

FURUNO

INSTALLATION MANUAL

COLOR LCD SOUNDER

MODEL FCV-600L



FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN



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.

Observe the following compass safe distances:

	Standard	Steering
Display Unit	0.8m	0.6m

When handling the transducer cable, keep in mind the 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.

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EQUIPMENT LISTS

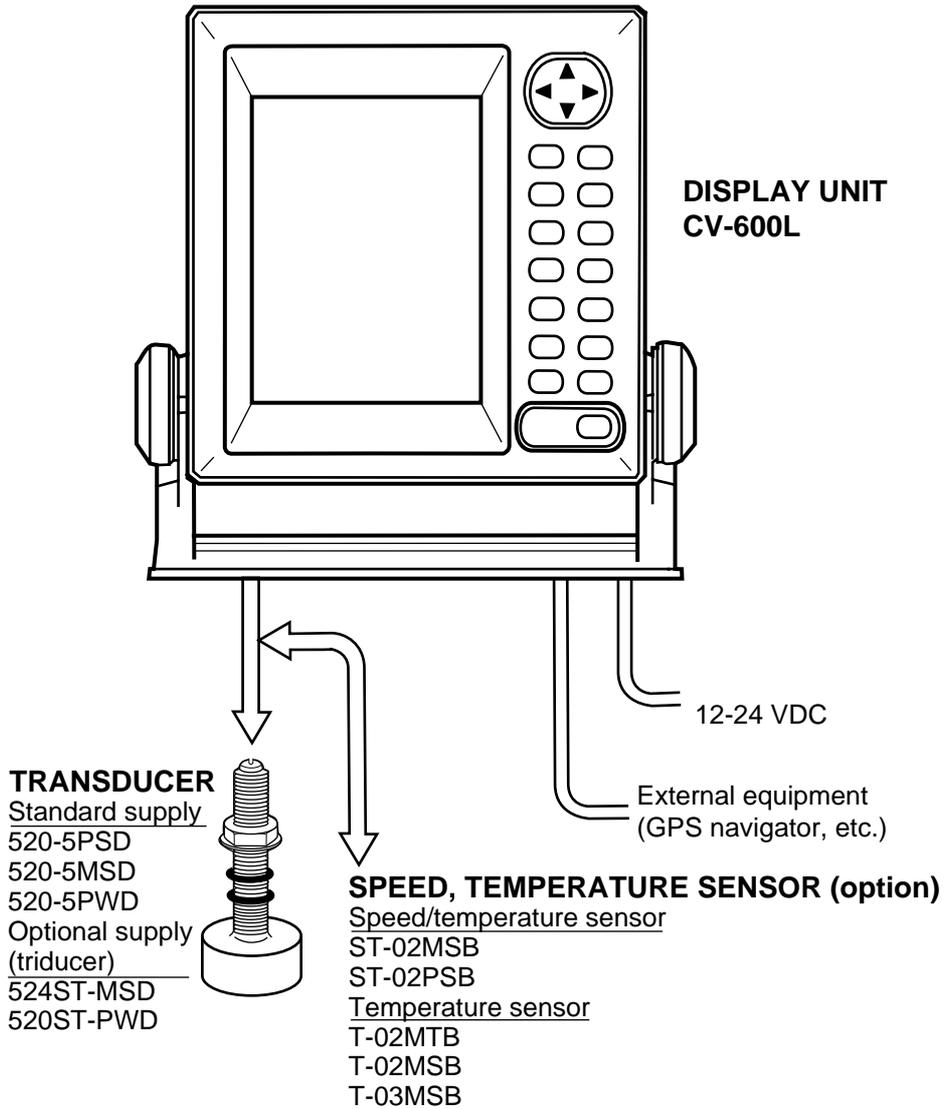
Standard Supply

No.	Name	Type	Code No.	Qty	Remarks
1	Display Unit	CV-600L		1	
2	Installation Materials	CP02-06000	000-015-398	1 set	Includes power cable
3	Spare Parts	SP02-03800	004-399-110	1 set	
4	Transducer	520-5PSD	000-015-125	Select one	Inside-hull
		520-5MSD	000-015-127		Inside-hull, w/8 m cable
		520-5PWD	000-015-126		Transom mount, w/8 m cable

Optional Supply

No.	Name	Type	Code No.	Remarks
1	Rectifier	PR-62		
2	Cable Assy.	MJ-A6SPF0012-050	000-134-424	6P-6P, 5 m
		MJ-A6SPF0012-100	000-133-817	6P-6P, 10 m
3	Cable Assy.	MJ-A6SPF0011-050	000-132-244	6P-4P, 5 m
		MJ-A6SPF0011-100	000-132-336	6P-4P, 10 m
4	Triducer	524ST-MSD	000-015-224	
		525ST-MSD	000-015-263	
		520ST-PWD	000-015-128	
		525ST-PWD	000-015-261	
5	Temperature Sensor	T-02MTB	000-040-026	With 8 m cable, transom mount
		T-02MSB	000-040-040	Thru-hull type
		T-03MSB	000-040-027	With 8 m cable, thru-hull type
6	ST Sensor	ST-02MSB	000-137-986	Thru-hull type
		ST-02PSB	000-137-987	With 8 m cable, thru-hull type
7	Inside Hull Kit S	22S0191-0	000-802-598	
8	Converter Connector	02S4093	000-134-901	Transducer of AIRMAR CORP.
9	Converter Connector	02S4147	000-141-082	Water temperature/speed sensor
10	Converter Connector	02S4167	000-142-503	Extends standard transducer cable 10m.

SYSTEM CONFIGURATION



MOUNTING

1.1 Display Unit

Mounting considerations

The display unit can be installed on a tabletop or on the overhead. When selecting a mounting location for the display unit keep the following in mind:

- Keep the display unit out of direct sunlight.
- 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.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables.
- A magnetcompass will be affected if placed too close to the display unit. Observe the following compass safe distances to prevent disturbance to the magnetcompass:

Standard compass: 0.8 meters
Steering compass: 0.6 meters

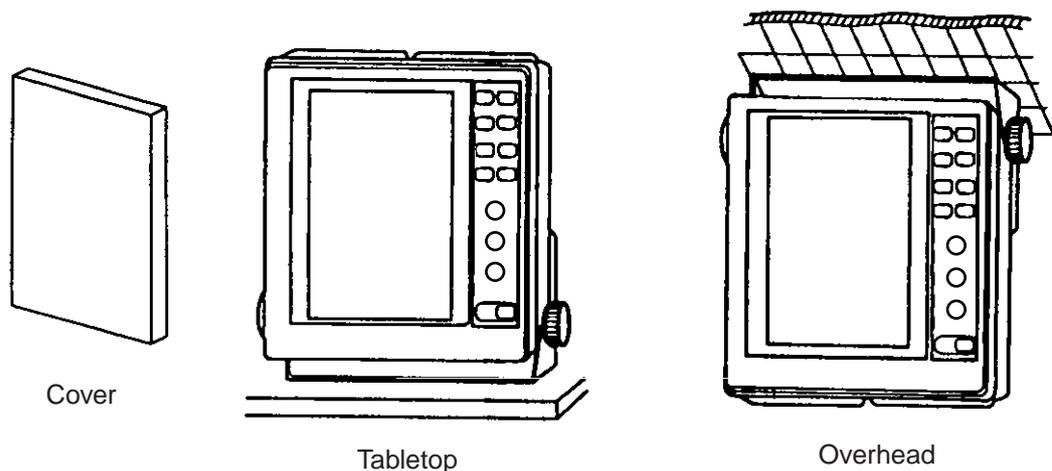
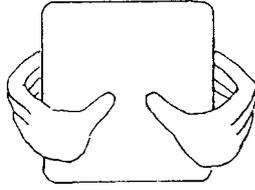


Figure 1-1 Display unit mounting methods

Removing cover

While pressing the center of the cover with your thumbs as illustrated, pull the cover towards you to remove it.



Mounting procedure

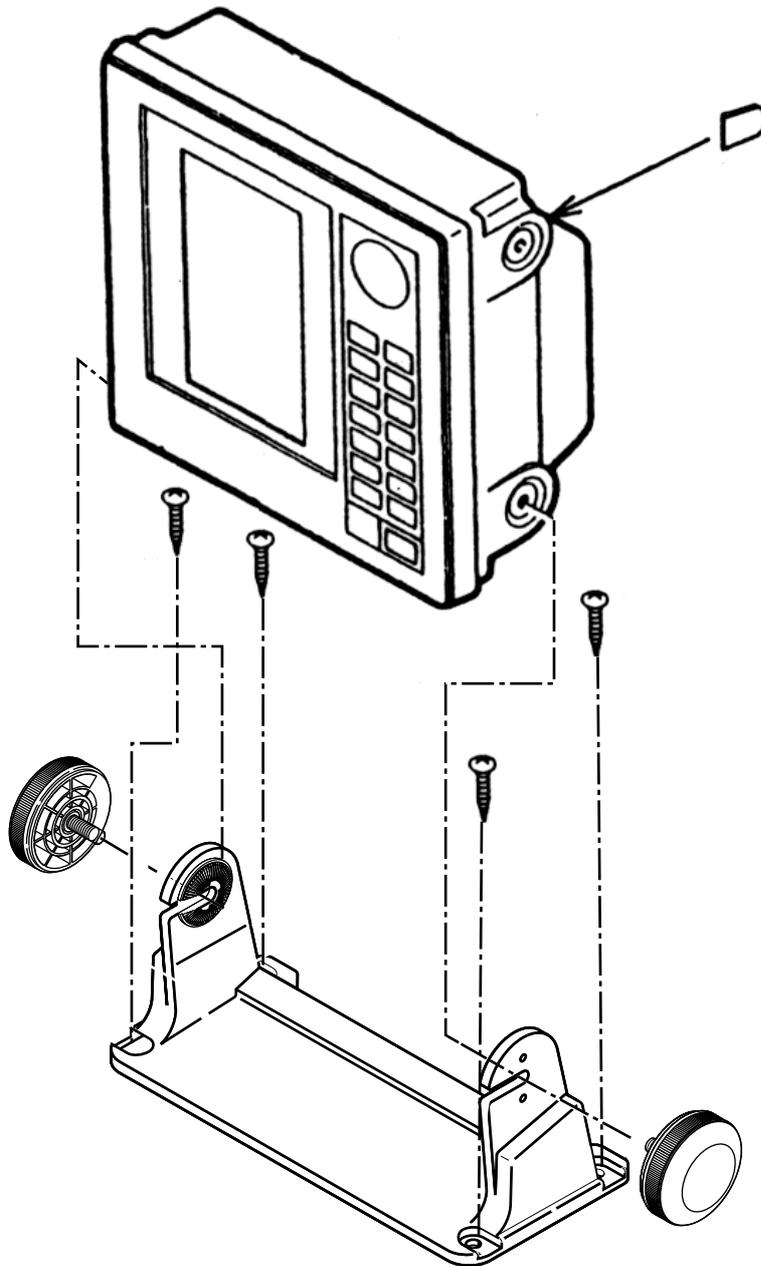


Figure 1-2 How to set the display unit to the hanger

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

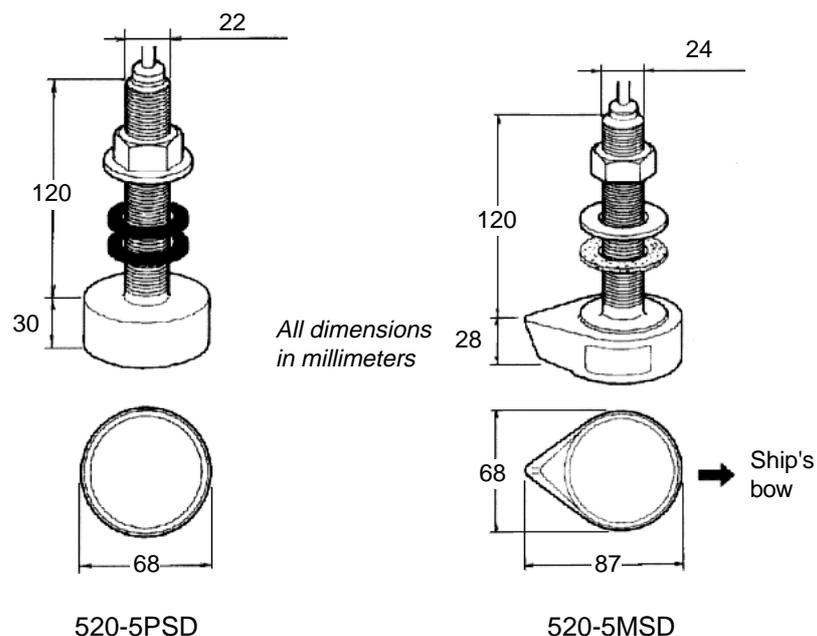
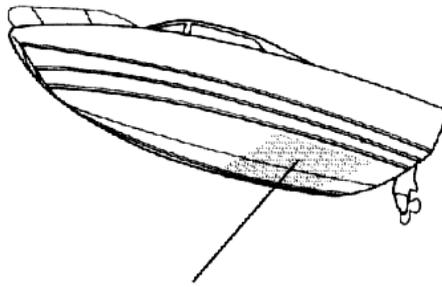


Figure 1-3 Dimensions of transducers 520-5PSD, 520-5MSD

Acceptable transducer mounting locations

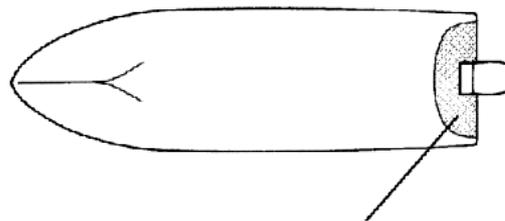
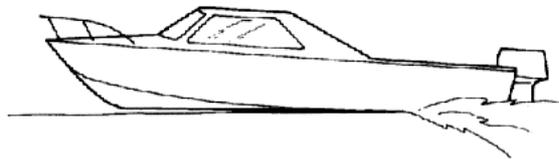
Deep-V hull



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

Figure 1-4 Transducer mounting location on deep-V hull

High speed V-planing hull



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

Figure 1-5 Transducer mounting location on high speed V-planing hull

Typical thru-hull mount transducer installations

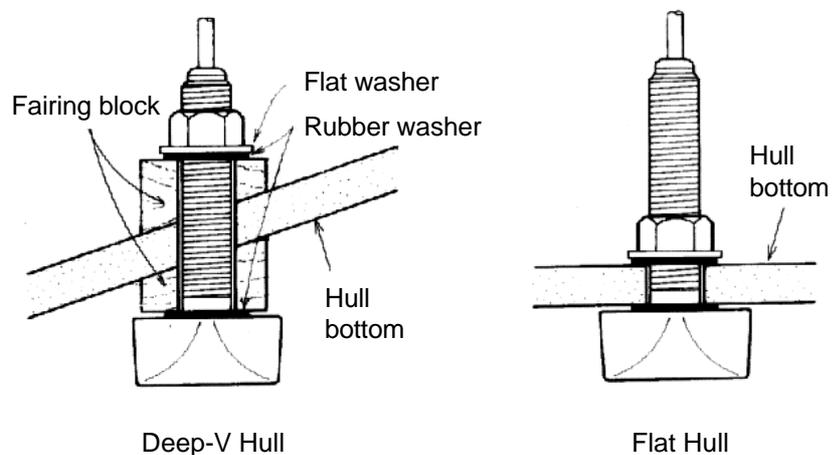


Figure 1-6 Typical thru-hull mount transducer installations

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.

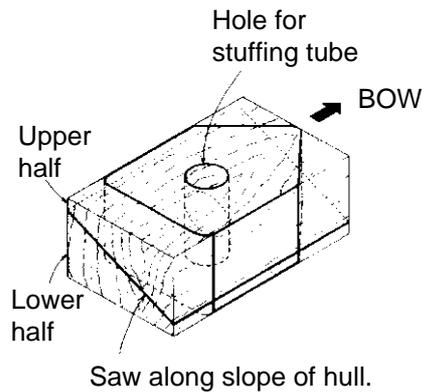


Figure 1-7 Construction of fairing block

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 waterline.

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, usually on relatively small I/O or outboard 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).

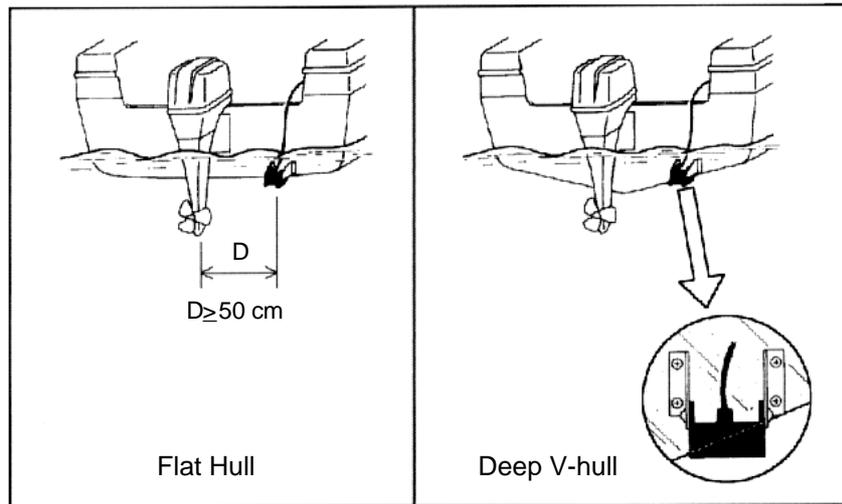


Figure 1-8 Transom mount transducer mounting locations

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.

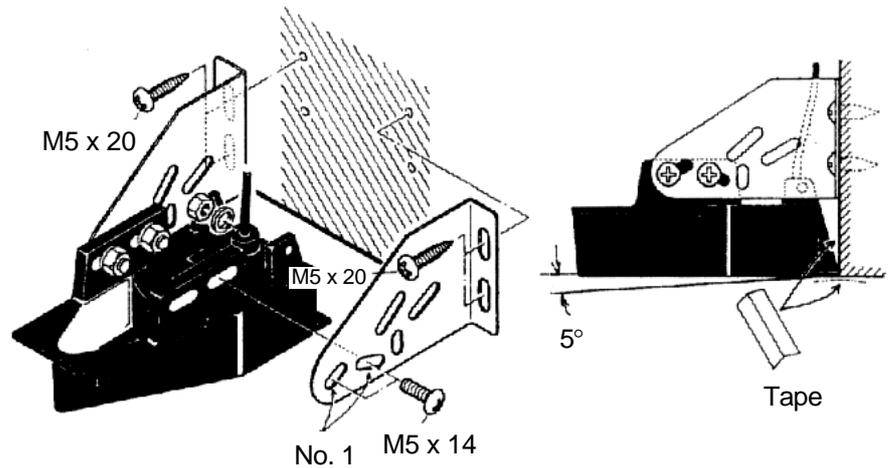


Figure 1-9 Transom mount transducer, mounting flush with hull

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.

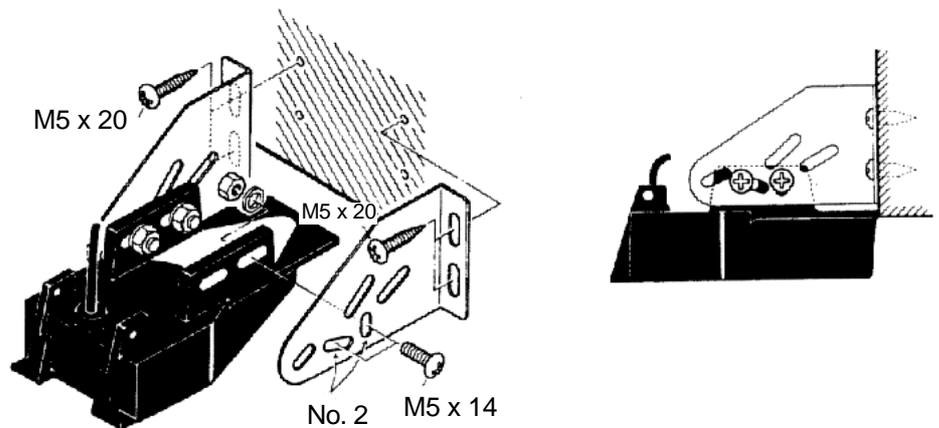


Figure 1-10 Transom mount transducer, projecting from hull

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.

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.

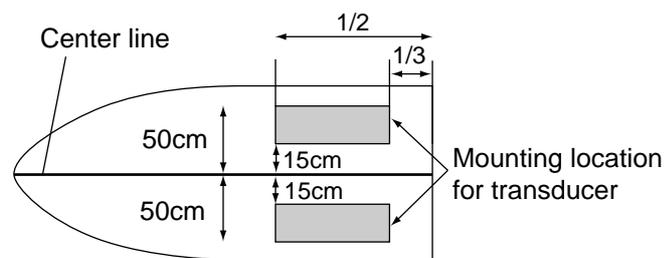


Figure 1-11 Inside-hull transducer mounting location

Attaching the 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.

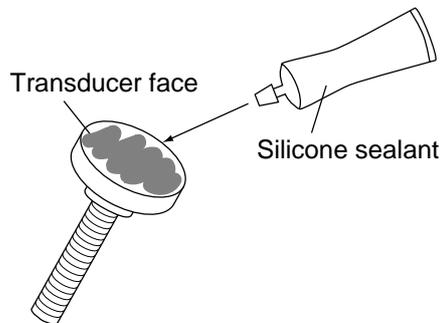


Figure 1-12 Coating the transducer face with silicone sealant

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.

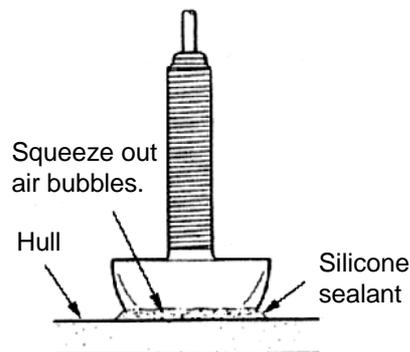


Figure 1-13 Attaching transducer to hull with silicone sealant

Checking the installation

1. Connect the battery to the display unit as shown on page 15.
2. Turn on the display unit.
3. Press the MODE key to select NORMAL (if it is not already selected) and press the MENU ESC key.
4. Press the AUTO key to select OFF (if it is not already selected) and press the MENU ESC key.
5. Press the GAIN+ key to set the gain to "5" and press the MENU ESC key.
6. Press the RANGE+ key to set the range to 30 feet and press the MENU ESC key.
7. If the bottom is displayed in red and the depth indication appears the mounting location is suitable. You can leave the transducer in position.

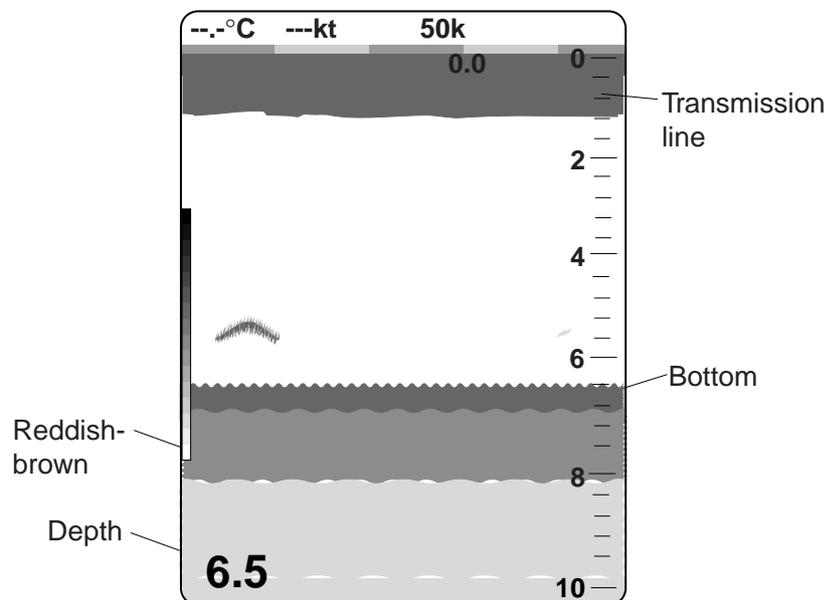


Figure 1-14 Sounder display

8. If the bottom is not displayed in red, the mounting location is unsuitable. Do the following:
 - 1) Press the POWER key to turn off the power.
 - 2) Gently dismount the transducer with a piece of wood.
 - 3) Reattach the transducer elsewhere as shown in "Attaching the transducer."
 - 4) Check the installation again.

Final preparation

Support the transducer with a piece of wood to keep it in place while it is drying. Let the transducer dry 24–72 hours.

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 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.

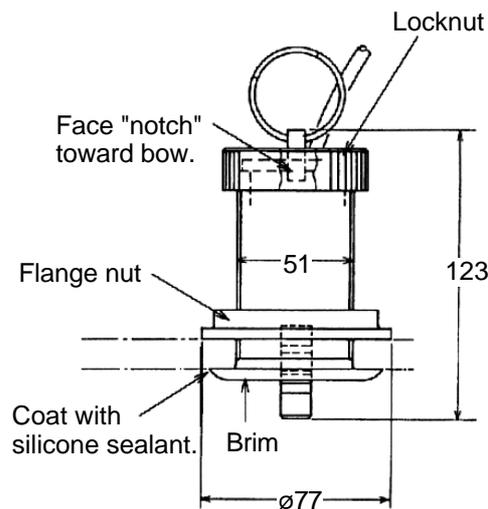


Figure 1-15 Water temperature/speed sensor ST-02MSB, ST-02PSB

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 diameter to pass the connector. After passing the cable, fill the hole with a sealing compound.

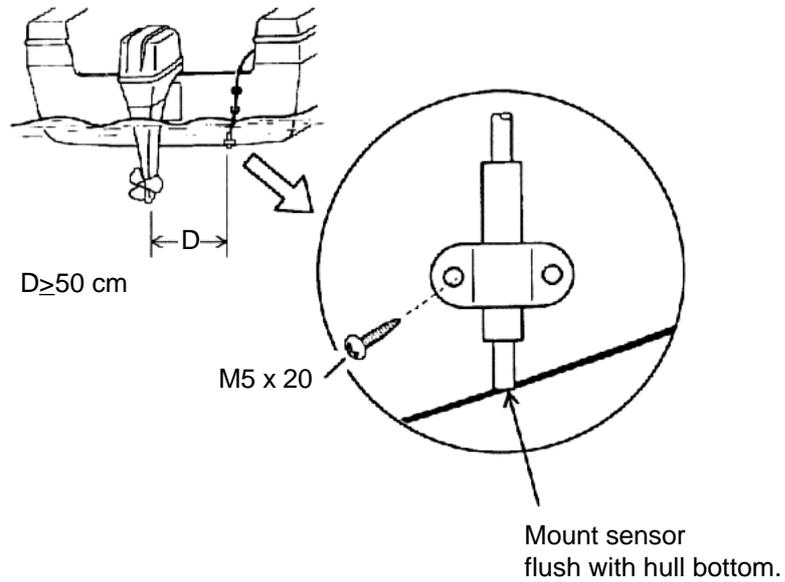


Figure 1-16 How to install transom mount water temperature sensor T-02MTB

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

- 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.

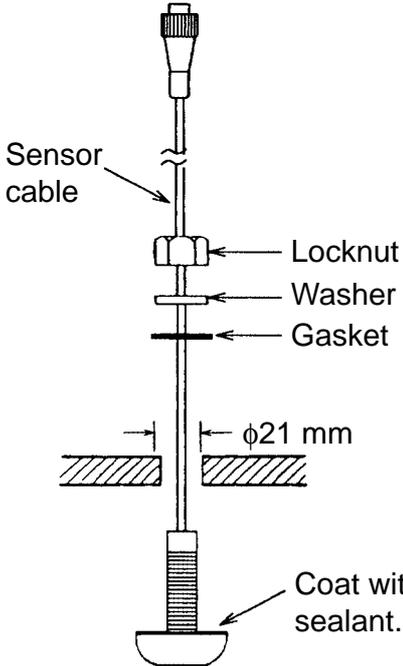
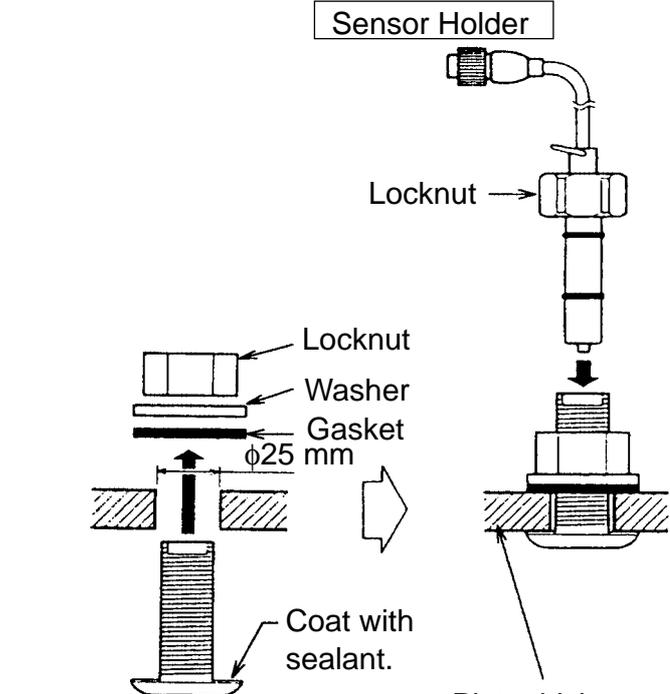
T-02MSB	T-03MSB
 <p>Mounting procedure</p> <ol style="list-style-type: none"> 1. Drill a hole of 21 mm in diameter in the mounting location. 2. Pass the sensor cable through the hole. 3. Pass gasket, washer and locknut onto cable in that order. 4. Coat the sensor flange with high quality sealant and then fasten the sensor with the locknut. (Torque: max. 59N·m) 5. Launch the boat to check for water leakage around the sensor. 	 <p>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 1-17 Thru-hull mount water temperature sensors
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.

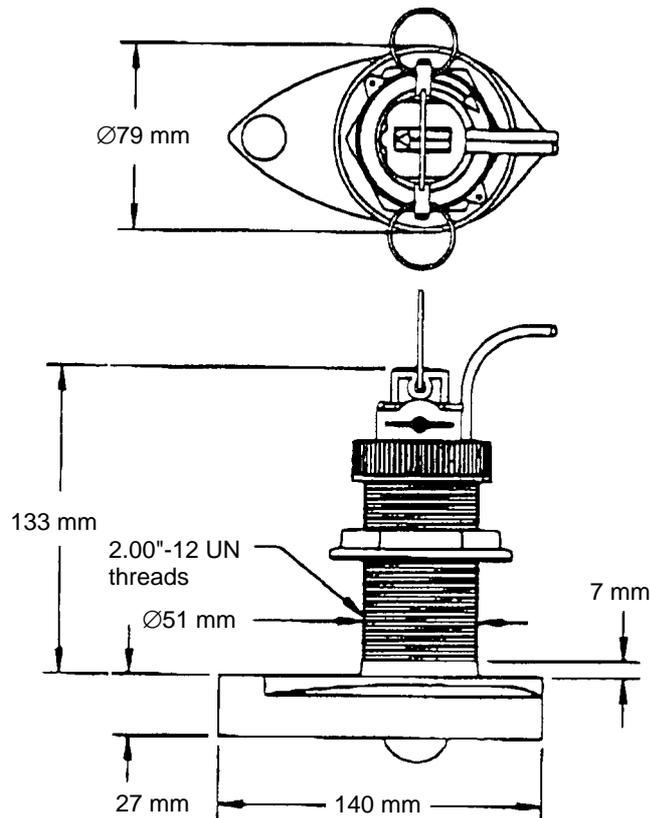


Figure I-18 Dimensions of triducer 524ST-MSD

WIRING

2.1 Wiring

All wiring are terminated at the rear of the display unit.

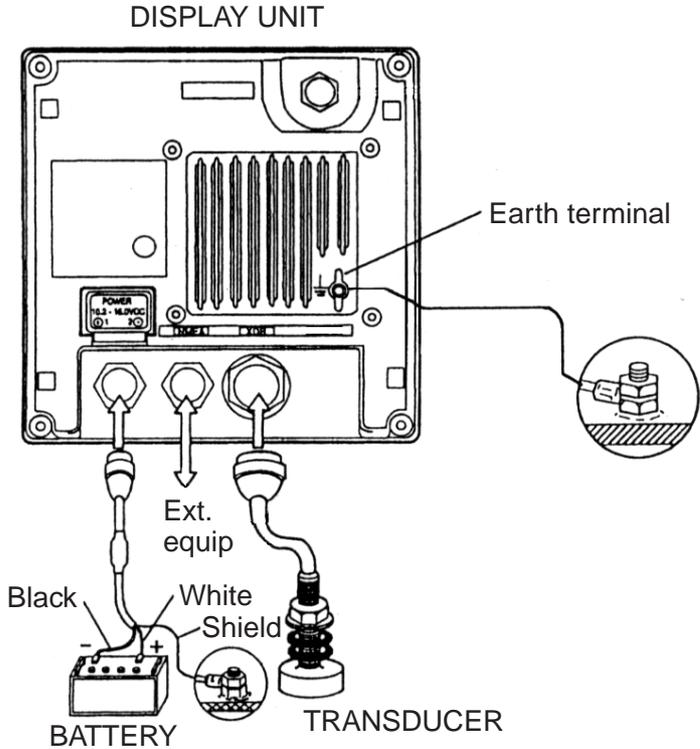


Figure 2-1 Display unit, rear view

Power cable

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

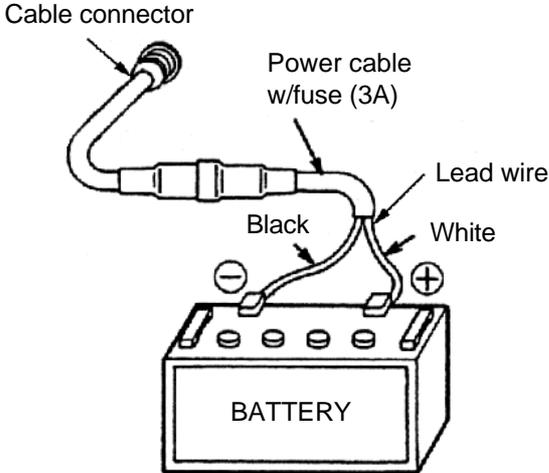


Figure 2-2 Connecting the power cable to the battery

Transducer, optional triducer

Connect the transducer cable to the XDR connector.

Ground

Connect the ground wire (KIV 2.0sq, 2m, supplied) 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 display unit. Do not use an “open-type” lug (.

Attaching EMI cores

Attach EMI cores to the power cable and transducer cable to prevent noise.

1. Tape the power cable and transducer cable where the EMI core is to be attached, to fix the core.
2. Attach cores where tape is placed on respective cables.

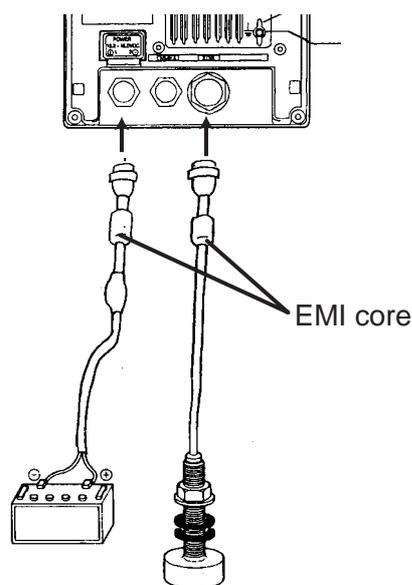


Figure 2-3 How to attach EMI cores

2.2 Connection of Optional Sensors

Water temperature sensor

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

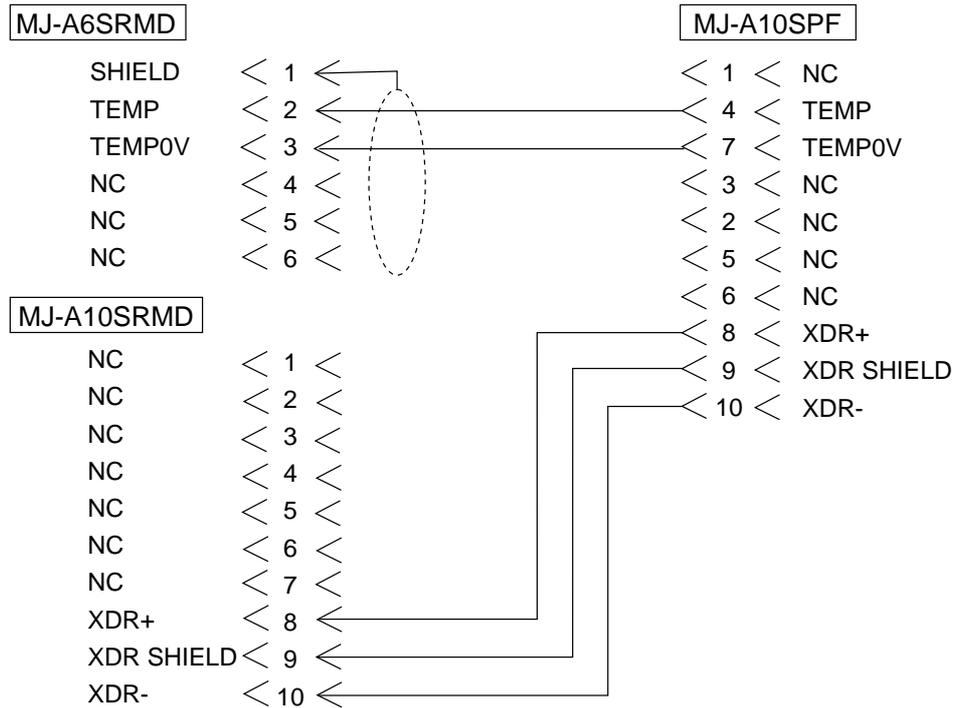


Figure 2-4 Connection of water temperature speed sensor

Water temperature/speed sensor

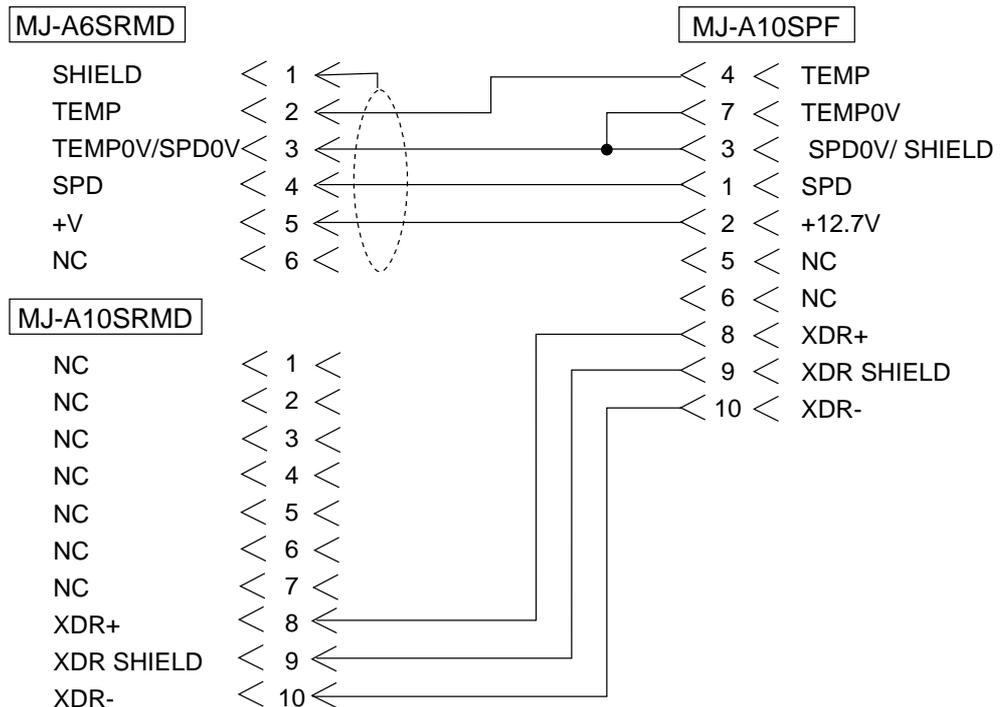


Figure 2-5 Connection of water temperature/speed sensor

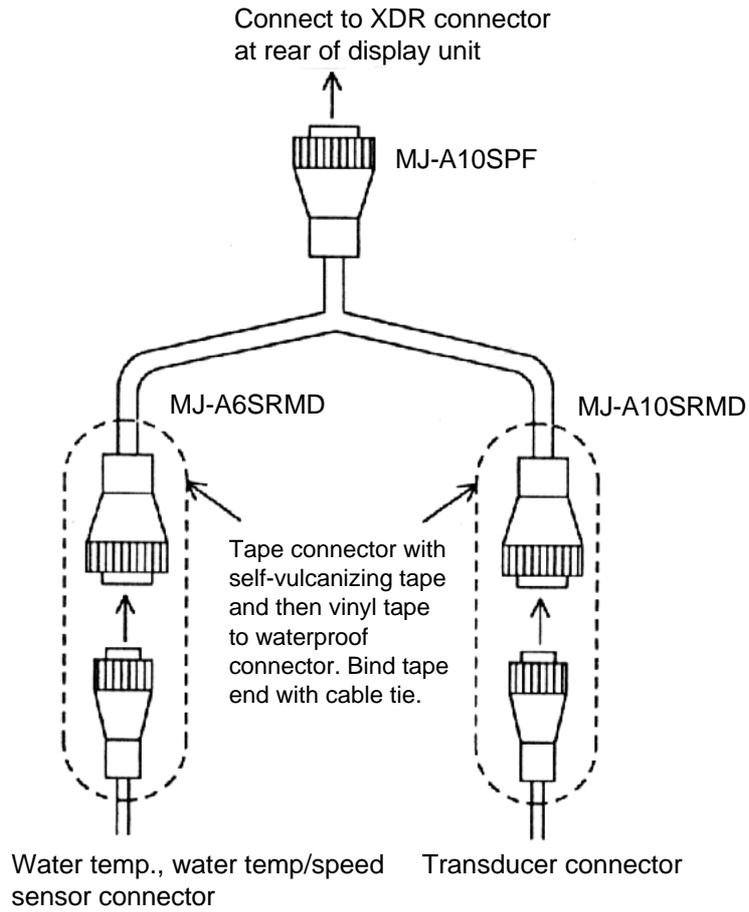


Figure 2-6 Connection of transducer, water temperature sensor, water temperature/speed sensor

NMEA data sentences

Input/Output	Data Sentence
INPUT: L/L, Course, Speed, Waypoint Range/Bearing, Water Temperature, Cross-Track Error	RMA, RMB, RMC, BWC, GLL, MTW, VTG, VHW, XTE
OUTPUT: Depth, Water Temperature, Speed	Output every 2 sec. DBT (Ver. 1.5) DPT (Ver. 2.0) MTW, VHW

EXTERNAL EQUIPMENT SETUP

This chapter shows you how to set up the FCV-600L when external equipment is connected. If a water temperature/speed sensor is installed, you should complete this section with the boat in the water and running, to confirm speed/water temperature readout.

Display the system menus as shown below, and then follow appropriate procedure(s) on the next page. Finish by resetting the power and checking for proper display of data.

3.1 External Equipment Setup

Displaying the system menu 1, system menu 2

1. Press the MENU ESC key.
2. Press ▼ to select GO TO SYSTEM MENU.
3. Press ► once to display the System menu 1; press it twice to display the System menu 2. You can switch between these menus with ◀ and ▶ when the MENU line is selected.

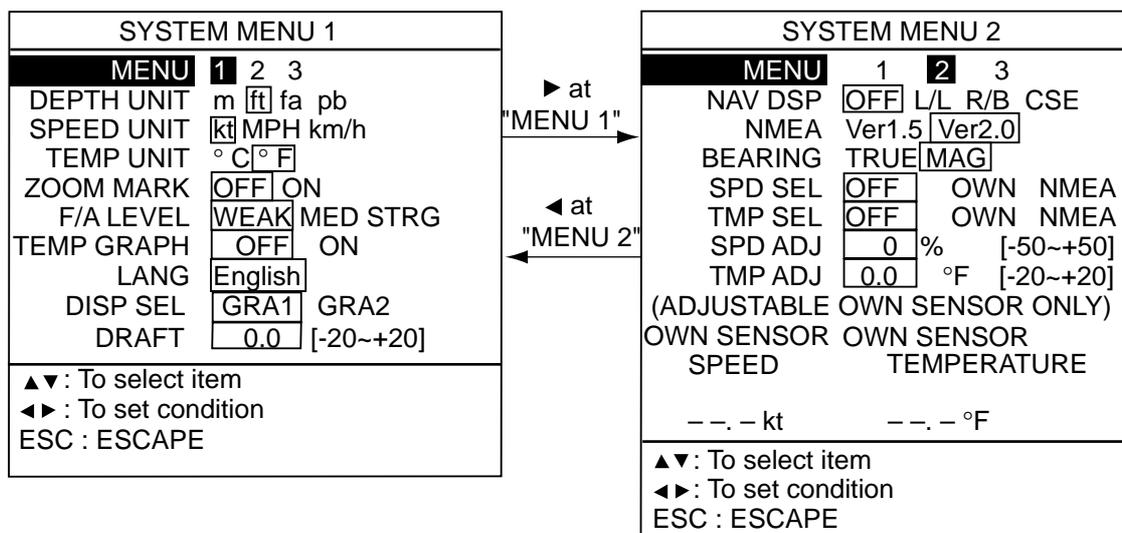


Figure 3-1 System menu 1, System menu 2

4. Follow appropriate procedure(s) on the next page.

Draft setup

1. At the System menu 1, press ▼ to select DRAFT.
2. Press ◀ or ▶ to set draft. For example, if the depth readout is 5 feet lower than actual depth, enter +5 feet.

Navigator setup

1. At the System menu 2, press ▼ to select NMEA.
2. Press ◀ or ▶ to select NMEA input format of navigator; Ver. 1.5 or Ver. 2.0. (If you are unsure of the version no., try both and select the one which successfully inputs nav data to the sounder.)
3. To display nav data on the sounder displays, press ▲ to select NAV DSP.
4. Press ◀ or ▶ to select which nav data to display; L/L (Position), R/B (Range and Bearing to a Waypoint), or CSE (Course).

Speed data setup

1. At the System menu 2, press ▼ to select SPD SEL.
2. Press ◀ or ▶ to select source of speed data; OWN (speed sensor) or NMEA.
3. For speed sensor-equipped sets, you may offset the speed readout if it is wrong. Run the boat at various speeds and watch the speed readout at the bottom of the screen. If it is unreasonably wrong, press ▼ to select SPD ADJ.
4. Press ◀ or ▶ to correct speed readout. For example, if the readout is 10% lower than actual speed, enter +10.

Water temperature data setup

1. At the System menu 2, press ▼ to select TMP SEL.
2. Press ◀ or ▶ to to select source of water temperature data; OWN (water temperature sensor) or NMEA.
3. For water temperature sensor-equipped sets, you may offset the water temperature readout if it is wrong. Watch the water temperature readout at the bottom of the screen. If it is unreasonably wrong, press ▼ to select TMP ADJ.
4. Press ◀ or ▶ to correct water temperature readout. For example, if the readout is 2° higher than actual temperature, enter -2°.
5. To display a water temperature graph (shows present water temperature), press ▲ to select MENU and press ◀ to select 1. The System menu 1 appears.
6. Press ▼ to select TEMP GRAPH.
7. Press ▶ to select ON.

Confirming indications

1. Reset the power.
2. Confirm that appropriate data appears on the display.

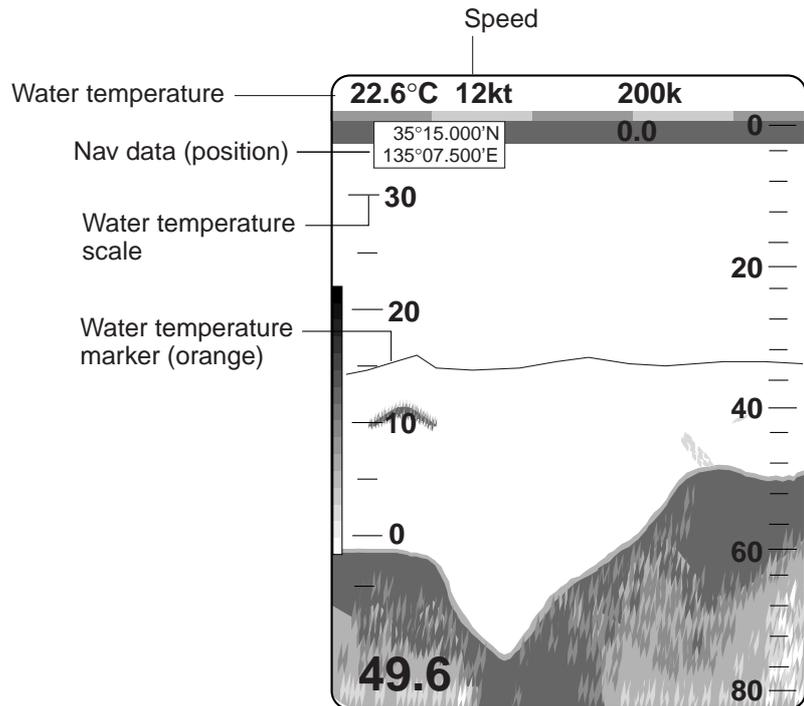


Figure 3-2 Location of speed, water temperature and nav data indications

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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

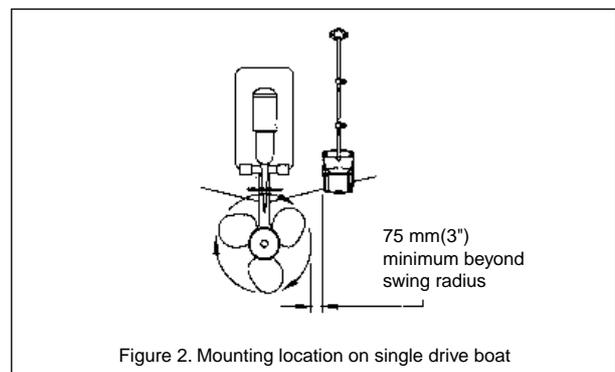
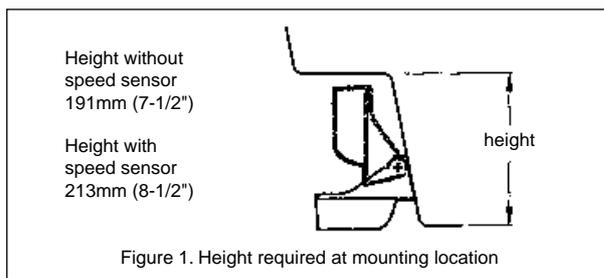
To ensure the best performance, the sensor *must* be submerged in aeration-free and turbulence-free water. Mount the sensor close to the centerline of the boat. On slower heavier displacement hulls, positioning it farther from the centerline is acceptable.

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.



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



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.

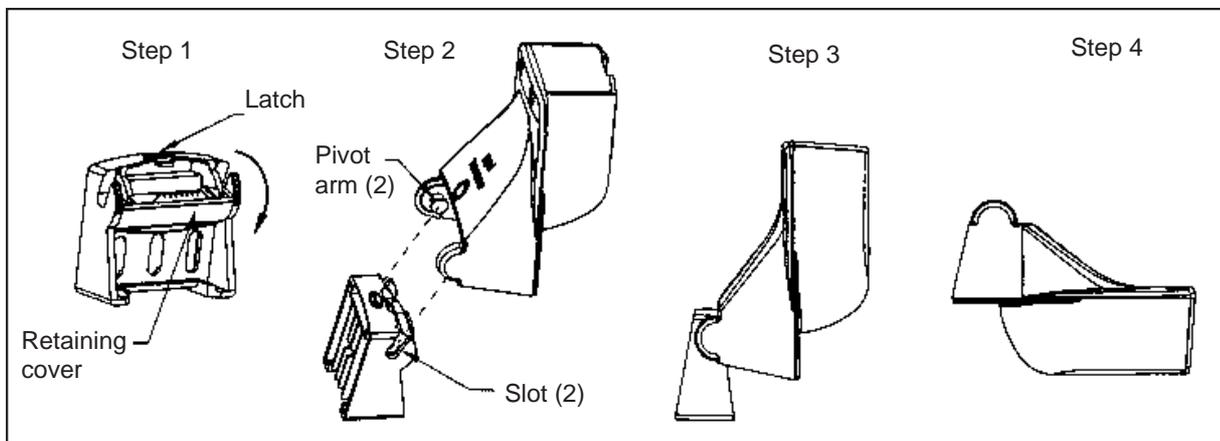
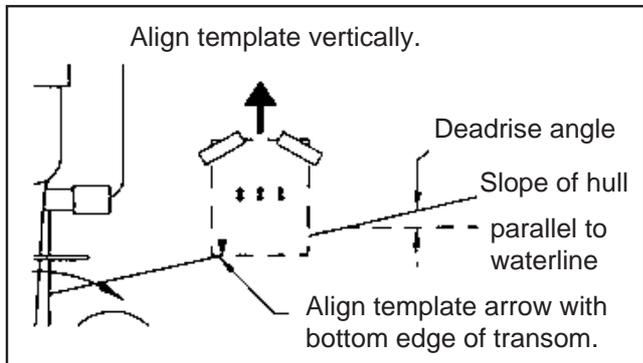
If you do not know the transom angle—Temporarily attach the bracket and sensor to the transom to determine if the plastic shim is needed.

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.



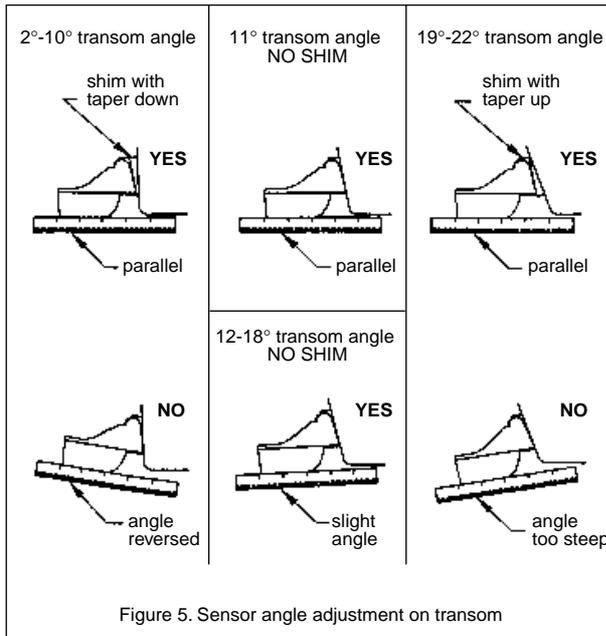


Figure 5. Sensor angle adjustment on transom

- 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.

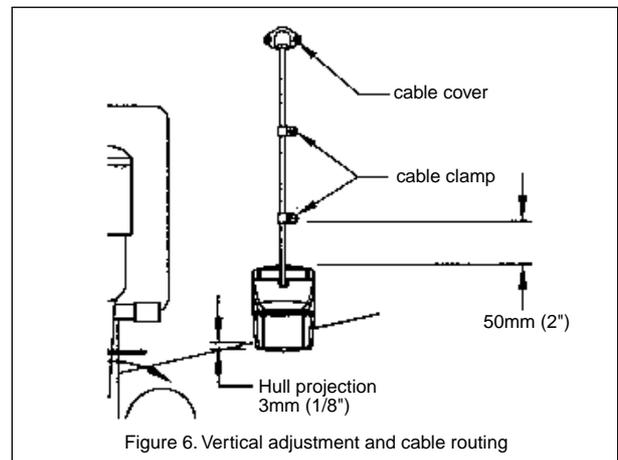
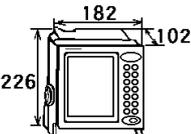
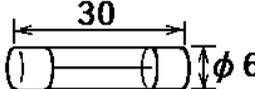
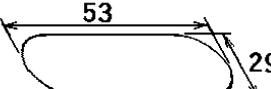
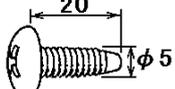
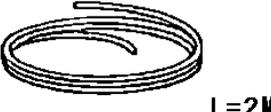
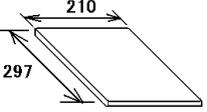
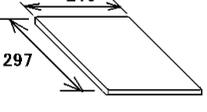


Figure 6. Vertical adjustment and cable routing

PACKING LIST

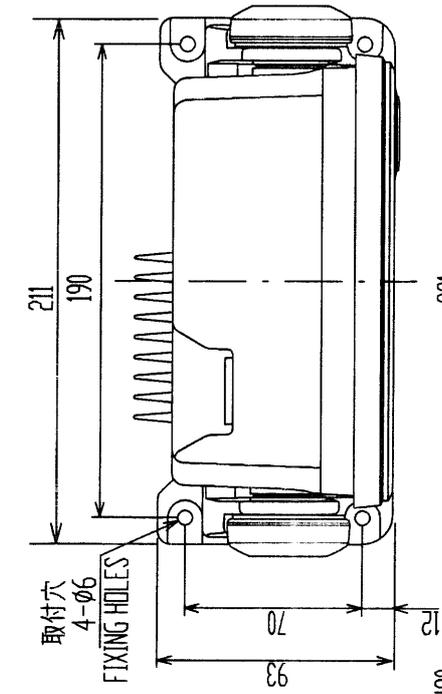
FCV-600L-J/E

NAME	OUTLINE	DESCRIPTION/CODE	Q'TY
ユニット UNIT			
指示器 DISPLAY UNIT		CV-600L-E 000-015-394 **	1
予備品 SPARE PARTS		SP02-03800	
ヒューズ FUSE		FGBO-A 3A AC125V 000-549-063	3
工事材料 INSTALLATION MATERIALS		CP02-06001	
プラントフィルム(K) DUMMY FILM(K)		03-118-1103-0 100-185-380	1
+トラスタップソネジ +TAPPING SCREW		5X20 SUS304 1ヶ 000-802-081	4
ビニル線 VINYL WIRE		KIV 2.0SQ 加 *2M* 000-554-516	1
フィルタ(EMI) FILTER		ESD-SR-150 000-149-159	2
その他工材 OTHER INSTALLATION MATERIALS			
ケーブル組品MJ POWER CABLE		MJ-A15A3F0013-035-3A 000-145-880	1
図書 DOCUMENT			
装備要領書(和) INSTALLATION MANUAL		IMJ-23620-* 000-808-219 **	1
取扱説明書(和) OPERATOR'S MANUAL		OMJ-23620-* 000-808-217 **	1

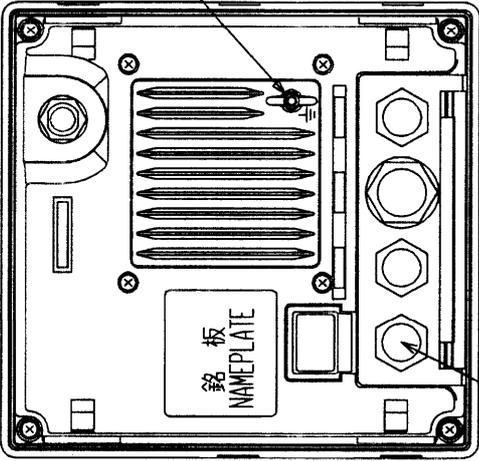
1.コード番号末尾の[**]は、選択品の代表型式/コードを表します。

CODE NUMBER ENDED BY "**" INDICATES THE NUMBER OF TYPICAL MATERIAL.

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



取付穴
4-φ6
FIXING HOLES



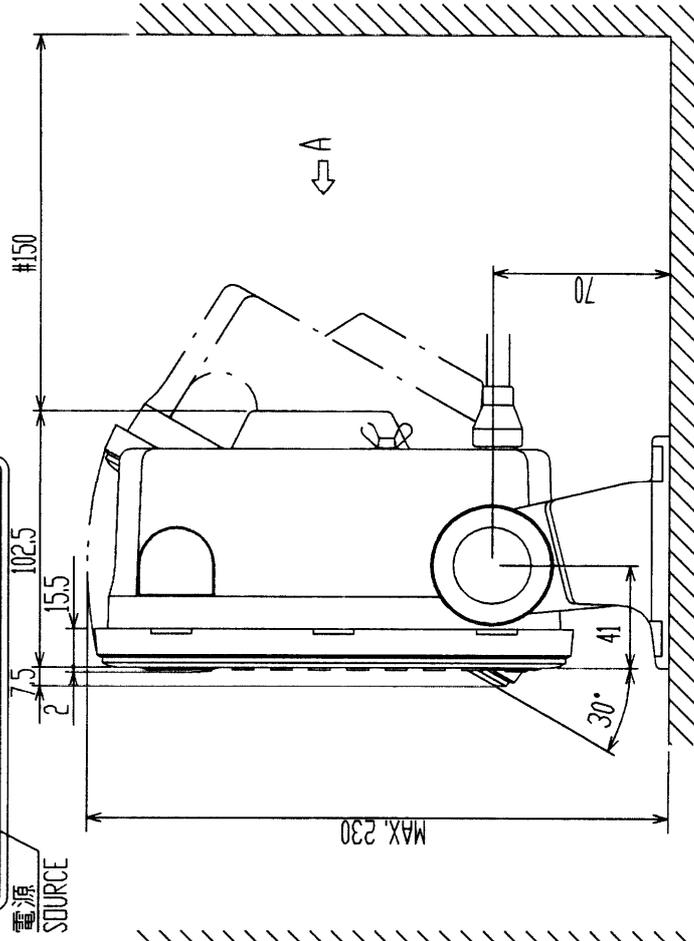
アース端子
GND TERMINAL

矢視 A
VIEW A

電源
SOURCE

表 1 TABLE 1

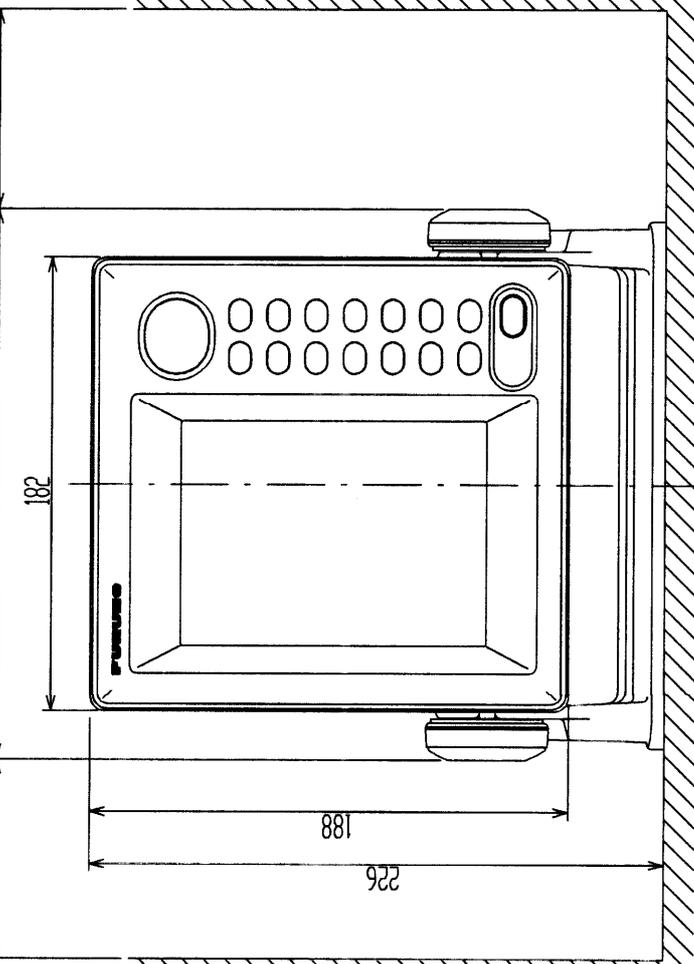
寸法範囲 (mm) DIMENSION	公差 (mm) TOLERANCE
0 < L ≤ 50	±1.5
50 < L ≤ 100	±2.5
100 < L ≤ 500	±3



#80

221

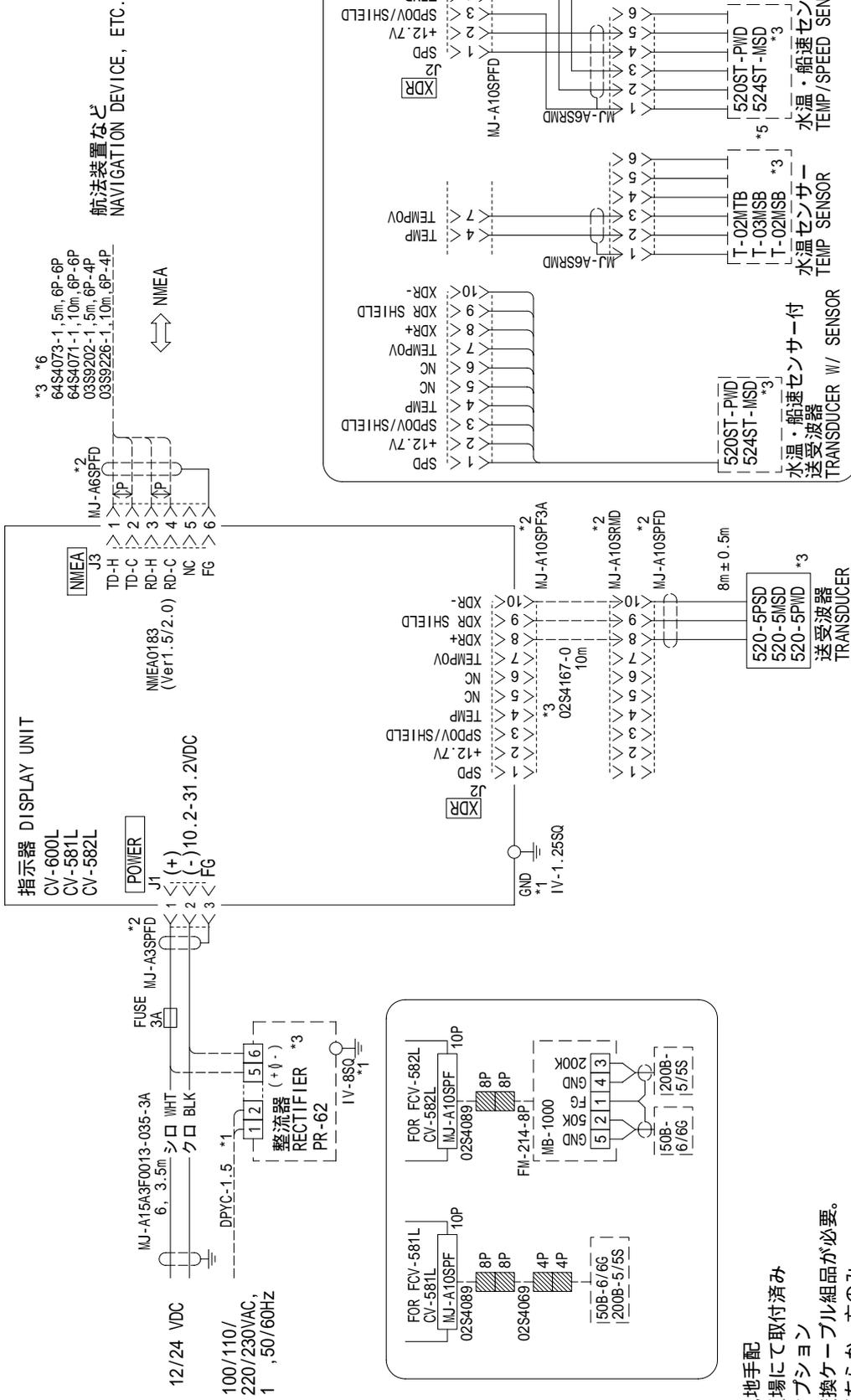
#80



- 注 記
- 1) 井：推奨するサービス空間寸法。
 - 2) 指定な寸法公差は表 1 による。
 - 3) 装備ケーブルはサービス時、本体を前方に引き出せるよう余裕を持たせること。
 - 4) 取付ネジはトラスタップピン呼び径 5x16 を使用のこと。

- NOTE
1. # RECOMMENDED SERVICE CLEARANCE.
 2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
 3. KEEP SUFFICIENT CABLE LENGTH BEHIND THE UNIT.
 4. USE TAPPING SCREWS #5x16 FOR FIXING THE UNIT.

製 造 元 MFG. CO.	YAMASAKI	型 号 MODEL	CV-600L
設 計 者 DESIGNER	Y. K.	名 称 NAME	指示器
検 査 者 CHECKER	K. K.	外 寸 図 DIMENSIONS	
縮 小 率 SCALE	1/3	機 種 TYPE	DISP. UNIT
図 面 番 号 DRAWING NO.	C2362-G01-B	出 力 電 圧 OUTPUT VOLTAGE	OUTLINE DRAWING



注記

- * 1) 現地手配
- * 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) 両端コネクタ付ケーブル。

NOTE

- * 1. LOCAL SUPPLY.
- * 2. FITTED AT FACTORY.
- * 3. OPTION
- * 4. THREE-WAY CONVERSION CABLE NEEDED (OPTION).
- * 5. EITHER ONE CAN BE CONNECTED.
- * 6. CABLE W/ CONNECTOR BOTH ENDS.

DRAWN	Jan. 8 '04	K. MIYAZAWA	TITLE	FCV-600L/581L/582L
CHECKED		Takahashi T.	名称	カラーLCD魚探
APPROVED		Y. Hatai	相互結線図	
SCALE		1/100	NAME	COLOR LCD SOUNDER
DWG. No.		C2362-C01-D	INTERCONNECTION DIAGRAM	



(Elemental Chlorine Free)

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is elemental chlorine free.

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