FURUNO

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Installation Manual
COLOR VIDEO SOUNDER FCV-1500
COLOR VIDEO MONITOR FCV-1500M

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(DAMI) FCV-1500/M

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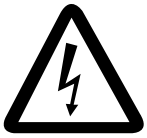
IME23630K10

⚠ 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.

⚠ CAUTION

Ground the equipment to prevent mutual interference.

Observe the following compass safe distances to prevent deviation of a magnetic compass:

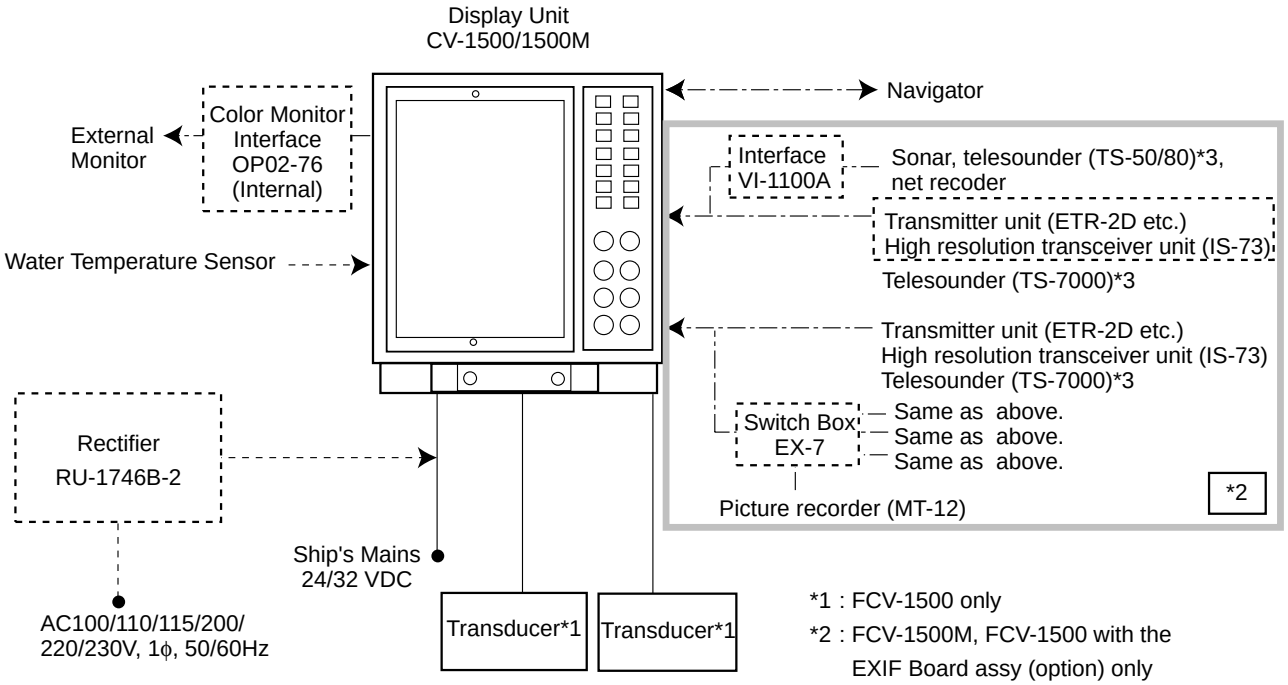
	Standard compass	Steering compass
Display unit	1.1 m	0.8 m

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.

SYSTEM CONFIGURATION



*1 : FCV-1500 only

*2 : FCV-1500M, FCV-1500 with the EXIF Board assy (option) only

*3 : Master ship; FCV-1500M, FCV-1500 with the EXIF Board assy are available.
Sister ship; FCV-1500 with the EXIF Board Assy (option) only.

- One external unit is connectable on the sister ship.
- Output signal is one frequency only.

- - - - - - - - : Option

—·—·—·— : Connectable External Equipment

EQUIPMENT LISTS

Standard Supply

Name	Type	Qty	Code No.	Remarks
Display Unit	CV-1500	1	–	For FCV-1500
	CV-1500M		–	For FCV-1500M
Transducer	Select from 1, 2 or 3kW transducer, referring to page iv to xv and the Appendix. Selection not necesary if transducer is already installed.			FCV-1500 only
Thru-hull Pipe				
Transducer Tank				
Spare Parts	SP02-04001	1 set	001-396-930	Fuse
Installation Materials	CP02-06201	1 set	001-396-940	For FCV-1500
	CP02-06202		001-399-090	For FCV-1500M
Accessories	FP02-04900	1 set	000-012-375	Filter

Optional Equipment

Name	Type	Code No.	Remarks
Color Monitor Interface	OP02-76	000-012-377	Includes CMIF assy., XH connector, M3X10 screw, clamp
Water Temperature Sensor	T-02MSB	000-040-040	Thru-hull type
	T-02MTB	000-040-026	Transom mount, with 8 m cable
	T-03MSB	000-040-027	Thru-hull type, with 8 m cable
Rectifier	RU-1746B-2	000-030-439	AC → DC
Cable Assy.	MJ-A6SPF 0012-050	000-134-424	6P-6P, 5 m, for connection of navigator
	MJ-A6SPF 0012-100	000-133-817	6P-6P, 10 m, for connection of navigator
	MJ-A6SPF 0011-050	000-132-244	6P-4P, 5 m, for connection of navigator
	MJ-A6SPF 0011-100	000-132-336	6P-4P, 10 m, for connection of navigator
Vinyl Cover	10-026-0601	000-800-199-04	
Hood	FP02-02610	002-007-280	
Vinyl Wire	KIV2.0SQ, Black	000-554-516	For earth
Connector	NCS-254-P	000-506-505	For connection of transducer (FCV-1500 only)
	FM14-8P	000-511-408	For FNZ-18
Handle	OP03-70	008-423-420	
Transmitter Unit	ETR-2D	000-001-548	FCV-1500M only
	ETR-3D	000-001-549	
	ETR-5D	000-001-578	
	ETR-10D	000-001-579	
High Resolution Transceiver Unit	IS-73	000-000-143	
Interface	VI-1100A	000-021-805	
Switch Box	EX-7	000-027-553	
Cable Assy.	NCS255AD-254P-L500	000-142-518	For FCV-1500, dual frequency transducer installation.
EXIF Board assy	OP02-77	000-012-378	For FCV-1500 only
Booster Box	BT-5	-	For FCV-1500 only

Transducers (FCV-1500 only)

1 kW Transducer

Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
15/45	Steel	15F-4S 45F-3H		
	FRP			
15/50	Steel	15F-4S 50B-6/6B		
	FRP			
	Steel	15F-4S 50B-9B		
	FRP			
	Steel	15F-4S 50F-8G		
	FRP			
15/68	Steel	15F-4S 68F-8H		
	FRP			
15/88	Steel	15F-4S 88B-8		
	FRP			
15/200	Steel	15F-4S 200B-5S		
	FRP			
28/45	Steel	28F-8 45F-3H		
	FRP			
28/50	Steel	28F-8 50B-6/6B		
	FRP			
	Steel	28F-8 50B-9B	TWB-6000 (2)	T-656
	FRP			
	Steel	28F-8 50F-8G		
	FRP			
28/68	Steel	28F-8 68F-8H		
	FRP			
28/88	Steel	28F-8 88B-8	TWB-6000 (2)	T-657
	FRP			
28/200	Steel	28F-8 200B-5S		
	FRP			
45/88	Steel	45F-3H 88B-8		
	FRP			

1 kW Transducer (con't.)

Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
45/200	Steel	45F-3H 200B-5S		
	FRP			
50/88	Steel	50B-6/6B 88B-8		
	FRP			
	Steel	50B-9B 88B-8	TWB-6000 (2)	T-658
	FRP			
	Steel	50F-8G 88B-8		
	FRP			
50/200	Steel	50B-6/6B 200B-5S		
	FRP			
	Steel	50B-9B 200B-5S		
	FRP			
	Steel	50F-8G 200B-5S		
	FRP			
	Steel	50/200-1T		
	FRP			
	Steel	50/200-1ST		
	FRP			
50/400	Steel	50B-6/6B 400B-52		
	FRP			
	Steel	50B-9B 400B-52		
	FRP			
	Steel	50F-8G 400B-52		
	FRP			
68/200	Steel	68F-8H 200B-5S		
	FRP			
88/200	Steel	88B-8 200B-5S		
	FRP			

2 kW Transducer

Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
15/45	Steel	15F-10 45F-6H		
	FRP			
15/50	Steel	15F-10 50B-12	TFB-7000 (2)	T-627
	FRP			
15/68	Steel	15F-10 68F-30H		
	FRP			
15/88	Steel	15F-10 88B-10	TFB-7000 (2)	T-629
	FRP		TRB-1100 (2)	T-629-F
15/200	Steel	15F-10 200B-8/8B/8N	TFB-7000 (2)	T-632
	FRP		TRB-1100 (2)	T-632-F
28/45	Steel	28F-18 45F-6H		
	FRP			
28/50	Steel	28F-18 50B-12	TFB-7000 (2)	T-634
	FRP			
28/68	Steel	28F-18 68F-30H		
	FRP		TRB-1100 (2)	T-634-F
28/88	Steel	28F-18 88B-10	TFB-7000 (2)	T-636
	FRP		TRB-1100 (2)	T-636-F
28/200	Steel	28F-18 200B-8/8B/8N	TFB-7000 (2)	T-638
	FRP		TRB-1100 (2)	T-638-F
45/88	Steel	45F-6H 88B-10		
	FRP			
45/200	Steel	45F-6H 200B-8/8B/8N		
	FRP			
50/88	Steel	50B-12 88B-10	TFB-7000 (2)	T-643
	FRP		TRB-1100 (2)	T-643-F
50/200	Steel	50B-12 200B-8/8B/8N	TFB-7000 (2)	T-645
	FRP			
68/200	Steel	68F-30H 200B-8/8B/8N		
	FRP		TRB-1100 (2)	T-645-F
88/200	Steel	88B-10 200B-8/8B/8N	TFB-7000 (2)	T-649
	FRP		TRB-1100 (2)	T-649-F

3 kW Transducer

Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
15/45	Steel	15F-10X2 45F-12H		
	FRP			
15/50	Steel	15F-10X2 50F-24H		
	FRP			
15/68	Steel	15F-10X2 68F-30H		
	FRP			
15/88	Steel	15F-10X2 88F-126H		
	FRP			
15/107	Steel	15F-10X2 100B-10R		
	FRP			
15/150	Steel	15F-10X2 150B-12H		
	FRP			
15/200	Steel	15F-10X2 200B-12H		
	FRP			
28/45	Steel	28F-24H 45F-12H		
	FRP			
28/50	Steel	28F-24H 50F-24H	TFB-7000 (2)	T-681
	FRP		TRB-1100 (2)	T-681-F
28/68	Steel	28F-24H 68F-30H		
	FRP			
28/88	Steel	28F-24H 88F-126H	TFB-7000 (2)	T-682
	FRP		TRB-1100 (2)	T-682-F
28/107	Steel	28F-24H 100B-10R		
	FRP			
28/150	Steel	28F-24H 150B-12H	TFB-7000 (2)	T-683
	FRP		TRB-1100 (2)	T-683-F
28/200	Steel	28F-24H 200B-12H	TFB-7000 (2)	T-683
	FRP		TRB-1100 (2)	T-683-F
45/88	Steel	45F-12H 88F-126H		
	FRP			
45/107	Steel	45F-12H 100B-10R		
	FRP			
45/150	Steel	45F-12H 150B-12H		
	FRP			

3 kW Transducer (con't.)

Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Hull Tank
45/200	Steel	45F-12H 200B-12H		
	FRP			
50/88	Steel	50F-24H 88F-126H	TFB-7000 (2)	T-682
	FRP		TRB-1100 (2)	T-682-F
50/107	Steel	50F-24H 100B-10R		
	FRP			
50/150	Steel	50F-24H 150B-12H	TFB-7000 (2)	T-683
	FRP		TRB-1100 (2)	T-683-F
50/200	Steel	50F-24H 200B-12H	TFB-7000 (2)	T-683
	FRP		TRB-1100 (2)	T-683-F
68/107	Steel	68F-30H 100B-10R		
	FRP			
68/150	Steel	68F-30H 150B-12H	TFB-7000 (2)	T-646
	FRP		TRB-1100 (2)	T-646-F
68/200	Steel	68F-30H 200B-12H	TFB-7000 (2)	T-646
	FRP		TRB-1100 (2)	T-646-F
88/150	Steel	88F-126H 150B-12H		
	FRP			
88/200	Steel	88F-126H 200B-12H	TFB-7000 (2)	T-685
	FRP		TRB-1100 (2)	T-685-F
107/200	Steel	100B-10R 200B-12H		
	FRP			

1 kW/2 kW Transducer

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-hull Pipe	Tank
1 k/2 k	15/45	Steel	15F-4S 45F-6H		
		FRP			
	15/50	Steel	15F-4S 50B-12	TFB-7000 (2)	T-626
		FRP		TRB-1100 (2)	T-626-F
	15/68	Steel	15F-4S 68F-30H		
		FRP			
	15/88	Steel	15F-4S 88B-10	TWB-6000 (2)	T-628
		FRP		TRB-1100 (2)	T-628-F
	15/200	Steel	15F-4S 200B-8/8B/8N	TWB-6000 (2)	T-631
		FRP		TRB-1100 (2)	T-631-F
	28/45	Steel	28F-8 45F-6H		
		FRP			
	28/50	Steel	28F-8 50B-12		
		FRP			
	28/68	Steel	28F-8 68F-30H		
		FRP			
	28/88	Steel	28F-8 88B-10		
		FRP			
	28/200	Steel	28F-8 200B-8/8B/8N	TWB-6000 (2)	T-657
		FRP			
	45/88	Steel	45F-3H 88B-10		
		FRP			
	45/200	Steel	45F-3H 200B-8/8B/8N		
		FRP			

1 kW/2 kW Transducer (con't.)

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-hull Pipe	Tank
1 k/2 k	50/88	Steel	50B-6/6B 88B-10		
		FRP			
		Steel	50B-9B 88B-10		
		FRP			
		Steel	50F-8G 88B-10	TFB-7000 (2)	T-636
		FRP		TRB-1100 (2)	T-636-F
	50/200	Steel	50B-6/6B 200B-8/8B/8N		
		FRP			
		Steel	50B-9 200B-8/8B/8N	TWB-6000 (2)	T-658
		FRP			
		Steel	50F-8G 200B-8/8B/8N	TFB-7000 (2)	T-638
		FRP		TRB-1000 (2)	T-638-F
	68/200	Steel	68F-8H 200B-8/8B/8N		
		FRP			
	88/200	Steel	88B-8 200B-8/8B/8N	TWB-6000 (2)	T-659
		FRP			

1 kW/3 kW Transducer

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
1 k/3 k	15/45	Steel	15F-4S 45F-12H		
		FRP			
	15/50	Steel	15F-4S 50F-24H		
		FRP			
	15/68	Steel	15F-4S 68F-30H		
		FRP			
	15/88	Steel	15F-4S 88F-126H		
		FRP			
	15/107	Steel	15F-4S 100B-10R		
		FRP			
	15/150	Steel	15F-4S 150B-12H	TFB-7000 (2)	T-637
		FRP		TRB-1100 (2)	T-637-F
	15/200	Steel	15F-4S 200B-12H		
		FRP			
	28/45	Steel	28F-8 45F-12H		
		FRP			
	28/50	Steel	28F-8 50F-24H		
		FRP			
	28/68	Steel	28F-8 68F-30H		
		FRP			
	28/88	Steel	28F-8 88F-126H		
		FRP			
	28/107	Steel	28F-8 100B-10R		
		FRP			
	28/150	Steel	28F-8 150B-12H		
		FRP			
	28/200	Steel	28F-8 200B-12H		
		FRP			
	45/88	Steel	45F-3H 88F-126H		
		FRP			
	45/107	Steel	45F-3H 100B-10R		
		FRP			
	45/150	Steel	45F-3H 150B-12H		
		FRP			

1 kW/3 kW Transducer (con't.)

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
1 k/3 k	45/200	Steel	45F-3H 200B-12H		
		FRP			
	50/88	Steel	50B-6/6B 88F-126H		
		FRP			
		Steel	50B-9B 88F-126H		
		FRP			
		Steel	50F-8G 88F-126H		
		FRP			
	50/107	Steel	50B-6/6B 100B-10R		
		FRP			
		Steel	50B-9B 100B-10R		
		FRP			
		Steel	50F-8 100B-10R		
		FRP			
	50/150	Steel	50B-6/6B 150B-12H		
		FRP			
		Steel	50B-9B 150B-12H		
		FRP			
		Steel	50F-8G 150B-12H		
		FRP			
	50/200	Steel	50B-6/6B 200B-12H		
		FRP			
		Steel	50B-9B 200B-12H		
		FRP			
		Steel	50F-8G 200B-12H		
		FRP			
	68/107	Steel	68F-8H 100B-10R		
		FRP			
	68/150	Steel	68F-8H 150B-12H		
		FRP			
	68/200	Steel	68F-H 200B-12H		
		FRP			
	88/150	Steel	88B-8 150B-12H		
		FRP			
	88/200	Steel	88B-8 200B-12H		
		FRP			

2 kW/3 kW Transducer

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
2 k/3 k	15/45	Steel	15F-10 45F-12H		
		FRP			
	15/50	Steel	15F-10 50F-24H		
		FRP			
	15/68	Steel	15F-10 68F-30H		
		FRP			
	15/88	Steel	15F-10 88F-126H		
		FRP			
	15/107	Steel	15F-10 100B-10R		
		FRP			
	15/150	Steel	15F-10 150B-12H		
		FRP			
	15/200	Steel	15F-10 200B-12H		
		FRP			
	28/45	Steel	28F-18 45F-12H		
		FRP			
	28/50	Steel	28F-18 50F-24H		
		FRP			
	28/68	Steel	28F-18 68F-30H		
		FRP			
	28/88	Steel	28F-18 88F-126H		
		FRP			
	28/107	Steel	28F-18 100B-10R	TFB-7000 (2)	T-636
		FRP		TRB-1100 (2)	T-636-F
	28/150	Steel	28F-18 150B-12H	TFB-7000 (2)	T-637
		FRP		TRB-1100 (2)	T-637-F
	28/200	Steel	28F-18 200B-12H		
		FRP			
	45/88	Steel	45F-6H 88F-126H		
		FRP			
	45/107	Steel	45F-6H 100B-10R		
		FRP			
	45/150	Steel	45F-6H 150B-12H		
		FRP			

2 kW/3 kW Transducer (con't.)

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
2 k/3 k	45/200	Steel	45F-6H 200B-12H		
		FRP			
	50/88	Steel	50B-12 88F-126H		
		FRP			
	50/107	Steel	50B-12 100B-10R	TFB-7000 (2)	T-643
		FRP		TRB-1100 (2)	T-643-F
	50/150	Steel	50B-12 150B-12H	TFB-7000 (2)	T-644
		FRP		TRB-1100 (2)	T-644-F
	50/200	Steel	50B-12 200B-12H		
		FRP			
	68/107	Steel	68F-30H 100B-10R		
		FRP			
	68/150	Steel	68F-30H 150B-12H		
		FRP			
	68/200	Steel	68F-30H 200B-12H		
		FRP			
	88/150	Steel	88B-10 150B-12H		
		FRP			
	88/200	Steel	88B-10 200B-12H		
		FRP			

3 kW/2 kW Transducer

Output (W)	Frequency (kHz)	Hull Material	Transducer	Thru-Hull Pipe	Tank
3 k/2 k	15/45	Steel	15F-10X2 45F-6H		
		FRP			
	15/50	Steel	15F-10X2 50B-12		
		FRP			
	15/68	Steel	15F-10X2 68F-30H		
		FRP			
	15/88	Steel	15F-10X2 88B-10		
		FRP			
	15/200	Steel	15F-10X2 200B-8/8B/8N		
		FRP			
	28/45	Steel	28F-24H 45F-6H		
		FRP			
	28/50	Steel	28F-24H 50B-12		
		FRP			
	28/68	Steel	28F-24H 68F-30H		
		FRP			
	28/88	Steel	28F-24H 88B-10		
		FRP			
	28/200	Steel	28F-24H 200B-8/8B/8N		
		FRP			
	45/88	Steel	45F-12H 88B-10		
		FRP			
	45/200	Steel	45F-12H 200B-8/8B/8N		
		FRP			
	50/88	Steel	50F-24H 88B-10		
		FRP			
	50/200	Steel	50F-24H 200B-8/8B/8N		
		FRP			
	68/200	Steel	68F-30H 200B-8/8B/8N	TFB-7000 (2)	T-647
		FRP		TRB-1100 (2)	T-647-F
	88/200	Steel	88F-126H 200B-8N		
		FRP			
	100/200	Steel	100B-10R 200B-8/8B/8N	TFB-7000 (2)	T-649
		FRP		TRB-1100 (2)	T-649-F

MOUNTING

1.1 Display Unit

Mounting considerations

The display unit is designed to be mounted on a desktop. When selecting a mounting location for the display unit keep in mind the following points.

- Locate the unit where it can be easily operated and the screen viewed while looking over the bow.
- Locate the unit out of direct sunlight and away from heat sources because of heat that can build up inside the cabinet.
- Locate the equipment away from places subject to water splash and rain.
- Be sure the mounting location is strong enough to support the weight of the unit under the continued vibration which is normally experienced on the ship. If necessary reinforce the mounting location.
- Leave sufficient space on the sides and rear of the unit to facilitate maintenance. Also, leave a foot or so of “service loop” in cables behind the unit so it can be pulled forward for servicing or easy removal of connectors.
- A magnetic compass will be affected if placed too close to the display unit. Observe the following compass safe distances to prevent deviation of a magnetic compass: Standard compass, 1.1 m, Steering compass, 0.8 m.

Procedure

1. Unfasten two bolts (M8X40) at the front of the display unit. Remove the mounting plate.
2. Referring to the drawing below for dimensions, drill four mounting holes of ø12 mm in the mounting location.

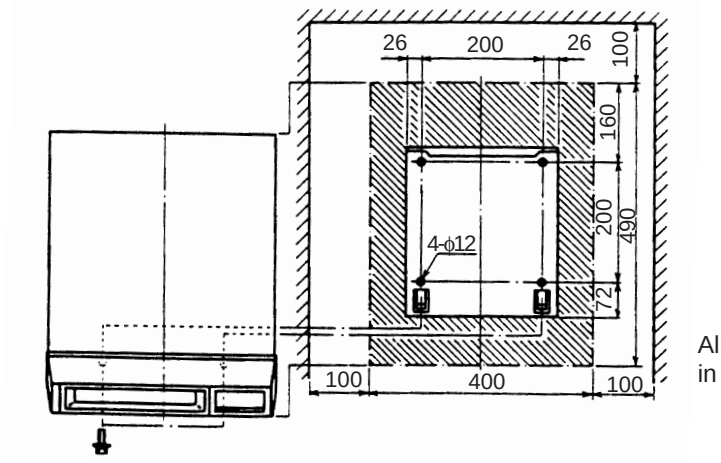


Figure 1-1 Display unit mounting dimensions

3. Fix the mounting plate to the mounting location with M10 bolts, nuts and washers.
4. Fasten the display unit to the mounting plate with the screws removed at step 1.

1.2 Transducer (FCV-1500 only)

The performance of the color video sounder greatly depends on the transducer location. A place least affected by air bubbles should be selected since turbulence interferes with sounding. Also, select a place least influenced by engine noise. It is known that bubbles are at a minimum, at normal cruising speed, at the location where the first bow wave falls and the next wave rises. On small, low speed boats, the position between 1/3 and 1/2 of ship's length from the bow is usually a good place. The face of the transducer must be facing the sea bottom in normal cruising trim of the ship.

1.3 Optional Water Temperature Sensors

Transom mount water temperature sensor T-02MTB

Select a suitable mounting location considering the following:

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

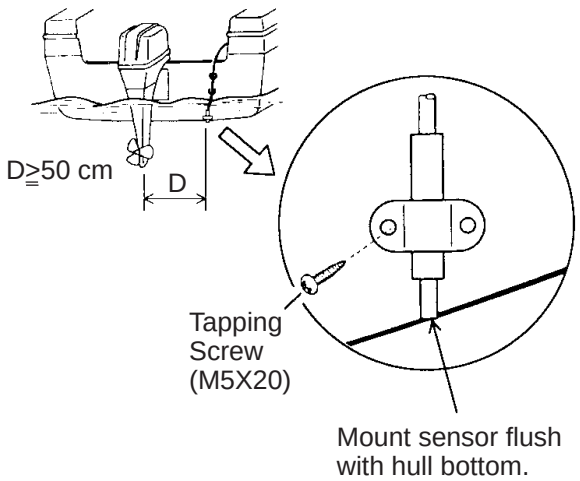


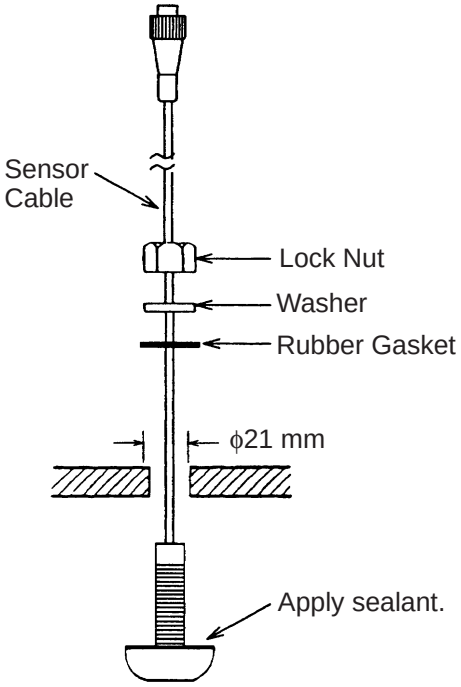
Figure 1-2 How to install transom mount water temperature sensor T-02MTB

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

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

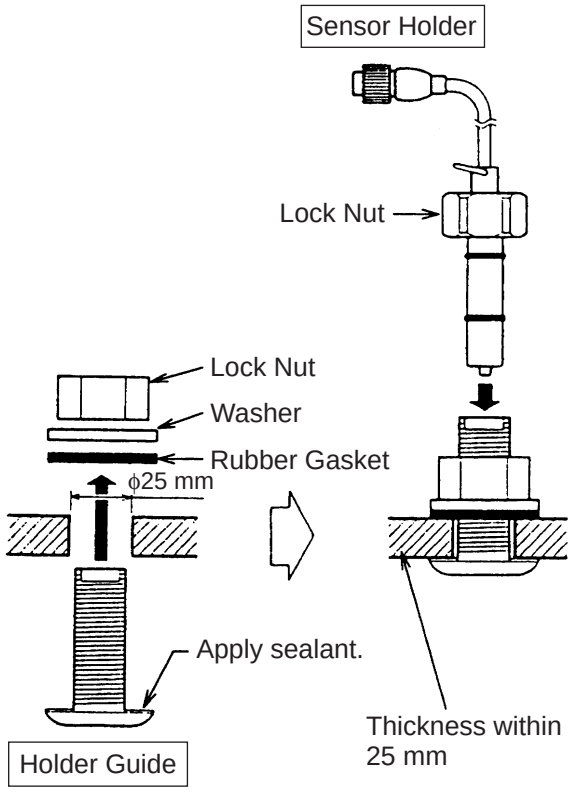
- Select a mid-boat flat position.
- The sensor does not have to be installed perfectly perpendicular, however it must not be located where it won't be damaged when the boat is dry docked.
- Select a place apart from equipment generating heat.
- Select a place in the forward direction viewing from the drain hole, to allow for circulation of cooling water.
- Select a place free from vibration.

T-02MSB



1. Drill a hole of ϕ21 mm in the hull.
2. Pass the sensor cable through the hull.
3. Pass the rubber gasket, washer and lock nut onto the cable in that order.
4. Apply high-grade sealant to the sensor flange, sensor and lock nut. Tighten the lock nut. Do not overtighten it; torque should be less than 59N•m.
5. Launch the boat and check for water leakage around the sensor.

T-03MSB



1. Drill a hole of ϕ25 mm in the hull.
2. Coat the holder guide with sealant, and then pass it through the hull from outside the boat.
3. Pass the rubber gasket, washer and lock nut onto the holder guide in that order. Tighten the lock nut. Torque should be less than 59N•m.
4. Lead in the sensor holder from inside the boat and set it to the holder guide. Tighten the lock nut.
5. Launch the boat and check for water leakage around the sensor.

Figure 1-3 How to mount thru-hull mount water temperature sensors T-02MSB, T-03MSB

WIRING

All wiring is terminated at the rear of the display unit. The power and transducer cables must be fitted with a connnector in the field. The water temperature sensor (option) cable is prefitted with a connector. For detailed information see the interconnection diagram at the end of this manual.

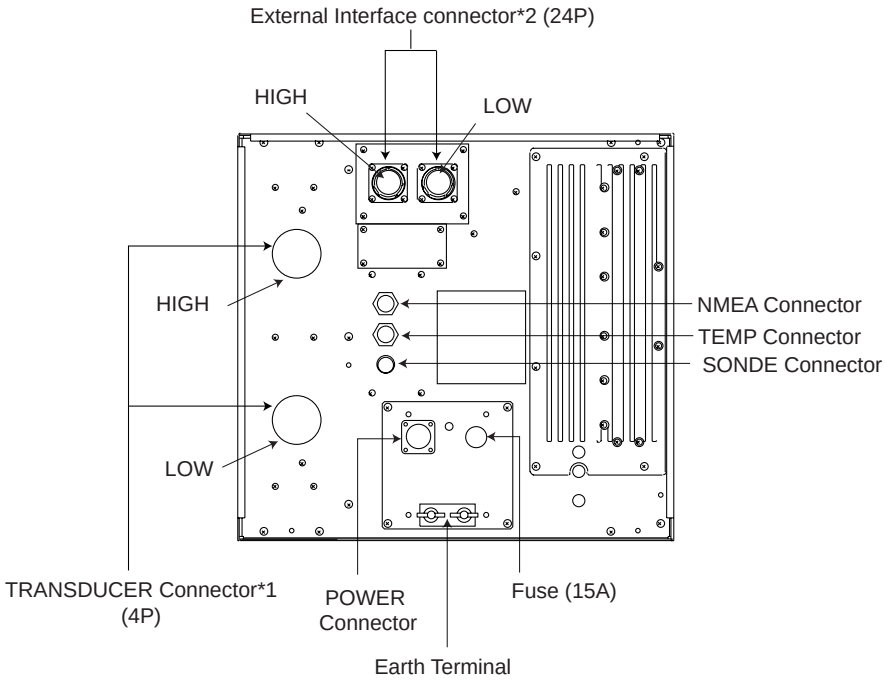


Figure 2-1 Display unit, rear view

2.1 General Wiring

Transducer (FCV-1500 only)

Separate the transducer cable as far apart as possible from other cables to prevent interference to this equipment. Fabricate the transducer cable as below and connect it to the appropriate TRANSDUCER connector on the rear panel.

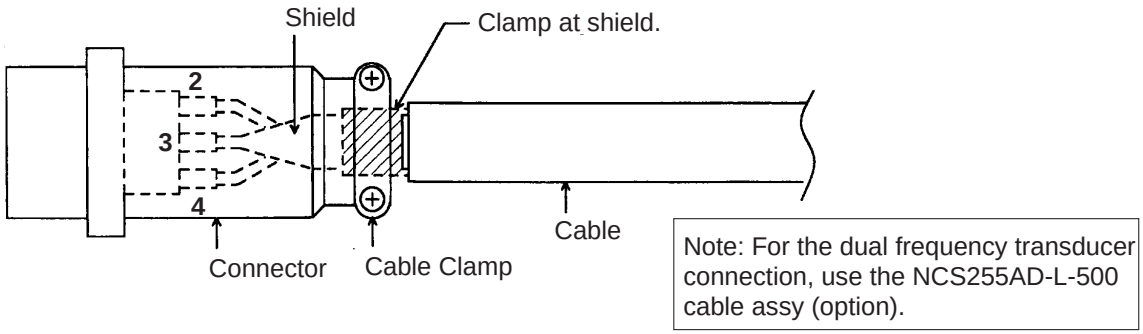


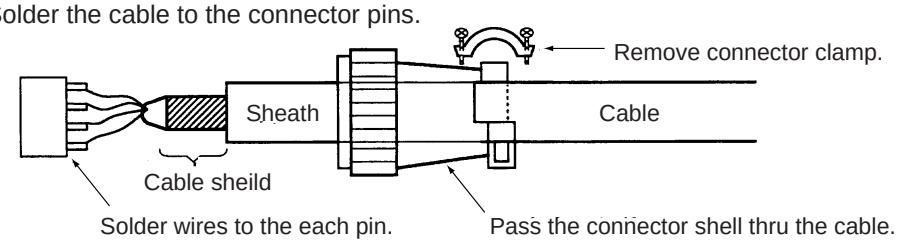
Figure 2-2 How to attach connector to transducer cable

External interface (FCV-1500M only)

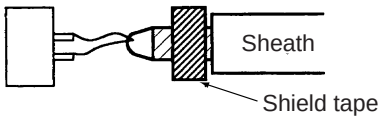
When the external equipment (E/S, Transmitter unit, Switch box) is connected, attach the SRCN6A25-24P connector (installation materialls) to the cable.

Note:The EXIF Board assy (option) enables connection of the FCV-1500 to other equipment. SRCN6A25-24P connectosr are supplied with this option in the box.

1. Solder the cable to the connector pins.



2. Wind sheild tape supplied.



3. Screw the shell on the connector. Fix the connector onto the cable by tightening the clamp.

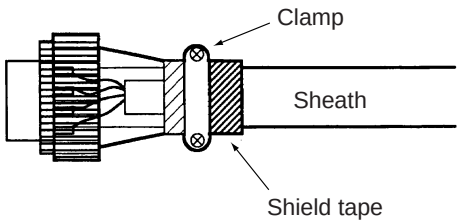


Figure 2-3 SRCN6A25-24P connector fablication

Power supply

The display unit is powered by a 24 or 32 VDC power supply (20-40 VDC). The length of the power cable (type DPYCYS-3.5, or equivalent) should be as short as possible. Plug the power cable in the POWER connector at the rear of the display unit and connect the leads to the power supply; white lead to positive (+), black lead to minus (-). Clamp the shield with the connector.

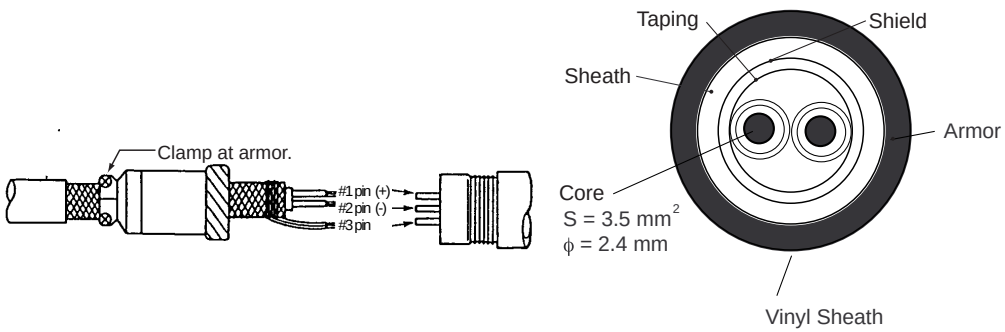


Figure 2-4 How to attach connector to power cable DPYCYS-3.5

Earth

Fasten the copper strap (supplied) between the earth terminal on the display unit and the ship's superstructure.

⚠ CAUTION

Ground the equipment to prevent electrical shock and mutual interference.

2.2 Connection of Optional Equipment

Navigator

Use cable type MJ-A6SPF0011/0012 (option) to connect a navigator (GPS, etc.) to the NMEA connector at the rear of the display unit. For details, see the interconnection diagram at the end of this manual.

Water temperature sensor (T-02MSB, T-02MTB, T-03MSB)

Connect the water temperature sensor to the TEMP connector at the rear of the display unit.

Note: The navigator and the water temperature sensor use the same type of connector. Be sure not to confuse them when connecting.

Net Sonde FNZ-18

Use connector type FM14-8P (optional supply) and 5-twisted pair cable type CO-SPEVV-SB-CO 0.2X5P (optional supply). Attach the connector to the cable as below. Connect the cable between the CIF port on the display unit of the FNZ-18 and the SONDE connector at the rear of the display unit. Be sure the shield of the interconnection cable lies in the cable clamp of the connector (both FNZ-18 and FCV-1500/M). (Analog sonde signal and sonde temperature are also available. For details see the interconnection diagram at the end of this manual and the installation manual of the FNZ-18.)

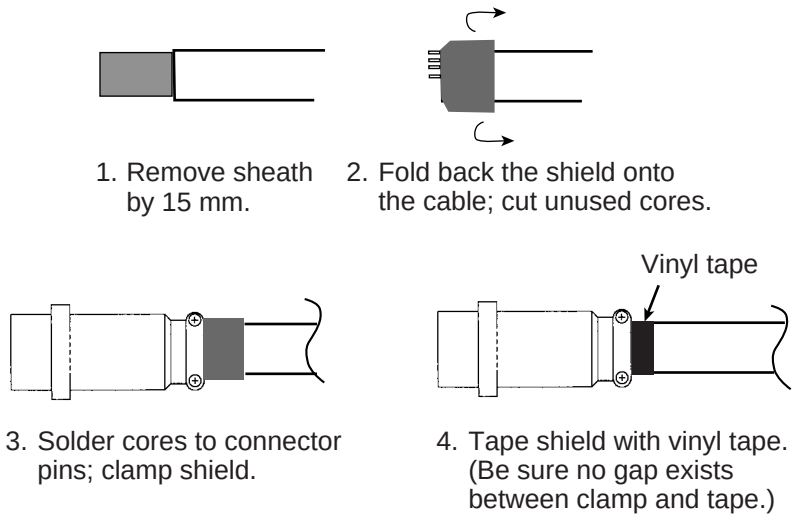


Figure 2-5 How to attach FM14-8P connector

Color monitor interface

The optional Color Monitor Interface is required to connect a standard VGA monitor. Supply monitor and interconnection cable locally.

Contents of Color Monitor Interface Kit (Type: OP02-76, Code No.: 000-012-377)

Name	Type	Qty	Code No.	Remarks
CMIF Assy.	OP02-76	1	001-396-910	RGB-BUFF pcb
XH Connector	02-986 (13-13P)	1	001-396-740	
Clamp	No.1197	1	000-515-870	
Pan-head Screw	M3X10	4	000-881-105	C2700W, MBN12

1. Unfasten eight binding screws (M4X8) to dismount the cover.

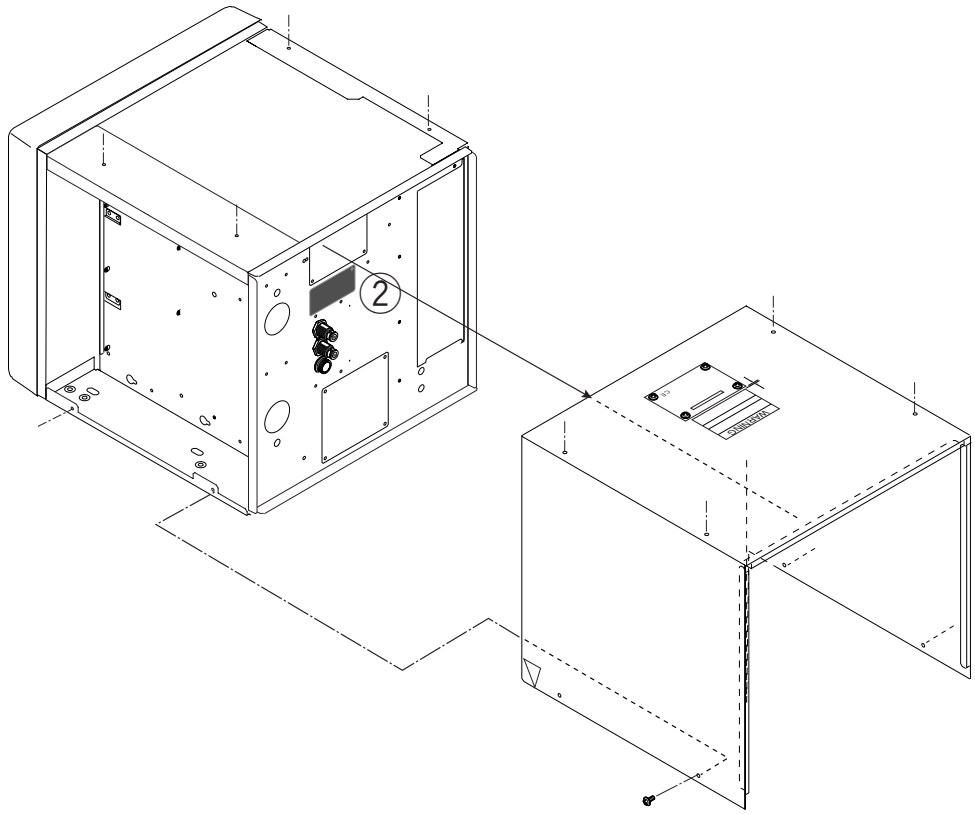


Figure 2-6 Display unit, cover removed

2. Unfasten four screws (M3X6) to dismount panel ② shown in Figure 2-3. These screws may be discarded.
3. At the location of panel ②, orient the CMIF assy (supplied) as shown in Figure 2-4 on the next page. Fasten the CMIF assy. with four pan-head screws (M3X10, supplied).
4. Connect the XH connector (13-13P, supplied) between the INTERFACE Board on the CMIF assy. and J9 on the MAIN Board.
5. Insert clamp at location shown in Figure 2-4. Set cable to clamp.

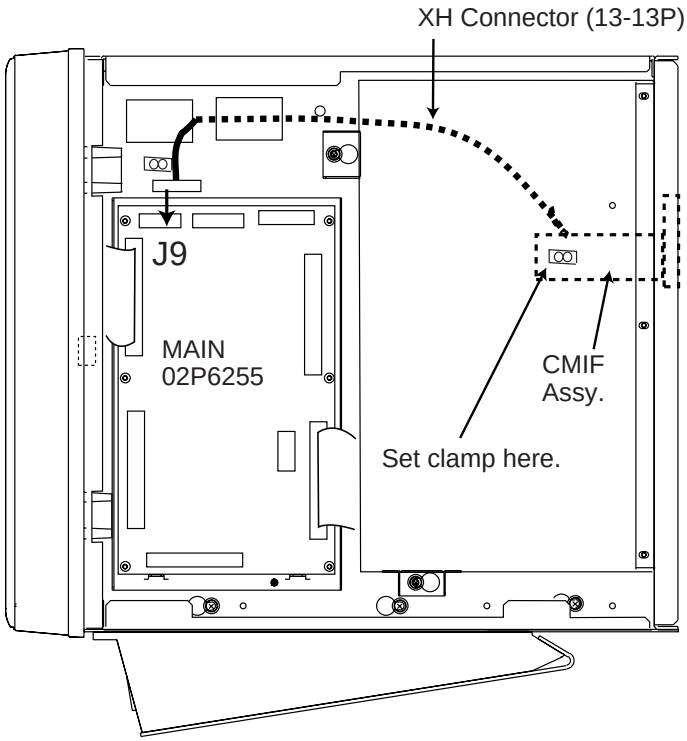


Figure 2-7 Display unit, right side view

6. Attach the cover.

EXIF Board assy (option)

When connecting telesounder or picture recorder with FCV-1500, the following option kit is necessary.

Contents of EXIF Board assy (Type: OP02-77, Code No.: 000-012-378)

Name	Type	Qty	Code No.	Remarks
EXIF Board assy		1	-	EXIF pcb assembly
Cable assy	81-548-0776	1	000-142-526	
Connector	SRCN6A25-24P	2	000-508-676	For other equipment connection
Pan-head Screw	M3X10	4	000-807-900	

1. Unfasten eight screws (M4x8) to remove the display unit cover.

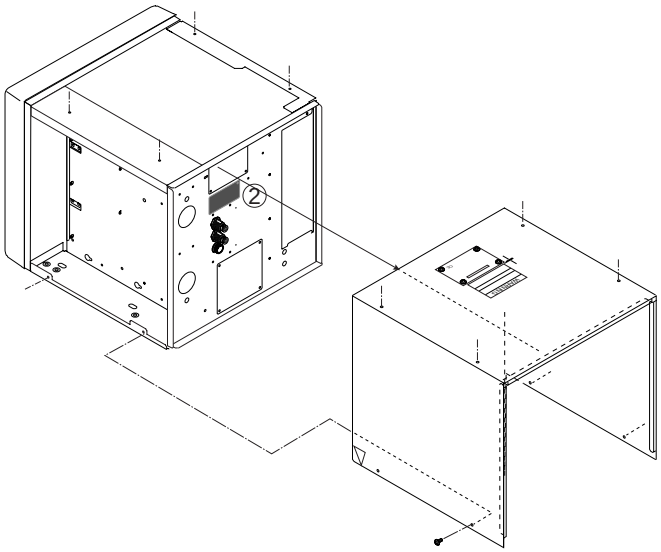


Figure 2-8 Display unit, removing cover

2. Unfasten four screws (M3X8) to remove the panel (2) shown in Figure 2-8.
3. At the location of panel (2), attach EXIF board assy (supplied as option kit) with four pan head screws (M3X10, supplied as option).

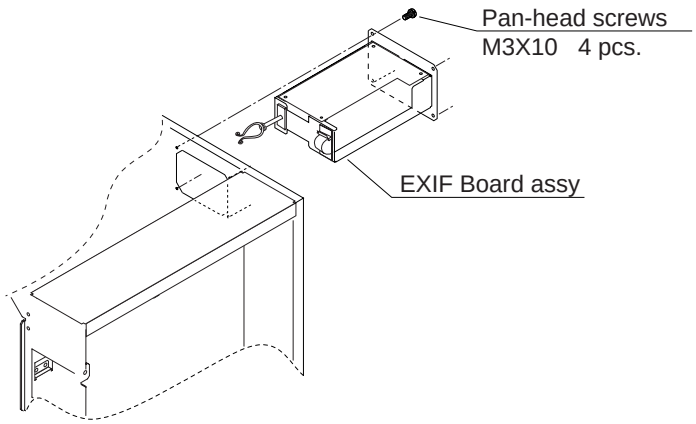


Figure 2-9 Attachment of EXIF Board assy

4. Fix J2 cable (XH connector assy, 20P) and J5 cable (XH connector assy, 4P) from the PWR Board with two cable clamps attached to the EXIF Board (02P6278).

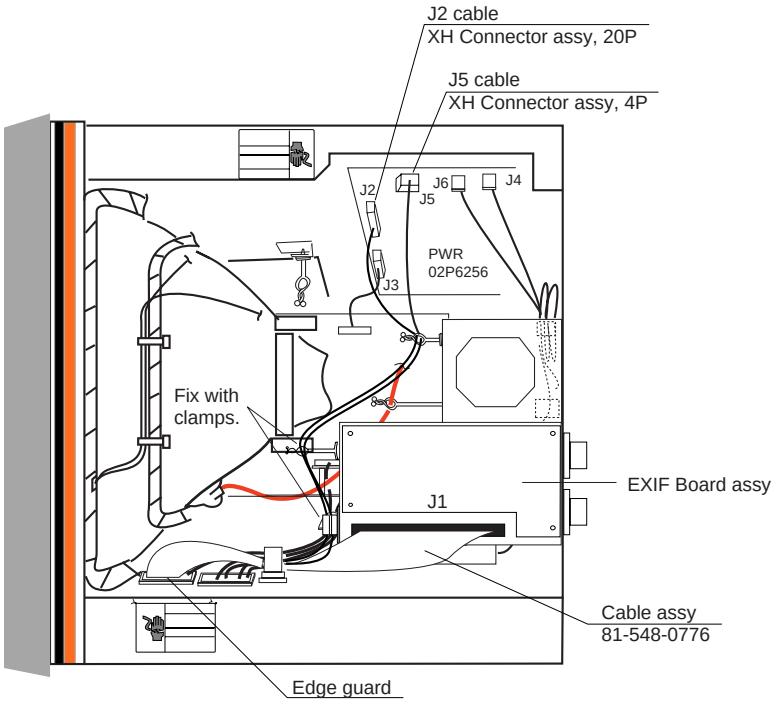


Figure 2-10 Display unit, top view

5. Connect the connector assy (81-548-0776, supplied as option) to J1 on the EXIF Board assy.

6. Pass the cable attached to J1 on the EXIF Board at step 5 through the edge guard shown in Figure 2-10.

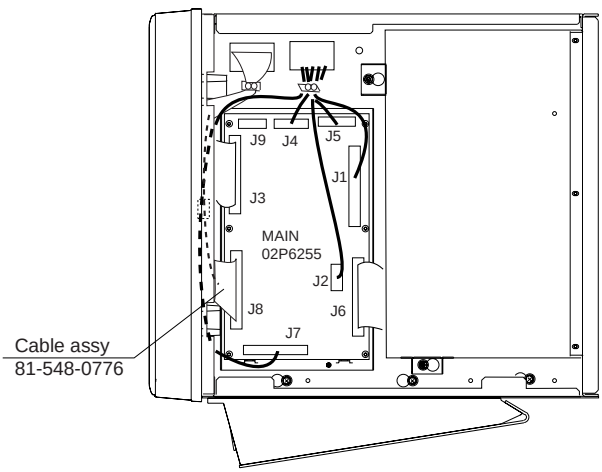


Figure 2-11 Display unit, side view

7. Fix the cable from J1 on the EXIF Board with three clamps as shown Figure 2-12

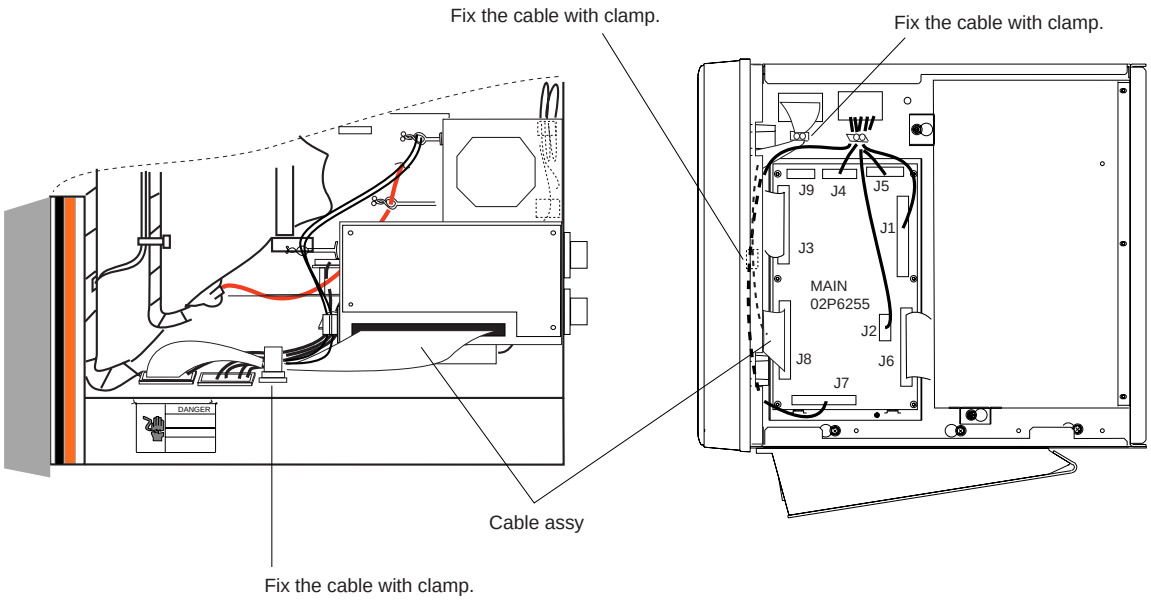


Figure 2-12 Location of clamps

8. Attach the cover.

2.3 I/O Data Sentences

Input Sentences	RMA, RMC, GLL, GTD, GLC, VTG, MTW, GGA
Output Sentences	DBT, DPT, DBS, MTW, TLL, SDVRM

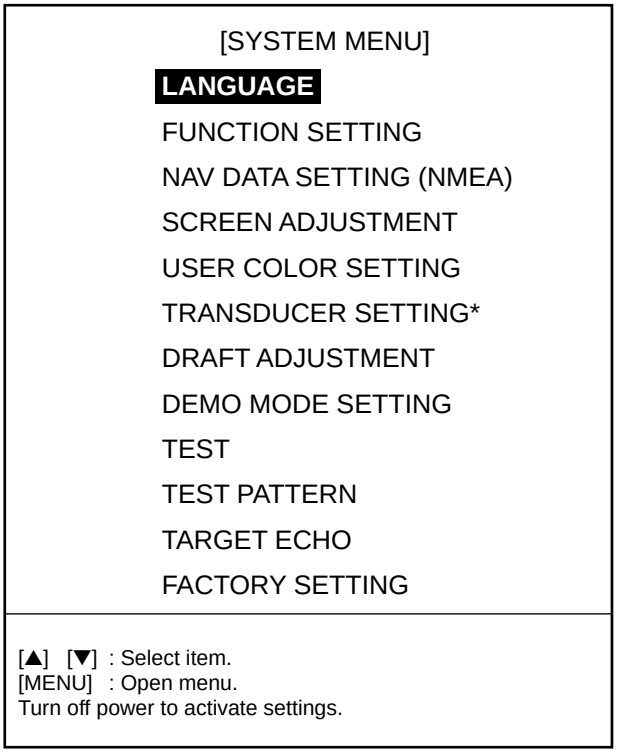
ADJUSTMENTS

This section provides the procedures for initial set up of the equipment. The type of transducer used should be properly set before operating the equipment.

3.1 System Menu

Initial settings are made on SYSTEM menu. Open the menu as follows.

1. Press the [PWR] key while pressing and holding down any key.



*Not available on FCV-1500M.

Figure 3-1 SYSTEM menu

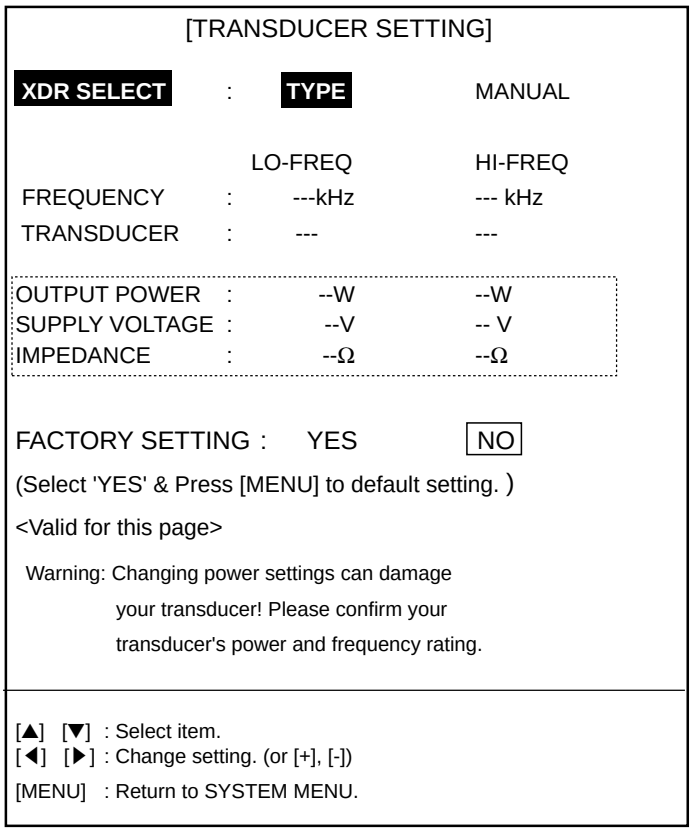
2. Select menu with the [▲]/[▼] key. The selected item is highlighted in green.
3. Press the [MENU] key to open menu selected.
4. Select item with the [▲]/[▼] key. The selected item is highlighted in green.
5. Select option with the [◀]/[▶] key, or set value with the [+]/[-] key. The selected option is highlighted in white.
6. Press the [MENU] key to close the menu and return to the SYSTEM menu.
7. To escape from the SYSTEM menu turn off the power, and wait a few seconds and then the power on again. (This must be done when changing the language.)

3.2 Transducer Setting (FCV-1500 only)

Select the type of transducer used as follows:

Automatic selection of transducer

1. Select TRANSDUCER SETTING from the SYSTEM menu and press the [MENU] key. (Refer to page 3-1 for how to display the SYSTEM menu.)



⚠ CAUTION

Confirm type of transducer used before setting type on the menu.

Wrong transducer setting may damage the transducer and void the warranty.

For using SURFACE on the TARGET ECHO menu, the surface-use 1 kW transducer should be connected.

Use of it with another transducer may result in damage to the transducer.

Figure 3-2 TRANSDUCER SETTING menu

2. Select TYPE.
3. Select LO-FREQ or HI-FREQ with the arrow keys.
4. Set transducer frequency with [+]/[-] key.
5. Press [▼] to select the TRANSDUCER field.

6. Press [+]/[-] to display transducer list. The illustration below shows the available 50 kHz transducers.

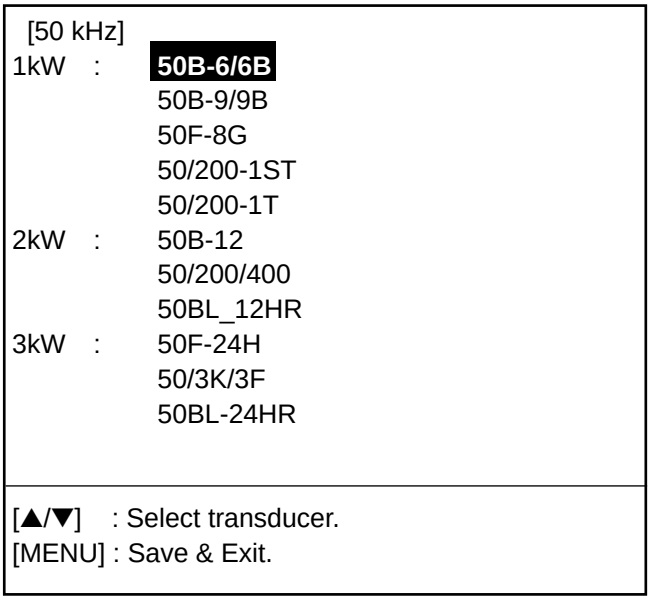


Figure 3-3 Transducer selection screen (50 kHz)

7. Select transducer type with [▲]/[▼] and then press the [MENU] key. The values for output power, supply voltage and impedance are automatically set.
8. For 2nd transducer, select appropriate transducer as above.
9. Press the [MENU] key to close the menu and return to the SYSTEM menu.

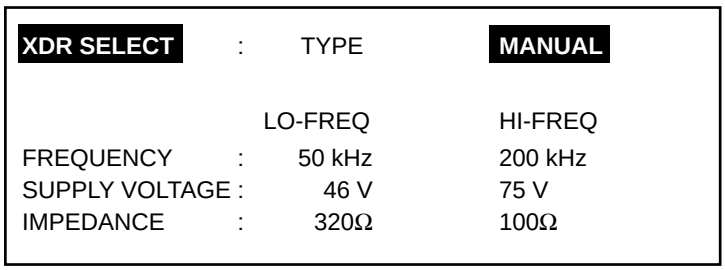
Manual selection of transducer

If the transducer to be used is not shown on the transducer list, manually set transducer type as below.

Note 1: When transducer 50/200-1T or 50/200-12M is used, set 50 kHz to 50B-6/6B; 200 kHz to 200B-5S. This is necessary until 50/200-1T and 50/200-12M are added to system program.

Note 2: Max. output on transducers 50F-38 and 28F-38 is 3 kW.

1. Select TRANSDUCER SETTING from the SYSTEM menu and press the [MENU] key. (Refer to page 3-1 for how to display the SYSTEM menu.)
2. Select MANUAL to display the following menu.



⚠ CAUTION

Do not manually set transducer type if type used is programmed in this unit.

Wrong transducer setting may damage the transducer and void the warranty.

Figure 3-4 Manual Transducer selection screen

3. Select HI-FREQ or LO-FREQ with the arrow keys.
4. Use the [+]/[-] key to set frequency.
5. Press [▼] to select SUPPLY VOLTAGE.
6. Set supply voltage with [+]/[-] key.
7. Press [▼] to select IMPEDANCE.
8. Set impedance with [+]/[-] key. (Not required; system will function properly without setting.)
9. For 2nd transducer, set it as appropriate.
10. Press the [MENU] key to return to the SYSTEM menu.

3.3 Adjustment for Transmitter Unit / Telesounder/ Picture Recorder

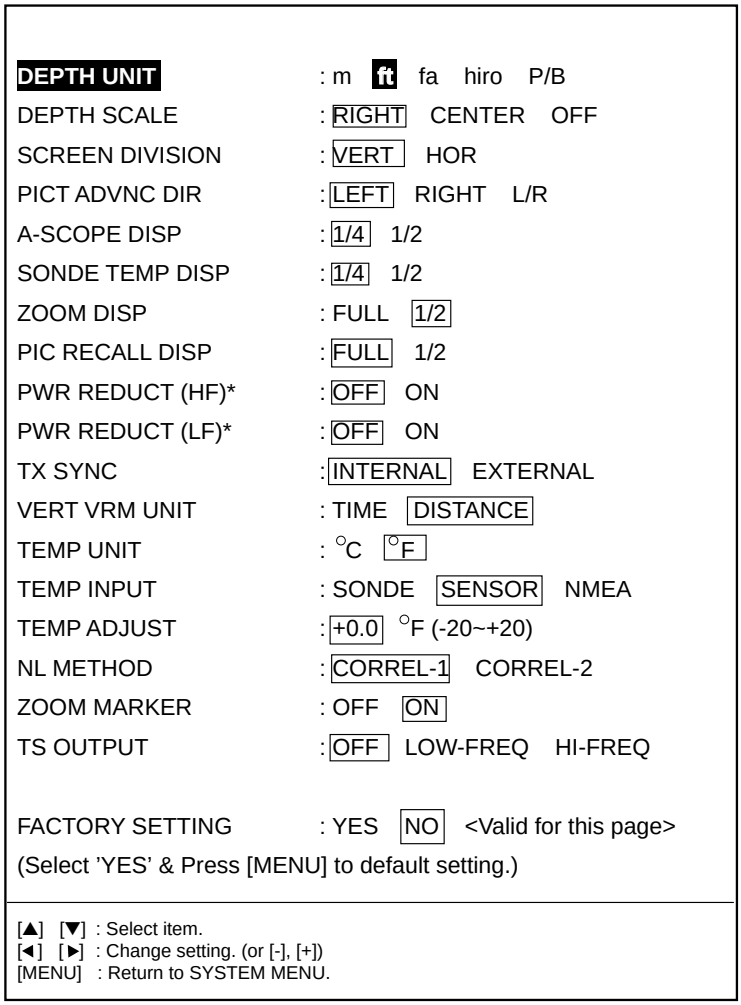
When the transmitter unit (ETR-2D etc.), video sounder, telesounder (TS-50/80/7000/8000) or picture recorder (MT-12) is connected, do the following adjustments.

Note 1: For FCV-1500, install the EXIF Board assy (option) before the connection.

Note 2: For FCV-1500M, only master ship is available to connect to the telesounder. The picture recorder is not available to record echo sounder signal, playback only.

Transmitter/video sounder

1. Select FUNCTION SETTING from the SYSTEM menu and press the [MENU] key.



*Not available on FCV-1500M.

Figure 3-5 FUNCTION SETTING menu

2. Select TS OUTPUT with [▲]/[▼].
3. Select "OFF" with [◀].

4. Press [MENU] key to close the menu and return to the SYSTEM menu.
5. Turn the power off and on again.
6. Display the sounder screen to measure how many feet the transmitting line of HIGH and LOW frequencies is shifted by VRM marker.
7. Turn the power off, and on again while holding any key down.
8. Select DRAFT ADJUSTMENT menu with [▲]/[▼].
9. Press the [MENU] key.

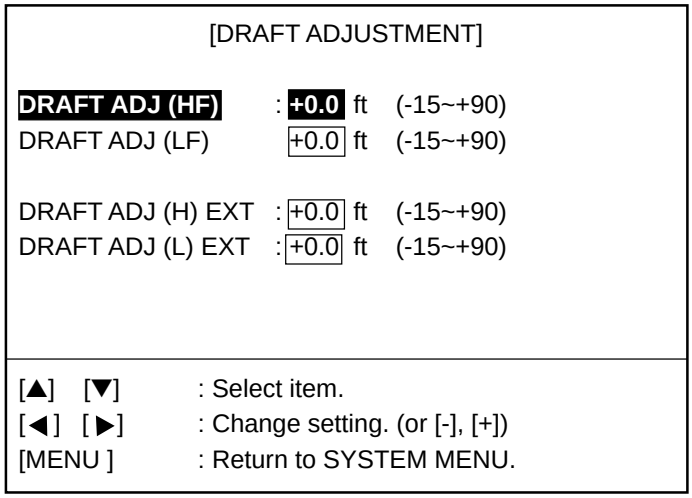


Figure 3-6 DRAFT ADJUSTMENT menu

10. Enter the value of the transmitting line measured in step 6 with - (minus) at the DRAFT ADJ (H) EXT and DRAFT (L) EXT lines with [◀]/[▶].
11. Press the [MENU] key to return to SYSTEM menu.

Telesounder

The FCV-1500M can be connected to a telesounder onboard a master ship and the FCV-1500 can be connected to a telesounder onboard a master ship and sister ship.

1. Select FUNCTION SETTING from the SYSTEM menu.
2. Press the [MENU] key.
3. Select TS OUTPUT with [▲]/[▼].
4. When FCV-1500/FCV-1500M installed on the master ship, select OFF with [◀]. When FCV-1500 is installed on the sister ship, select LOW-FREQ or HI-FREQ with [◀]/[▶]. (LOW-FREQ; outputs the signal to the master ship from the low frequency port, HI-FREQ; outputs the signal to the master ship from the high frequency port)
5. Press the [MENU] key to return to SYSTEM menu.
6. Turn the power off and on again.

7. For FCV-1500 only, do the following.
   a) Press the [MENU] key.
   b) Open the TX/RX menu with [+]/[-] key.
   c) When your unit is on the master ship, select EXTER at TDR CNNCT (HF/LF) for input port. When installing on the sister ship, select INTER at TDR CNNCT (HF/LF) for output port.
8. Display the sounder screen to measure how many feet the transmitting line of HIGH and LOW frequencies is shifted by VRM marker.
   Transmitting line is low: to the next step,
   Transmitting line is same position: to step 15.
9. Turn the power off, and on again while holding any key down.
10. Select DRAFT ADJUSTMENT with [▲]/[▼].
11. Press the [MENU] key.
12. At DRAFT ADJ (HF/LF) line for the sister ship, at DRAFT ADJ (HF/LF) EXT line for the master ship, enter the value of the transmitting line measured in step 7 with - (minus).
13. Press the [MENU] key to return to SYSTEM menu.
14. Turn the power off, and on again.
15. Check the error between the display transmitted from the sister ship and the display of own ship.

Picture recorder

The FCV-1500M can playback echo sounder signal and FCV-1500 can record/playback it.

1. Select FUNCTION SETTING from the SYSTEM menu.
2. Press the [MENU] key.
3. Select TS OUTPUT with [▲]/[▼].
4. For playback, select OFF with [◀]. For recording, select LOW-FREQ or HI-FREQ with [◀]/[▶]. (LOW-FREQ; outputs the signal from the low frequency port, HI-FREQ; outputs the signal from the high frequency port)
5. Press the [MENU] key to return to SYSTEM menu.
6. Turn the power off and on again.
7. For FCV-1500 only, do the following steps.
   a) Press the [MENU] key.
   b) Open the TX/RX menu with [+]/[-] key.
   c) For playback, select EXTER at TDR CNNCT (HF/LF) line for input port. For recording, select INTER at TDR CNNCT (HF/LF) line for output port.

8. Display the sounder screen to measure how many feet the transmitting line of HIGH and LOW frequencies is shifted by VRM marker.

   Transmitting line is low: to the next step,

   Transmitting line is same position: The setting is finished.

9. Turn the power off, and on again while holding any key down.
10. Select DRAFT ADJUSTMENT with [▼] key.
11. Press the [MENU] key.
12. Enter the value of the transmitting line measured in step 8 with - (minus). at the DRAFT ADJ (H) EXT and DRAFT (L) EXT line with [◀]/[▶]
13. Press the [MENU] key to return to SYSTEM menu.

3.4 Nav Data Setting

1. Select NAV DATA SETTING (NMEA) from the SYSTEM menu and press the [MENU] key.

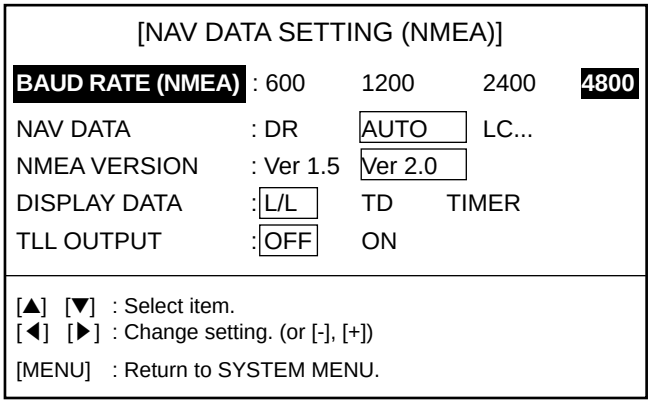


Figure 3-7 NAV DATA SETTING (NMEA) menu

2. Set baud rate of navigator with [◀]/[▶].
3. Select NAV DATA with [▲]/[▼].
4. Set type of NMEA talker of navigator (GPS, Loran C, Loran A, Decca, DR, AUTO) with [◀]/[▶]. Select AUTO when more than one navigator is connected, and the priority is GPS, Loran C, Loran A, Decca, DR.
5. Select NMEA VERSION with [▲]/[▼].
6. Set NMEA version of navigator with [◀]/[▶]. If you are unsure of version number try both and select the one which successfully receives nav data.
7. Select DISPLAY DATA with [▲]/[▼].
8. Select L/L or TD as appropriate with [◀]/[▶].
9. Select TLL OUTPUT with [▲]/[▼]. (This enables/disables L/L position output when the [MARKER] key is operated.)
10. Select ON or OFF as appropriate with [◀]/[▶].
11. Press the [MENU] key to close the menu and return to the SYSTEM menu.

3.5 Picture Adjustment

1. Select SCREEN ADJUSTMENT from the SYSTEM menu and press the [MENU] key.

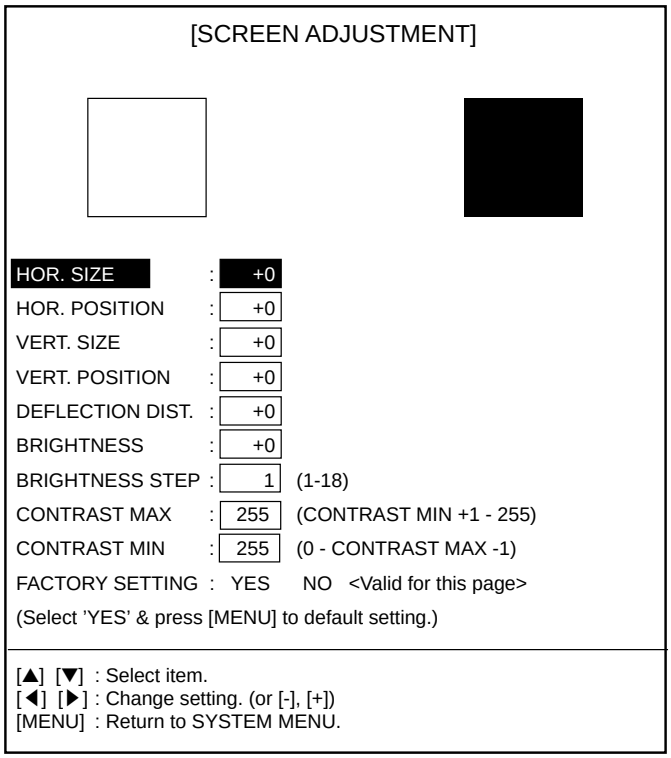
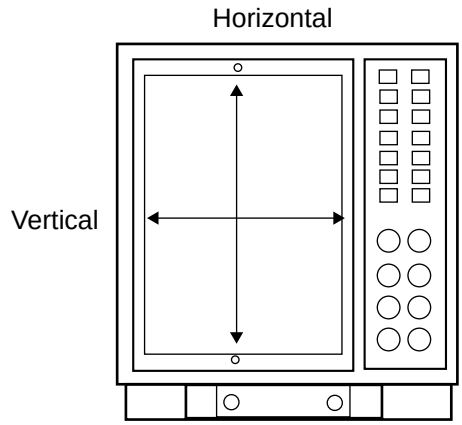


Figure 3-8 Screen adjustment menu

2. Use the [▲]/[▼] key to select item to adjust.



HOR. SIZE: Adjusts picture size in horizontal direction.
HOR. POSITION: Adjusts picture position in horizontal direction.
VER. SIZE: Adjusts picture size in vertical direction.
VER. POSITION: Adjusts picture position in vertical direction.
DEFLECTION DIST: Corrects concave distortion.
BRIGHTNESS: Adjusts picture brightness.
BRIGHTNESS STEP: Sets the amount of brightness levels available when changing picture brightness.
CONTRAST MAX: Sets contrast setting to use with maximum brightness setting (8). (Setting cannot be lower than CONTRAST MIN setting.)
CONTRAST MIN: Sets contrast setting to use with minimum picture brightness is used. (Setting cannot be higher than CONTRAST MAX setting.)
FACTORY SETTING: Restores the factory settings of this menu. (All zeroes except CONTRAST which is 255.)

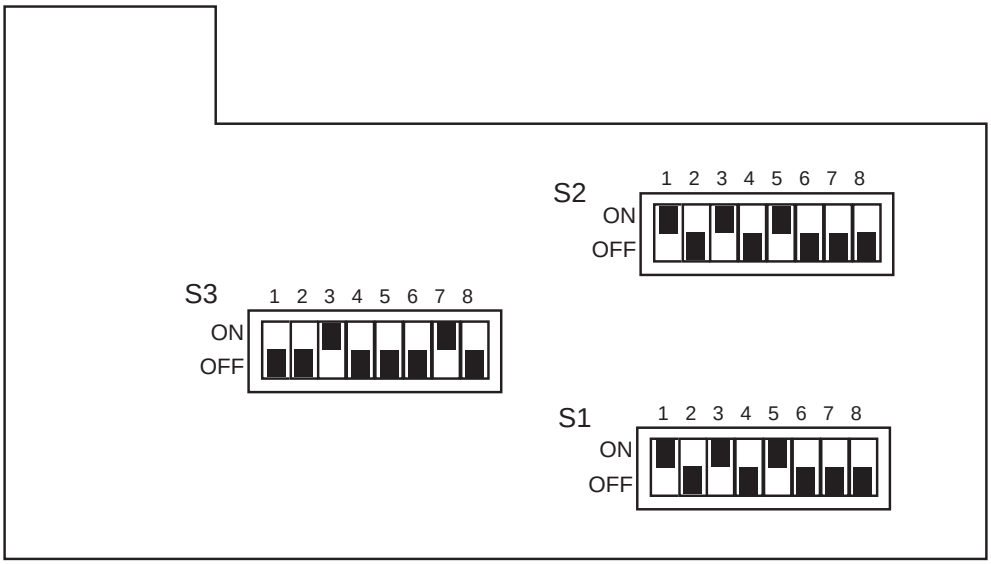
3. Use the [◀]/[▶] key (or[+]/[-]) key to enter appropriate value.

4. Press the [MENU] key to close the menu and return to the SYSTEM menu.

Note: Vertical and horizontal are reversed as shown right.

3.6 DIP Switch Settings for EXIF Board

Set the DIP switches on the EXIF Board 02P6279 according to equipment connected. No change is necessary when connecting a video sounder which uses a linear amplifier (FCV-271/382/782, etc.). For a video sounder with a log amplifier (FCV-1500, etc.) change the DIP switch settings as below. Early model FURUNO video sounders which have a log amplifier cannot be connected.



DIP switch settings on EXIF Board for linear amp

DIP SWITCH S1	DIP SWITCH S2	DIP SWITCH S3
1 2 3 4 5 6 7 8 ON OFF	1 2 3 4 5 6 7 8 ON OFF	1 2 3 4 5 6 7 8 ON OFF
1: KP OUT L POS (Default: ON) 2: KP OUT L NEG (Default: OFF) 3: KP IN L POS (Default: ON) 4: KP IN L NEG (Default: OFF 5: LINER IN L (Default: ON) 6: LOG IN L (Default: OFF) 7: KP IN L 12V (OFF, Default) KP IN L 5 V (ON) 8: WL IN L 12V (OFF, Default) WL IN L 5 V (ON)	1: KP OUT H POS (Default: ON) 2: KP OUT H NEG (Default: OFF) 3: KP IN H POS (Default: ON) 4: KP IN H NEG (Default: OFF 5: LINER IN H (Default: ON) 6: LOG IN H (Default: OFF) 7: KP IN H 12V (OFF, Default) KP IN H 5 V (ON) 8: WL IN H 12V (OFF, Default) WL IN H 5 V (ON)	1: GND (Default: OFF) 2: KP OUT L (Default: OFF) 3: RECO H (Default: ON) 4: ETRREC H (Default: OFF) 5: GND (Default: OFF) 6: KP OUT H (Default: OFF) 7: RECO L (ON) 8: ETRREC L (Default: OFF)

LINEAR AMP (Default setting)
Low frequency
S1-5: ON, S1-6: OFF
High frequency
S2-5: ON, S2-6: OFF

LOG AMP
Low frequency
S1-5: OFF, S1-6: ON
High frequency
S2-5: OFF, S2-6: ON

ETR-2D, ETR-3D, ETR-5D/2, ETR-10D/2, EX-7
EXT-H (9 pin ... GND)
S3-1: ON, S3-2: OFF
EXT-L (9 pin ... GND)
S3-5: ON, S3:6, OFF

Note: Do not turn ON S3-1 and S3-2 or S3-5 and S3-6 together. This will short a circuit board.

DIP switch settings on EXIF Board for log amp

APPENDIX NEW BLT TRANSDUCERS

A new type BLT transducer (Bolt-clamp Langevin Transducer) has been developed for this echo sounder. The BLT has large bandwidth, good sound efficiency, compact structure and is reinforced to protect against slamming.

Transducer, thru-hull pipe and tank list

Frequency (kHz)	Transducer	Hull Material	Tank (Code No.)	Fasten inside hull (Code No.)	Fasten outside hull (Code No.)
28/200	28BL-6HR/200B-8B	Steel	T-693 (000-015-044)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-693F (000-015-241)	TRB-1100 (2) (000-015-219)	-
38/200	38BL-9HR/200B-8B	Steel	T-693 (000-015-044)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-693F (000-015-241)	TRB-1100 (2) (000-015-219)	-
50/200	50BL-12HR/200B-8B	Steel	T-693 (000-015-044)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-693F (000-015-241)	TRB-1100 (2) (000-015-219)	-
28/38	28B L-12HR/38BL-15HR	Steel	T-681 (000-015-849)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-681F (000-015-850)	TRB-1100 (2) (000-015-219)	-
28/50	28B L-12HR/50BL-24HR	Steel	T-681 (000-015-849)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-681F (000-015-850)	TRB-1100 (2) (000-015-219)	-
38/50	38B L-15HR/50BL-24HR	Steel	T-681 (000-015-849)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-681F (000-015-850)	TRB-1100 (2) (000-015-219)	-
28/88	28B L-12HR/88F-126H	Steel	T-682 (000-015-851)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-682F (000-015-852)	TRB-1100 (2) (000-015-219)	-
38/88	38B L-15HR/88F-126H	Steel	T-682 (000-015-851)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-682F (000-015-852)	TRB-1100 (2) (000-015-219)	-

50/88	50B L-24HR/88-126H	Steel	T-682 (000-015-851)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-682F (000-015-852)	TRB-1100 (2) (000-015-219)	-
28/200	28BL-12HR/200B-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-
38/200	38BL-15HR/200B-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-
50/200	50BL-24HR/200B-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-
28/150	28BL-12HR/150B-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-
38/150	38BL-15HR/150-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-
38/150	50BL-24HR/156-12H	Steel	T-683 (000-015-853)	TWB-6000 (2) (000-015-207)	TFB-7000 (2) (000-015-209)
		FRP	T-683F (000-015-854)	TRB-1100 (2) (000-015-219)	-

Settings

1. Referring to page 14, set the menu as below.
   XDCR SELECT: MANUAL
   FREQ: 28/38/50 kHz

Transducer	Output	Supply Voltage
28BL-6HR	2	70
38BL-9HR		70
50BL-12HR		70
28BL-12HR	3	90
38BL-15HR		90
50BL-24HR		90

FURUNO

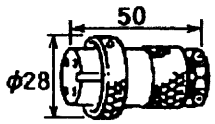
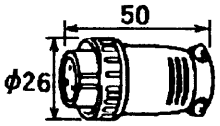
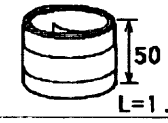
CODE NO.	001-396-940	02FH-X-9401 -1
TYPE	CP02-06201	1/1

工事材料表

INSTALLATION MATERIALS

FCV-1500　カラー魚群探知機

COLOR VIDEO SOUNDER

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	コネクタ CONNECTOR		NCS-254-P CODE NO. 000-506-505	2	
2	ｺﾈｸﾀ CONNECTOR		NJC-203-PF CODE NO. 000-506-703	1	
3	ｱｰｽ板 COPPER STRAP		WEA-1004-0 CODE NO. 500-310-040	1	

DWG NO.
C2363-M01- B

FURUNO ELECTRIC CO ., LTD

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

FURUNO

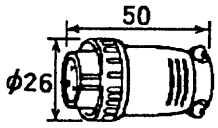
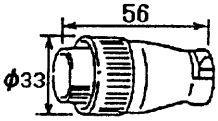
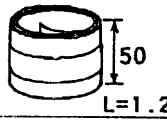
CODE NO.	001-399-090	02FH-X-9402-0
TYPE	CP02-06202	1/1

工事材料表

INSTALLATION MATERIALS

FCV-1500M　カラー魚群探知機

COLOR VIDEO SOUNDER

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｺﾈｸﾀ CONNECTOR		NJC-203-PF CODE NO. 000-506-703	1	
2	ｺﾈｸﾀ CONECTOR		SRCN6A25-24P CODE NO. 000-508-676	2	
3	ｱｰｽ板 COPPER STRAP		WEA-1004-0 CODE NO. 500-310-040	1	

DWG NO. C2363-M02- A

FURUNO ELECTRIC CO., LTD

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

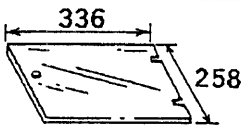
FURUNO

CODE NO.	000-012-375	02FH-X-9501 -1
TYPE	FP02-04900	1/1

付属品表

ACCESSORIES

FCV-1500
FCV-1500M
カラー魚群探知機
COLOR VIDEO SOUNDER

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	フィルタ組品 FILTER ASSY.		FP02-02620 CODE NO. 002-007-290	1	

DWG NO.
C2363-F01- B

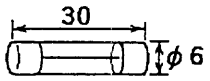
FURUNO ELECTRIC CO . , LTD

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

FURUNO

CODE NO.	001-396-930	02FH-X-9301 -1
TYPE	SP02-04001	BOX NO. P

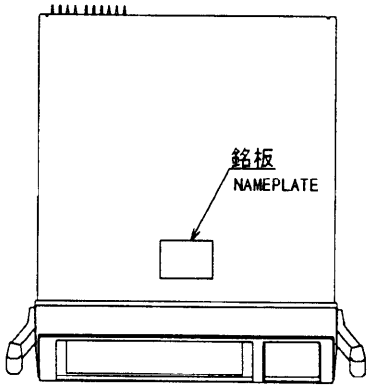
SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL
	FCV-1500 カラー魚群探知機 FCV-1500M COLOR VIDEO SOUNDER		

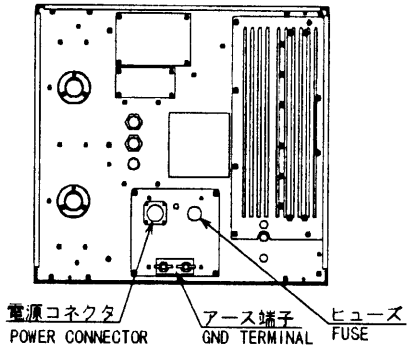
ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ FUSE		FGBO 15A AC125V	1		3	000-549-014

MFR'S NAME	FURUNO ELECTRIC CO.,LTD	DWG NO.	C2363-P01- B	1/1

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

FURUNO

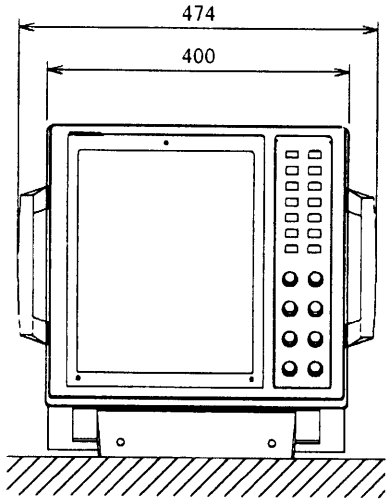


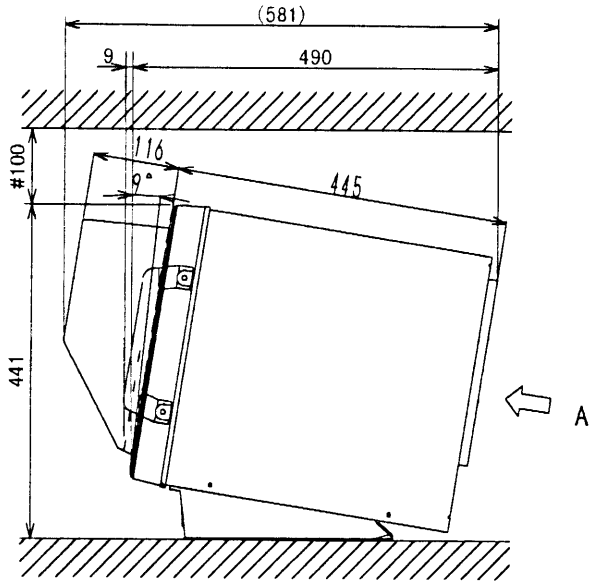


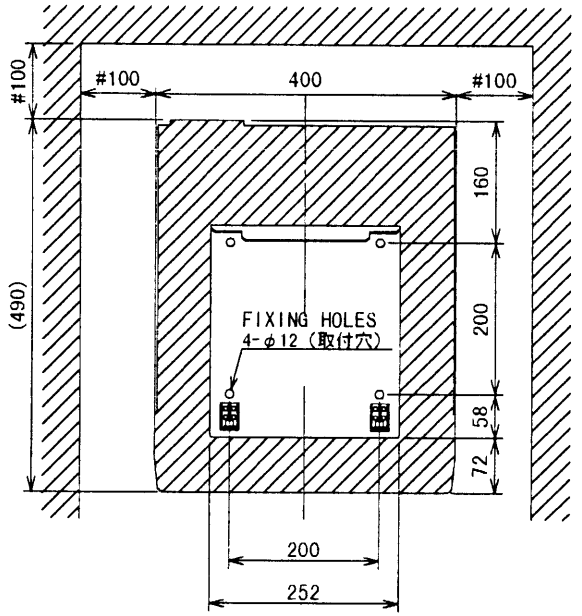
矢視A（背面図） VIEW A(REAR)

範囲 DIMENSION	公差 TOL.
L≦50	±1.5 mm
50<L≦100	±2.5 mm
100<L≦500	±3 mm

表 1 TABLE 1







取付寸法
MOUNTING DIMENSIONS

注 記 1）#印寸法は最小サービス空間寸法とする
2）指定外寸法公差は表1による

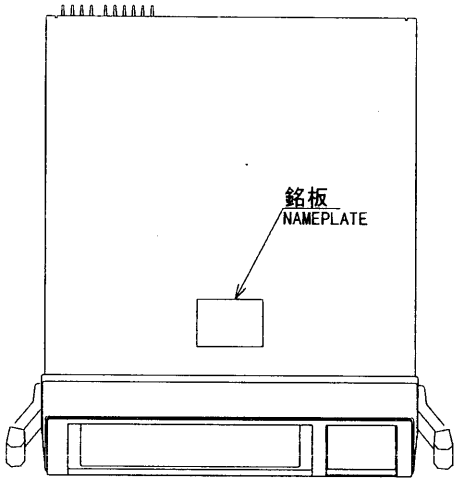
NOTE 1. #: RECOMMENDED SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

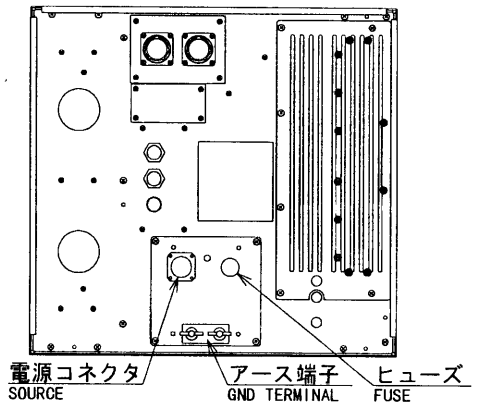
DRAWN Apr 7'99 T.YAMASAKI		TITLE	CV-1500
CHECKED Apr 7'99 K.Kusunoki		名称	指示器
APPROVED Apr. 7'99 K.Kusunoki			外寸図
SCALE 1/10 MASS 32 kg		NAME	DISPLAY UNIT
DWG. No. C2363-G01- B	02-126-1000-G4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

D-1

FURUNO

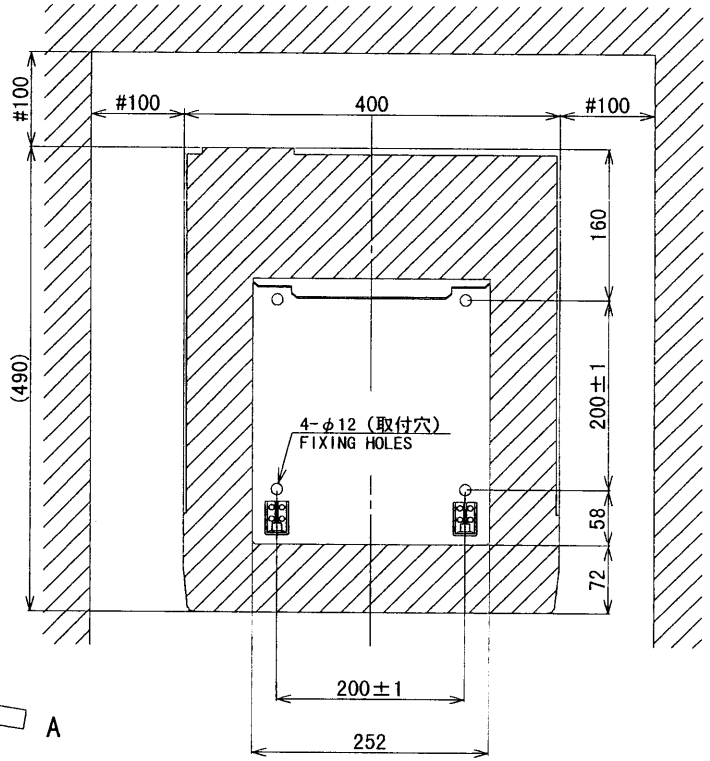


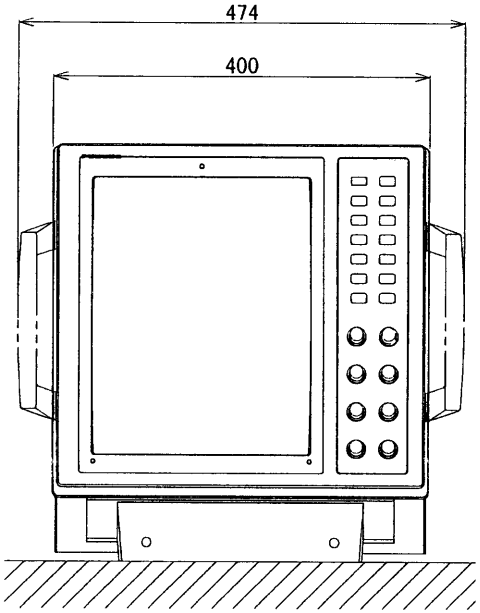


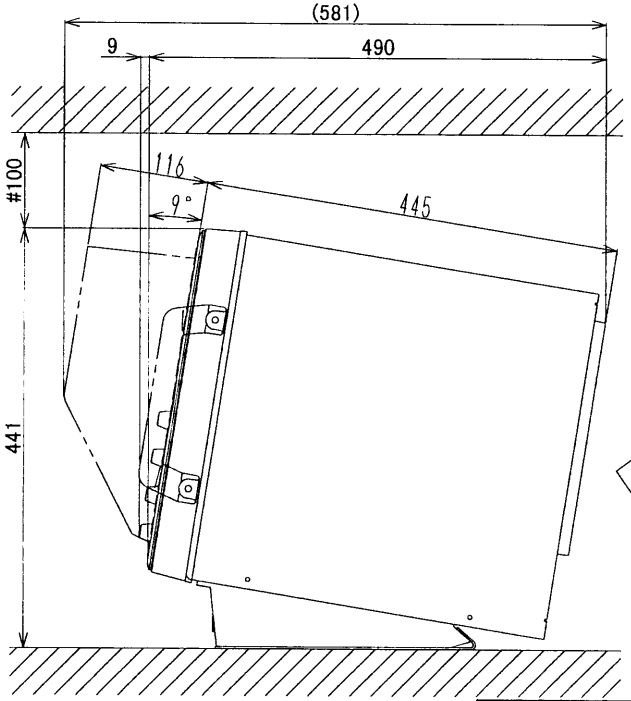
矢視A（背面図）
VIEW A (REAR)

範　囲 DIMENSION	公差 TOL.
L≦５０	±1.5 mm
５０<L≦１００	±2.5 mm
１００<L≦５００	±3 mm

表 1
TABLE 1





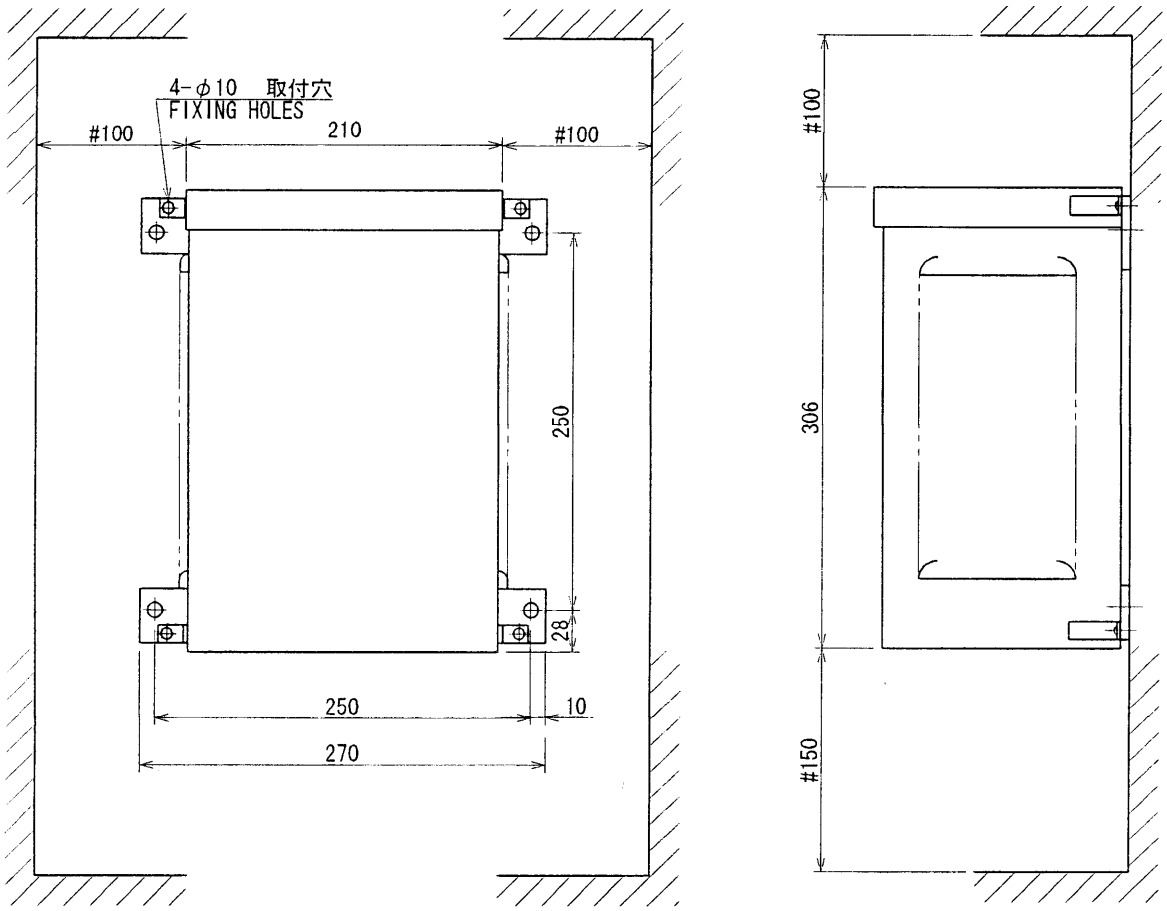


注　記　１）　#印寸法は最小サービス空間寸法とする
　　２）　指定外寸法公差は表１による

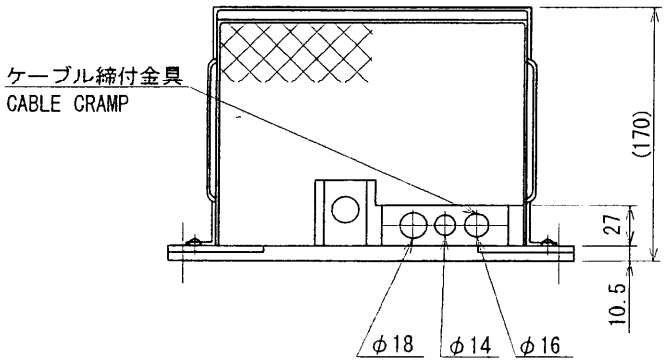
NOTE　1. #: RECOMMENDED SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.

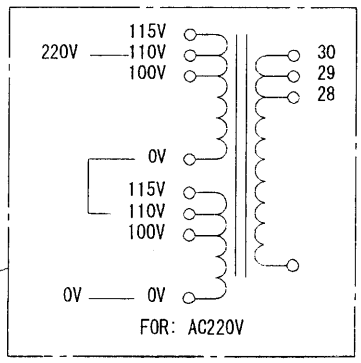
DRAWN Sep29'99 T.Yamasaki		TITLE	CV-1500M
CHECKED Sep29'99 K.Kusunoki		名称	指示器
APPROVED Sep29'99 K.Kusunoki			外寸図
SCALE 1/8 MASS 30 kg		NAME	DISPLAY UNIT
DWG. No. C2363-G02- B	02-126-2000-G0		OUTLINE DRAWING

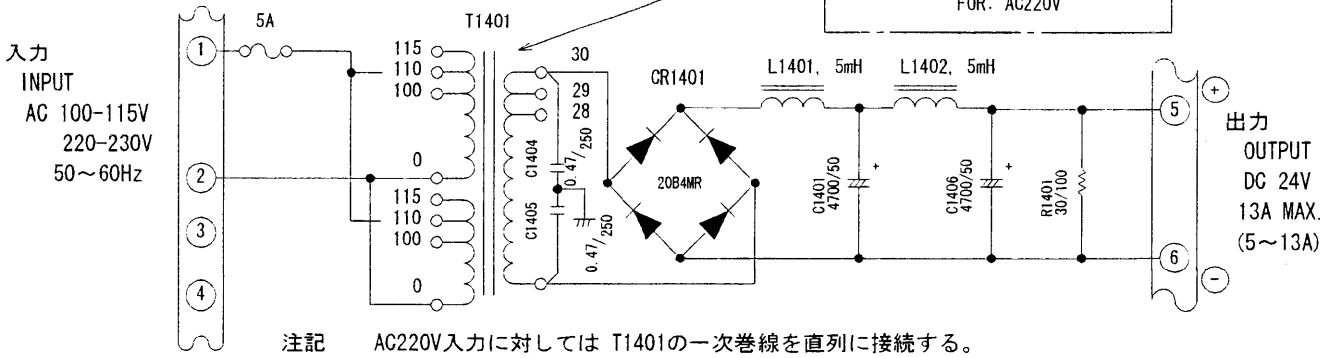
FURUNO ELECTRIC CO., LTD.



NOTE 1. # : 推奨サービス空間
RECOMMENDED SERVICE CLEARANCE.



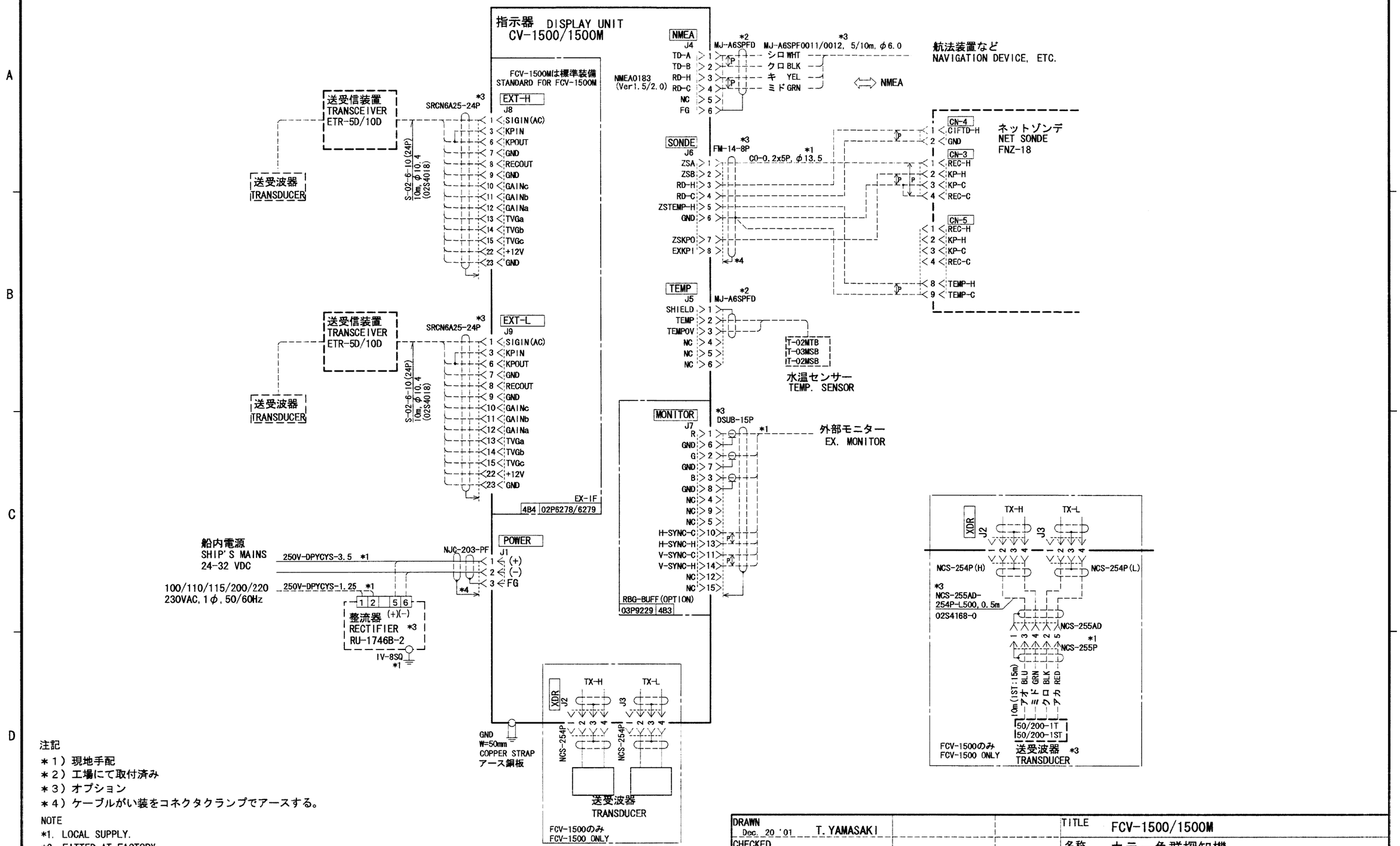




注記 AC220V入力に対しては T1401の一次巻線を直列に接続する。
NOTE FOR 220V AC INPUT, CONNECT T1401 PRIMARY WINDINGS IN SERIES.

DRAWN Aug 16'00 T.YAMASAKI		TITLE	RU-1746B-2
CHECKED Aug 17'00 T.K		名称	整流器
APPROVED Aug 17'00 T.K			外寸図
SCALE 1/5	MASS 17 kg ±10%	NAME	RECTIFIER UNIT
DWG. No. C3002-002- N			OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

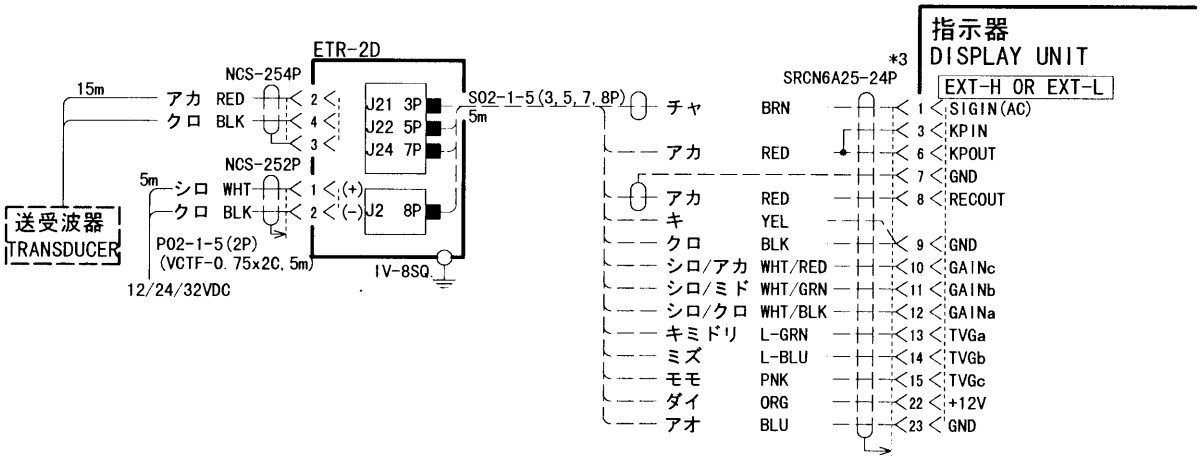


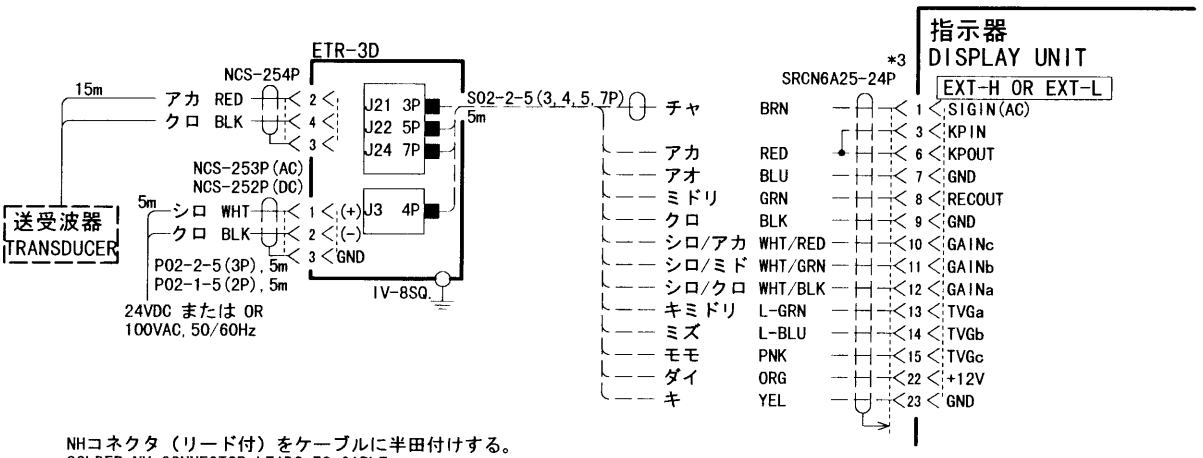
注記
＊1）現地手配
＊2）工場にて取付済み
＊3）オプション
＊4）ケーブルがい装をコネクタクランプでアースする。

NOTE
*1. LOCAL SUPPLY.
*2. FITTED AT FACTORY.
*3. OPTION
*4. GROUNDING THRU CONNECTOR CLAMP W/ ARMOR SHEATH.

DRAWN Dec. 20 '01 T. YAMASAKI			TITLE FCV-1500/1500M
CHECKED Dec 27 '01 Y.K.			名称 カラー魚群探知機
APPROVED Dec 27 '01 Y.K.			相互結線図
SCALE	MASS kg		NAME COLOR VIDEO SOUNDER
DWG. No. C2363-C01- H			INTERCONNECTION DIAGRAM

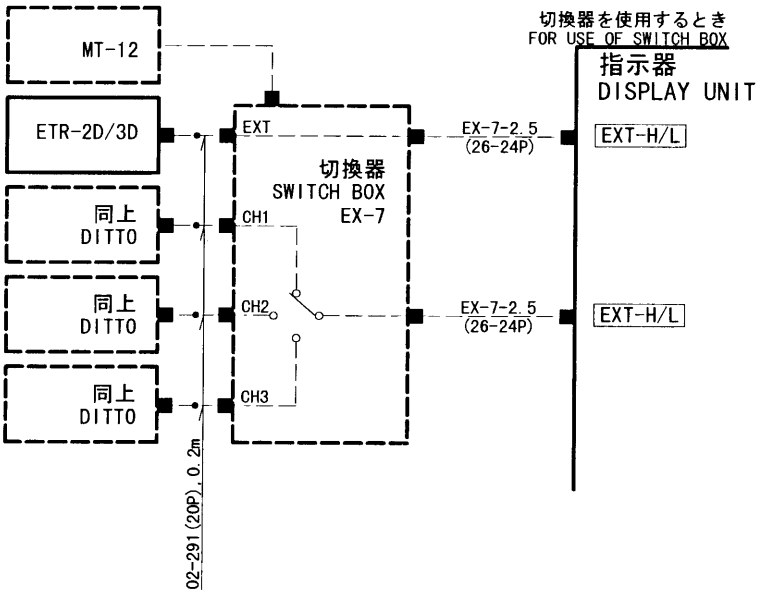
FURUNO ELECTRIC CO., LTD.





NHコネクタ（リード付）をケーブルに半田付けする。
SOLDER NH-CONNECTOR LEADS TO CABLE.

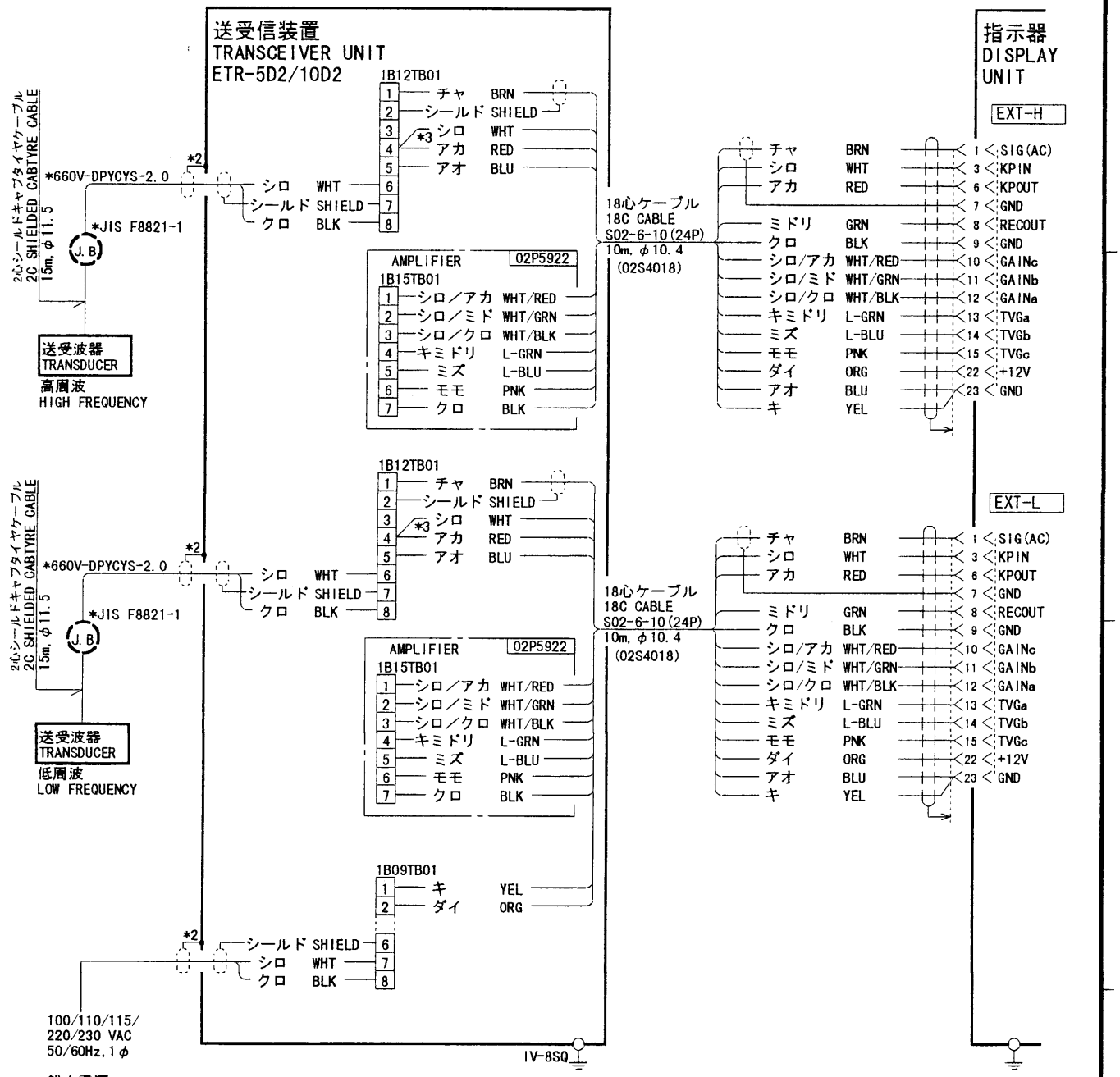
NH	ETR-2D		ETR-3D	
1	チャ	BRN	チャ	BRN
2				
3	シロ	WHT	シロ	WHT
4				
5				
6	アカ	RED		
7	シールド	SHIELD	キ+アオ	YEL+BLU
8	アカ	RED	ミドリ	GRN
9	キ+アオ	YEL+BLU	クロ	BLK
10	シロ/アカ	WHT/RED	シロ/アカ	WHT/RED
11	シロ/ミド	WHT/GRN	シロ/ミド	WHT/GRN
12	シロ/クロ	WHT/BLK	シロ/クロ	WHT/BLK
13	キミドリ	L-GRN	キミドリ	L-GRN
14	ミズ	L-BLU	ミズ	L-BLU
15	モモ	PNK	モモ	PNK
18	ダイ	ORG	ダイ	ORG



注記
1）＊：造船所支給
2）ケーブルクランプでアースに落とす。
3）オプション。

NOTE
1. *: SHIPYARD SUPPLY.
2. GROUND THRU CONNECTOR CLAMP.
3. OPTON.

DRAWN Oct 4'99 T.YAMASAKI		TITLE	ETR-2D/3D
CHECKED Oct 4'99 K.Kusunoki		名称	送受信装置
APPROVED Oct 4'99 K.Kusunoki			相互結線図
SCALE / MASS kg		NAME	TRANSCEIVER UNIT
DWG. No. C2019-C01- B			INTERCONNECTION DIAGRAM



注記

1）＊：造船所支給

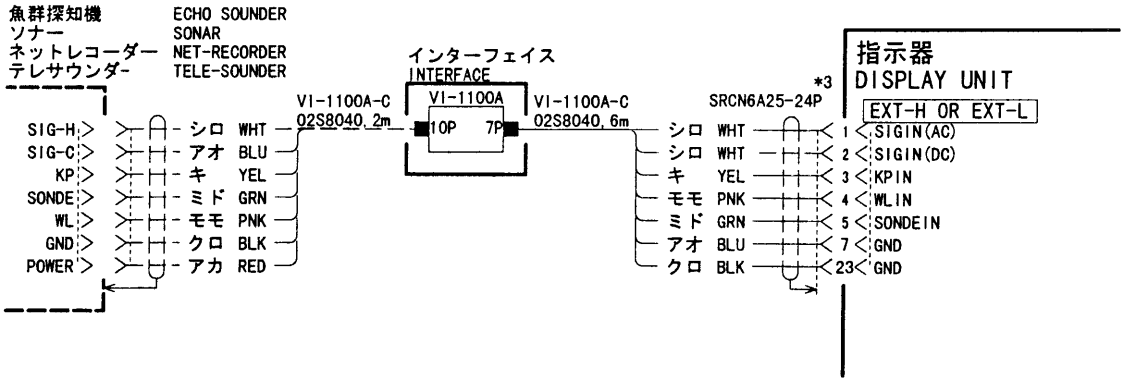
2）ケーブルクランプでアースに落とす。

3）赤と白の芯線は短絡する。

NOTE

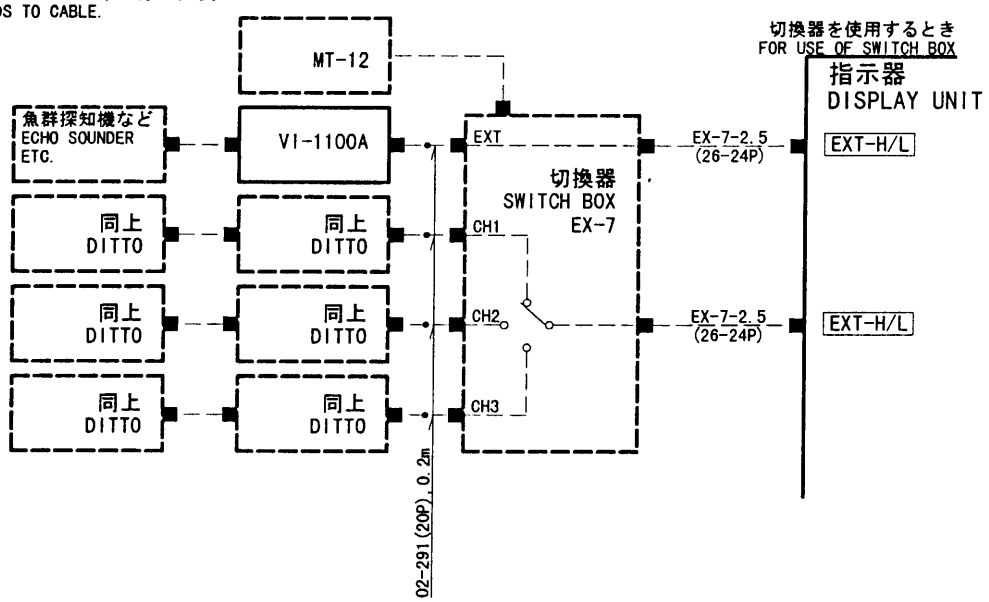
1. *: SHIPYARD SUPPLY.
2. GROUND THRU CONNECTOR CLAMP.
3. CONNECT RED AND WHITE LINE EACH OTHER.

DRAWN May 18'00 T.YAMASAKI		TITLE	ETR-5D2/10D2
CHECKED May 18'00 T.Kimura		名称	送受信装置
APPROVED May 18'00 T.Kimura			相互結線図
SCALE / MASS kg		NAME	TRANSCEIVER UNIT
DWG. No. C2020-C01- C			INTERCONNECTION DIAGRAM



NHコネクタ（リード付）をケーブルに半田付けする。
SOLDER NH-CONNECTOR LEADS TO CABLE.

NH	VI-1100A	
1	シロ(AC)	WHT(AC)
2	シロ(DC)	WHT(DC)
3	キ	YEL
4	モモ	PNK
5	ミドリ	GRN
6		
7	アオ	BLU
8		
9	クロ	BLK



注記
1）*：造船所支給
2）ケーブルクランプでアースに落とす。
3）オプション。

NOTE
1. *: SHIPYARD SUPPLY.
2. GROUND THRU CONNECTOR CLAMP.
3. OPTON.

DRAWN July 30 '99 T.YAMASAKI			TITLE VI-1100A
CHECKED July 30 '99 K.Kusuoki			名称 インターフェイス
APPROVED July 30 '99 K.Kusuoki			相互結線図
SCALE	MASS kg		NAME INTERFACE UNIT
DWG. No. C2018-C01- A			INTERCONNECTION DIAGRAM