

Color Video Sounder FCV-667/668

Installation Manual

This manual contains the necessary procedures for the installation of the FCV-667/668 Color Video Sounder. The basic installation consists of siting and mounting the transducer and the display unit, and cable connection.

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* IME23450H00 *



SAFETY INSTRUCTIONS



WARNING

Do not open the cover unless totally familiar with electrical circuits and service manual.

Improper handling can result in electrical shock.

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 installation site.

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.



CAUTION



Ground the equipment to prevent mutual interference.

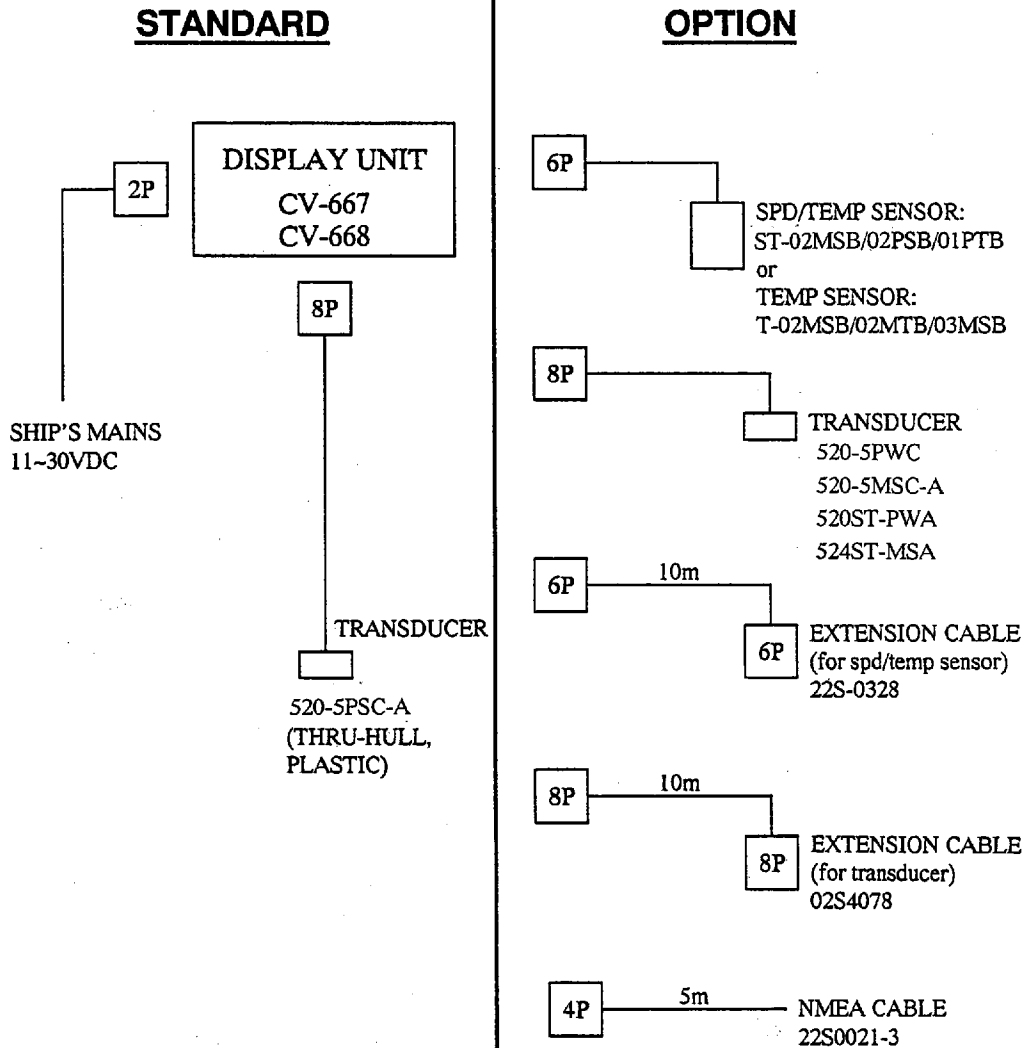
When handling the transducer cable, keep in mind following points.

- **Keep the cable away from oil and fuel.**
- **Keep the cable away from the place where it may be damaged during the installation.**
- **Do not paint the cable.**

The sheath of the transducer cable is made of chlorophrene rubber (or vinyl chloride). Therefore, do not paint the sheath with organic liquid (such as toluene) since it may harm the sheath.

1. SYSTEM CONFIGURATION

The FCV-667/668 consist of the following units.



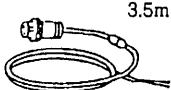
Complete Set

No.	Name	Type	Code No.	Qty	Remarks
1	Display Unit	CV-667-E	-	1	For FCV-667
		CV-668-E-50	-		For FCV-668
		CV-668-E-200	-		
2	Transducer	520-5PSC-A (Thru-hull, Plastic)	000-015-229	1	
3	Installation Materials	CP02-05000	000-014-886	1 set	
4	Accessories	FP02-04400	000-014-986	1 set	
5	Spare Parts	SP02-02100	000-024-730	1 set	
6	Documents	Operator's Manual & Installation Manual		1 set	

Installation Materials


No.	Name	Type	Code No.	Qty	Fig.
1	Power Cable Assembly	22S0023	000-109-516	1	1
2	Vinyl Wire	KIV 2.0sq, 2m	000-554-516	1	2
3	Connector Cap	02-103-1211	100-152-071	1	3

1



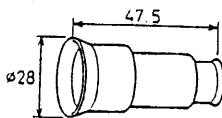
3.5m

2



L=2m

3

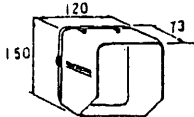


47.5
φ28

Accessories

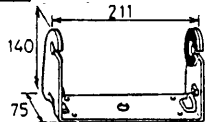
No.	Name	Type	Code No.	Qty	Fig.
1	Viewing Hood	FP02-03410	001-378-780	1	1
2	Bracket	FP02-04410	001-381-750	1	2
3	Knob Bolt Assy	FP02-03621	001-380-620	1 set	3
4	Tapping Screw	6x20, SUS304	000-802-084	4	4

1



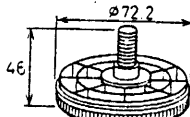
120
150
73

2



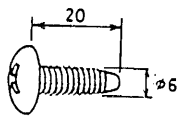
211
140
75

3



φ72.2
46

4



20
φ6

Spare Parts

No.	Name	Type	Code No.	Qty
1	Fuse	FGBO-A 3A, AC125V	000-549-063	2

Option

No.	Name	Type	Code No.	Remarks
1	Rectifier	PR-62, 100VAC	-	
		PR-62, 110VAC	-	
		PR-62, 220VAC	-	
		PR-62, 230VAC	-	
2	EMI Filter	OP02-73	001-381-640	To reduce electro-magnetic interference to other equipment
3	Flush Mount Kit	OP02-72	001-381-630	For flush mounting display unit
4	Magnifying Lens	OP02-62	001-359-000	
5	NMEA Cable Assy	CP02-02320	001-358-810	For connection of naval
6	Transducer (Dual frequency transducer)	520-5MSC-A	000-015-230	Bronze, thru-hull mount
		524ST-MSA	000-015-223	
		525ST-MSA	000-015-262	
		520-5PWC	000-015-108	Transom mount
		520ST-PWA	000-015-106	Transom mount, with speed/temp sensor
		525ST-PWC	000-015-260	
7	Kick-up Bracket	OP02-29	000-014-413	For transom mount transducer
8	Adhesive	OP02-31	000-013-634	For inside-hull mount
9	Extension Cable Assy	02S4078	000-131-748	For transducer
10	Speed/Temperature Sensor	ST-02MSB	000-137-986	Bronze, thru-hull mount
		ST-02PSB	000-137-987	Plastic, thru-hull mount
		ST-01PTB	000-109-503	Transom mount
11	Temperature Sensor	T-02MSB	000-040-040	Bronze, thru-hull mount
		T-03MSB	000-040-027	Bronze, thru-hull mount
		T-02MTB	000-040-026	Transom mount
12	Speed/Temperature Sensor Bracket	OP02-030	000-014-414	For ST-01PTB
13	Extension Cable Assy	22S0328	000-131-749	For spd/temp sensor
14	Inner Hull kit	22S0191	000-802-598	

2. MOUNTING

2.1 TRANSDUCER

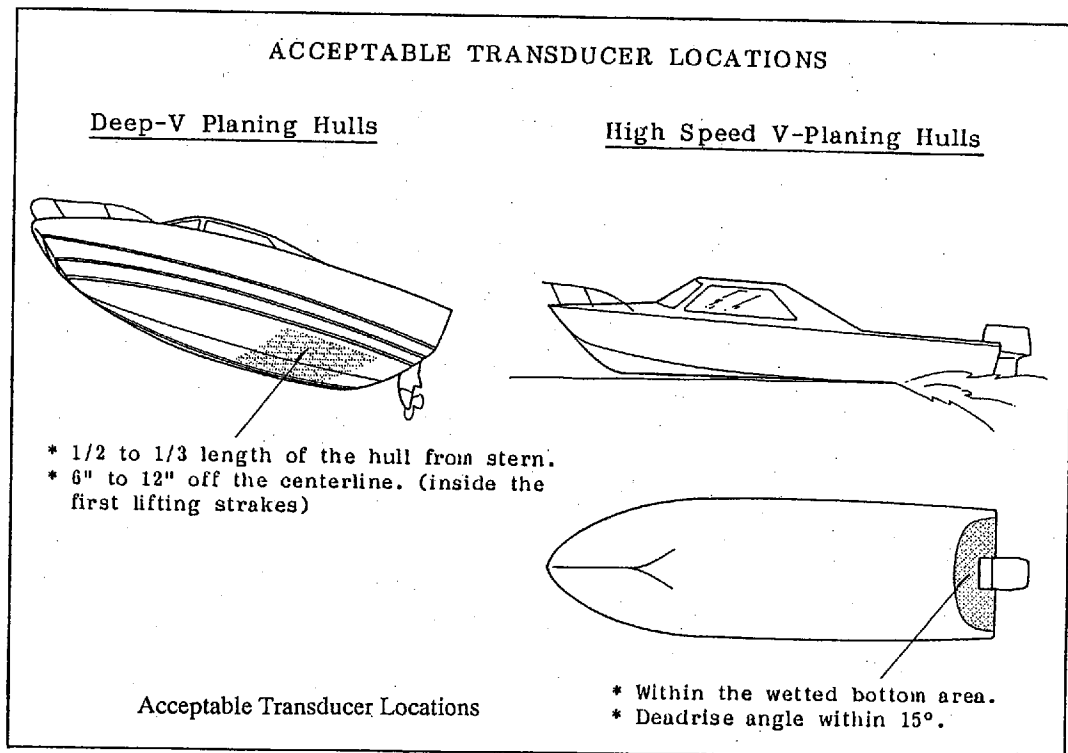
Overview

The FCV-667/668 are available with either a transom mount, inside-hull mount or through-hull mount transducer. This section shows installation procedure for the through-hull and inside-hull mounts which can be performed with the standard supply transducer 520-5PSC and optional transducer 520-5MSC. For transom mount installation, refer to "4. Optional Device Installation".

Location

The performance of the video 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 (8m) 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 rifting strakes are notorious for creating acoustic noise, and these must be avoided by keeping the transducer inboard of them.

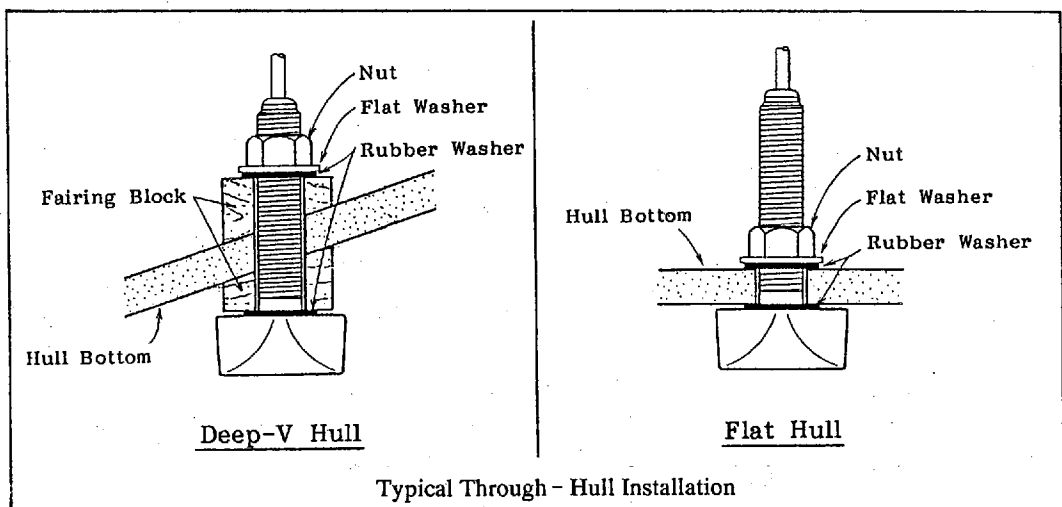


- The transducer must always remain submerged, even when the boat is rolling, pitching or up on a plane at high speed.
- For displacement hulls, using inside-hull and through-hull installations, a practical choice would be somewhere between $\frac{1}{3}$ and $\frac{1}{2}$ of the boat's length from the stern. For planing hulls, a practical location is generally rather far astern, so that the transducer is always in the water regardless of the planing attitude.

Through-Hull Mount

Overview

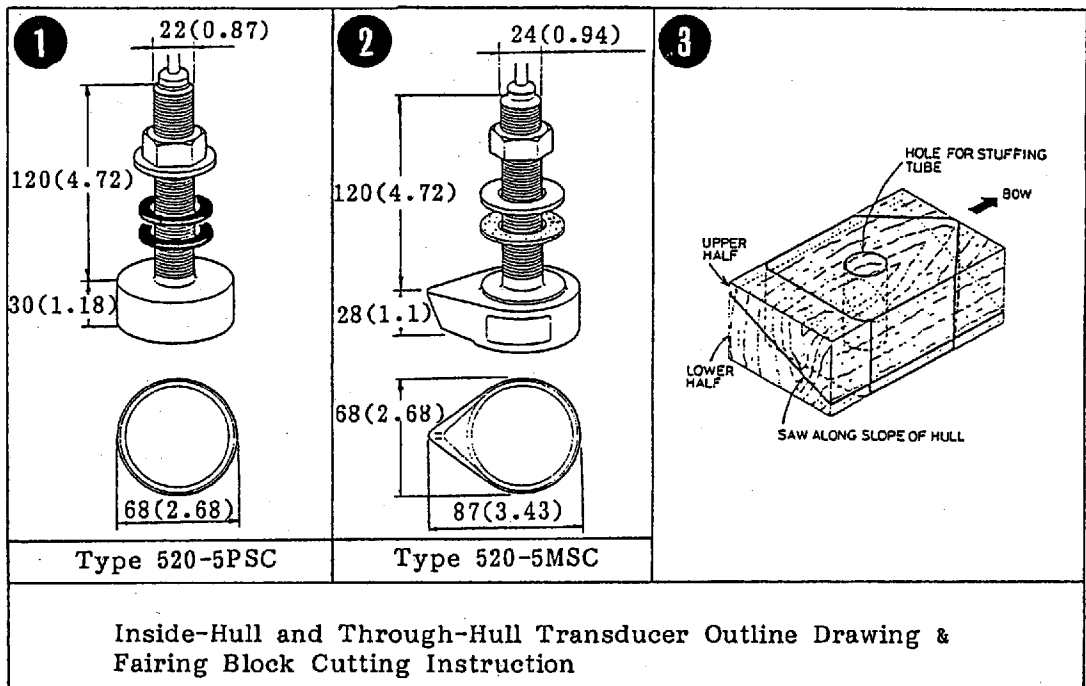
This type of mounting provides the best performance of all, since the transducer protrudes from the hull and the effect of air bubbles and turbulence near the hull skin is reduced. To determine the transducer location, keep in mind the general considerations described on page 4. Also when the boat has a keel, the transducer should be at least 30cm (1 foot) away from it. Typical through-hull mountings are illustrated below.



Mounting Procedure

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 degrees 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 on the next page 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.

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



Inside-Hull Mount

Introduction

While this is by no means an optimum mounting scheme for deep water sounding, this type of mounting can sometimes be used on fiberglass boats. A transducer can be likened to an antenna used with a TV set. Mounting an antenna inside your attic is like mounting an echo sounder transducer inside the hull. Both will work well enough, but are hardly optimum for either TV or echo sounder operation.

Mounting Location

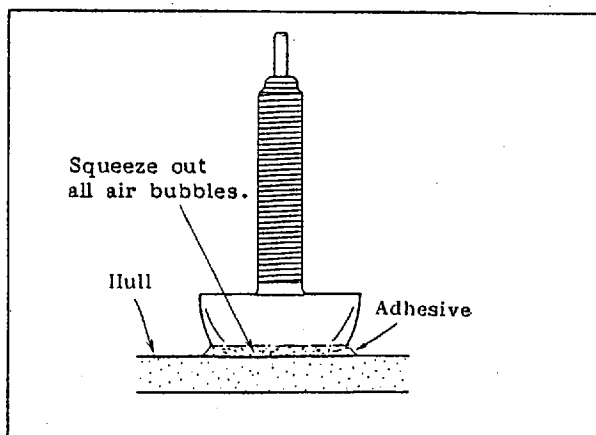
In addition to the general considerations described on page 4, you must be sure that the transducer is in an area that has a single-hull thickness and is void of air or flotation materials other than solid fiberglass between the transducer face and the water. Also, do not place the transducer over hull struts or ribs which run under the hull. Further, avoid a location where the rising angle of the hull exceeds 15° to minimize the effect of the boat's rolling.

It is advisable that you may finalize the mounting location through a little trial and error after you have completed all other installation works. Temporarily put some silicone grease (not the type that sets up after drying!) inside the hull. Push the transducer down to squeeze out any air bubbles. Turn on your unit. Run the boat at various speeds and move the transducer to different locations to select the position where you may get the best picture. Once you find a good location, permanently mount the transducer.

The inside-hull mounting is accomplished as follows. See page 6 for outline drawing.

Mounting Procedure

1. Lightly roughen the transducer face with fine #10 sandpaper and degrease it with a solvent (thinner or alcohol). Also, roughen and degrease the inside of the hull where you mount the transducer.



2. Allow both to dry completely, then coat the transducer face and the hull with the adhesive (option). In a cold environment, warm the adhesive to about 40°C before usage to soften it.
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 adhesive. Allow sufficient time for the adhesive to dry.

Transducer Preparation and Painting

Just before putting your boat into the 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. Cutting this will lengthen the time required for complete "saturation" and will reduce the performance of the unit.

To maintain the sensitivity of the transducer, do not coat the face with heavy pigmented antifouling paints, that is, cuprous oxide types. Use only a light, thin coat of a vinyl based antifouling paint, like International Paint's TRI-LUX No.67 or No.68.

2.2 DISPLAY UNIT

Mounting Location

The display unit is carefully constructed to be able to withstand the humidity and corrosive atmosphere common in the marine environment, but it is not designed to be used outside, directly exposed to that environment. Salt water splash will most assuredly cause damage to the sensitive components inside. Keep these and the following factors in mind when planning the installation of the display unit.

■ CAUTION

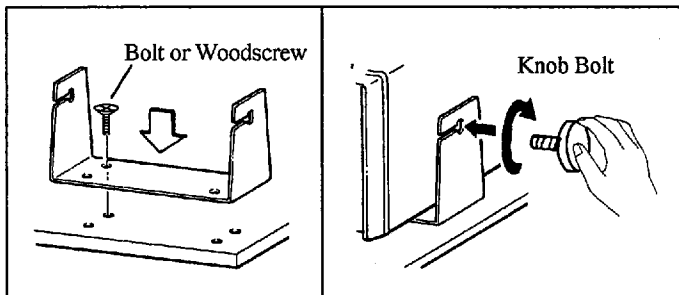
Furuno will assume no responsibility for the damage caused by exposure to either fresh or salt water.

- The display unit consumes very little power, so there is no need of forced air ventilation. However it is necessary to provide at least some circulation of cooling air by allowing sufficient space around the unit.
- The display unit must be mounted inside an enclosed cabinet, completely shielded from salt water spray, and from fresh water spray if the boat is usually hosed down after a day's outing. Most small center console boats are equipped with such an enclosed cabinet behind the wheel, and most have clear doors so that equipment may be seen behind them.
- Consideration should be made to provide space for access to the mounting hardware on the side and connectors behind the display unit. Also allow at least a foot or so of service loop in the cables to allow the unit to be pulled forward for servicing or internal adjustment.
- Even though the display is quite legible even in direct sunlight, it is recommended to keep the display unit out of direct sunlight or at least shaded because of heat that can build up inside the cabinet.
- The display unit can be mounted either on table-top, bulkhead or overhead. Make sure that the selected location is strong enough to support the unit under the conditions of continued vibration or shock which will be normally encountered on the boat. If necessary, appropriate reinforcement measure should be taken in the mounting area.
- The display unit should be mounted apart from equipment emitting heat. Also, do not put things on the top of the unit.

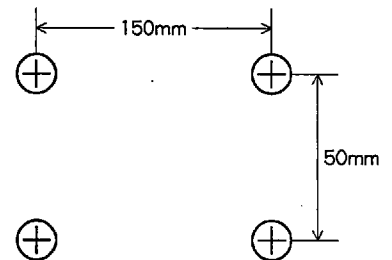
Mounting using Bracket

The display unit can be mounted as follows on a table-top, bulk-head or overhead by using the bracket supplied as standard.

1. Mark the screw locations by using the bracket as a template.
2. Drill four pilot holes for the bracket.
3. Install the bracket by using self-tapping screws.
4. Install the display unit on the bracket. Tighten the knobs securely.



Mounting Hole Dimension



Mounting using Flush Mount Kit (Option)

Many owners undoubtedly use the FCV-667/668 on small boats, many with center consoles and wish to mount flush with console panel. It is recommended that the flush mount kit OP02-72 be used for this purpose. Detailed installation instruction is attached to the flush mount kit.

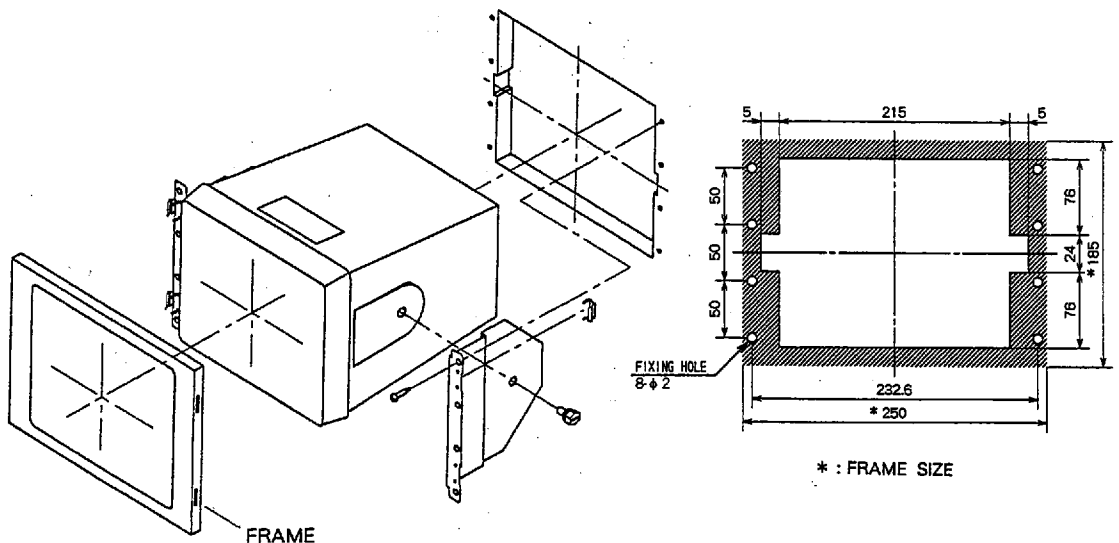


表 1
TABLE 1

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

4

3

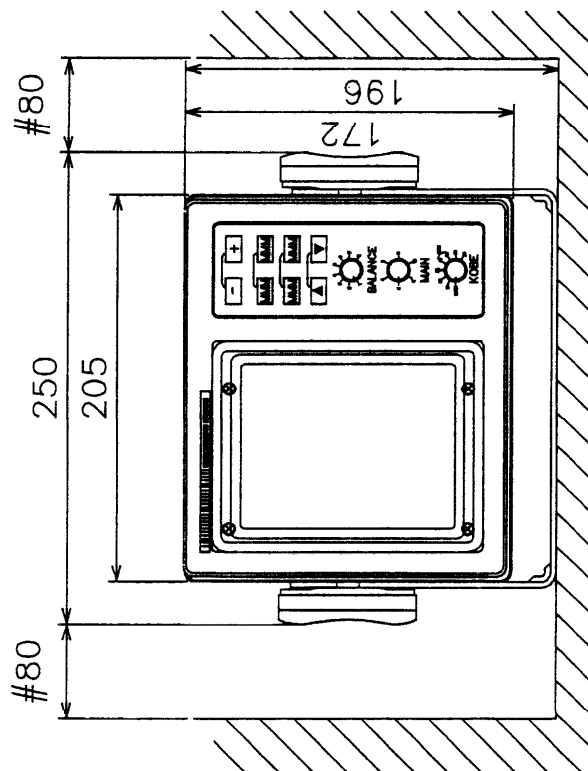
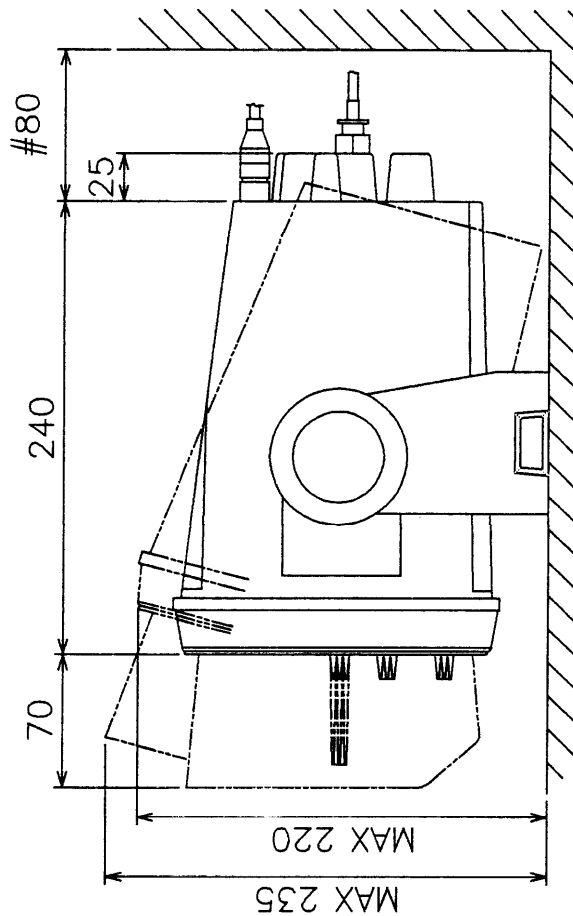
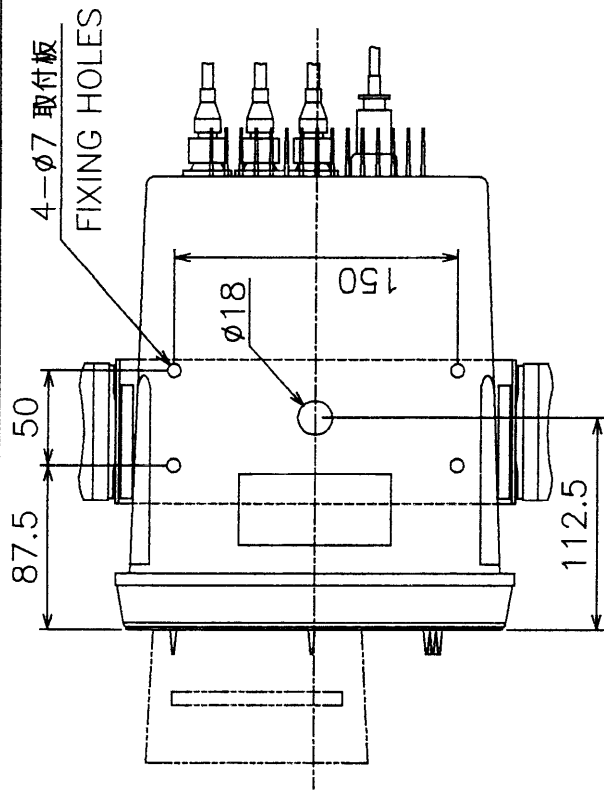
2

A

B

C

11



注記

- 1) 指定なき寸法公差は表 1 による。
- 2) # ; 推奨するサービスクリアランス。

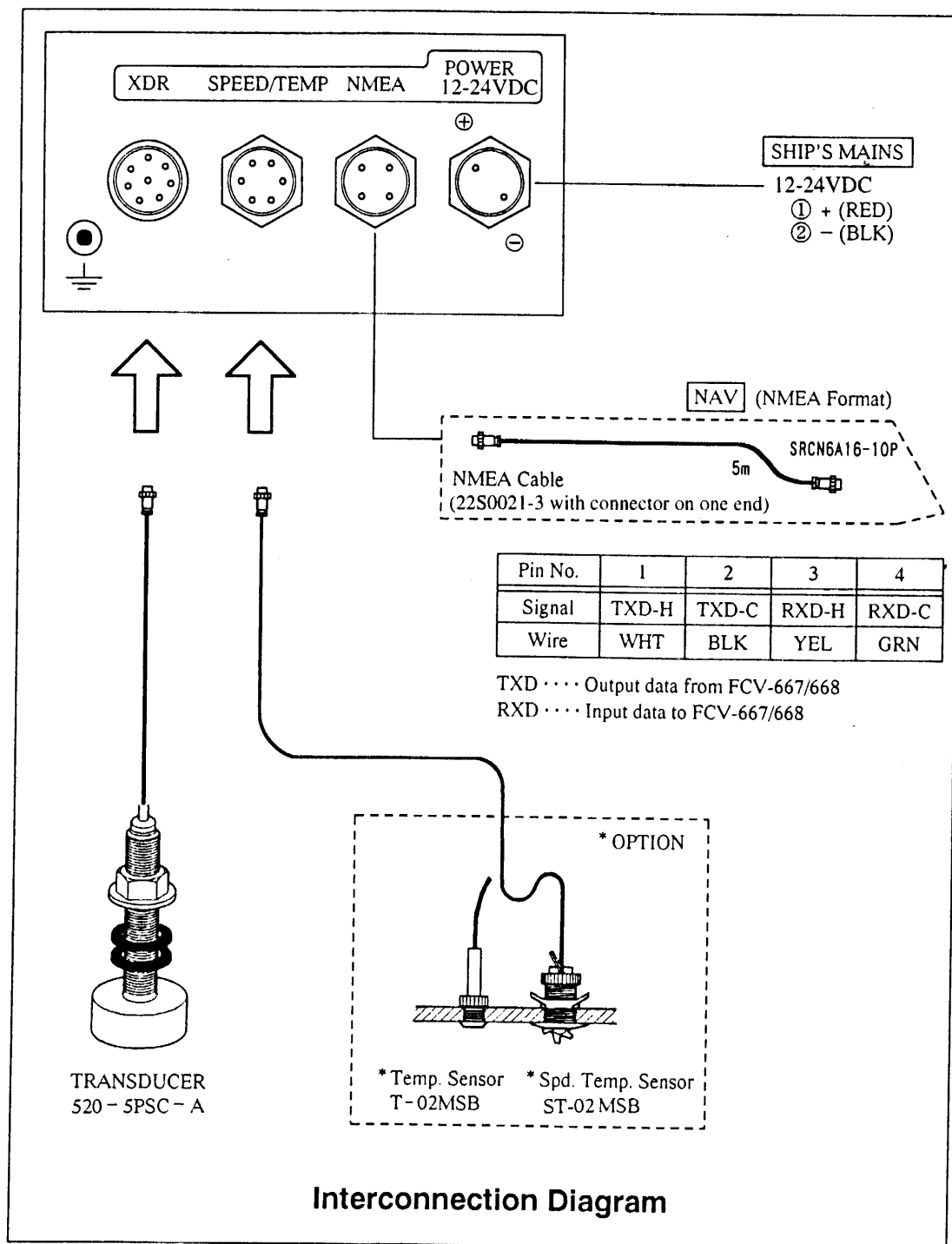
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
2. # ; RECOMMENDED SERVICE CLEARANCE.

DRAWN Jun 27 '01 T.YAMASAKI	CHECKED Jun 27 '01 Y.KIMURA	APPROVED Jun 27 '01 Y.KIMURA	SCALE 1/4	MASS 4.5 kg	BLOCK NO. (0000)	NAME DISPLAY UNIT	OUTLINE DRAWING
TITLE CV667/668, CV-611/612	名 称 指示器	外寸法	外寸法	外寸法	外寸法	外寸法	外寸法

3. CABLE CONNECTION

Cable connections to the FCV-667/668 display unit are made at the connectors located at the rear of the unit. The figure below shows the wiring instructions.



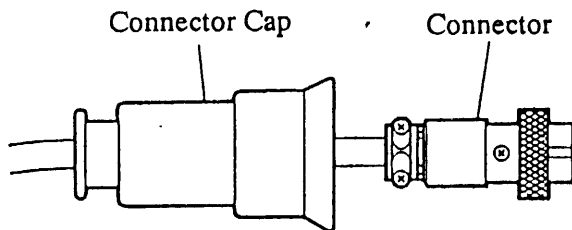
Transducer Cable

In order to minimize the possibility of picking up electrical interference, avoid where possible routing the transducer cable near other on-board electrical equipment. Also avoid running the cable in parallel with power cables.

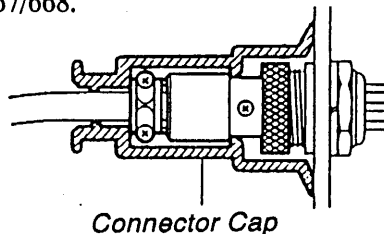
Waterproofing Connector

An ordinary connector has been fitted to the transducer cable. To make it waterproof, attach the connector cap supplied as an installation material.

1. Unsolder the connector FM-148P from the transducer cable.



2. Pass the cable through the connector cap and refit the connector.
3. Plug the connector into the receptacle on the FCV-667. Slide the connector cap over the connector and press it onto the chassis of the FCV-667/668.



■ NOTE:

The power, NMEA and temperature/speed sensor cables have been fitted with waterproof connectors. The display unit is splash proof.

Power Cable

The FCV-667/668 is designed to operate normally at a voltage between 11 and 30Vdc. The power should be directly taken from the distribution board or breaker panel.

Connect the red lead of the cable to the positive (+) terminal of the battery and the black lead to the negative (-) terminal.

■ CAUTION

Reversing the polarity will result in blowing the fuse.

Connection to Nav-Equipment

To connect the FCV-667/668 with the position fixing equipment, the NMEA cable assembly (type CP02-02320, code no. 001-358-810) is optionally required. The contents of the assembly are as follows.

No.	Name	Type	Qty
1	NMEA Cable	22S0021-3	5m
2	Connector	SRCN6A16-10P	1
3	Rubber Bush	02-073-2001-0	1

The FCV-667/668 accept Furuno CIF or NMEA #0183 format data. The table below shows NMEA sentences which are accepted by the FCV-667/668.

NMEA 0183 Format Input/Output Sentence (version 1.5)

Input	RMB, BWC, RMC, RMA, GLL, VTG, VHW, MTW, XTE
Output	SDDBT (depth), YCMTW* (watertemperature), VWVHW* (ship's speed), SDDPT (depth)

*When speed/temperature sensor is connected

Connection

Connect the yellow and green leads of the cable to the signal and return lines of the position fixing equipment respectively.

Grounding

The FCV-667/668 MARK-2 are designed to operate normally without grounding the display unit, provided that the cable routing precautions stated before are taken. However in some cases, interference may show up at high gain settings, and it may become necessary to ground the unit to the boat's grounding bus to eliminate the problem. In such cases, run a heavy duty ground wire from the grounding terminal on the rear bottom of the display unit to the nearest grounding point on the boat.

On a fiberglass boat, it is best to install a ground plate that measures about 20 cm by 30 cm (0.8 feet by 1.0 feet) on the outside of the hull bottom to provide a ground point. If this is not practical, the engine block can be used.

4. OPTIONAL DEVICE INSTALLATION

Transom mount Transducer (520-PWC/520ST-PWA)

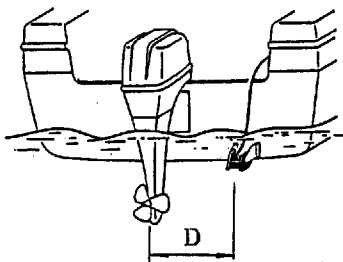
Introduction

This type of mounting is very commonly employed, usually on relatively small I/O or outboard boats. Do not attempt this mounting on an inboard boat because turbulence is created by the propeller ahead of the transducer

Procedure

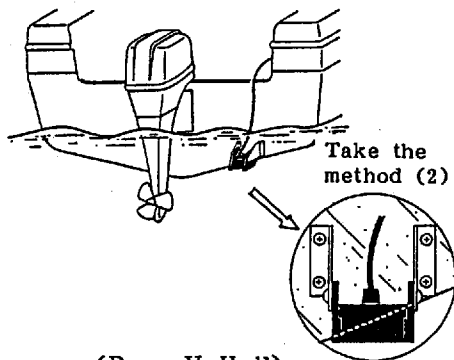
1. Attach the transducer to the bracket.
2. To determine a suitable transducer mounting location, run the boat at several speed ranges and observe the water flow at the rear and near the transom. Suitable location is at least 50 cm away from engine and where the water flow is smooth.
3. On a relatively flat hull, the transducer is mounted flush with the hull-bottom, and there are two choices of installation as shown on the next page. Note that the direction of the transducer and fixing holes used on the brackets are different in each method. Although there is less influence from air bubbles with method (2), you must be careful not to damage the transducer when the boat is hauled out of the water/put on the trailer. On a deep "V" hull, the transducer is mounted in the same method as method (2). It should be mounted as near as the bottom edge of the transom, and the transducer face must be parallel with the seabed, not with the hull bottom.
4. Mark the screw locations by holding the transducer in position on the transom.
5. Drill four pilot holes.
6. Mount the transducer and secure it with four self-tapping screws. Small amount of sealing compound under the head of each screw will preserve the watertight integrity of the transom.
7. Adjust the transducer position so that the transducer faces right the seabed.
8. If necessary, to improve water flow and minimize air bubbles staying on the transducer face, incline the transducer about 5 degrees at the rear. This may require a certain amount of experimentation for fine tuning at high cruising speeds.
9. Fill the gap between the wedge front of the transducer and transom with epoxy material to eliminate any air spaces.

When the transducer with speed/temperature sensor (molded in one unit: 520ST-PWA) is installed, follow the installation methods (2) on the next page.



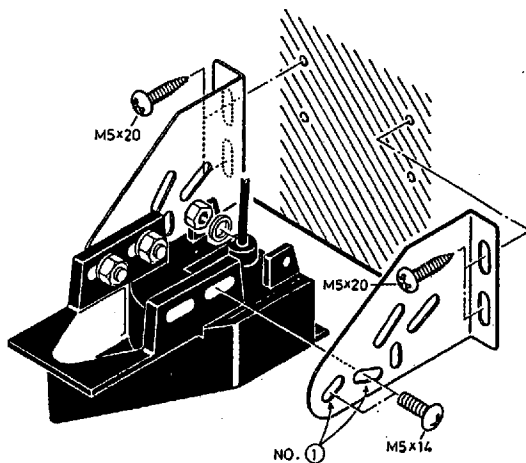
$D \geq 50 \text{ cm (18")}$

(Flat Hull)

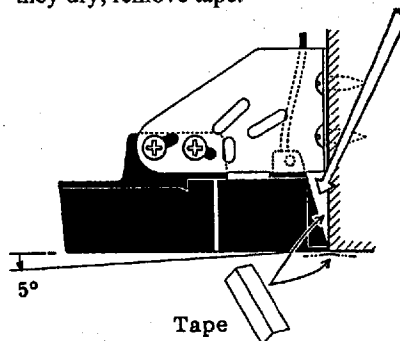


(Deep V-Hull)

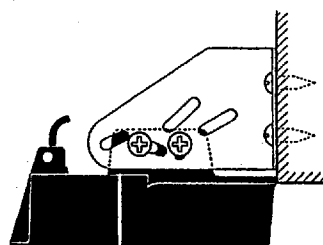
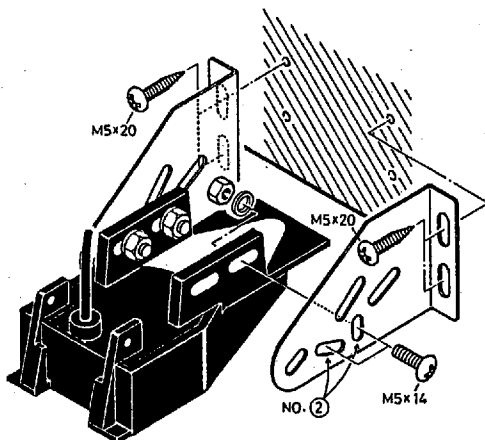
METHOD (1) ... flush with hull



Cover the gap between transducer and hull plate with tape. Fill in epoxy materials and wait until they dry. When they dry, remove tape.



METHOD (2) ... projected from hull

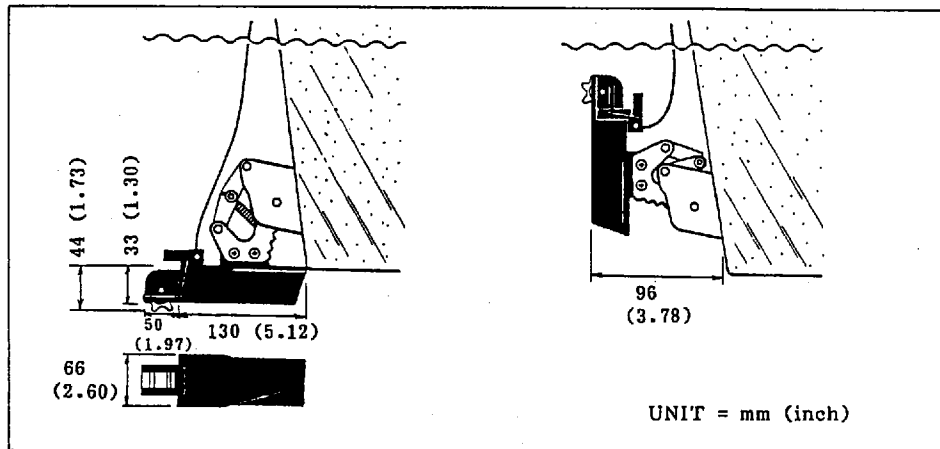


Installation

Mounting Transom Mount Transducer using Kick-up Bracket (OP02-29)

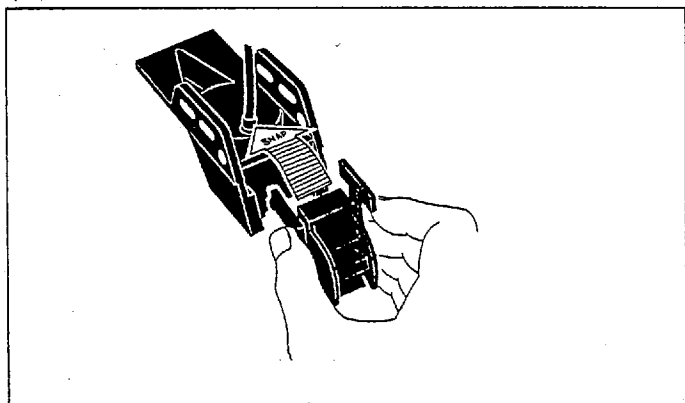
When the transducer is mounted projected from the hull bottom as shown below, it is subject to damage or loss due to floating objects, such as a log.

To minimize such an accident it is recommended to install the transducer, using the optional Kick-up Bracket. When an impact by a floating object or extraordinary water pressure is applied, the transducer is kicked up and damage or loss will be avoided. It may be also used to flip the transducer up when the boat is hauled out of water and put on a trailer.

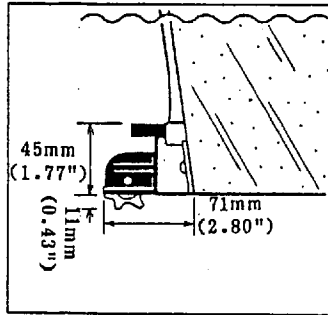


Transom Mount Speed/Temperature Sensor (ST-01PTB)

- 1) When the transom mount transducer (520-5PWC) is installed projected from the hull bottom or is mounted with the kick-up bracket, the speed/temperature sensor can be directly attached to it without using any installation material.



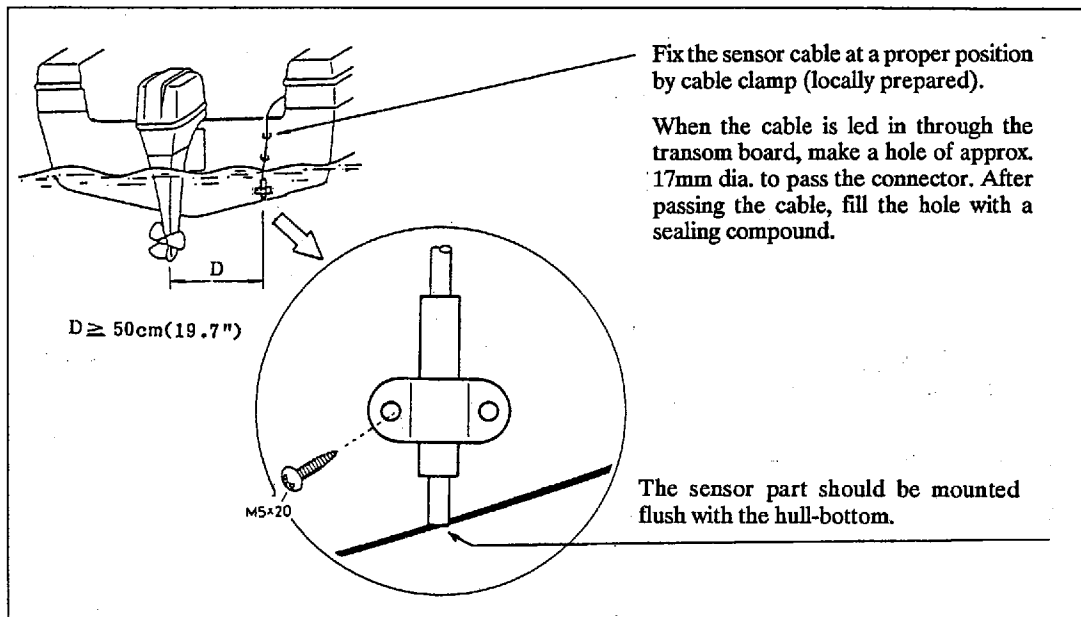
- 2) When the transom mount transducer (520-5PWC) is installed flush with the hull bottom, you can not attach the speed/temperature sensor to the transducer because it is mounted with the sensor snapping side directed to the transom. In this case, you must install the speed/temperature sensor separately, using the optional Sensor Bracket (OP02-030). See below figure.



Temperature Sensor (T02MTB/T-02MSB/T-03MSB)

Transom Mount (T-02MTB)

Mounting Location and Mounting Method



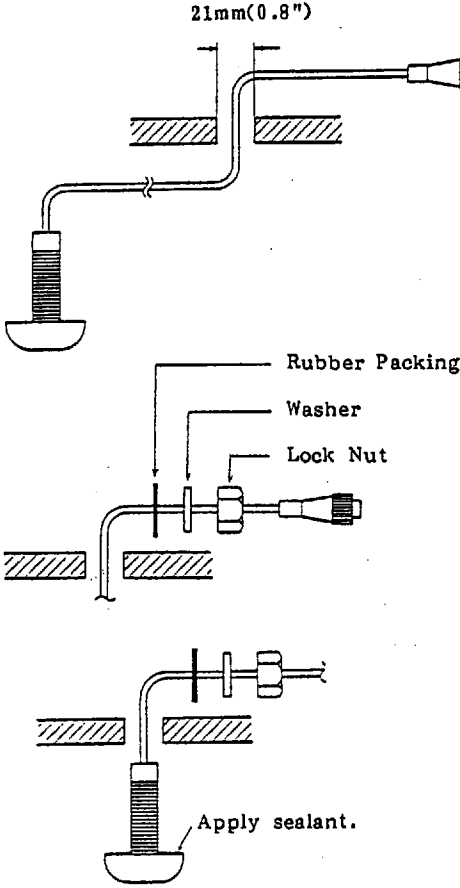
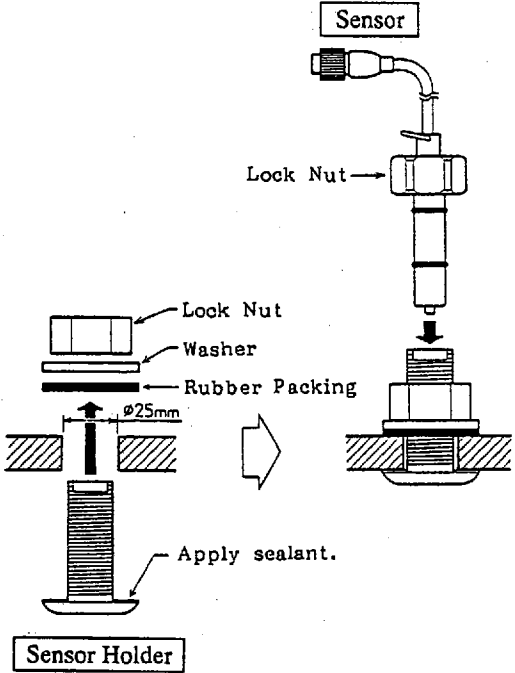
Thru-hull Mount (T-02MSB/ T-03MSB)

Mounting Location

- 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 forward direction viewing from the drain hole for cooling water.
- Select a place free from vibration.

Mounting Procedure

T-02MSB		T-03MSB	
1	Dry-dock the boat.	1	Dry-dock the boat.
2	Make a hole of approx. 21mm dia. on the hull bottom	2	Make a hole of approx. 25mm dia. on the hull bottom.
3	Run the sensor cable through the hole.	3	Apply high grade sealant to the flange of the sensor holder and pass the sensor holder through the hole.
 <p>21mm(0.8")</p> <p>Rubber Packing</p> <p>Washer</p> <p>Lock Nut</p> <p>Apply sealant.</p>		 <p>Sensor</p> <p>Lock Nut</p> <p>Lock Nut</p> <p>Washer</p> <p>Rubber Packing</p> <p>25mm</p> <p>Apply sealant.</p> <p>Sensor Holder</p>	

4	Pass the cable through the rubber packing, washer and the lock nut as shown above.	4	Fix the sensor holder to the hull bottom using the rubber packing, washer and lock nut. Do not tighten the nut excessively. (58.8Nm max.)
5	Apply high grade sealant to the sensor flange as shown above.	5	Insert the sensor to the sensor holder and tighten by the nut.
6	Fix the sensor by turning the lock nut. Do not tighten the nut excessively. (58.8Nm max.)	6	After launching, check for water leakage around the sensor.
7	After the launching, check for water leakage around the sensor.	7	Note: 1) For boats of more than 25 mm thick hull plate, this sensor can not be installed. 2) When the sensor seems to be deteriorated, the check, cleaning or replacement can be carried out without dry-docking.

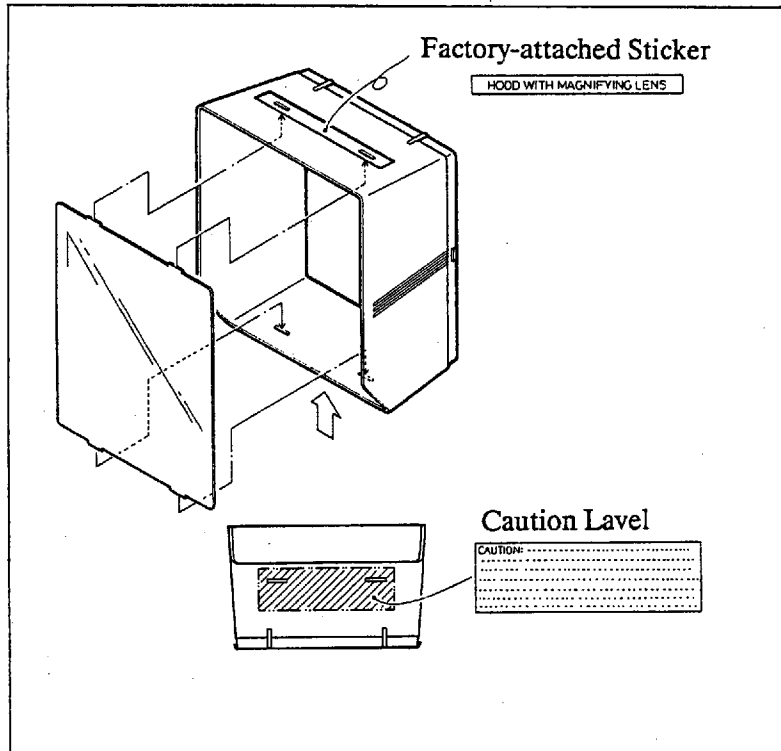
Through-hull Mount Speed/Temperature Sensor (ST-02PSB/ST-02MSB)

Refer to the installation manual attached to the sensor.

Attaching Magnifying Lens to Viewing Hood

The optional magnifying lens expands the display to 7" size. To attach it to the viewing hood follow the procedure below.

1. Peel off the factory-attached sticker from the top of the hood.
2. Fix the caution label to underside of the hood.
3. Set the legs of the lens in holes of the viewing hood.



APPENDIX

TRIDUCER 525ST-PWC/PWD

This appendix provides a copy of the installation instructions for AIRMAR triducer. If you loose 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 form 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**).

Height without
speed sensor
191mm (7-1/2")

Height with
speed sensor
213mm (8-1/2")

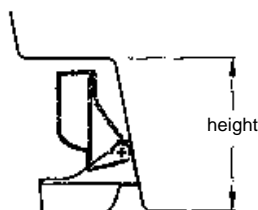


Figure 1. Height required at mounting location

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.

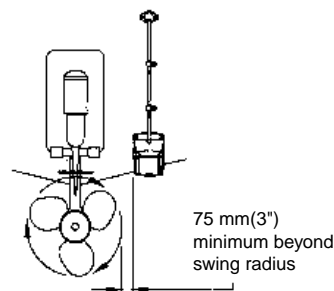


Figure 2. Mounting location on single drive boat

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

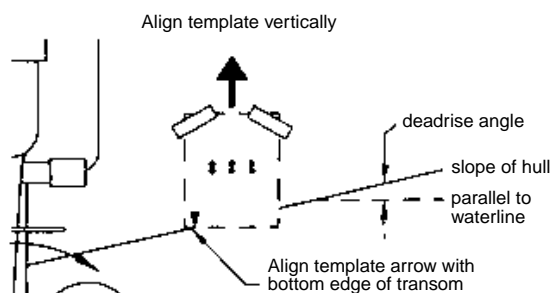


Figure 3. Template position

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.

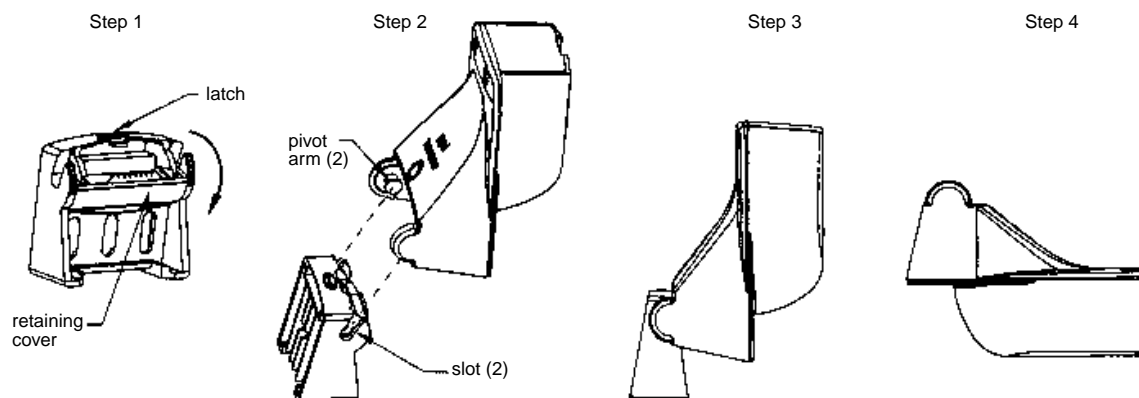
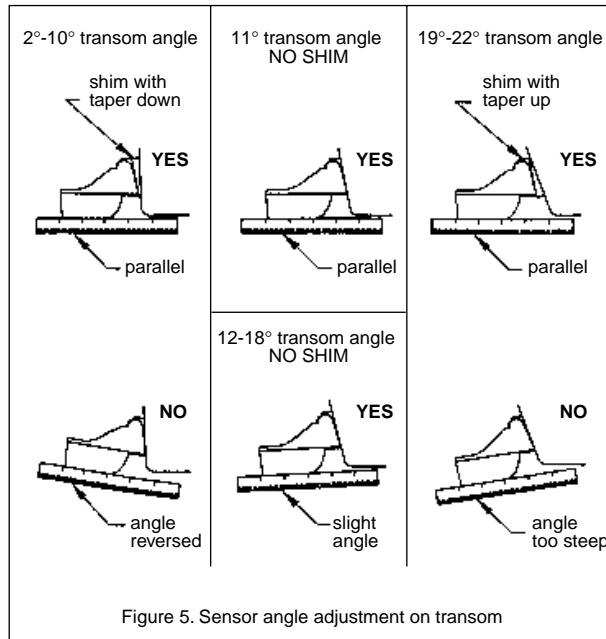


Figure 4. Attaching the sensor to the bracket



- 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.

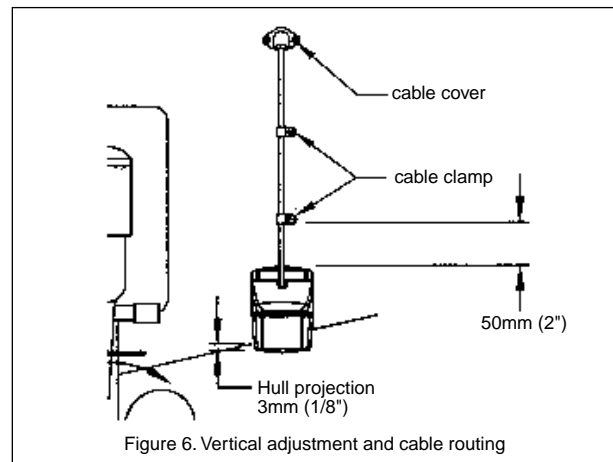
Cable Routing

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

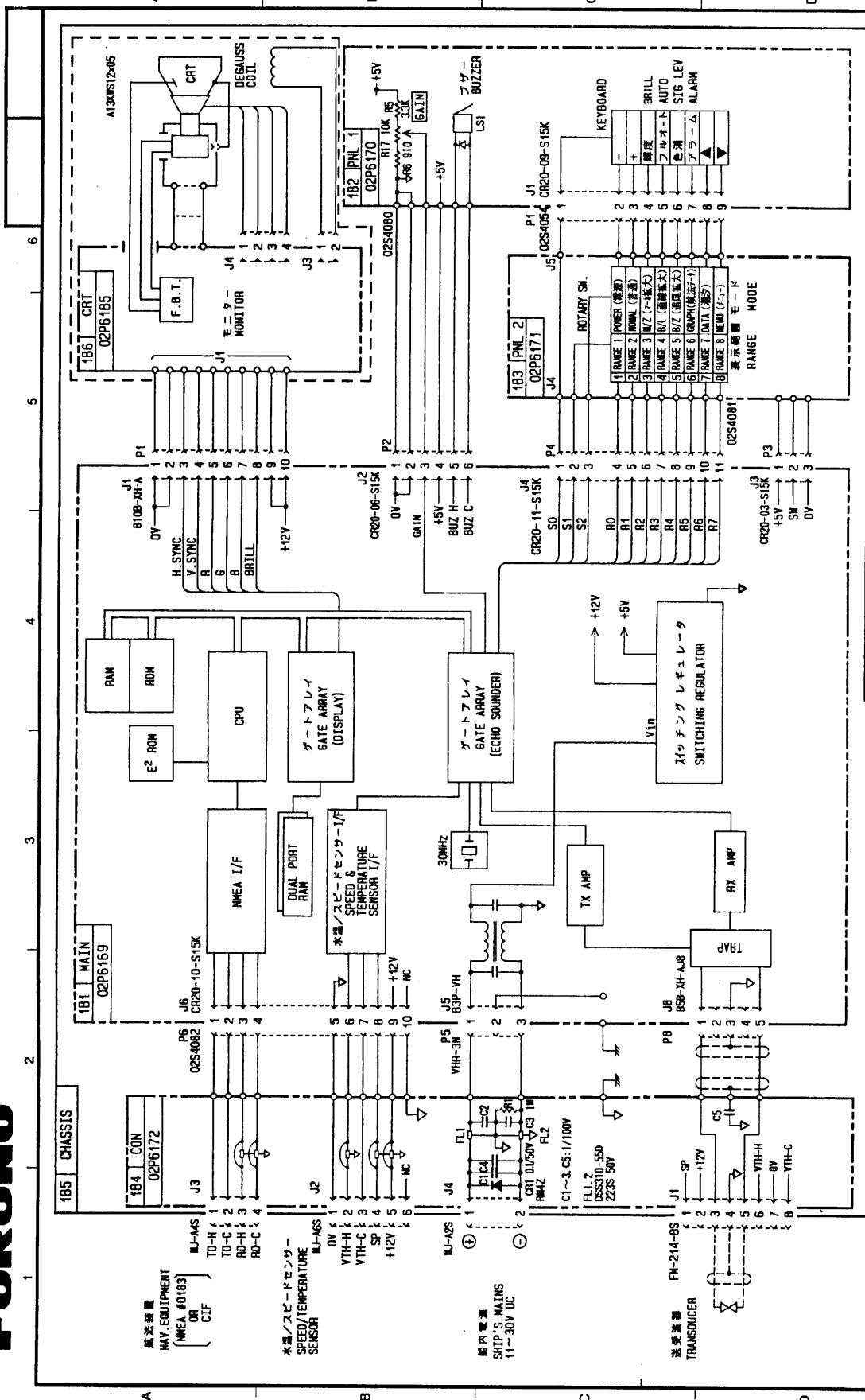
Caution: Never cut the cable or remove the connector; this will void the warranty.

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.







DRAWN JAN 1999 T. Nakamura		TYPE CV-668	SCHEMATIC DIAGRAM	
CHECKED SEP 1999 K. Kikuchi		名称 指示器		
APPROVED SEP 1999 K. Kikuchi		回路図		
SCALE 1		BLOCK NO.		
DATE NO. C2348-K01-C		FCV-668		
		APPLICABLE TO: (OPTIONAL)		
		DISPLAY UNIT		

FURUNO ELECTRIC CO., LTD.