FURUNO

# OPERATOR'S MANUAL

*NETWORK FISH FINDER*

**Model** **DFF-1UHD**

FURUNO ELECTRIC CO., LTD.

www.furuno.com

# IMPORTANT NOTICES

## General

- This manual has been authored with simplified grammar, to meet the needs of international users.
- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty.
- All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

## How to discard this product

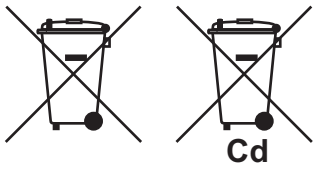
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (http://www.eiae.org/) for the correct method of disposal.

## How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. Follow the instructions below if a battery is used. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

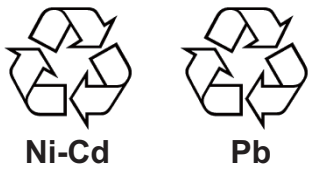
### In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.




### In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.




### In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.

# SAFETY INSTRUCTIONS

The user and installer must read the appropriate safety instructions before attempting to install or operate 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, may result in minor or moderate injury. |

Warning, Caution  Prohibitive Action  Mandatory Action

***Safety instructions for the operator***

## WARNING

**Do not open the equipment.**

Only qualified personnel should work inside the equipment.

**Do not disassemble or modify the equipment.**

Fire, electrical shock or serious injury can result.

**Turn off the power immediately if the equipment is emitting smoke or fire.**

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

**Turn off the power immediately if water leaks into the equipment or an object is dropped inside the equipment.**

Continued use can cause fire or electrical shock.

**Turn off the power immediately if you feel the equipment is acting abnormally.**

If the equipment is hot to the touch or is emitting strange noises, turn off the power immediately and contact your dealer for advice.

## WARNING

**Do not operate the equipment with wet hands.**

Electrical shock can result.

**Do not place liquid-filled containers on the top of the equipment.**

Electrical shock can result.

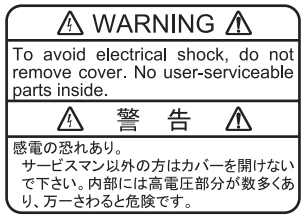
**Do not install the equipment where it may be subjected to rain or water splash.**

Fire or electrical shock can result if water gets inside the equipment.

**Use the proper fuse.**

Use of a wrong fuse can damage the equipment and may cause fire.

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




Name: Warning Label (1)
Type: 86-003-1011-3
Code No.: 100-236-233-10

### *Safety instructions for the installer*

## ⚠ WARNING

**Do not open the equipment.**

Only qualified personnel should work inside the equipment.

**Turn off the power before beginning the installation.**

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

**Be sure no water leaks at the mounting location for the transducer and temperature sensor.**

Water leakage can sink the vessel. Also, confirm that neither the transducer nor the sensor will loosen by vibration. The installer is solely responsible for the installation.

**Confirm that the power supply voltage is within the rating of this equipment.**

Incorrect voltage will damage the equipment and may cause fire.

## ⚠ CAUTION

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

- **Keep fuels and oils away from the cable.**
- **Locate the cable away from chemicals.**
- **Locate the cable away from locations where it might be damaged.**

**Do not apply the power with the transducer exposed to air.**

The transducer may be damaged.

**A magnetic compass may receive interference if it is placed too close to the network fish finder. Observe the compass safe distances shown below to prevent interference to a magnetic compass.**

| Standard compass | Steering compass |
|---|---|
| 0.65 m | 0.40 m |

# TABLE OF CONTENTS

# FOREWORD

## A Word to the Owner of the DFF1-UHD

Congratulations on your choice of the FURUNO DFF1-UHD Network Fish Finder. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

Since 1948, FURUNO Electric Company has enjoyed an enviable reputation for quality marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

This equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless operated and maintained properly. Please carefully read and follow the recommended procedures for operation and maintenance.

Thank you for considering and purchasing FURUNO.

## Features

The DFF1-UHD is a dual frequency echo sounder designed for use with the FURUNO NavNet 3D* and NavNet TZtouch* series. The DFF1-UHD feeds data about underwater conditions via a LAN.

- FURUNO's TruEcho CHIRP$^{TM}$ technology provides very high definition images.
- High resolution display greatly reduces the possibility of missing a target.
- Noise-suppressing display for enhanced detection performance.
- Fish size shown for depths up to 200 m and bottom discrimination.

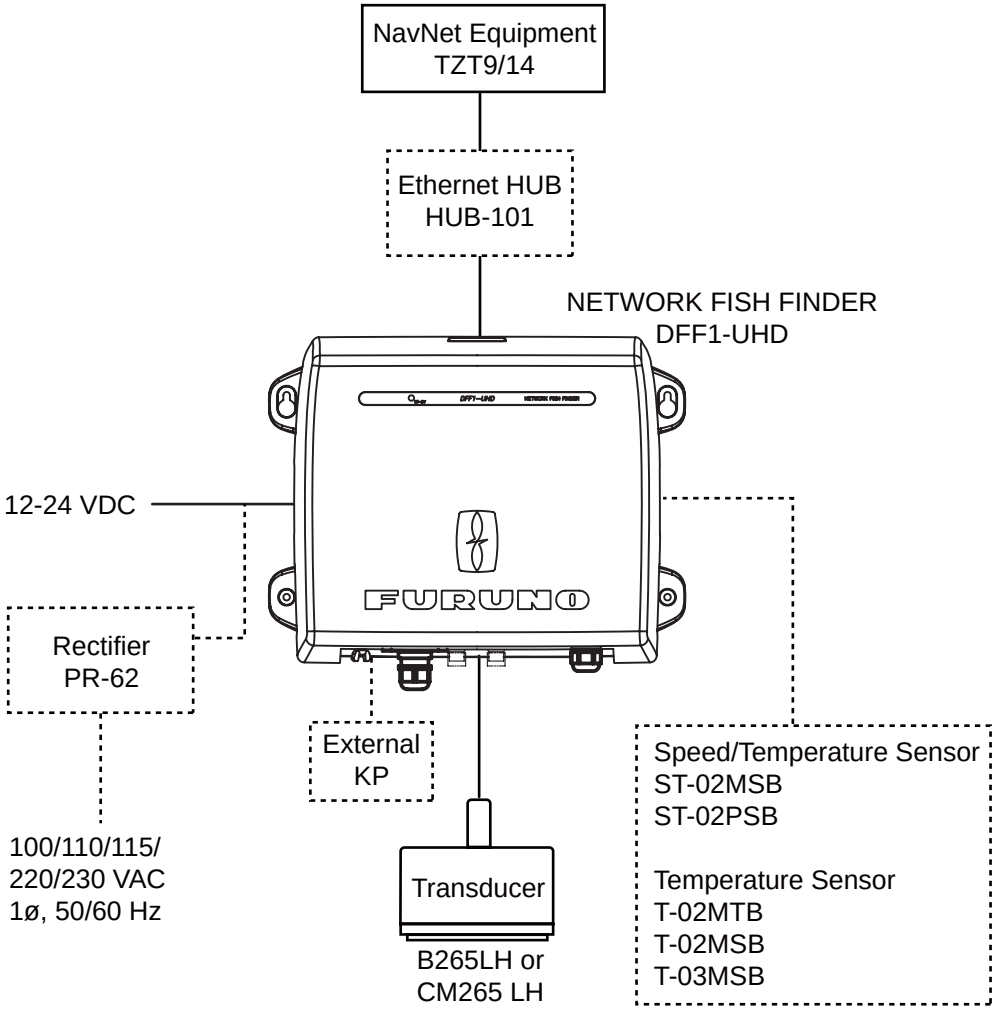
## Operating notices

- Echoes are shown in high ultra definition, thus echoes are displayed differently from those presented on the conventional fish finder.
- The interference rejector operates differently from the interference rejector on the conventional fish finder, thus its effect on echoes is different.
- The transducer cannot be installed inside the vessel.
- The length of the TX pulse changes according to the state of the ACCU-FISH$^{TM}$ feature. Therefore, the appearance of the display changes with the gain setting.
- Observe the following when using the bottom discrimination display (hereafter referred to as BDD):
  - Use the BDD under the following conditions:
    - Depth: 5-200 m (16.4-656.2 ft)
    - Speed: 10 knots or less
  - The BDD uses depth measured from the vessel's draft in its analysis of bottom composition. Be sure to set the draft at the NavNet equipment.
  - The TX interval slows when the BDD is active.
  - The BDD is inoperative if the transducer selection setting at the Navnet equipment is "Manual."

Measure for reduction of interference

If you receive interference from the fish finder/echo sounder of another vessel, switch to single frequency operation and change the frequency and/or reduce the transmitting sound pressure level to remove the interference.

# SYSTEM CONFIGURATION



# 1. INSTALLATION

## 1.1 Equipment Lists

**Standard supply**

| Name | Type | Code No. | Qty | Remarks |
|---|---|---|---|---|
| Network Fish Finder | DFF1-UHD | — | 1 | |
| Spare Parts | SP02-05601 | 001-033-740 | 1 set | Fuse (2 pcs.) |
| Installation Materials | CP02-08500 | 000-011-917 | 1 set | - Power cable assy. (3.5 m)<br>- LAN cable assy. (5 m)<br>- Self-tapping screws |

**Optional supply**

| Name | Type | Code No. | Remarks |
|---|---|---|---|
| Transducer | B265LH | 000-022-521 | 1 kW, bronze housing, thru hull |
| Transducer | CM265LH | 000-022-531 | 1 kW, plastic housing, tank mount |
| Thru-hull pipe | TFB-7000 | 000-022-532 | |
| Tank | T-711 | 000-022-539 | |
| Cable Assembly | MOD-Z072-020+ | 001-167-175-10 | 2 m, for HUB-101 |
| Cable Assembly | MOD-Z072-100+ | 001-167-177-10 | 10 m, for HUB-101 |
| Speed/Temper-ature Sensor | ST-02MSB | 001-164-150-10 | Thru-hull mount, steel hull |
| | ST-02PSB | 001-164-160-10 | Thru-hull mount, plastic hull |
| Temperature Sensor | T-02MTB | 000-040-026 | Transom mount |
| | T-02MSB | 000-040-040 | Thru-hull mount |
| | T-03MSB | 000-040-027 | Thru-hull mount |
| Rectifier | PR-62 | 000-013-484 | 100 VAC |
| | | 000-013-485 | 110 VAC |
| | | 000-013-486 | 220 VAC |
| | | 000-013-487 | 230 VAC |
| Connector Kit for TX Sync | OP02-86 | 001-205-780 | |

## 1.2 Network Fish Finder

The network fish finder can be installed on a desktop, deck or on a bulkhead. When selecting a mounting location, keep the following points in mind:

- The temperature and humidity at the mounting site should be moderate and stable.
- The mounting location must satisfy these requirements to get proper performance.
  - Operating temperature range: -15 to 55°C (-27 to 99°F)
  - Waterproofing standard: IP22
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- Keep the unit away from electromagnetic field-generating equipment such as motors and generators.
- Leave slack in cables for maintenance and servicing ease.
- A magnetic compass will be affected if the network sounder is placed too close to it. Observe the compass safe distances noted in the safety instructions to prevent interference to the magnetic compass.

Fasten the network sounder to the mounting location with four self-tapping screws (5×20), referring to the outline drawing at the back of this manual for mounting dimensions.

**Note:** For mounting on a bulkhead, the connectors must face downward to prevent the possibility of water leakage into the unit.


# 1.3 Transducer

The performance of the fish finder largely depends upon the transducer position. Select a place least affected by air bubbles since turbulence blocks the sounding path. The face of the transducer must be facing the sea bottom in normal cruising trim of the boat. Further, select a place least influenced by engine noise. It is known that air bubbles are fewest at the place where the bow first falls and the next wave rises, at usual cruising speed.

Do not install the transducer inside the hull. Performance cannot be guaranteed.

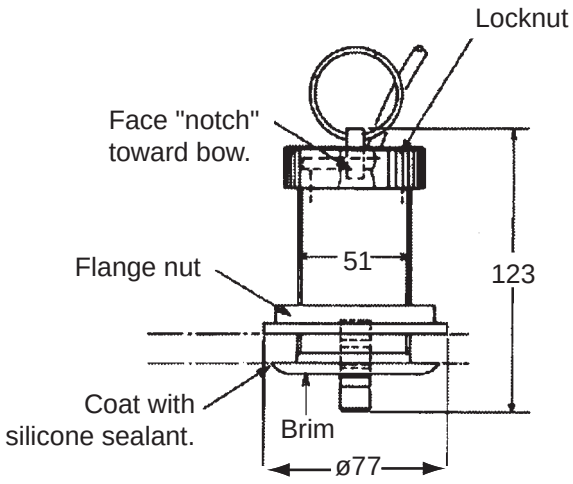
# 1.4 Optional Speed/Temperature Sensors ST-02MSB, ST-02PSB

## 1.4.1 Mounting considerations

- Select a mid-boat flat position. The sensor does not have to be installed perfectly perpendicular. However, the sensor must not be located where it may be damaged in dry-docking operations.
- 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.
- Do not install near the transducer of an echo sounder, to prevent interference to the echo sounder.

## 1.4.2 Mounting procedure

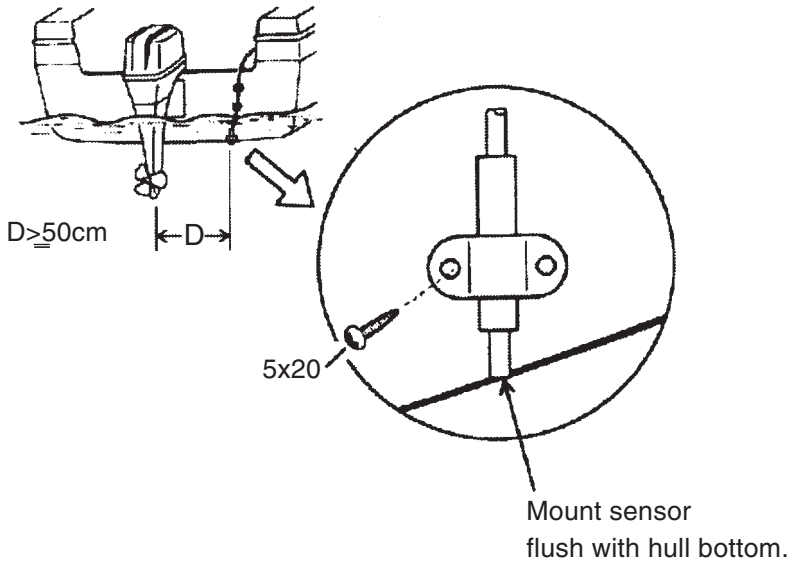
1. Dry dock the boat.
2. Make a hole of approx. 51 mm in diameter in the mounting location.
3. Unfasten locknut and remove the sensor section.
4. Apply high-grade sealant to the flange of the sensor.
5. Pass the sensor casing through the hole.
6. Face the notch on the sensor toward boat's bow and tighten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



# 1.5 Optional Temperature Sensors

## 1.5.1 Transom mount temperature sensor T-02MTB

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

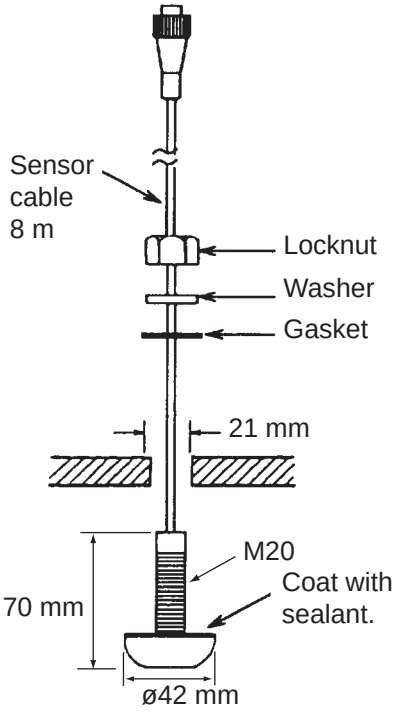


## 1.5.2 Thru-hull temperature sensor T-02MSB, T-03MSB

Select a suitable mounting location considering the following points.

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

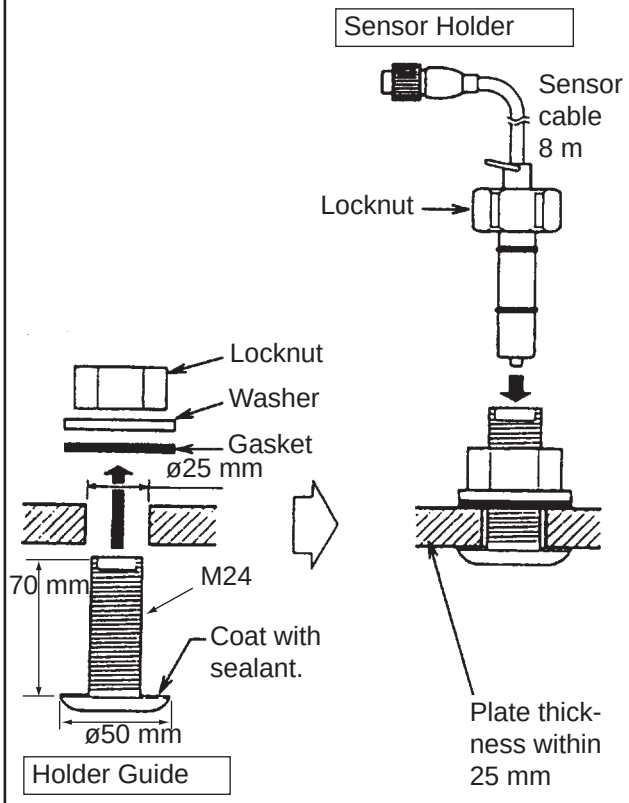
### T-02MSB




***Mounting procedure***

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.

### T-03MSB



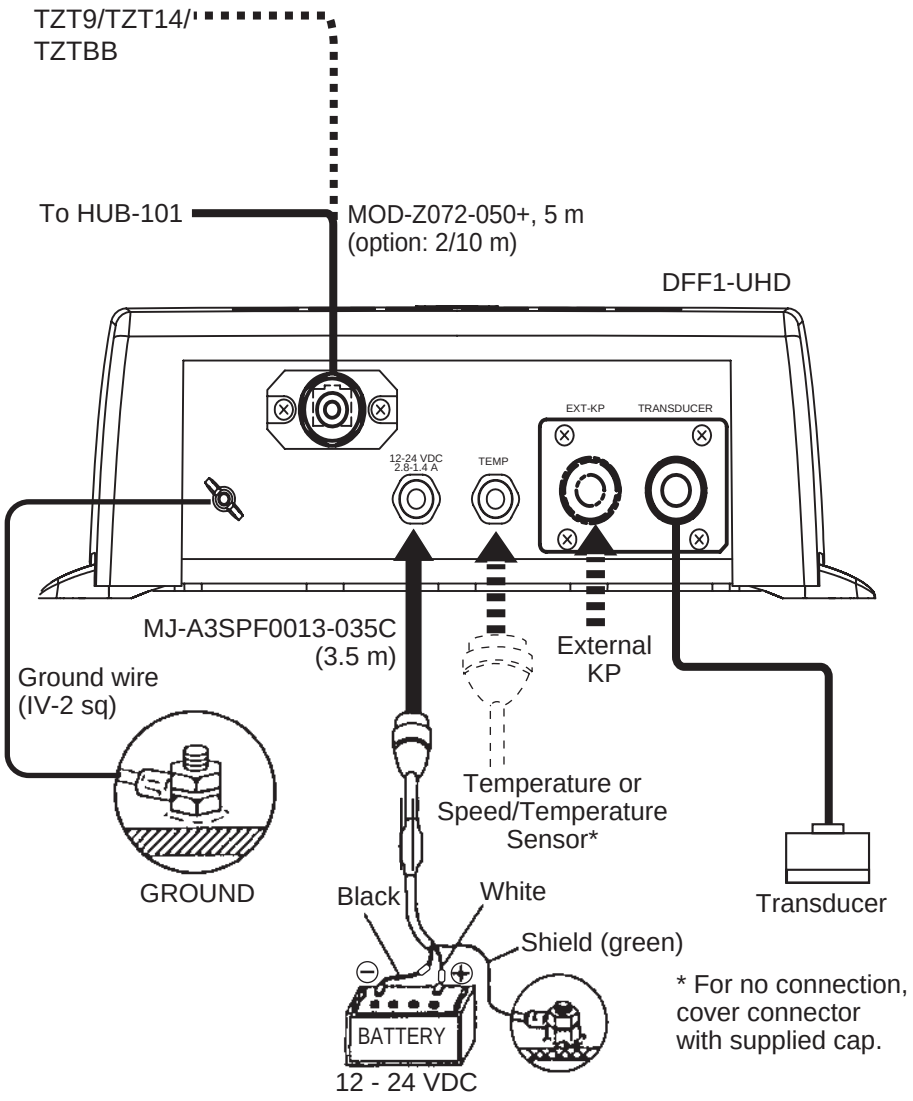

***Mounting procedure***

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.

# 2. WIRING

## 2.1 Wiring Outline

Connect the power cable, transducer cables, sensor cable, network cable and ground wire to their respective locations on the network sounder. See the next page for how to connect the transducer cables.




**Ground**

Connect a ground wire (IV-2 sq, local supply) between the ground terminal and ship's ground to prevent interference to the sounder picture. Make the length of the wire as short as possible. For FRP vessels, install a ground plate that measures about 20 cm by 30 cm on the outside of the hull bottom and connect the ground wire there.

**⚠ CAUTION**

**Ground the equipment to prevent mutual interference.**

# 2.2 Transducer Cable, Cable for External KP (option)

If the external KP is not to be connected, do only the applicable procedures in sections 2.2.1 and 2.2.2.

The KP from an echo sounder or sonar can be connected to this network fish finder to synchronize transmission (to prevent interference). Use the optional Connector Kit for TX Sync (Type, OP02-86, Code No. 001-205-780) and cable MPYC-4 (or MPYC-2) for the connection. (The MPYC-4 is a Japan Industrial Standard (JIS) cable. If not available locally, see the Appendix 2 for the equivalent cable.)

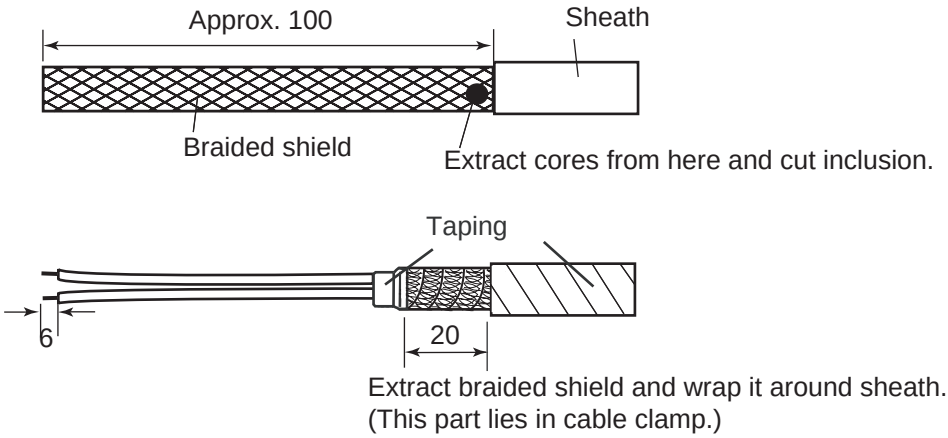
*Connector kit for TX sync*

| Name | Type | Code No. | Qty |
|---|---|---|---|
| Upset UI Screw-B | M4×20 | 000-163-756-10 | 2 |
| Super Gland | MGB20M-12B | 000-177-248-10 | 1 |
| PH Connector Assembly | 02-1097 (4P) | 001-206-000 | 1 |
| Cable Clamping Plate | 02-167-1528 | 100-379-090-10 | 1 |
| Rainproofing Panel KP | 02-167-1529 | 100-379-100-10 | 1 |
| EMI Core | GRFC-10 | 000-177-010-10 | 1 |
| Crimp-on Lug | NCW-1.25 | 000-157-213-10 | 4 |

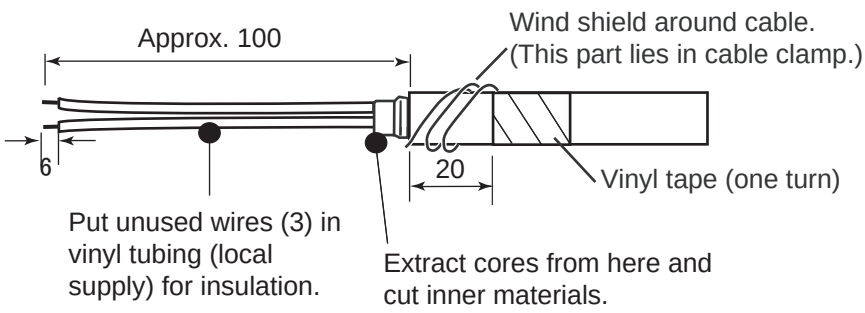
## 2.2.1 How to process the cables

**How to process the transducer cable**

CM265LH

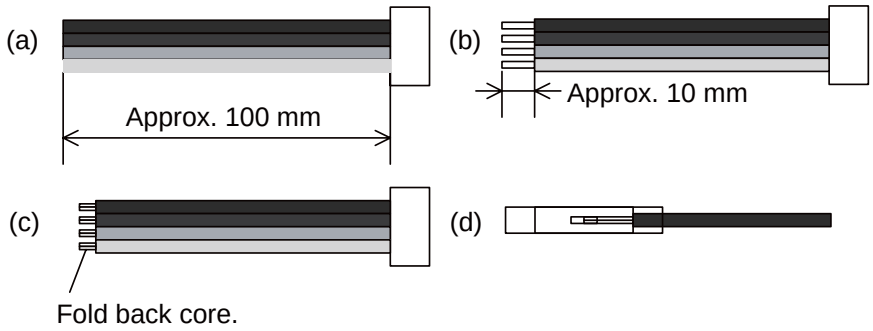



B265LH

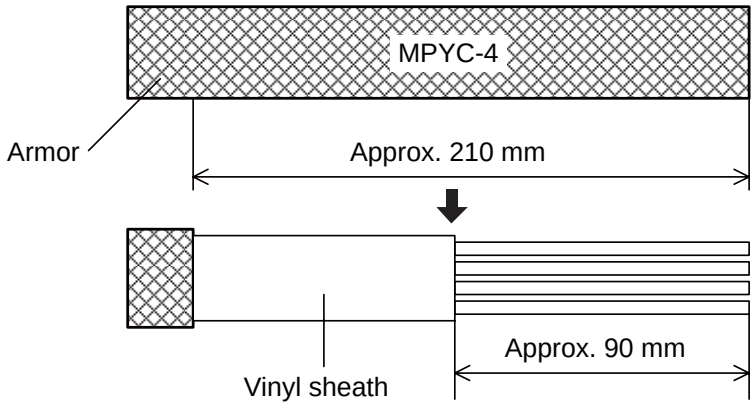


## How to process the cable for the external KP

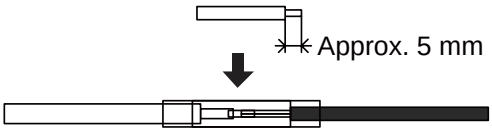
1. Process the PH connector (02-1097, optional supply) as shown below.
   a) Make the length of the wires of the PH connector 100 mm.
   b) Remove the sheath from the cores 10 mm.
   c) Fold back the cores in half.
   d) Attach crimp-on lug NCW-1.25 to each core.



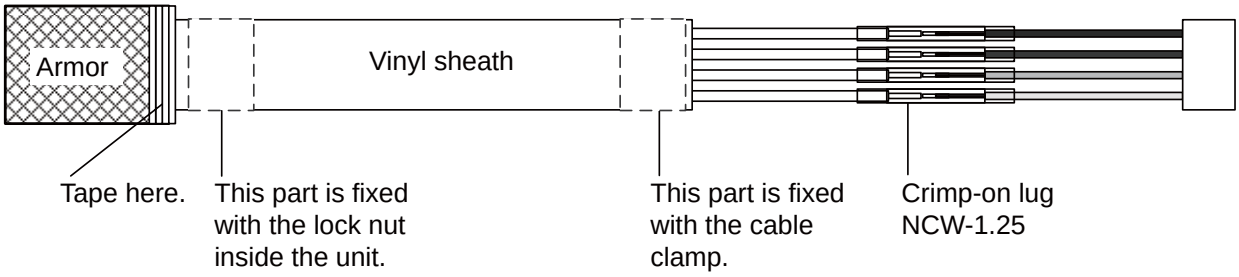

2. Remove the armor 170 mm and cut off the vinyl sheath 90 mm.




3. Remove 5 mm of the vinyl sheath from the cores then connect each crimp-on lug (attached at step 2) as shown below.



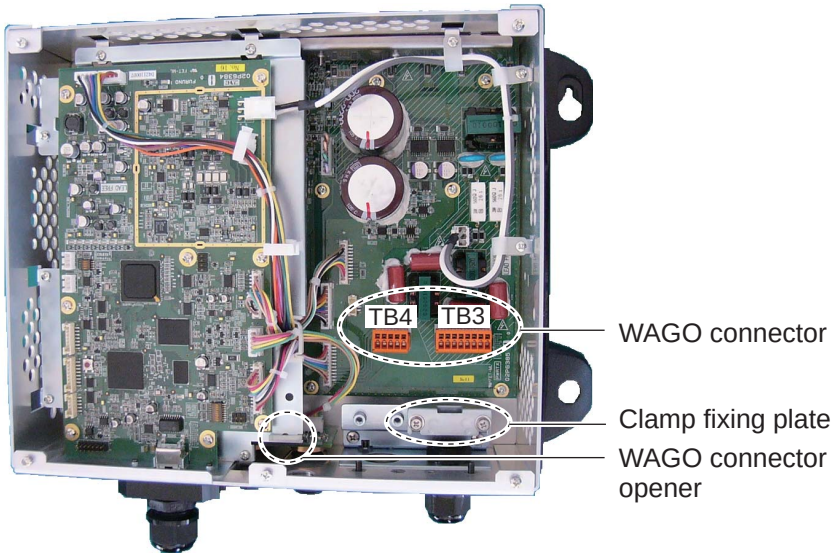

4. Wrap the armor with vinyl tape.



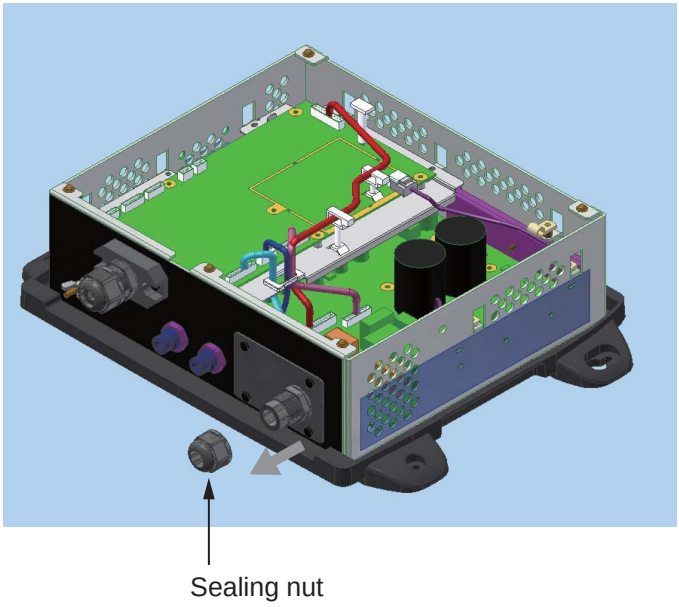
### 2.2.2 How to connect the transducer cable

This procedure shows you how to connect the transducer cable. To connect both the transducer cable and the cable for external KP, go to section 2.2.3.

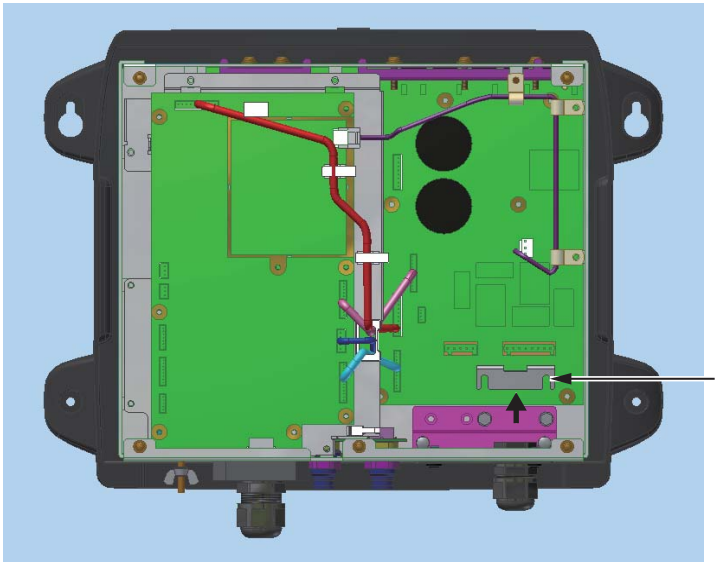
1. Open the cover: Grasp the cover at two sides, spread the cover slightly and lift.
2. Loosen five screws to remove the shield cover.
3. Detach the two WAGO connectors (TB3, TB4) inside the equipment.



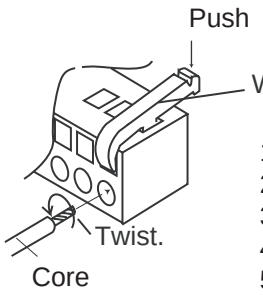

4. Unfasten the sealing nut from the super gland for the transducer cable.



5. Loosen the two screws fixing the clamp fixing plate to detach the plate.

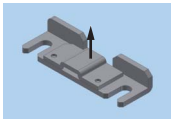
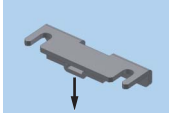



6. Pass the sealing nut (unfastened at step 4) onto the transducer cable and pass the cable through the super gland and into the unit.
7. Use the WAGO connector opener, attached inside the equipment, to connect the transducer cable to the WAGO connectors, following the instructions in the figure below and the interconnection diagram.




1. Twist conductors.
2. Insert opener as directed and press it down.
3. Insert core to hole.
4. Release opener.
5. Pull the core to make sure it is correctly inserted.

8. Attach the WAGO connectors.
9. Refasten the clamp fixing plate, referring to the table below for how to orient the plate.

| Transducer type | Clamp fixing plate orientation | |
|---|---|---|
| CM265LH | Projection on plate upward |  |
| B265LH | Projection on plate downward |  |

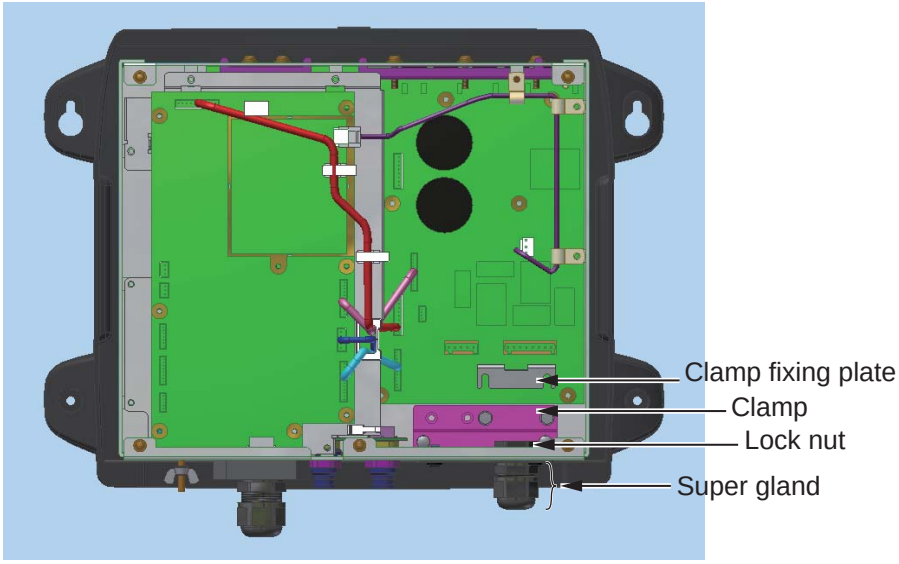
10. Tighten the sealing nut according to the information in the table below.

| Transducer | Clearance | | Torque |
|---|---|---|---|
| CM265LH | 4 mm |   | 1.8 - 2.0N/m |
| B265LH | 2 mm | | |

11. Reattach the shield cover and close the outer cover.

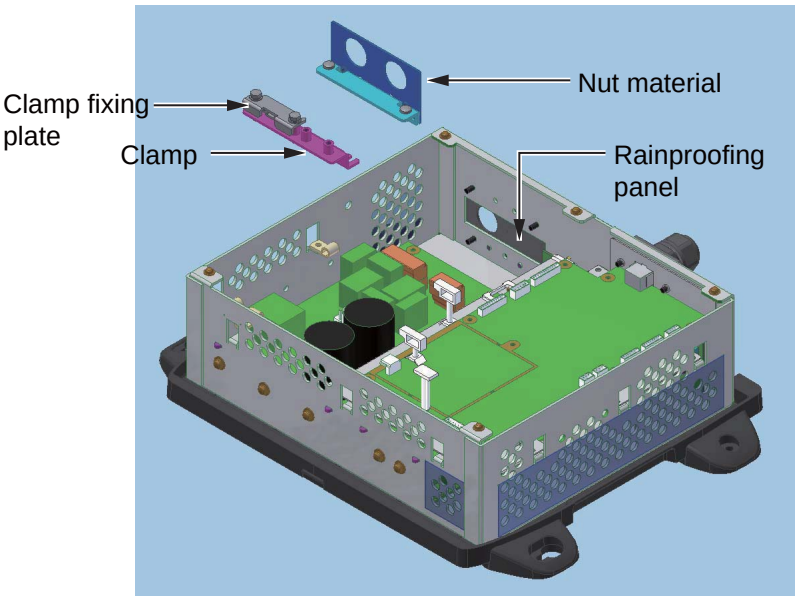
### 2.2.3 How to connect the transducer cable, cable for external KP

1. Remove the cover, shield cover and WAGO connectors, referring to steps 1-3 in section 2.2.2.
2. Unfasten the lock nut of the inside the unit to detach the super gland.

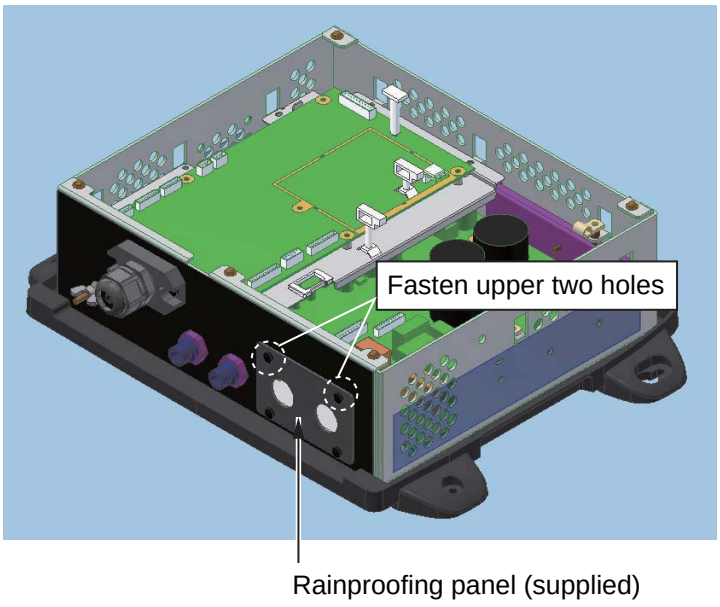



3. Unfasten two screws to remove the clamp fixing plate.
4. Unfasten two screws securing the clamp. Save the screws for later use.
5. Unfasten the four screws securing the rainproofing panel. You may discard the panel. Save the screws for later use.

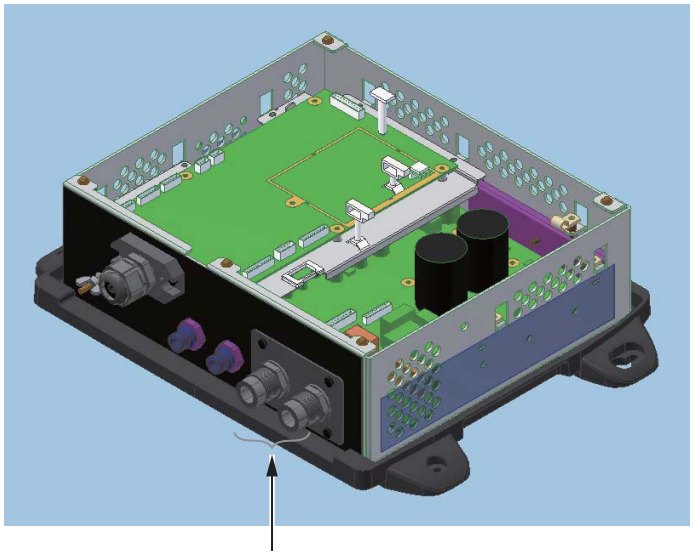
6. Unfasten the nut material inside the unit.



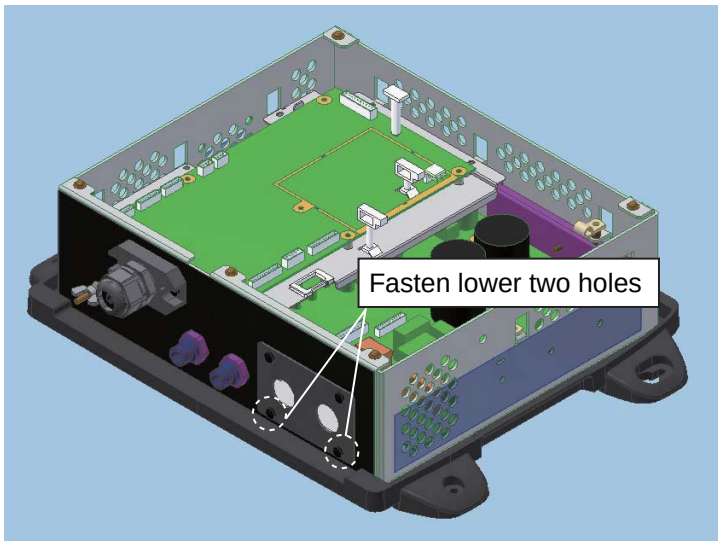

7. Using the two screws removed at step 5, fasten the upper two holes of the supplied rainproofing panel.



8. TIghten the lock nut inside the unit to fasten the super glands (two pcs., see step 12). The torque for the lock nut shall be 1.8 - 2.0 N/m.

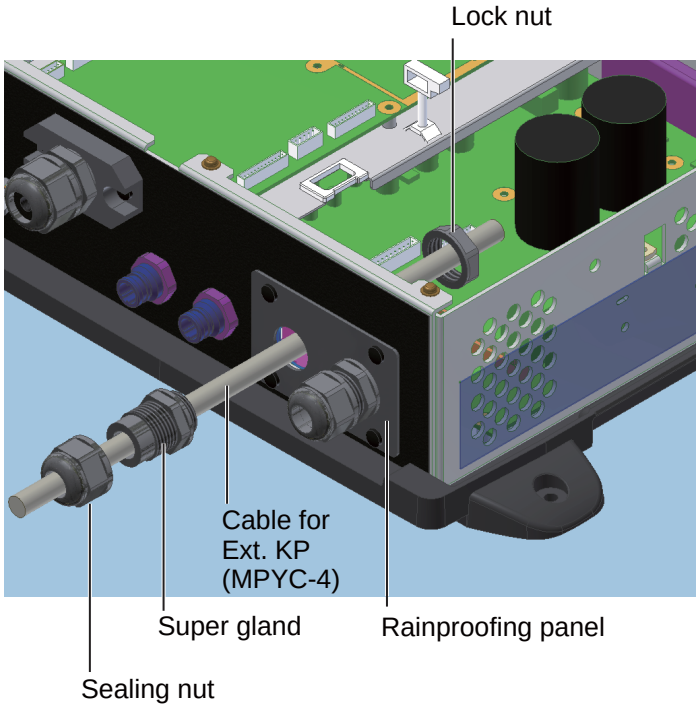



9. Set the nut material (removed at step 6) inside the unit, align its two protrusions with the lower holes on the rainproofing panel. Use the remaining two screws removed at step 5 to fasten the lower two holes on the rainproofing panel.

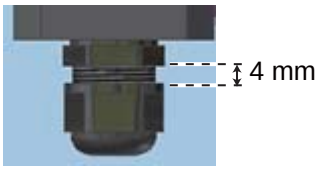



10. Use two screws to fasten the clamp removed at step 4.

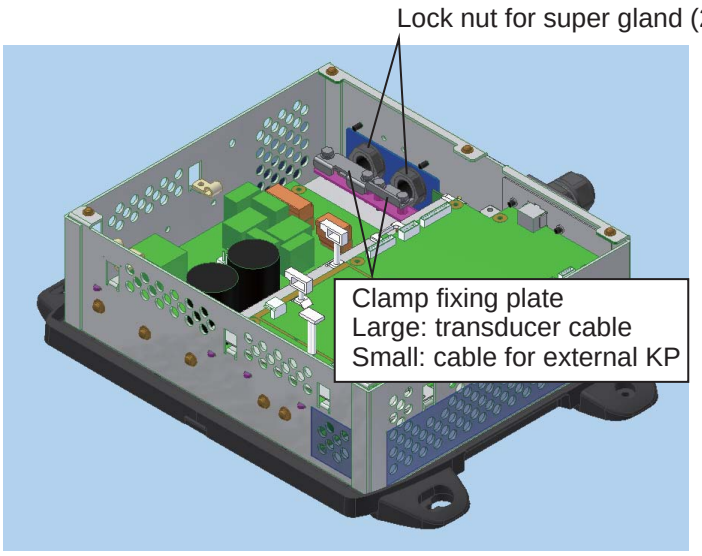
11. **For the transducer cable and the cable for the external KP**, pass each cable through its super gland, the supplied rainproofing panel and each hole in the unit. Then slip a lock nut onto each cable. (For the super gland of the cable for the external KP, unfasten the lock nut from the super gland then pass the cable through the super gland. See page 8 for how to treat the cable end.)



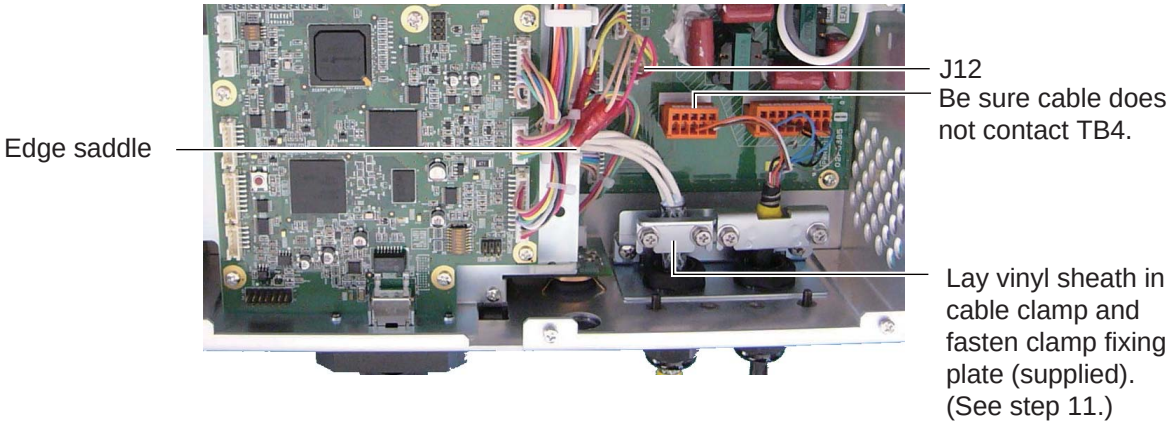

After passing the cable for the external KP, do as follows:
- Assemble the super gland.
- Tighten the sealing nut until the clearance is 4 mm. The torque shall be 1.8 - 2.0N/m.



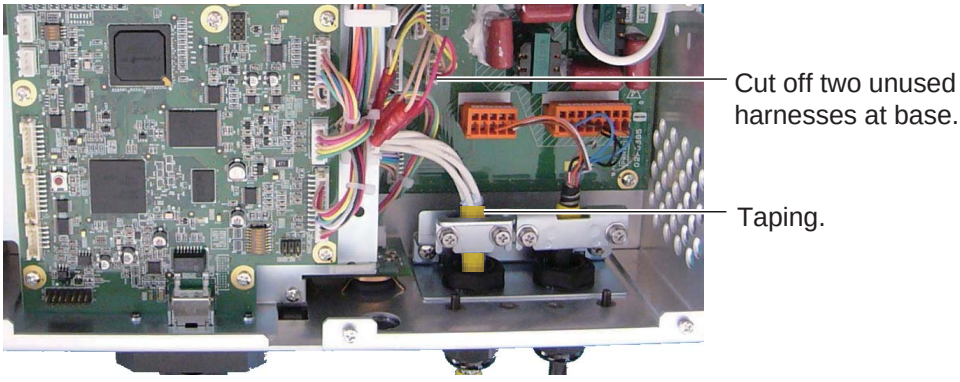
12. **Transducer cable**: Lay the transducer cable in the cable clamp then refasten the clamp fixing plate.
    **Cable for the external KP**: Lay the cable in the cable clamp and fix it with the supplied clamp fixing plate and two upset screws.



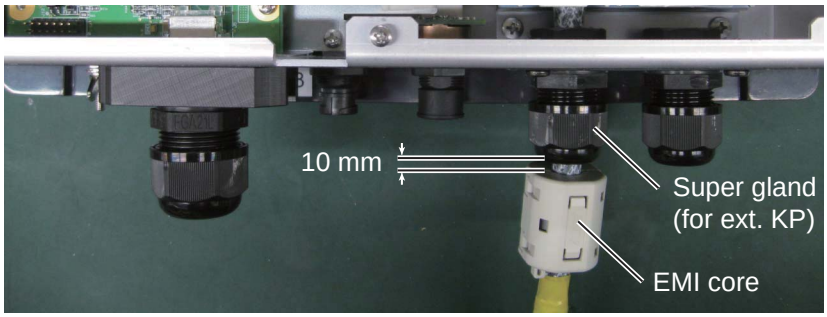

13. Connect the cables as follows:
    - **Transducer cable**: See section 2.2.2.
    - **Cable for external KP**: See the illustration below. Pass the cable through the edge saddle and connect the cable to J12 on the PWRTX board. Be sure the cable does not contact TB4.




**Note:** For cable MPYC-2, tape the vinyl sheath of the cable (approx. 6 to 7 turns) where it lies in the cable clamp and fasten the cable clamp. The PH connector has two unused harnesses. Cut them at their base or wrap them with vinyl tape.



14. Attach the supplied EMI core (GRFC-10) to the cable for the external KP approx. 100 mm from the super gland.

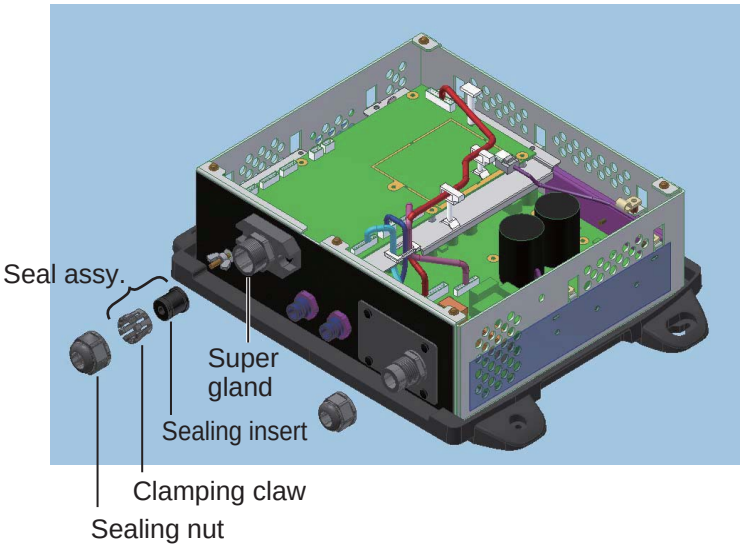



15. Attach the shield cover and close the outer cover.

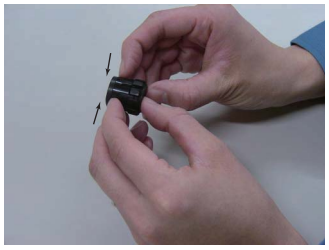
## 2.3 LAN Cable

Do as follows to connect the supplied LAN cable (MOD-Z072-050+) or the optional LAN cable (MOD-Z072-020+, MOD-Z072-100+).

1. Unfasten the sealing nut from the LAN connector then remove the sealing insert and clamping claw.
2. Detach the sealing insert from the clamping claw as shown below.



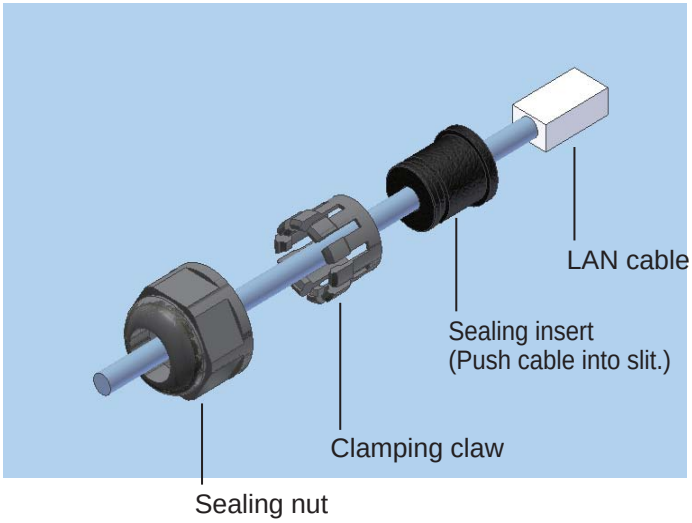

How to detach clamping claw



Hold the clamping claw/seal assy. as shown left, with the teeth of the clamping claw toward you.

Push in the sealing insert with your thumbs.

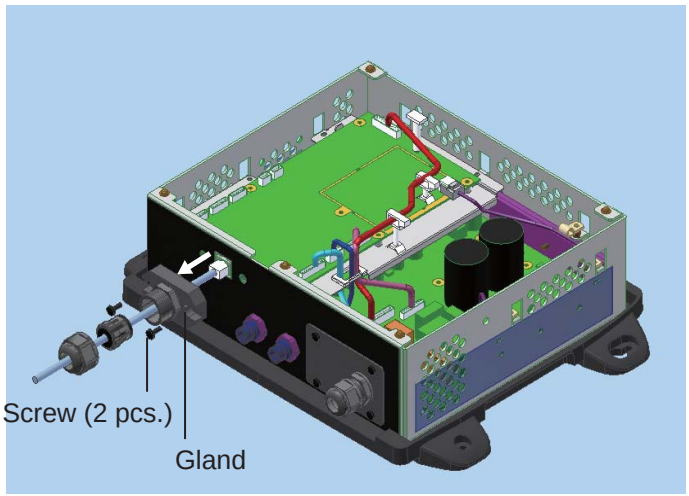
3. Pass the sealing nut, sealing insert and clamping claw onto the LAN cable in that order. Connect the cable to the LAN connector. (Note the orientation of the sealing insert when passing it onto the cable. Push the cable into the slit in the sealing insert.)




4. Set the sealing insert and clamping claw into the sealing nut then tighten the nut.
5. Tighten the sealing nut to fasten the LAN cable. The clearance between the lock nut and the sealing nut shall be 3 mm. The torque for the sealing nut shall be 1.8 - 2.0 N/m.


## How to disconnect the LAN cable

Loosen the two screws on the gland to access the cable's connector. A lock washer is fitted to the gland and the screws cannot be unfastened completely.



# 3. INITIAL SETTINGS

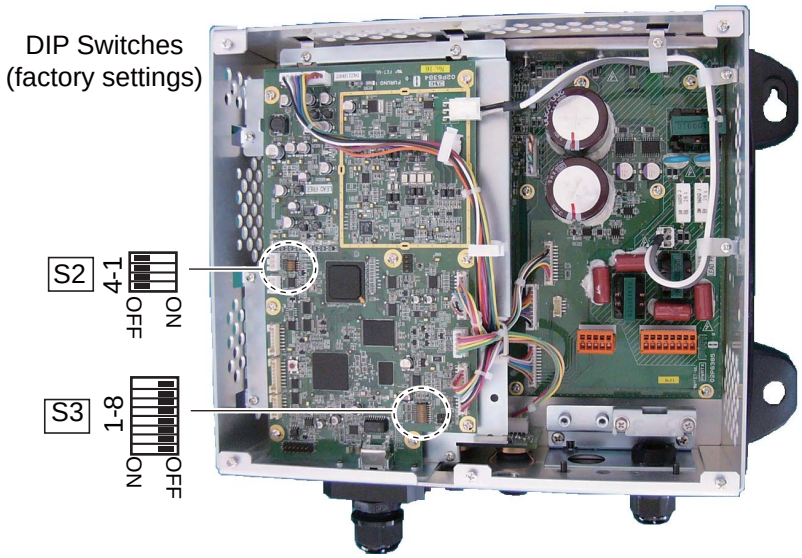
**⚠ WARNING**

Do not open the equipment unless totally familiar with electrical circuits.

Only qualified personnel should work inside the equipment.

## 3.1 DIP Switch Setting

The DIP switch S3 sets up the system according to the equipment connected. In the default setting all switches (1-8) are OFF. The DIP switch S2 should not be adjusted; leave all switches in the OFF position.




*DIP switch S3 description*

| Switch No. | Function | Setting |
|---|---|---|
| 1 | IP mode | **OFF**: FIxed (static) IP address. Set the IP address with switch #2, referring to the table below.<br>**ON**: Use IP address assigned by DHCP. |
| 2 | IP address no. | **OFF**: Set the #1 switch to OFF to set IP address. See the table on the next page for IP address assignment. |
| 3 | Restore default settings (other than LAN and transducer) | See section 4.3. |
| 4 | Restore ALL default settings | See section 4.3. |
| 5 - 6 | Keep these switches in the OFF position. | |
| 7 | No use | |
| 8 | No use | |

| #2 | Host name | IP address |
|---|---|---|
| OFF | ES092002 | 172.031.092.002 |
| ON | ES092003 | 172.031.092.003 |

After setting up the transducer at the DFF1-UHD, set the transducer type at the NavNet device. See respective Installation Manual for the procedure.

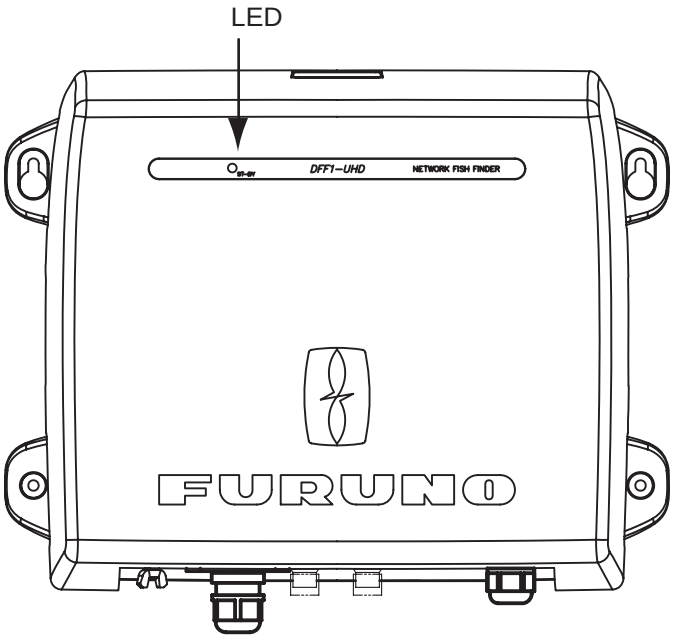
**Note:** DIP Switch S3 is for factory use. Do not change the settings.

# 3.2 Operation Check

For NavNet TZtouch, the DFF1-UHD is powered on/off from ship's switchboard. For NavNet 3D, it is powered on/off from the display unit. The LED on the cover of the DFF1-UHD lights or blinks according to equipment state, as described in the table below.

*LED state and meaning*

| LED state | Meaning |
|---|---|
| Lighting continuously | • Standby state. (If no signal is received via LAN for more than 10 minutes, the equipment automatically goes into standby to lessen power consumption.)<br>• Power on (20 seconds during initialization)<br>• IP address not set |
| Blinking every two seconds | Normal operation |
| Blinking every 0.4 seconds | Transducer settings at NavNet device not properly set. |



# 4. MAINTENANCE

**⚠ WARNING**

**ELECTRICAL SHOCK HAZARD**
**Do not open the equipment.**

Only qualified personnel should work inside the equipment.

**NOTICE**

**Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.**

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

## 4.1 Maintenance

Regular maintenance is essential for good performance. Check the items listed in the table below at the suggested interval to help keep your equipment in good shape for years to come.

| Item | Check point, action | Check interval |
|---|---|---|
| Transducer cable | Check that cable is tightly fastened and is not damaged. Refasten if necessary. Replace if damaged. | Once a month |
| Power cable, sensor cable | Check that these cables are tightly fastened and not damaged. Refasten if necessary. Replace if damaged. | Once a month |
| Ground | Check for corrosion. Clean if necessary. | Once a month |
| Power supply voltage | Check voltage. If out of rating correct problem. | Once a month |
| Cleaning the network fish finder's cabinet | Dust or dirt on the cabinet may be removed with a dry cloth. Do not use chemical-based cleaners to clean the cabinet; they can remove markings and damage the cabinet. | Once a month |
| Transducer | Marine life on the transducer face will result in a gradual decrease in sensitivity. Check the transducer face for cleanliness each time the boat is removed from the water. Carefully remove any marine life with a piece of wood or fine-grade sandpaper. | When vessel is removed from the water |

## 4.2 How to Replace the Fuse

The 5A fuse (Type: FGBO-A 125V 5A PBF, Code No. 000-155-853-10) in the snap-in fuse holder on the power cable protects the equipment from equipment fault and reverse polarity of the power supply. If the equipment cannot be powered, the fuse may have blown. Find out the cause for the blown fuse before replacing it. If the fuse blows again after replacement, contact a FURUNO agent or dealer for instructions.

**⚠ WARNING**

**Use the proper fuse.**

Use of a wrong fuse can damage the equipment and cause fire.

## 4.3 How to Restore Default Settings

This procedure restores all default sounder settings on the NavNet series device. You can restore all default settings or restore those other than transducer and LAN. This procedure should only be performed by a suitably qualified FURUNO technician.

1. Disconnect the power and LAN cables from the DFF1-UHD.
2. Turn on the #3 or #4 switch of DIP Switch S3 as applicable.
   #3: Restore default settings other than LAN and transducer.
   #4: Restore all default settings. Use this when changing transducers.
3. Connect the power cable to the DFF1-UHD, and turn on the power at the ship's switchboard.
4. The LED blinks (every 0.4 seconds) when default settings are completely restored.

# APPENDIX 1 JIS CABLE GUIDE

Cables listed in the manual are usually shown as Japanese Industrial Standard (JIS). Use the following guide to locate an equivalent cable locally.

JIS cable names may have up to 6 alphabetical characters, followed by a dash and a numerical value (example: DPYC-2.5). For core types D and T, the numerical designation indicates the *cross-sectional Area ($mm^2$)* of the core wire(s) in the cable. For core types M and TT, the numerical designation indicates the *number of core wires* in the cable.

### 1. Core Type

D Double core power line

T Triple core power line

M Multi core

TT Twisted pair communications (1Q=quad cable)

### 2. Insulation Type

P Ethylene Propylene Rubber

### 3. Sheath Type

Y PVC (Vinyl)

### 4. Armor Type

C Steel

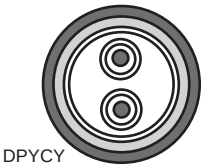
### 5. Sheath Type

Y Anticorrosive vinyl sheath

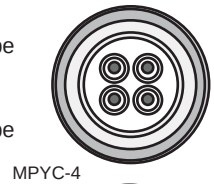
### 6. Shielding Type

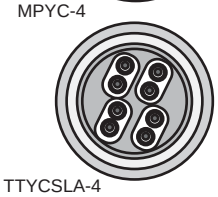
SLA All cores in one shield, plastic tape w/aluminum tape

-SLA Individually shielded cores, plastic tape w/aluminum tape


DPYCY


TPYCY


MPYC-4


TTYCSLA-4

1 2 3 4 5 6

EX: DPYCYSLA - 1.5 (Designation type: DPYCYSLA; Core Area ($mm^2$): 1.5)

1 2 3 4

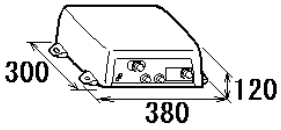
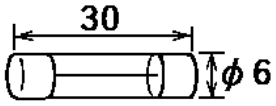
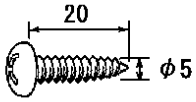
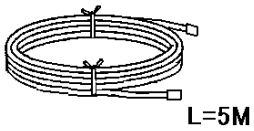
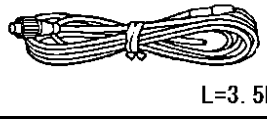
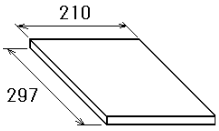
MPYC - 4 (Designation type: MPYC; # of cores: 4)

The following reference table lists gives the measurements of JIS cables commonly used with Furuno products:

| Type | Core Area | Core Diameter | Cable Diameter | Type | Core Area | Core Diameter | Cable Diameter |
|---|---|---|---|---|---|---|---|
| DPYC-1.5 | 1.5mm² | 1.56mm | 11.7mm | TPYCY-1.5 | 1.5mm² | 1.56mm | 14.5mm |
| DPYC-2.5 | 2.5mm² | 2.01mm | 12.8mm | TPYCY-2.5 | 2.5mm² | 2.01mm | 15.5mm |
| DPYC-4 | 4.0mm² | 2.55mm | 13.9mm | TPYCY-4 | 4.0mm² | 2.55mm | 16.9mm |
| DPYC-6 | 6.0mm² | 3.12mm | 15.2mm | TPYCYSLA-1.5 | 1.5mm² | 1.56mm | 13.9mm |
| DPYC-10 | 10.0mm² | 4.05mm | 17.1mm | TTYC-7SLA | 0.75mm² | 1.11mm | 20.8mm |
| DPYC-16 | 16.0mm² | 5.10mm | 19.4mm | TTYCSLA-1 | 0.75mm² | 1.11mm | 9.4mm |
| DPYCY-1.5 | 1.5mm² | 1.56mm | 13.7mm | TTYCSLA-1Q | 0.75mm² | 1.11mm | 10.8mm |
| DPYCY-2.5 | 2.5mm² | 2.01mm | 14.8mm | TTYCSLA-4 | 0.75mm² | 1.11mm | 15.7mm |
| DPYCY-4 | 4.0mm² | 2.55mm | 15.9mm | TTYCY-4SLA | 0.75mm² | 1.11mm | 19.5mm |
| DPYCYSLA-1.5 | 1.5mm² | 1.56mm | 11.9mm | TTYCYSLA-1 | 0.75mm² | 1.11mm | 11.2mm |
| DPYCYSLA-2.5 | 2.5mm² | 2.01mm | 13.0mm | TTYCYSLA-4 | 0.75mm² | 1.11mm | 17.9mm |
| MPYC-2 | 1.0mm² | 1.29mm | 10.0mm | | | | |
| MPYC-4 | 1.0mm² | 1.29mm | 11.2mm | | | | |
| MPYC-7 | 1.0mm² | 1.29mm | 13.2mm | | | | |
| MPYCY-12 | 1.0mm² | 1.29mm | 19.0mm | | | | |
| MPYCY-19 | 1.0mm² | 1.29mm | 22.0mm | | | | |

# PACKING LIST

## DFF1-UHD

| NAME | OUTLINE | DESCRIPTION/CODE No. | Q'TY |
|---|---|---|---|
| **ユニット UNIT** | | | |
| ﾈｯﾄﾜｰｸ魚探<br>NETWORK FISH FINDER |  | DFF1-UHD<br>000-022-520-00 | 1 |
| **予備品 SPARE PARTS** | | **SP02-05601** | |
| ﾋｭｰｽﾞ<br>GLASS TUBE FUSE |  | FGB0-A 125V 5A PBF<br>000-155-853-10 | 2 |
| **工事材料 INSTALLATION MATERIALS** | | **CP02-08500** | |
| +ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ<br>SELF-TAPPING SCREW |  | 5X20 SUS304<br>000-162-608-10 | 4 |
| ｹｰﾌﾞﾙ(組品)LAN<br>LAN CABLE ASSEMBLY |  | MOD-Z072-050+<br>000-167-176-10 | 1 |
| ｹｰﾌﾞﾙ組品MJ<br>CABLE ASSEMBLY |  | MJ-A3SPF0013-035C(5A)<br>000-157-939-10 | 1 |
| **図書 DOCUMENT** | | | |
| 取扱説明書<br>OPERATOR'S MANUAL |  | OM*-20400-*<br>000-177-244-1* ** | 1 |

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

型式/ｺｰﾄﾞ番号が2段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。

TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

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

# SPECIFICATIONS OF NETWORK FISH FINDER DFF1-UHD

## 1 GENERAL

1.1 TX frequency 50/200 kHz, alternative transmission

1.2 Output power 1 kW nominal

1.3 Amplifier type Straight amplifier (H/L gain switching available)

1.4 Depth range and Pulse repetition rate (PRR) at 200 kHz, TX rate: 20

| Range (m) | PRR (times/min, max.) |
|---|---|
| 2 | 2403 |
| 5 | 2403 |
| 10 | 1621 |
| 40 | 476 |
| 100 | 222 |
| 400 | 58 |
| 1200 | 34 |

## 2 INTERFACE

2.1 I/O port

Network 1 port

Temp/speed sensor 1 port

External KP 1 port (external KP kit: option)

2.2 Network method Ethernet 10Base-T/100Base-TX

## 3 POWER SUPPLY

3.1 Network fish finder 12-24 VDC: 2.5-1.3 A

3.2 Rectifier (PR-62, option) 100/110/220/230 VAC, 1 phase, 50/60 Hz

## 4 ENVIRONMENTAL CONDITIONS

4.1 Ambient temperature -15°C to +55°C

4.2 Relative humidity 93% or less at +40°C

4.3 Degree of protection IP22

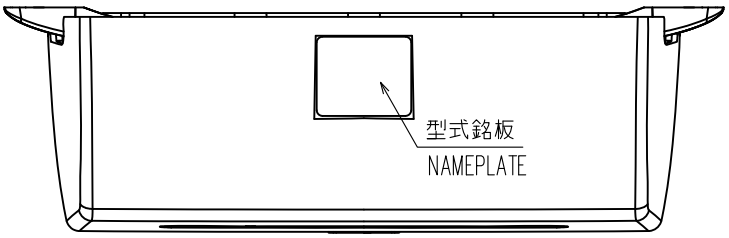
4.4 Vibration IEC 60945 Ed.4

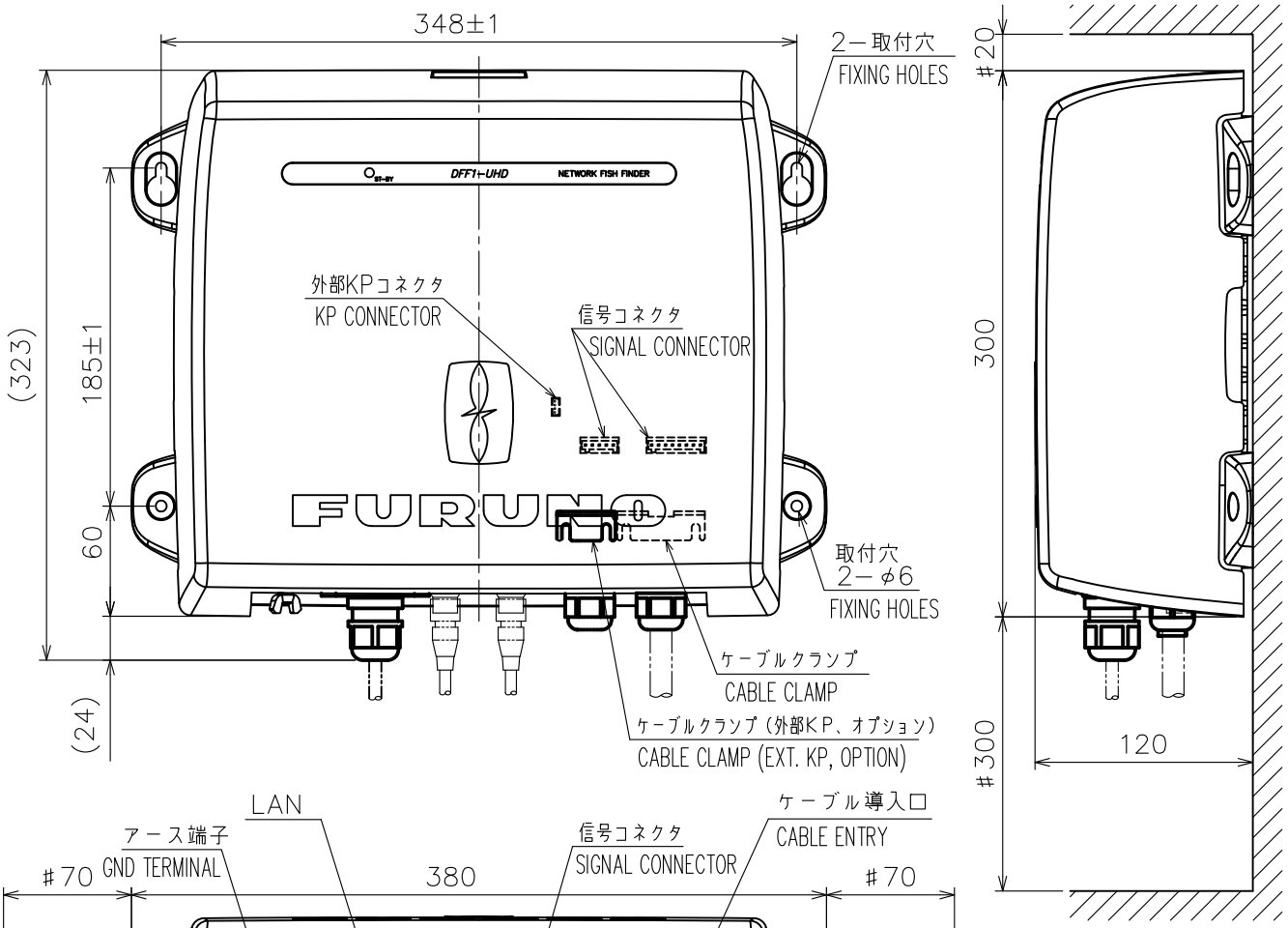
## 5 UNIT COLOR

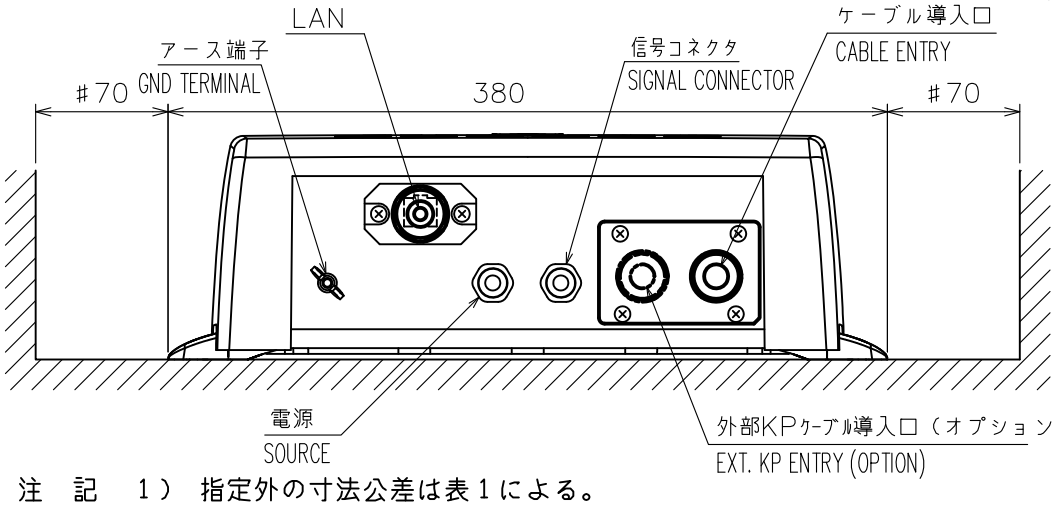
5.1 Network fish finder N2.5 (fixed)

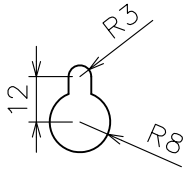
表1 TABLE 1

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



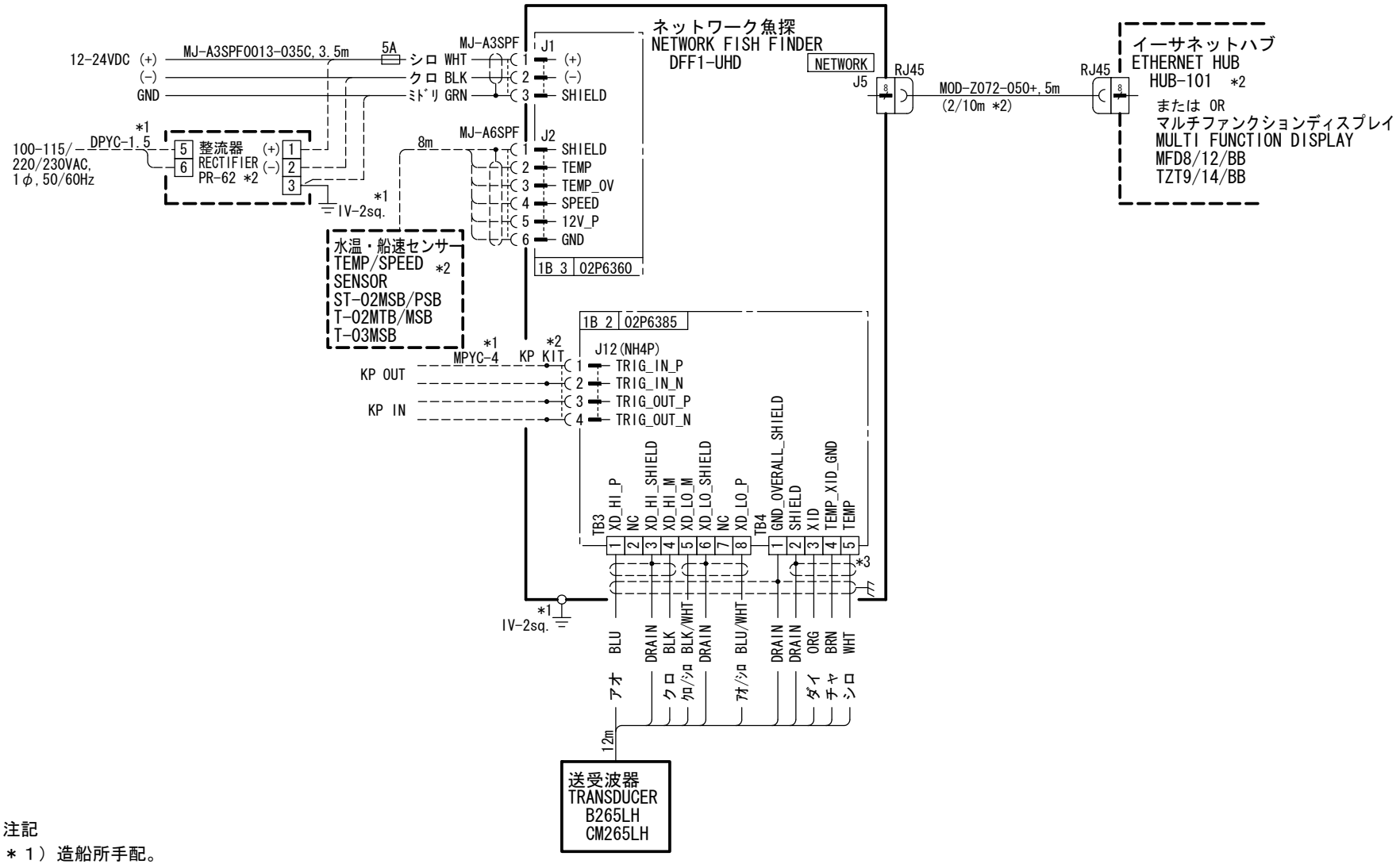




取付穴詳細（尺度：１／２）
DETAIL FOR FIXING (SCALE: 1/2)

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）　取付用ネジはトラスタッピンネジ呼び径５ｘ２０を使用のこと。

NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2.　#: MINIMUM SERVICE CLEARANCE.
　　3.　USE TAPPING SCREWS ø5x20 FOR FIXING THE UNIT.

| | | | |
|---|---|---|---|
| DRAWN 6/Dec/2012 T.YAMASAKI | | TITLE | DFF1-UHD |
| CHECKED 6/Dec/2012 H.MAKI | | 名称 | ネットワーク魚探 |
| APPROVED 7/Dec/2012 Y.NISHIYAMA | | | 外寸図 |
| SCALE 1/4 | MASS 3.5 ±10% kg | NAME | NETWORK FISH FINDER |
| DWG. No. C2040-G01- B | REF. No. 02-167-100G-3 | | OUTLINE DRAWING |




注記
＊１）造船所手配。
＊２）オプション。
＊３）CM265LHのみ。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CM265LH ONLY.

| | | | |
|---|---|---|---|
| DRAWN 3/Dec/2012 T. YAMASAKI | | TITLE | DFF1-UHD |
| CHECKED 3/Dec/2012 H. MAKI | | 名称 | ネットワーク魚探 |
| APPROVED 4/Dec/2012 Y. NISHIYAMA | | | 相互結線図 |
| SCALE / MASS kg | | NAME | NETWORK FISH FINDER |
| DWG. No. C2040-C01- A | REF. No. 02-167-1001-0 | | INTERCONNECTION DIAGRAM |