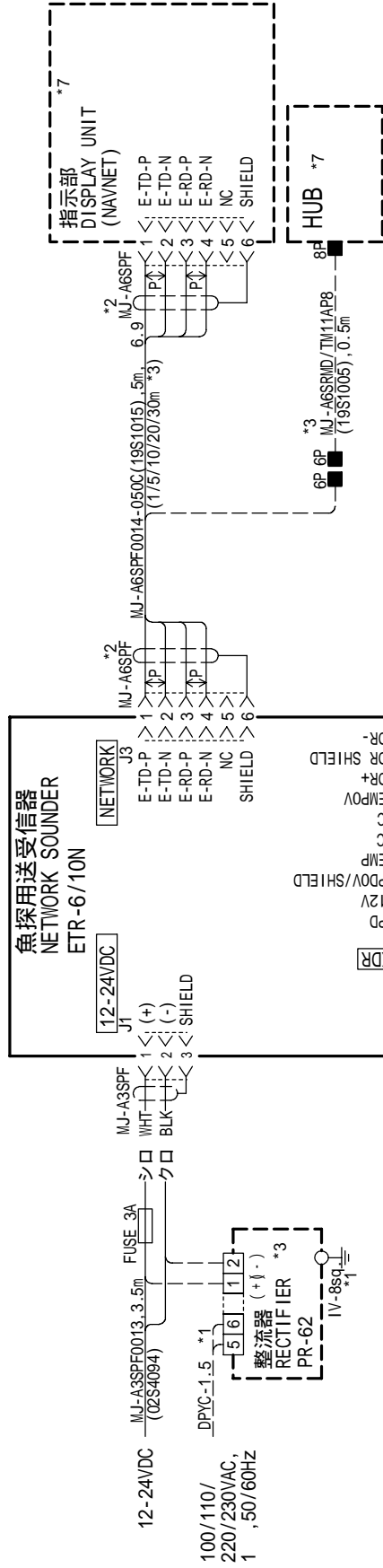
3

2

A

B

C



注記

- * 1) 造船所手配
- * 2) 工場にて取付済み
- * 3) オプション
- * 4) 変換ケーブル組品が必要
- * 5) どちらか一方のみ
- * 6) ETR-6/10N内部でジャンパーコネクタ切換が必要
- * 7) ユーザー手配

NOTE

- * 1. SHIPYARD SUPPLY
- * 2. FITTED AT FACTORY.
- * 3. OPTION
- * 4. THREE-WAY CONVERSION CABLE NEEDED (OPTION).
- * 5. EITHER ONE CAN BE CONNECTED.
- * 6. CHANGE JUMPER CONNECTOR IN THE ETR-6/10N.
- * 7. USER SUPPLY

DRAWN _Sep.28.05 CHECKED TAKAHASHI.T	TITLE ETR-6/10N
APPROVED Y. Hatai	名称 魚探用送受信器
SCALE MASS kg	相互結線図
DWG.No. C2024-C01-C	NAME NETWORK SOUNDER
	INTERCONNECTION DIAGRAM



(Elemental Chlorine Free)

The paper used in this manual
is elemental chlorine free.

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(TATA) ETR-6/10N

FURUNO Authorized Distributor/Dealer

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