

Installation Manual Fish Finder Power Amplifier Model DI-FFAMP

A Word to the Owner of the DI-FFAMP

Congratulations on your choice of the FURUNO DI-FFAMP Fish Finder Power Amplifier. The DI-FFAMP is a power amplifier designed for use with the internal fish finder of the TZtouch3 (TZT12F/16F/19F) multi function display. Please carefully read and follow the recommended procedures for installation and maintenance. Thank you for considering and purchasing FURUNO.

Operational cautions

- A separate power supply is required. Take the power from the ship's mains via the ship's switchboard.
- The DI-FFAMP is not turned off when the multi function display is powered off. The power amp's standby power is 6.2 W, so turn it off when it is not in use.
- Bottom Discrimination, RezBoost and ACCU-FISH are disabled when the power amp is in use.
- The amp can be used with two in-hull transducers, R599LM/LH and R111LH. Do not transmit with the transducer out of water, to prevent damage to the transducer.
- Use the multi function display to change the program version of the power amp. Contact FURUNO for information on how to upgrade program version.

Safety Instructions

The installer must read the safety instructions before attempting to install the equipment.

WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

Warning, Caution	Prohibitive Action	Mandatory Action
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WARNING				
<div style="display: flex; align-items: center;"> <p>Do not disassemble or modify the equipment.</p> </div> <p style="margin-top: 5px;">Fire, electrical shock or serious injury can result.</p>				
<div style="display: flex; align-items: center;"> <p>Use the proper fuse.</p> </div> <p style="margin-top: 5px;">Use of a wrong fuse can damage the equipment and may cause fire.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px 10px;">12VDC</td> <td style="padding: 2px 10px;">24VDC</td> </tr> <tr> <td style="padding: 2px 10px;">15 A</td> <td style="padding: 2px 10px;">10 A</td> </tr> </table>	12VDC	24VDC	15 A	10 A
12VDC	24VDC			
15 A	10 A			

CAUTION				
Observe the following compass safe distance to prevent interference to a magnetic compass:				
<table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="padding: 2px 10px;">Standard compass</td> <td style="padding: 2px 10px;">Steering compass</td> </tr> <tr> <td style="padding: 2px 10px;">0.3 m</td> <td style="padding: 2px 10px;">0.3 m</td> </tr> </table>	Standard compass	Steering compass	0.3 m	0.3 m
Standard compass	Steering compass			
0.3 m	0.3 m			

Equipment list

Name	Type	Code No.	Qty	Remark
Fish Finder Power Amplifier	DI-FFAMP	-	1	
Installation Materials	CP02-09600	000-037-176	1	Cable assy. (3 pcs), EMI core, Fuses (10A/15A), Self-tapping screws

Option

Name	Type	Code No.	Qty	Remark
Booster Box	BT-5-1	000-012-520	1	For 5 kW(10 kW) transducer (single/dual)
	BT-5-2	000-012-521		
Transducer cable (For BT-5)	NCS-2RNCTSB	001-247-169		3m
		001-247-170		20m
		001-247-171		50m
		001-247-172		100m

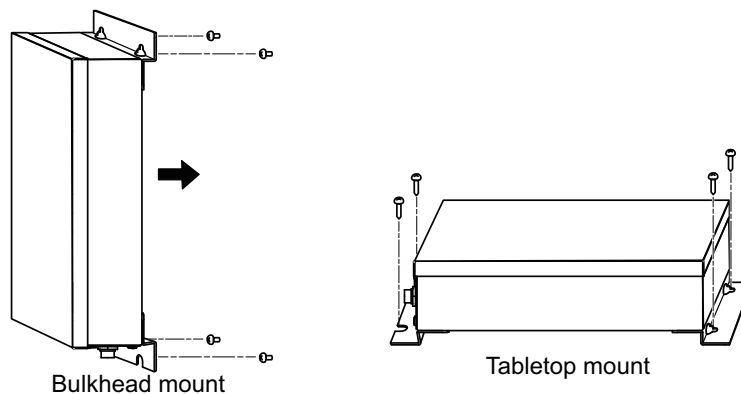
Installation

Select the mounting location considering the following points.

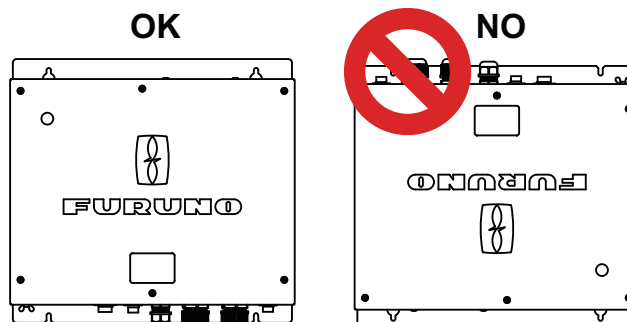
- Locate the unit away from areas subject to water splash.
- Select a location that is well ventilated.
- Observe the compass safe distances shown on page 1.
- Leave the sufficient service clearance around the unit.

Procedure

1. Drill four pilot holes in the bulkhead (or tabletop) for the self-tapping screws.
2. Screw four self-tapping screws ($\phi 5 \times 20$) into the pilot holes, leave 5 mm protruding.
3. Set unit onto the screws, then tightly fasten the screws to fix the unit in place.



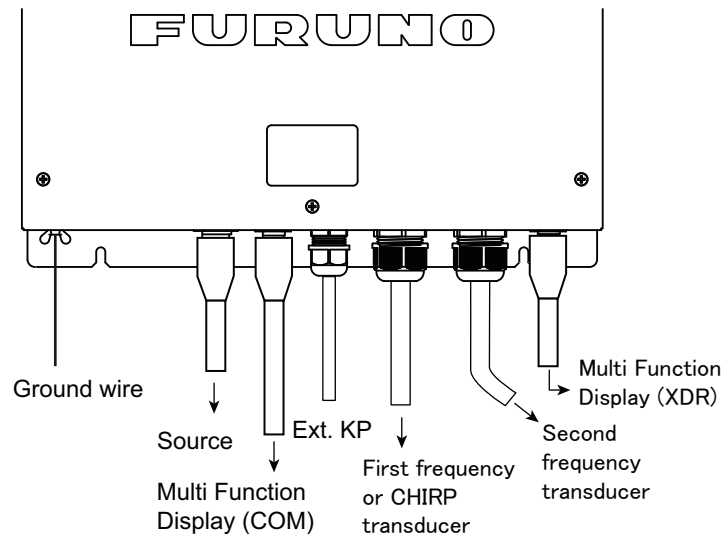
NOTE: For mounting on a bulkhead, the connectors must face downward.



Wiring

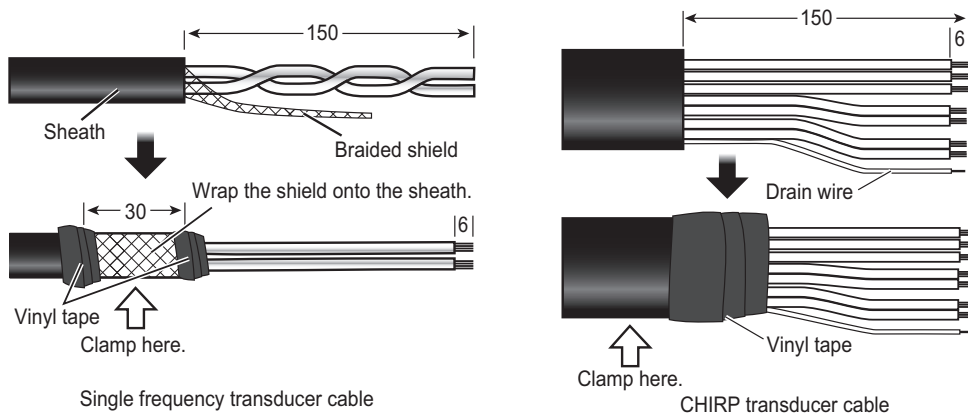
Wiring Outline

The figure below shows general connection for the DI-FFAMP. Refer to the interconnection diagram for details.



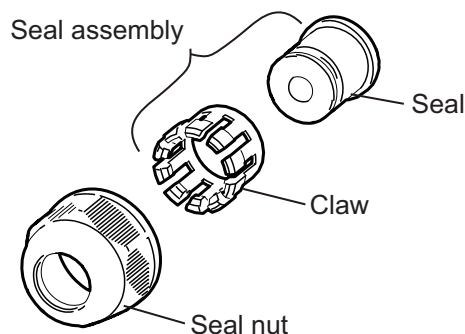
Procedure

1. Unfasten six screws to remove the cover.
2. Fabricate the transducer cable(s) as shown below.
Fabricate the cables for both the high and low frequencies. For a CHIRP transducer, fabricate the ID signal and both the high and low frequencies cores. Refer to the interconnection diagram.

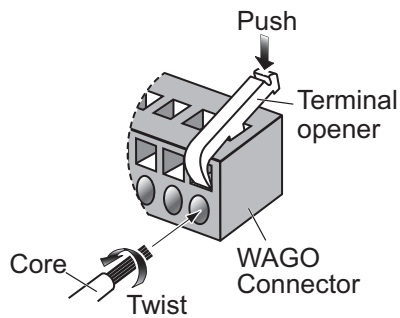


NOTE: When the previous CHIRP transducer cable (with 4 drain wires and braided shield) is used, turn back the shield onto the sheath and fix with vinyl tape.

3. Unfasten the seal nut on the cable entry for transducer cable.
4. Pass the seal nut, claw and seal onto the transducer cable, in that order.



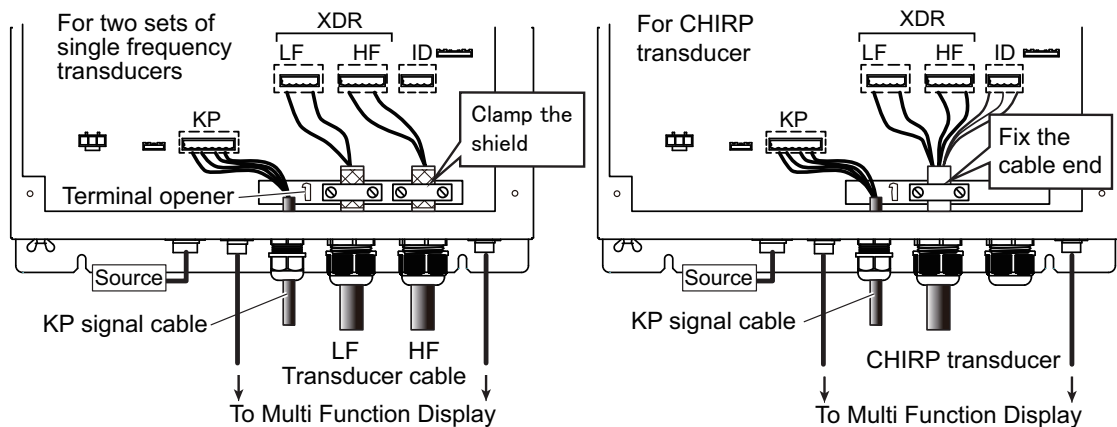
5. Push the seal assembly into the seal nut, then tighten the super gland.
6. Remove the WAGO connectors from PCB, then attach the transducer cable to the connector.



Procedure

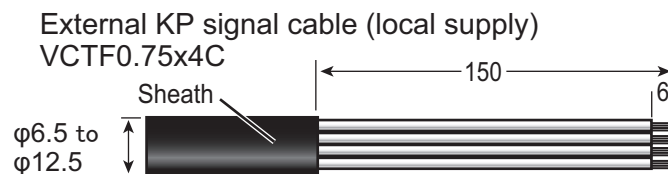
1. Twist conductor.
2. Insert terminal opener and push.
3. Insert a conductor into hole.
4. Release the terminal opener.
5. Pull the core to confirm it is correctly inserted.

7. Clamp the braided shield with a cable clamp or fix the cable end when braided shield is not.
8. Attach the WAGO connector to the PCB.



NOTE: For previous CHIRP transducer cable, connect the drain wires to the connector and clamp the shield.

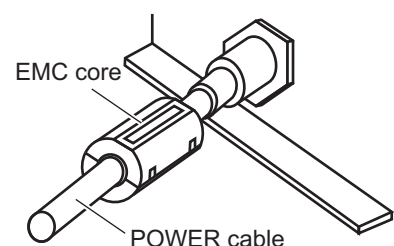
9. Fasten the seal nut to fix the transducer cable. The torque shall be 2.0 Nm and the gap between the seal nut and the super gland shall be approx. 3 mm.
10. Fabricate the external KP signal cable as shown below. (core size 0.75 sq, outer dia 7.6 approx)



11. Pass the cable through the seal nut and seal assembly, like you did with the transducer cable.
12. Push the seal assembly into the seal nut, then tighten the super gland.
13. Tighten the seal nut to fasten the cable. The torque shall be 2.0 Nm and the gap between the seal nut and the super gland shall be approx. 3 mm.
14. Attach the WAGO connectors to the PCB.
15. Reattach the cover and fasten the screws to fix the cover. Power cable (FRU-3P-FF-A002M-050C, 2m) and signal cables from Multi Function Display (FRU-F12F12-050C, 5m and FRU-F7F7-050C, 5m) should be connected with their attached connectors.

NOTE: Attach the EMC core to the power cable near the super gland to prevent noise.

Attach the ground wire (IV-1.25sq, local supply) to the ground terminal with a crimp-on lug (M3, local supply) to prevent interference.



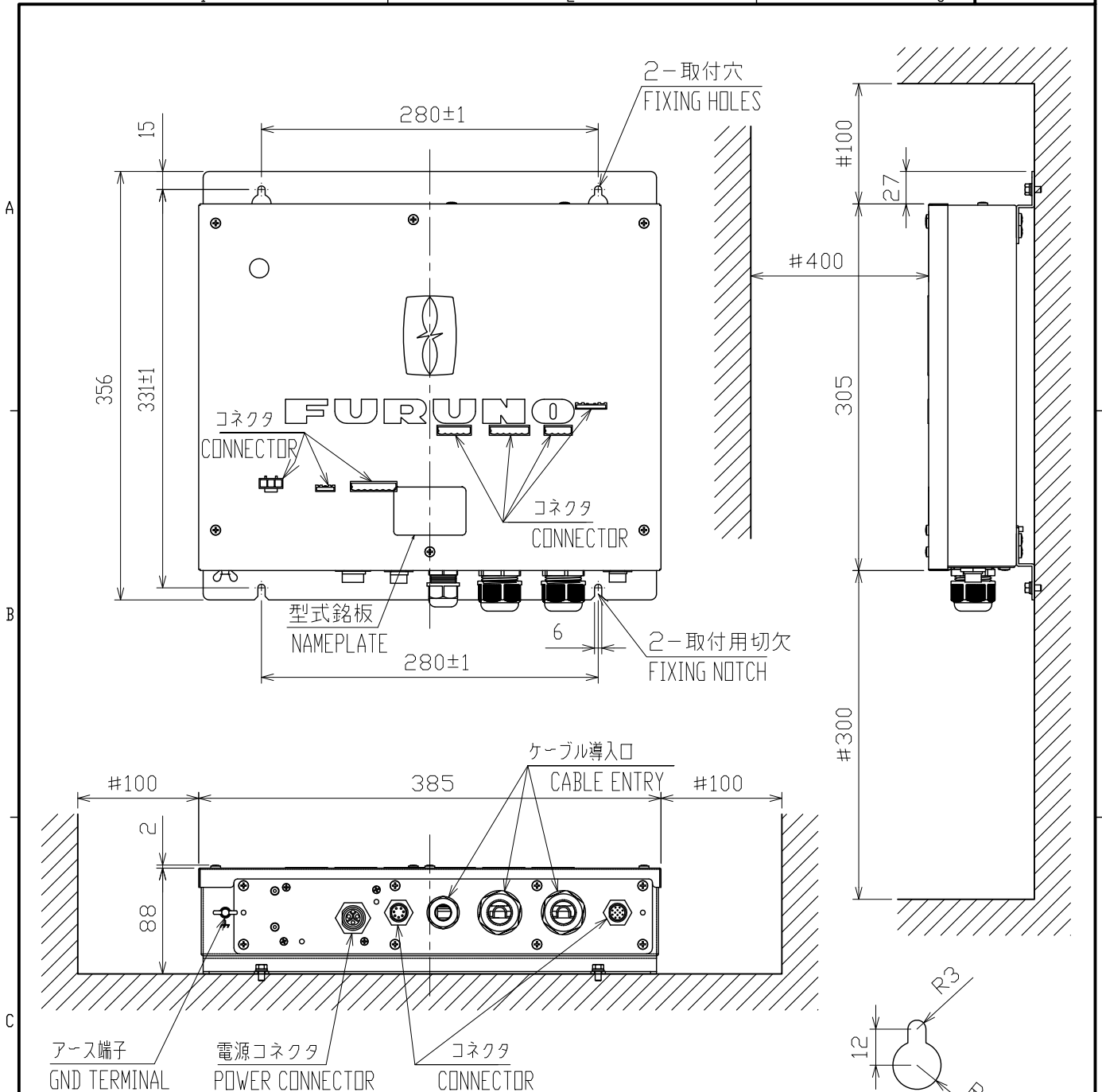
Troubleshooting

The table below provides basic troubleshooting procedures which the user may follow to restore normal operation. If you cannot restore normal operation, do not check inside unit. Have a FURU-NO dealer check the equipment.

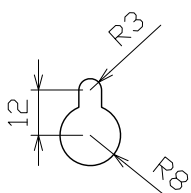
Problem	Reason
Cannot turn on power.	<ul style="list-style-type: none">• The power cable is disconnected or damaged. Check the power cable and if it damaged, replace it.• Check the ship's mains and check the switch board is turned off.• Check the fuse on the power cable. If the fuse has blown, find the cause then replace it.
No echo appears but fixed range scale appears.	<ul style="list-style-type: none">• The sensor cable is disconnected or damaged. Check the cable and reconnect or replace it as necessary.
Sensitivity is low.	<ul style="list-style-type: none">• Gain setting is too low. Raise the gain.• Marine life is adhering to the transducer face. Clean the transducer face.• Vessel is in heavily sedimented water.

Specifications

Frequency	26.6 to 242 kHz
Number of channels	2 ch
Output power	3 kW
Power supply	12-24 VDC: 3.2-1.9 A
Environment conditions	
Ambient temperature	-15°C to +55
Degree of protection	IP22
Vibration	IEC60945 Ed.4



取付部詳細 (尺度: 1/2)
DETAIL FOR FIXING (SCALE: 1/2)



- 注記
- 1) 指定外の寸法公差は表 1 による。
 - 2) #印寸法は最小サービス空間寸法とする。
 - 3) 取付ネジはトラスタッピンネジ呼び径φ5×20を使用のこと。

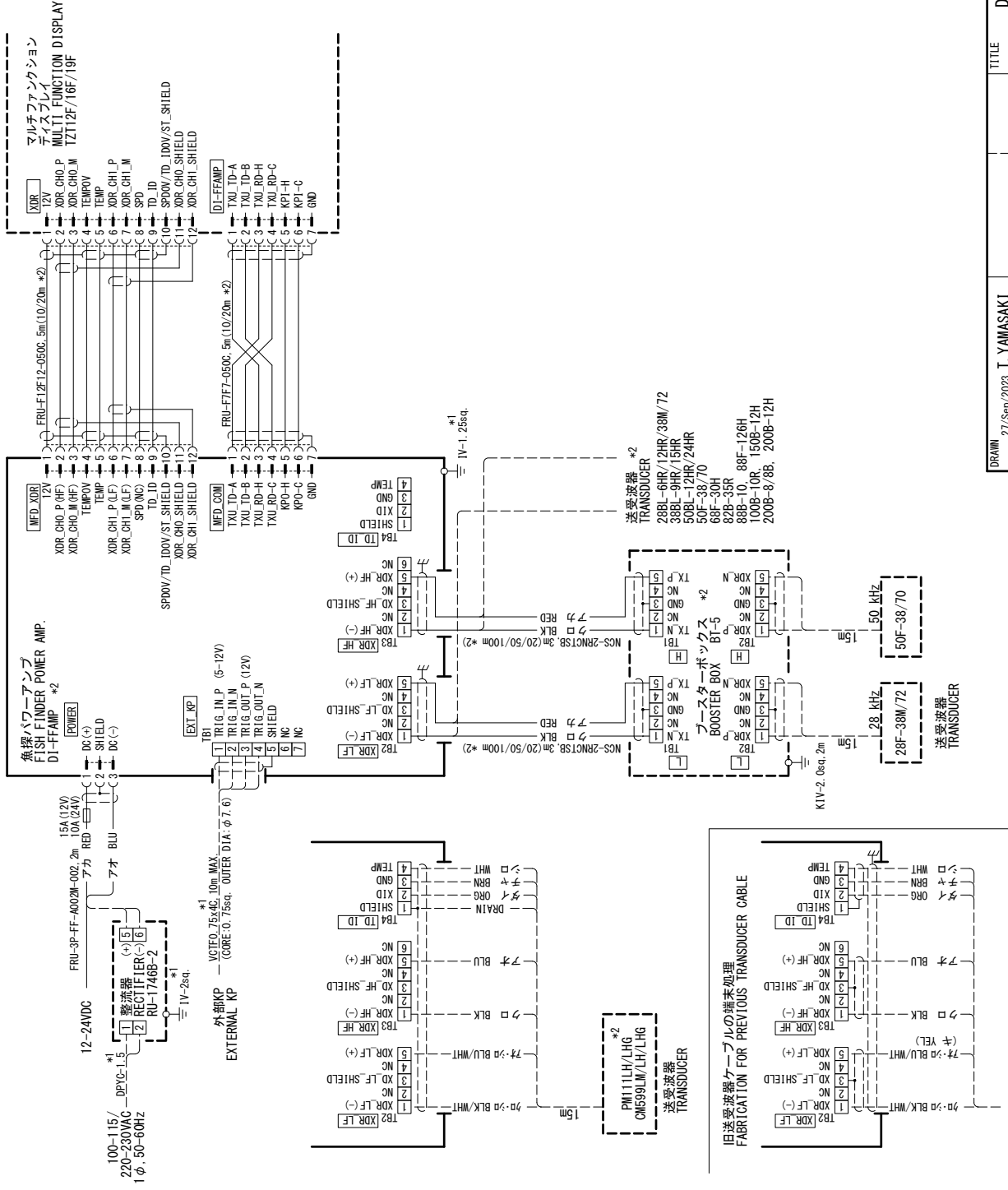
表 1 TABLE 1

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

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS φ5×20 FOR FIXING THE UNIT.

DRAWN 8/Nov/2019 T.YAMASAKI		TITLE DI-FFAMP
CHECKED 8/Nov/2019 H.MAKI		名称 魚探パワーアンプ (壁掛・卓上装備)
APPROVED 11/Nov/2019 H.MAKI	TZT12F/16F/19F	外寸図
SCALE 1/5	MASS 6.3 ±10% kg	NAME FISH FINDER POWER AMPLIFIER (BULKHEAD/TABLE TOP MOUNT)
DWG. No. C4512-G03-B	REF. No. 02-178-500G-1	OUTLINE DRAWING



注記
 * 1) 造船所手配。
 * 2) オプション。

NOTE
 *1: SHIPYARD SUPPLY.
 *2: OPTION.

DRAWN	27/Sep/2023	T. YAMASAKI	TITLE	DI-FFAMP
CHECKED	27/Sep/2023	H. MAKI	名称	魚探パワーアンプ
APPROVED	27/Sep/2023	H. MAKI	相互結線図	
SCALE	MASS	kg	NAME	FISH FINDER POWER AMPLIFIER
DWG No.	C4510-C02-D	REF. No.	02-178-2001-0	INTERCONNECTION DIAGRAM



Declaration of Conformity



We **FURUNO ELECTRIC CO., LTD.**

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

FISH FINDER POWER AMPLIFIER DI-FFAMP

(Model name, type number)

to which this declaration relates conforms to the following standard(s) or other normative document(s)

EU
EMC Directive 2014/30/EU

UK
SI 2016 No.1091 EMC Regulations 2016 as amended

IEC 60945 Ed.4.0: 2002

EN 60945: 2002

For assessment, see

- Test report
Labotech International Co., Ltd.
LIC 12-19-176, 7 Oct 2019

For assessment, see

- Test report
Labotech International Co., Ltd.
LIC 12-19-176, 7 Oct 2019

(title and/or number and date of issue of the standard(s) or other normative document(s))

On behalf of Furuno Electric Co., Ltd.

Nishinomiya City, Japan
26 July 2021

(Place and date of issue)

Akihiko Kanechika
Department General Manager
Quality Assurance Department

(name and signature or equivalent marking of authorized person)

送受波器リスト Transducer list

出力 (W) Output	周波数 (kHz) Frequency	送受波器 Transducer	船種 Hull Material	貫通金物 Thru-hull pipe	船底タンク Tank
2k/2k	28/200	28BL-6HR, 200B-8/8B	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-693
			FRP	TWB-1100 (2)	T-693-F
	38/200	38BL-9HR, 200B-8/8B	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-693
			FRP	TWB-1100 (2)	T-693-F
	82/200	82B-35R, 200B-8/8B	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-649
			FRP	TRB-1100 (2)	T-649-F
88/200	88B-10, 200B-8/8B	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-649	
		FRP	TRB-1100 (2)	T-649-F	
3k/2k	107/200	100B-10R, 200B-8/8B	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-649
			FRP	TRB-1100 (2)	T-694-F
3k/3k	28/38	28BL-12HR, 38BL-15HR	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-681
			FRP	TRB-1100 (2)	T-681-F
	28/50	28BL-12HR, 50BL-12HR	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-681
			FRP	TRB-1100 (2)	T-681-F
	28/88	28BL-12HR, 88F-126H	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-682
			FRP	TRB-1100 (2)	T-682-F
	28/150	28BL-12HR, 150B-12H	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-683
			FRP	TRB-1100 (2)	T-683-F
	38/50	38BL-15HR, 50BL-24HR	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-681
			FRP	TRB-1100 (2)	T-681-F
2k/2k	38-75/ 130-210	PM111LH	鋼 Steel	TFB-7000 (1)	T-712
			FRP	TRB-1100 (1)	T-712-F
3k/2k	28-60/ 130-210	CM599LH	鋼 Steel	TFB-7000 (1)	T-712
			FRP	TRB-1100 (1)	T-712-F
	28-60/80-130	CM599LM	鋼 Steel	TFB-7001 (1)	T-712
			FRP	TRB-1100 (1)	T-712-F

出力 (W) Output	周波数 (kHz) Frequency	送受波器 Transducer	船種 Hull Material	貫通金物 Thru-hull pipe	船底タンク Tank
5k/5k*1 w/BT-5	28/50	28F-38M, 50F-38M	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-653
			FRP	TRB-1100 (1)	T-653-F
	28/50	28F-38M, 50F-38	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-653
			FRP	TRB-1100 (1)	T-653-F
		28F-72, 50F-70	鋼 Steel	TFB-7000 (2), TWB-6000 (2)	T-673
			FRP	TRB-1100 (1)	T-673-F

*1: 5 kW 以外にも 10 kW 送受波器が接続可能。ただし出力は 3kW 以下となります。

Not only 5 kW, but also 10 kW transducers. However 10 kW transducer's output is 3 kW or less