FURUNO

Marine Display

Model **MU-150HD**

FURUNO ELECTRIC CO., LTD.

• FURUNO Authorized Distributor/Dealer

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FURUNO ELECTRIC CO., LTD.

www.furuno.com

OPERATOR'S MANUAL

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 instructions in this manual.
  Wrong operation or maintenance can void 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 the 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 void the warranty.
- The following concern acts as our importer in Europe, as defined in DECISION No 768/2008/EC.
  - Name: FURUNO EUROPE B.V.
  - Address: Siriusstraat 86, 5015 BT, Tilburg, The Netherlands
- The following concern acts as our importer in UK, as defined in SI 2016/1025 as amended SI 2019/470.
  - Name: FURUNO (UK) LTD.
  - Address: West Building Penner Road Havant Hampshire PO9 1QY, U.K.
- All brand, product names, trademarks, registered trademarks, and service marks belong to 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. If a battery is used, tape the + and - terminals of the 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.
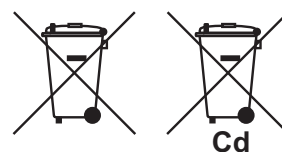
In the USA
The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.
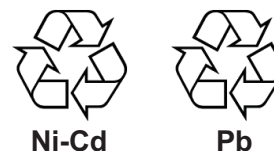
In the other countries
There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.

⚠ SAFETY INSTRUCTIONS

Read these safety instructions before you operate the equipment.

⚠ **WARNING**	Indicates a condition that can cause death or serious injury if not avoided.
⚠ **CAUTION**	Indicates a condition that can cause minor or moderate injury if not avoided.

⚠ Warning, Caution	🚫 Prohibitive Action	❗ Mandatory Action

Safety Instructions for the Operator

⚠ WARNING

❗ **Immediately turn off the power at the switchboard if water leaks into the equipment or something is dropped into the equipment.**

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

❗ **Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.**

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

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

Fire, electrical shock or serious injury can result.

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

Turn off the power at the switchboard if the equipment becomes abnormally warm or is emitting odd noises. Contact a FURUNO dealer or agent for advice.

⚠ WARNING

❗ **Use the proper fuse.**

Fuse rating is shown on the power cable. Use of a wrong fuse can result in damage to the equipment.

🚫 **Do not place any object near the exhaust or intake vent.**

Fire may result.

⚠ CAUTION

🚫 **Do not connect/disconnect the signal cable while turning the power on.**

The unit may be damaged.

❗ **Handle the LCD monitor with care.**

The face of the LCD monitor is made of glass. Injury may result if the glass breaks.

Safety Instructions for the Installer

⚠ **WARNING**

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 damage to the equipment.

⚠ **CAUTION**

Observe the following compass safe distances to prevent interference to a magnetic compass:

	Standard compass	Steering compass
MU-150HD	0.80 m	0.50 m

When lifting the display unit, hold it together with the hard cover.

Grasping by the hard cover alone may allow the display unit to fall, resulting in possible bodily injury or damage to the equipment.

About the TFT LCD

The TFT LCD is constructed using the latest LCD techniques, and displays 99.99% of its pixels. The remaining 0.01% of the pixels may drop out or blink, however this is not an indication of malfunction.

TABLE OF CONTENTS

Note: This manual contains both English and Japanese instructions. The Installation Materials, Outline Drawings, and Interconnection Diagram are located at the back of this manual.

FOREWORD

A Word to the Owner of the MU-150HD

FURUNO Electric Company thanks you for purchasing the MU-150HD 15" Marine Display. We are confident you will discover why the FURUNO name has become synonymous with quality and reliability.

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

Your equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained. Please carefully read and follow the operation, installation and maintenance procedures set forth in this manual.

We would appreciate feedback from you, the end-user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO.

Features

The main features of the MU-150HD are as shown below.

- Selectable screen from RGB (1 line), Digital (2 lines) or Composite (3 lines).
- Main or remote display for radars, video sounders, sonars, plotter. For the connectable equipments, see "Connectable equipment" on page vi.
- High resolution display of 1024 x 768 (XGA)
- Brightness of 1000 cd/m^2 (maximum) and 0.3 cd/m^2 or less (minimum) for comfortable viewing day and night.
- Brilliance adjustment automatically with the light sensor.
- Picture-in-picture function
- Power on/off automatically through the DVI signal.

Program Number

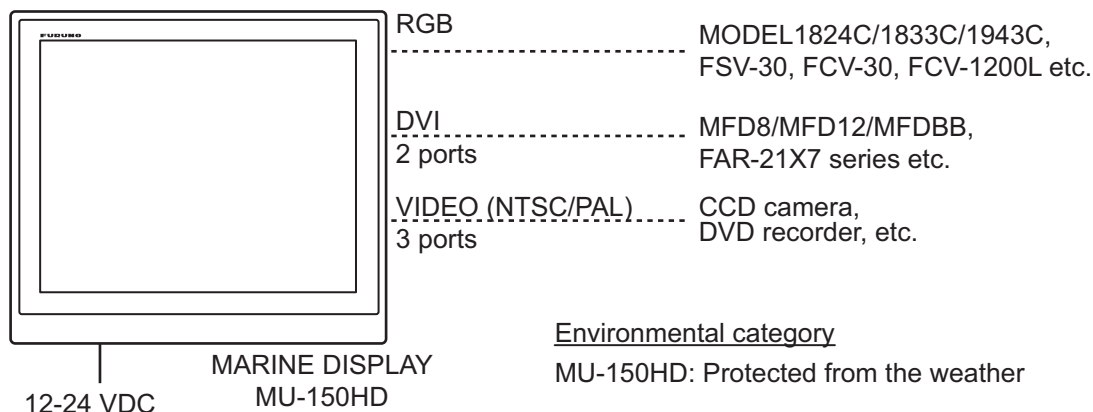| Program Name	Version	Date of Modification
Main	1.xx	Feb. 2010

xx: minor change

CE declaration

With regards to CE declarations, please refer to our website (www.furuno.com), for further information on RoHS conformity declarations.

Disclosure of Information about China RoHS

With regards to China RoHS information for our products, please refer to our website (www.furuno.com).

SYSTEM CONFIGURATION

RGB
.... MODEL1824C/1833C/1943C,
FSV-30, FCV-30, FCV-1200L etc.

DVI
.... MFD8/MFD12/MFDBB,
2 ports
FAR-21X7 series etc.

VIDEO (NTSC/PAL)
.... CCD camera,
3 ports
DVD recorder, etc.

MARINE DISPLAY
MU-150HD

12-24 VDC

Environmental category
MU-150HD: Protected from the weather

Connectable equipment

Equipment	Resolution	Signal
FCV-1200L/M	VGA	Analog RGB, via IF-8000
CH-250/S	VGA	Analog RGB, via IF-8000
CH-270	VGA	Analog RGB, via IF-8000
CH-300	VGA	Analog RGB, via IF-8000
CSH-5L/8L	XGA	Analog RGB
FSV-24/S-BB	SXGA	Analog RGB
FSV-30/S-BB	SXGA	Analog RGB
FSV-84/L	SXGA	Analog RGB
FCV-30	SXGA	Analog RGB
CI-68/88	VGA	Analog RGB
FR-1510MK-3	XGA	Analog RGB, OP03-153 required
FR-21x5 series	SXGA	Analog RGB, OP03-162 required
FAR-21x7 series	SXGA	DVI
FEA-2107	SXGA	DVI
FEA-2807	SXGA	DVI
FCR-21x7 series	SXGA	DVI
FCR-28x7 series	SXGA	DVI
MODEL1833C series (NavNet)	VGA	Analog RGB, OP03-176 required
MODEL1833C-BB series (NavNet)	VGA	Analog RGB
MODEL1824C series (NavNet vx2)	VGA	Analog RGB, OP03-176 required
MODEL1824C-BB series (NavNet vx2)	VGA	Analog RGB
MFD8 (NavNet 3D)	VGA	DVI
MFD12 (NavNet 3D)	SVGA	DVI
MFDBB (NavNet 3D)	SVGA	DVI
	XGA	
	SXGA	

Note 1: This equipment is used as a display for a Non-SOLAS radar or ECDIS.

Note 2: Landscape orientation only.

Note 3: When inputting SXGA, a circle may be displayed as an ellipse because the aspect ratio differs. See "DISP MODE*" on page 17. Also, it may be difficult to read small characters.

EQUIPMENT LISTS

Standard supply

Name	Type	Code No.	Qty	Remarks
Display Unit	MU-150HD	—	1	w/ Hard cover
Installation Materials	CP26-01300	000-016-267	1 set	• CP26-01302* • Flush Mounting Plate Assy. (CP26-01301, Code: 001-080-760) 2 pcs. • Cable Assembly (MJ-A3SPF0017-050ZC, Code: 000-157-995-10) 1 pc.
Accessories	FP26-00401	001-175-940	1 set	LCD Cleaning Cloth (19-028-3125-5, Code: 100-360-675-10) 1 pc.
Spare Parts	SP26-00201	001-080-750	1 set	• Fuse (FGBO-A 125V 5A PBF, Code: 000-155-853-10) 3 pcs.

*: See the Installation materials at the back of this manual.

Optional supply

Name	Type	Code No.	Qty	Remarks
Cable Assembly	3COX-2P-6C 5M	001-077-230-10	1	Cable length: 5 m (15 pin D-sub connector at both ends)
	3COX-2P-6C 10M	001-077-220-10	1	Cable length: 10 m (15 pin D-sub connector at both ends)
	DVI-D/D S-LINK 5M	001-132-960-10	1	Cable length: 5 m (with DVI-D connector at both ends)
	DVI-D/D S-LINK 10M	001-133-980-10	1	Cable length: 10 m (with DVI-D connector at both ends)
Bracket Assembly (w/knobs)	OP26-2	000-016-268	1 set	
Hood Assembly	OP26-3	001-080-840	1 set	
Flush Mount Kit	OP26-36	001-497-450	Either one of the two is supplied.	
	OP26-4	001-080-850		
Glass Fixing Kit	OP26-37	001-566-980	1 set	For flush mouting (fixed at rear)/ desktop mounting
Glass Fixing Kit (front)	OP26-38	001-566-990	1 set	For flush mouting (fixed at front)

1. MOUNTING, WIRING

1.1 Preparation

Mounting type

You can install the display unit as follows. See the outline drawing at the back of this manual for mounting dimensions.

- Flush mounting, fixed at rear (standard)
- Flush mounting, fixed at front (option)
- Flush mounting, fixed at rear, with hood (option)
- Desktop mounting (option)
- Flush mounting a series side by side, fixed at rear

Note: The face of the LCD monitor is made of glass. Handle it with care.

Mounting location

When you choose a mounting location, remember the following points:

- Make sure the mounting location is strong enough to support the weight of the unit.
- Locate the unit away from direct sunlight. An LCD may black out if it is exposed to direct sunlight for a long time.
- Select a location where the display can be easily viewed and the controls can be easily operated.
- Leave enough space around the unit for service and maintenance. See the outline drawing at the back of this manual for minimum service clearance.
- Locate the unit away from areas subject to water splash and rain.
- Observe the compass safe distances (see page iii) to prevent interference to a magnetic compass.

Note: If the unit is installed with the screen tilted downwards, the appropriate glass fixing kit (see "Optional supply" on page vii) must be used.

How to remove/attach the hard cover

Before you install this display unit, remove the hard cover as follows.

+---+
| ⚠ **CAUTION** |
+---+
| 🛇 **When lifting the display unit, hold it** |
| **together with the hard cover.** |
| |
| Grasping by the hard cover alone may |
| allow the display unit to fall, resulting in |
| possible bodily injury or damage to the |
| equipment. |
+---+

The upper edge of the hard cover

Pull forward the upper edge by pressing here with thumbs.
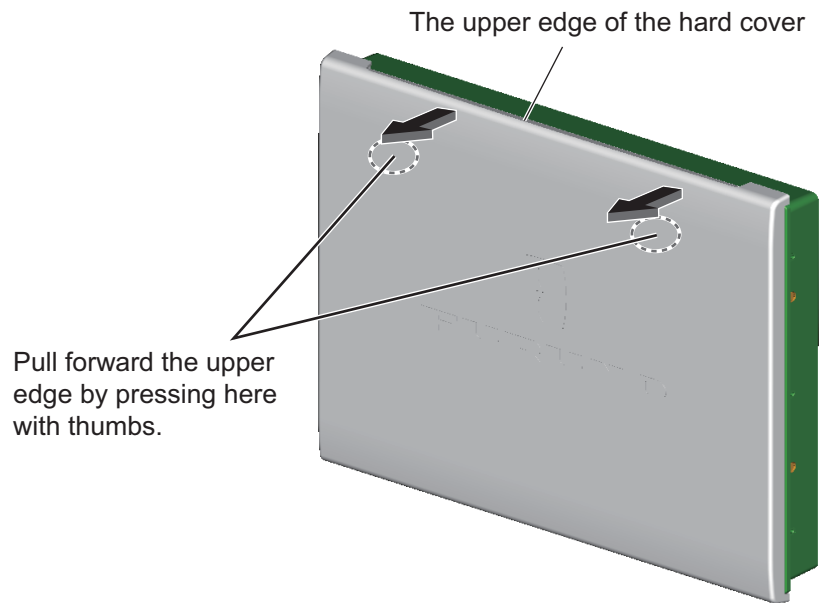
How to remove the hard cover

To attach the hard cover, follow the illustration in the figure below.

Cutout

Tab

Hard cover

Set the tabs on the top of the hard cover to the cutouts of the display unit.

Push the tabs of the bottom of the hard cover strongly (2 places).
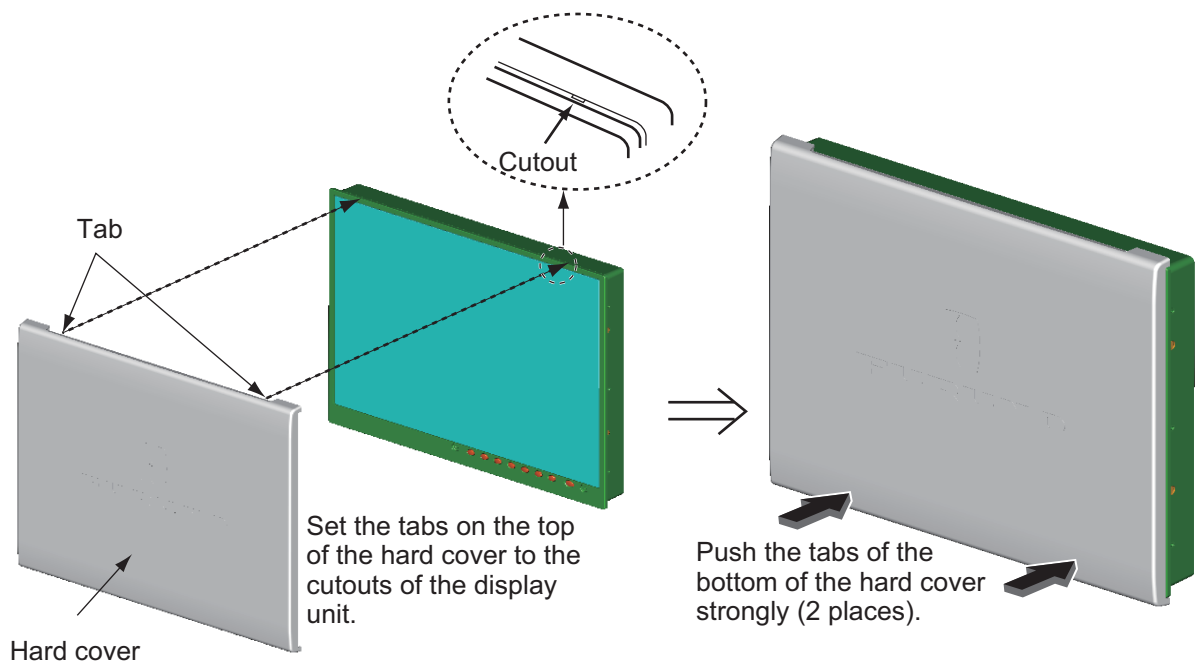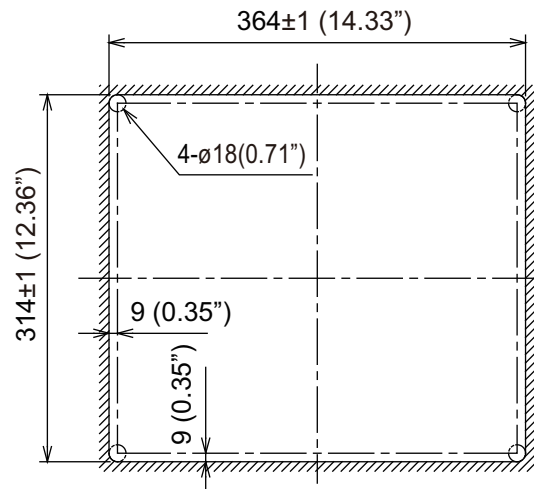
How to attach the hard cover

Cable running

Before you install the display unit, run all cables you use. See the interconnection diagram at the back of this manual.
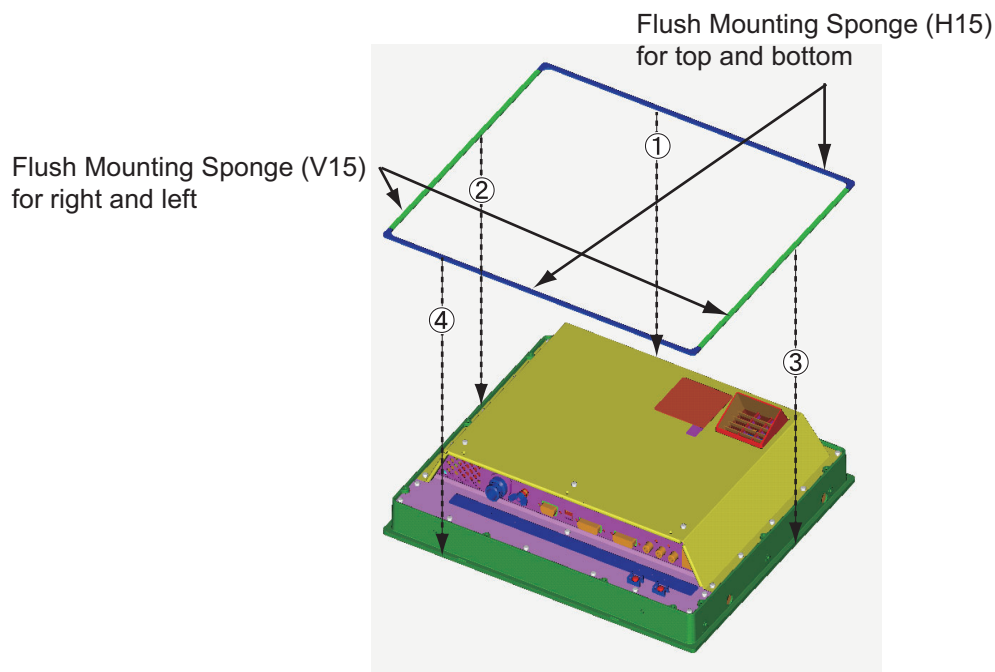
1.2　Flush Mounting, Fixed at Rear

This is the standard installation method.

1.　Make a cutout in the mounting location with the "Flush mounting template" (included).
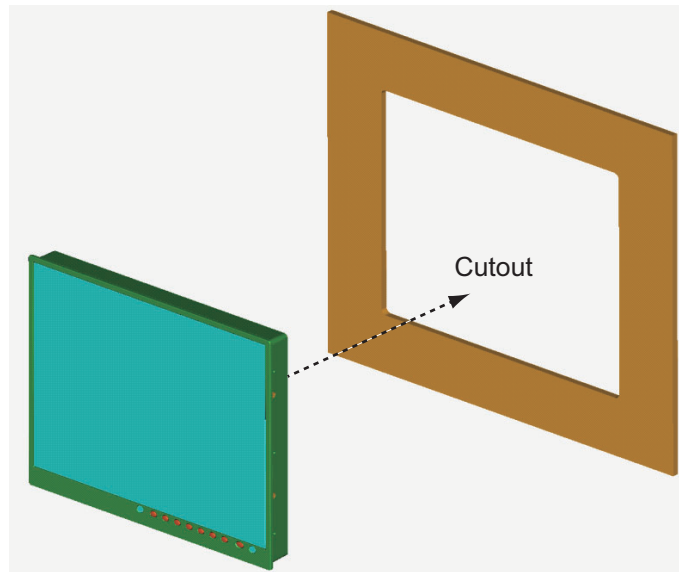

2.　Attach the flush mounting sponges H15 and V15 in the order shown in the figure below.

3.　Connect all cables at the back of the display unit. See section 1.7.

3

4. Set the display unit to the cutout.

5. Screw the wing bolts and the wing nuts of the flush mount fixture so that the protector moves to the mounting plate.
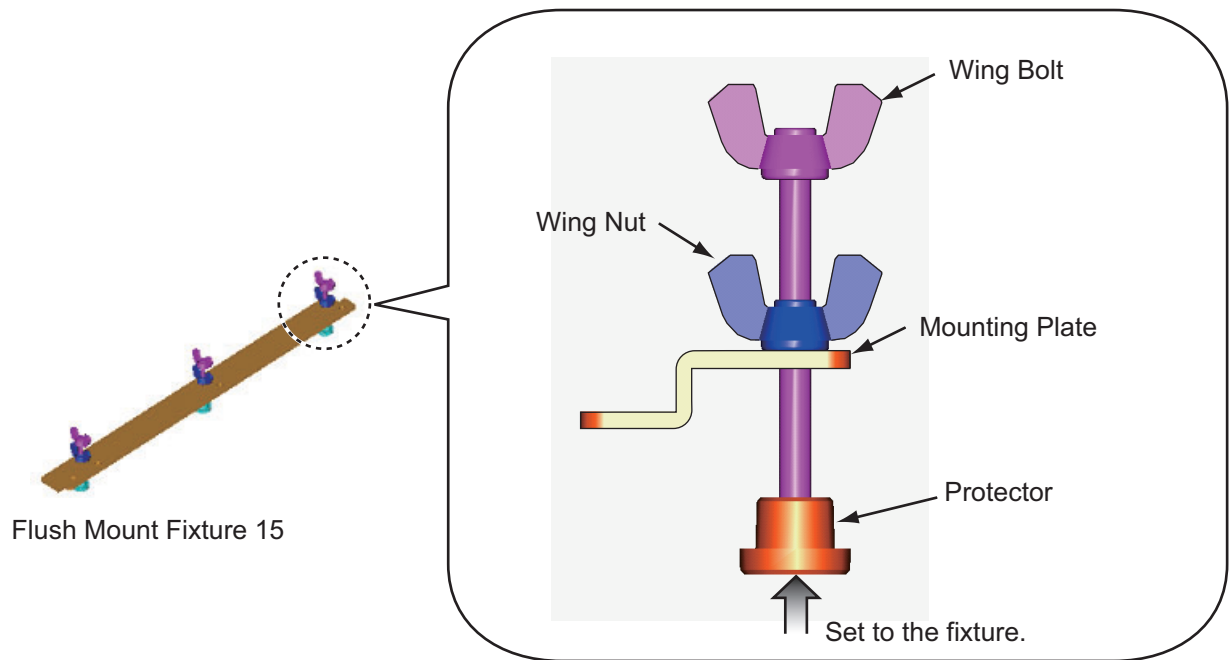
Flush Mount Fixture 15

6. Fasten the flush mount fixture 15 to the right and left sides of the rear of the display unit with the washer head screws (6 places).
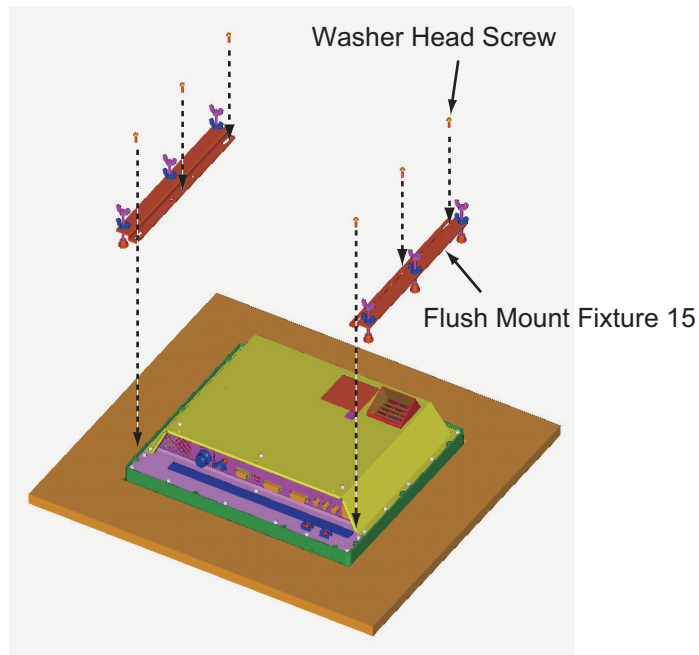
7. Fasten the wing bolts, in the order of the number shown in the figure below so that the protectors touch the mounting panel.
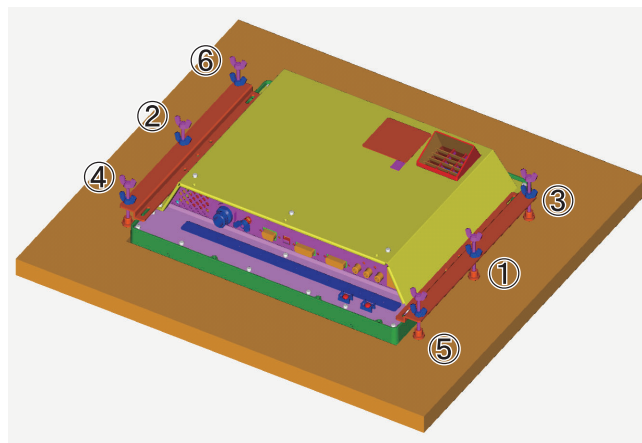
8. Fasten the wing bolts tightly, in the order shown in step 7.

9. Fasten the wing nuts tightly.
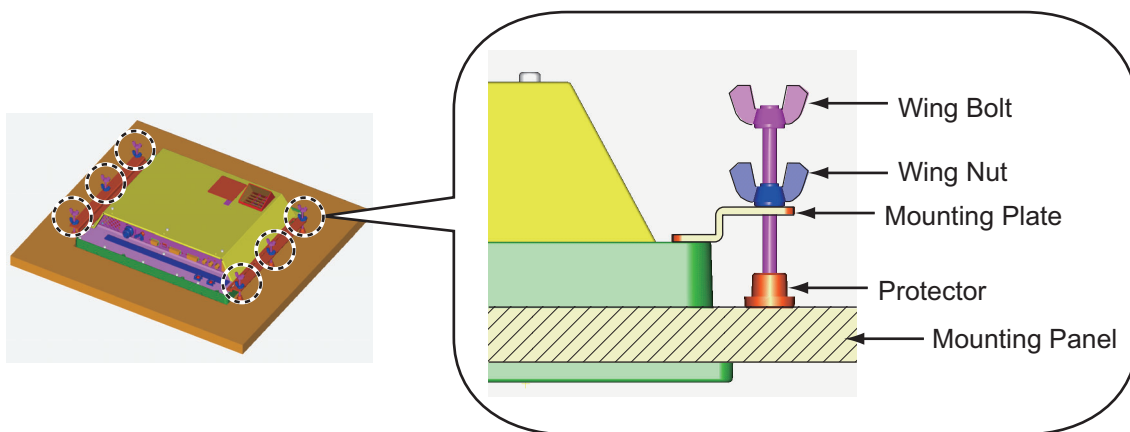
1.3 Flush Mounting, Fixed at Front

If you do not have the enough space to fix the display unit from the rear, you can fix it from the front with the optional flush mount kit OP26-36 (code no.: 001-497-450) or OP26-4 (code no.: 001-080-850).

Flush Mount Kit

Name	Type	Code No.	Qty.	Remarks
Flush Mounting Panel (15)	OP26-36-1	001-497-520-00	Either one of the two is supplied.	For OP26-36
	OP26-4-1	001-080-960-00		For OP26-4
Washer Head Screw	M4x10	000-163-836-10	8	
Self Tapping Screw	5x20	000-162-609-10	4	
Flush Mounting Template	C42-00909-x	000-172-636-1x	1	x denotes minor modifications.

1. Make a cutout in the mounting location with the flush mounting template (included).
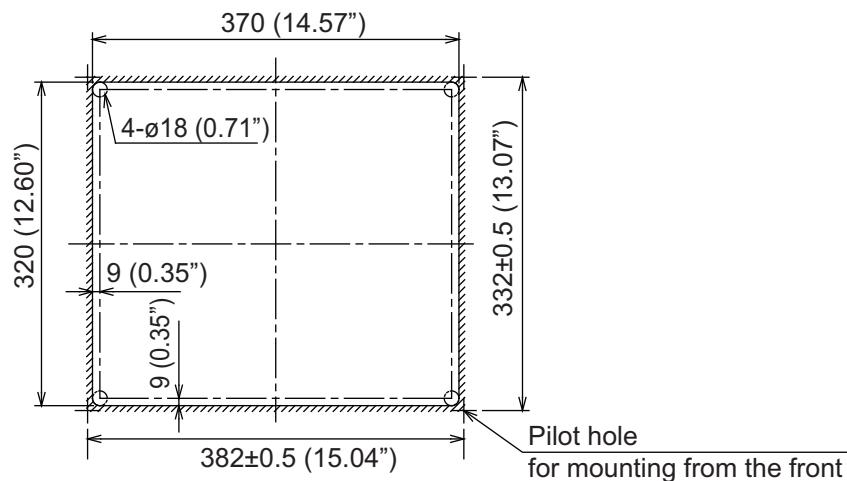
2. Attach the flush mounting sponges H15 and V15 in the order shown in the figure below.

Flush Mounting Sponge (H15) for top and bottom

Flush Mounting Sponge (V15) for right and left
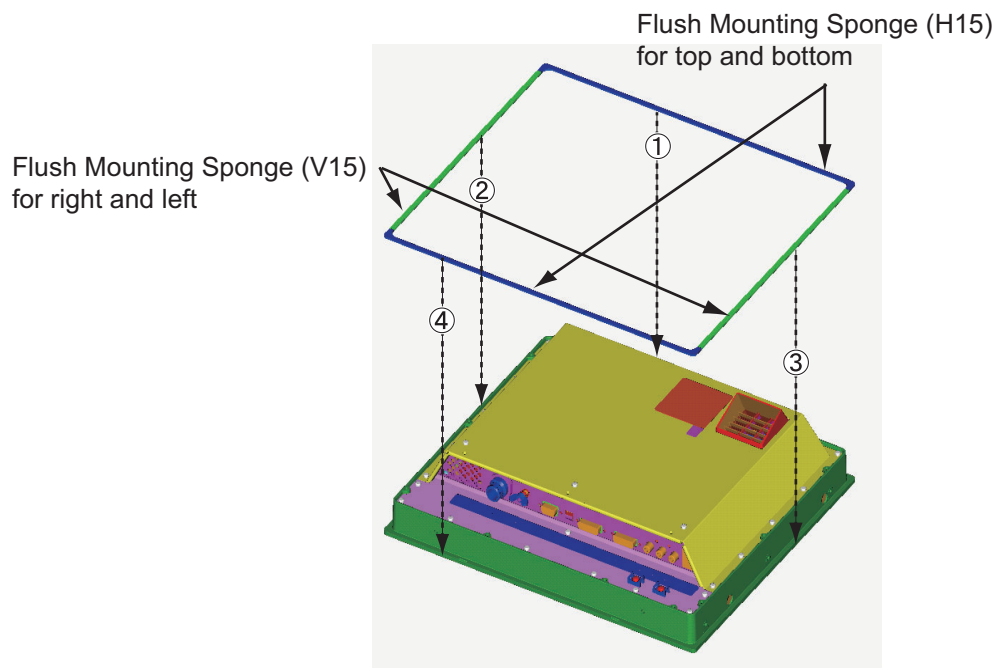
3. Attach the flush mounting panel (15) to the display unit from the rear with the washer head screws (M4×10, 8 places, torque: 1.2 N•m). Do not confuse the top and bottom of the panel and check that screw holes on the panel and unit match.

For OP26-36

For OP26-4
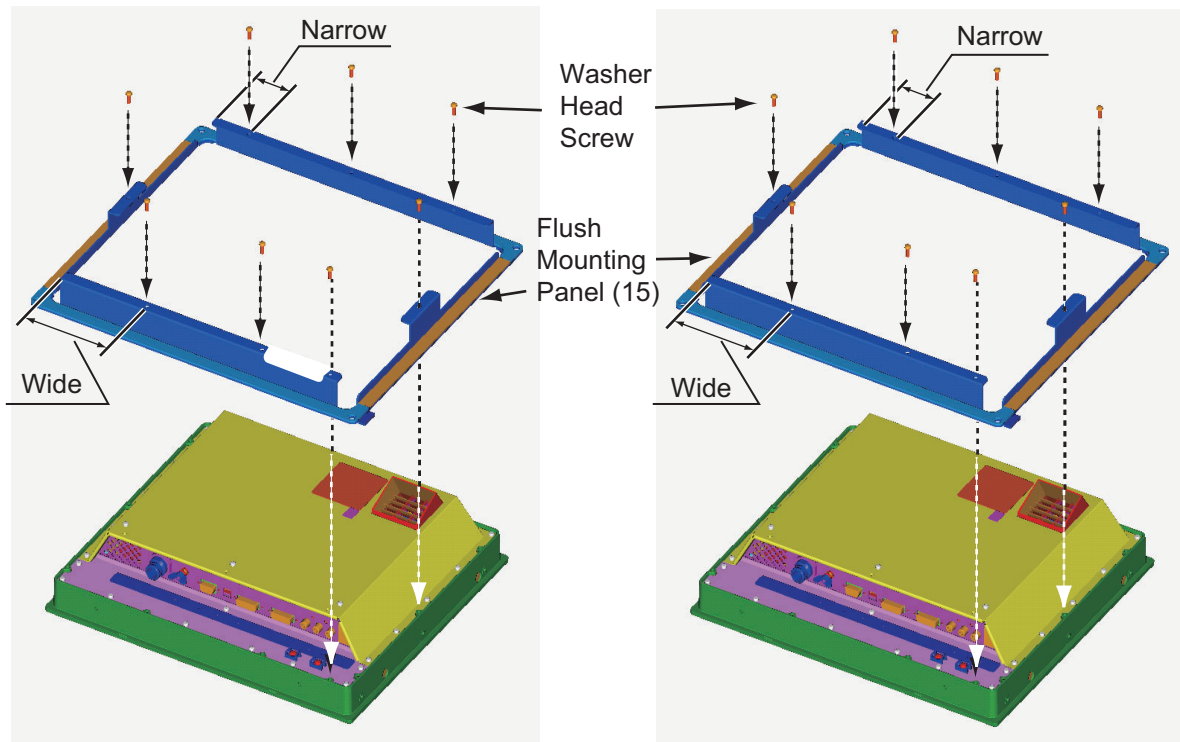
4. Connect all cables at the back of the display unit. See section 1.7.
5. Set the display unit assembly prepared at the step 3 to the cutout for the mounting location.
6. Fix the display unit to the cutout with the self tapping screws (4 places).
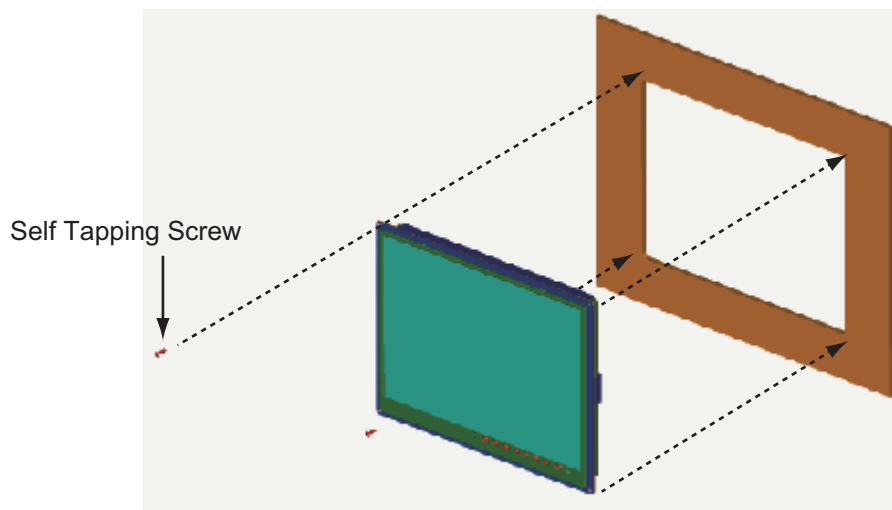
1.4   Flush Mounting, Fixed at Rear, with hood

You can attach a hood when flush mounting the unit from the rear, using the hood assembly OP26-3 (option).

Hood Assembly OP26-3 (Code: 001-080-840)

Name	Type	Code No.	Qty.
Hood (15) Assembly	OP26-3-1	001-080-950-00	1
F-Mount Hood Gasket 15	26-005-2305	100-351-710-10	1
Hood Gasket Bottom 15	26-005-2306	100-351-720-10	1
F-Mount Hood Gasket Side 15	26-005-2307	100-351-730-10	2
Hood Fixing Plate 15	26-005-2302	100-351-321-10	2
Knob M4	03-163-2303	100-343-602-10	4
Flat Head Screw	M3x8	000-172-167-10	6
Flush Mounting Template	C42-00908	000-172-635-10	1

1.   Make a cutout in the mounting location with the flush mounting template (included).
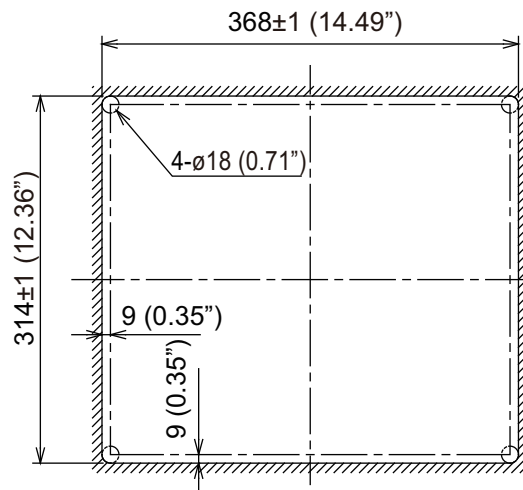
2.   Fix the hood fixing plates to the right and left of the display unit with the flat head screws (M3×8, 6 places, torque: 0.6 N•m).
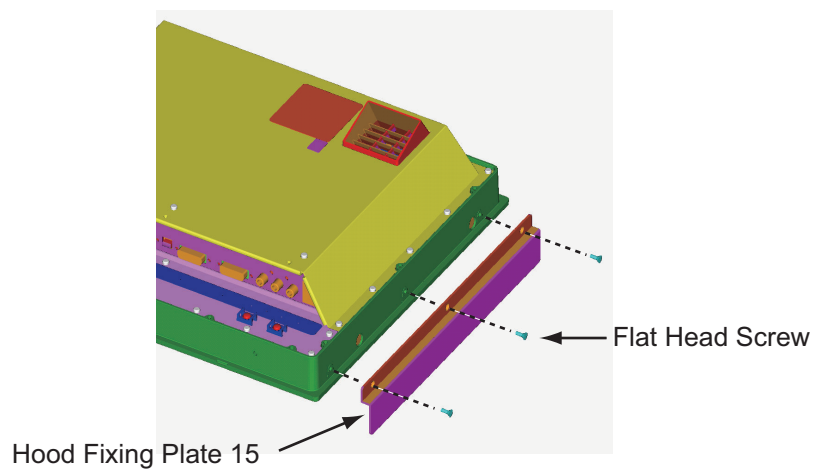
3. Attach the "F-Mount Hood Gasket 15" to the top brim, the "Hood Gasket Bottom 15" to the bottom brim, and then attach the "F-Mount Hood Gasket Side 15" to the right and left sides of the display unit from the rear side as shown the figure below.
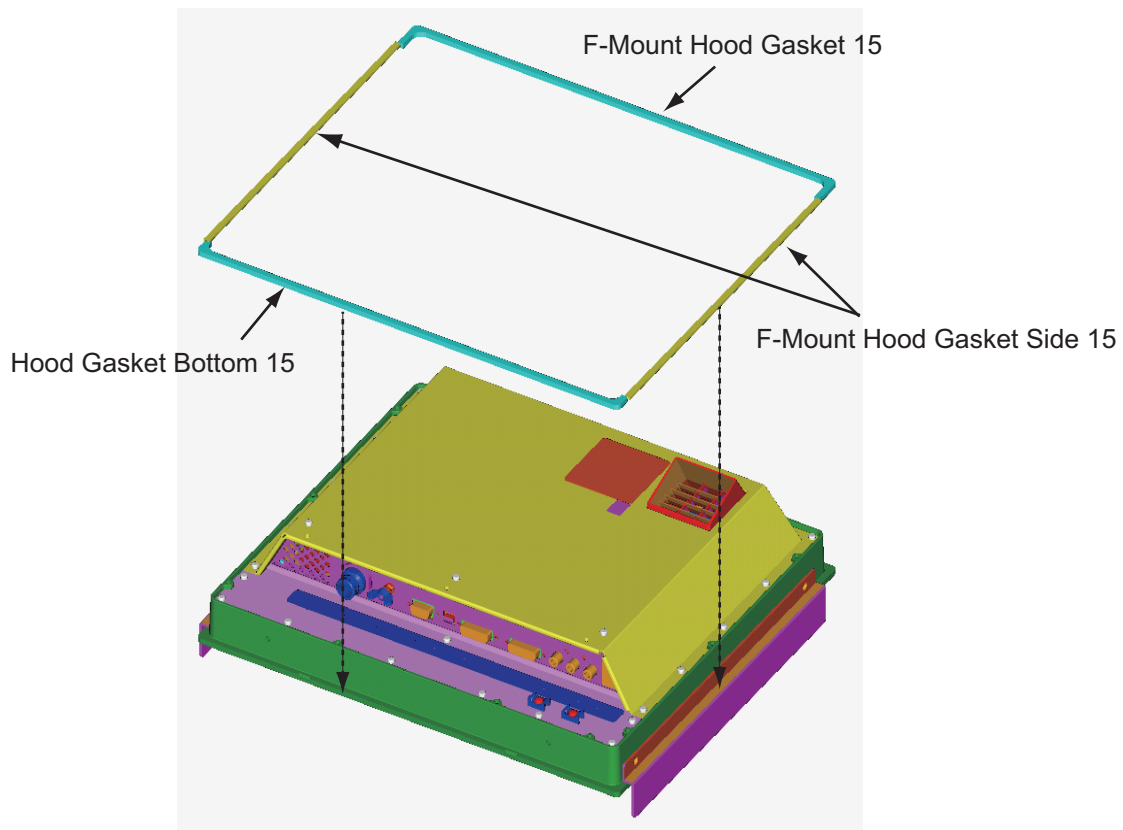
4. Follow steps 3 to 9 in section 1.2 to fix the display unit to the mounting location.
5. Loosely fix the knobs (4 pcs.) to the hood fixing plate.
6. Slide the cutouts of the hood assembly to the knobs.
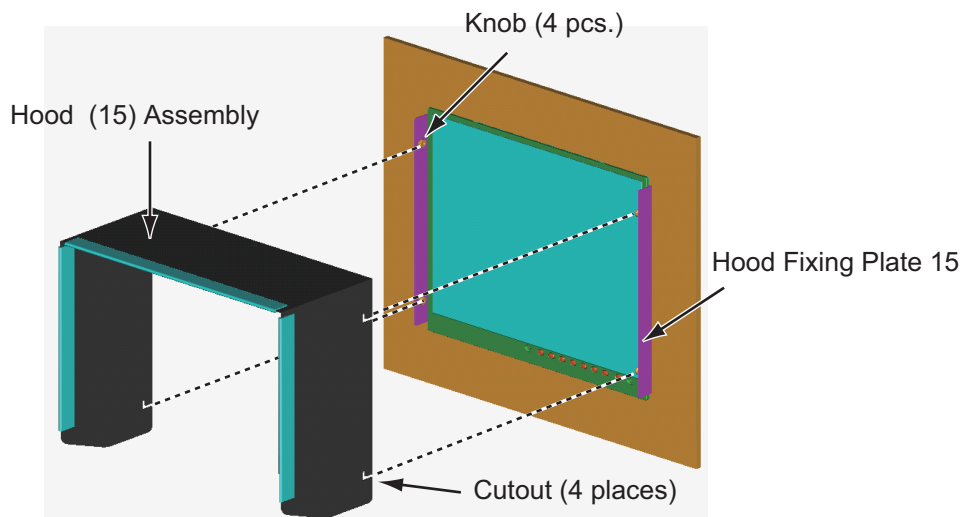
7. Press the top of the hood to fit the knobs in the cutouts.
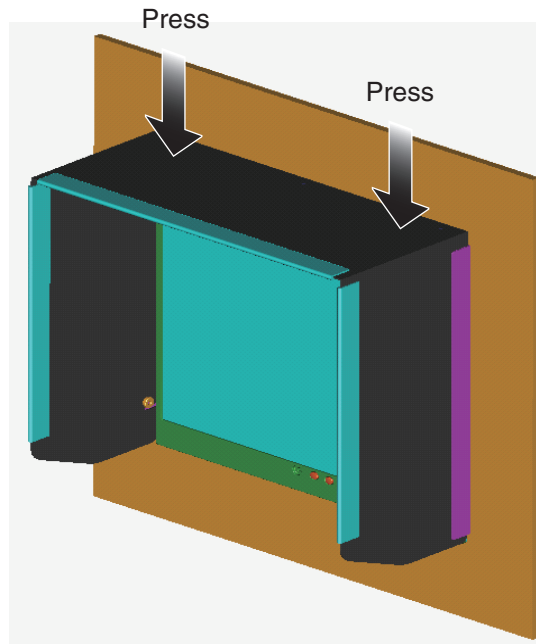
8. Fix the hood assembly with the knobs tightly (4 places).

1.5 Desktop Mounting

You can fix the display unit to a desktop, using the optional bracket assembly OP26-2.

Bracket assembly OP26-2 (Code: 000-016-268)

Name	Type	Code No.	Qty.
Mounting Bracket (15)	OP26-2-1	001-080-820-00	1
Bracket Support w/knobs	OP26-2-2	001-080-830-00	
Self-Tapping Screw	5x20	000-162-608-10	4
Binding Head Screw	M4x10	000-172-165-10	9

1. MOUNTING, WIRING

1. Loosen the knobs of the bracket support to separate the mounting bracket from the bracket support.

Mounting Bracket (15)

Bracket Support

Knob
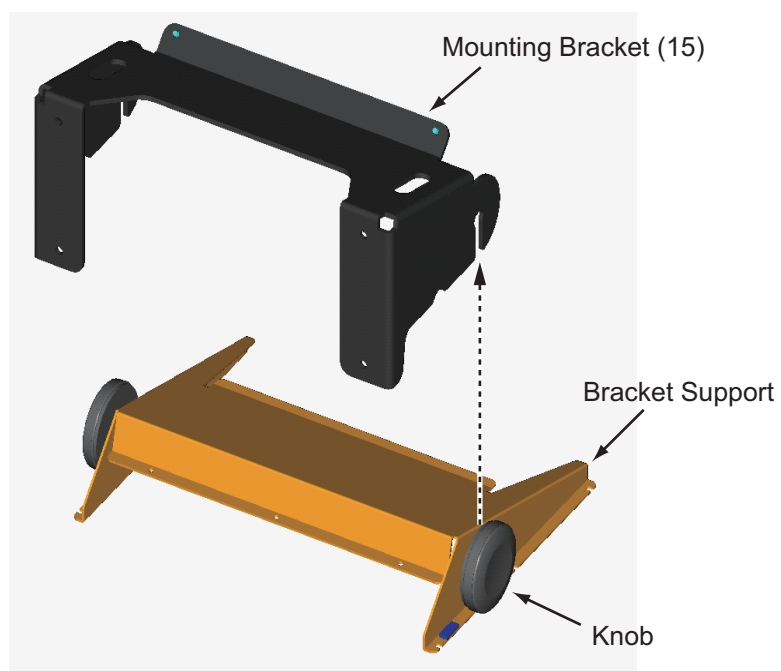
2. Set the mounting bracket to the mounting location with four self tapping screws.

Self-Tapping Screw
5x20

Mounting Bracket (15)
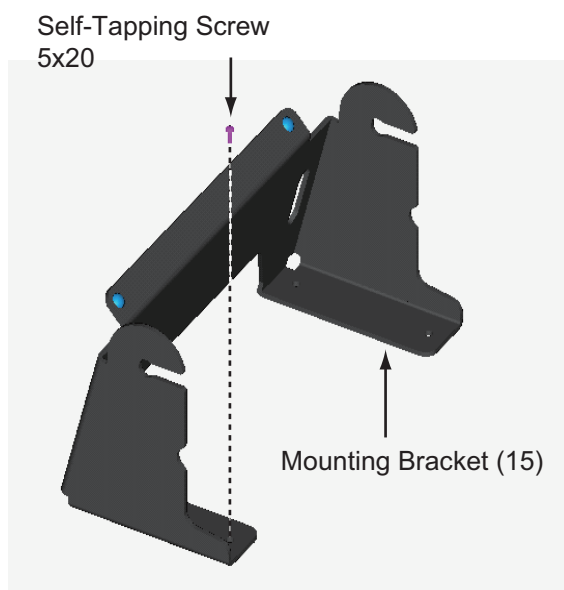
3. Attach the bracket support to the rear of the display unit with the binding head screws (9 places, torque: 1.2 N•m).
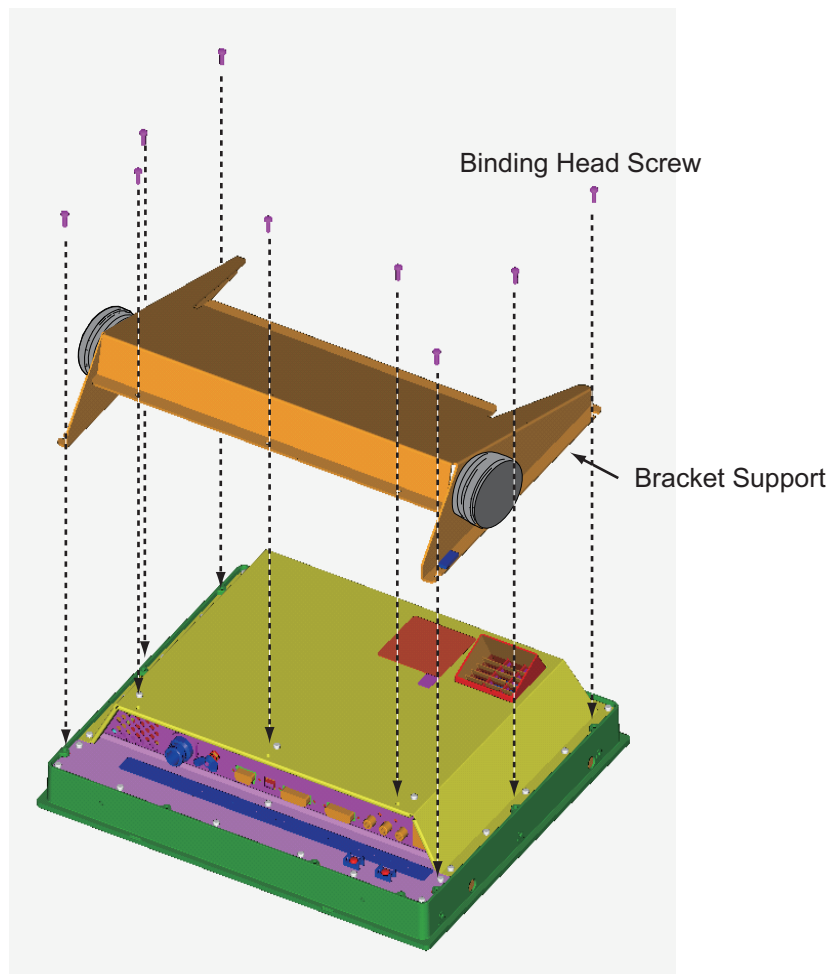
4. Connect all cables at the back of the display unit. See section 1.7.

5. Loosen the knobs of the bracket support and set them in the notches on the mounting bracket.
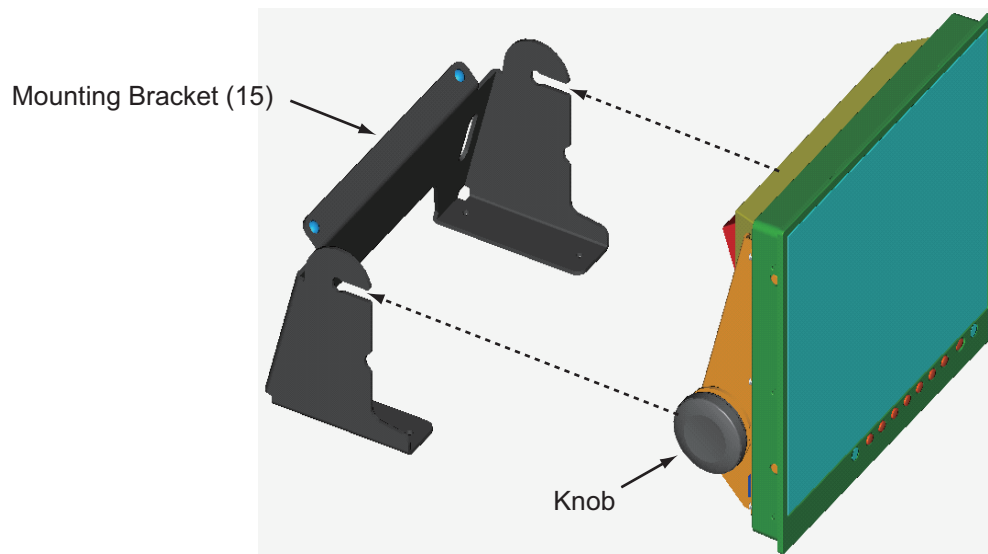
6. Adjust the angle of the display unit and fix the knobs tightly.

1.6   Flush Mounting a Series Side by Side

You can flush mount two display units side by side.

1.   Make a cutout in the mounting location as shown below.
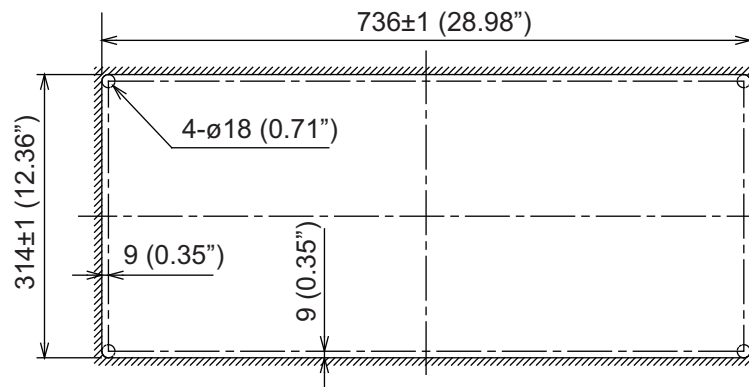
2.   Follow steps 2 to 5 in section 1.2 to set the two display units in the mounting location.

3.   Attach the flush mount fixtures with the washer head screws to join the two display units.
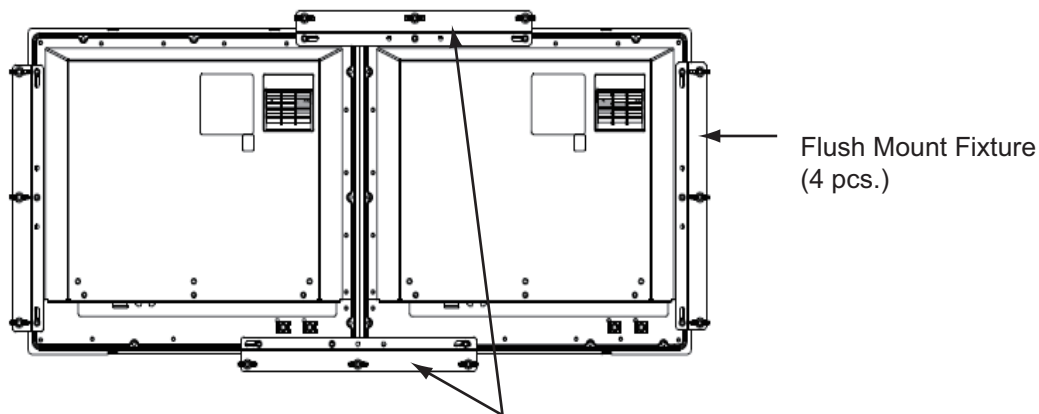
Join the display units with the flush mount fixtures.

4.   Fasten the two display units tightly. See steps 7 to 9 in section 1.2.

1.7   Wiring

Refer to figure below and the interconnection diagram at the back of this manual to connect cables.

Connector

The bottom of the rear of the display unit

Slide switch*¹

Composite signal cable

RGB signal
3COX-2P-6C
5 m/10 m (option)

Digital signal
DVI-D/D S-LINK
5 m/10 m (option)

CCD camera
DVD recorder

BRILL CTRL port*²

MODEL 1833C series
FSV-30
FCV-30
FCV-1200L

FAR-21x7 series
FEA-2107 series
FCR-2107 series
MFD8/MFD12/MFDBB

IV-1.25 sq
(local supply)

NOTE:
Attach a crimp-on lug (inner dia. ø 4) for display unit side.
Connect the ground cable as short as possible.

To ground terminal on hull

MJ-A3SPF0017-050ZC
(5 m, standard supply)

12-24 VDC

⚠ **CAUTION**

If the power is 24 VDC, replace the 10 A fuse with the 5 A fuse (supplied). And then attach the fuse label on the fuse cover.

*¹: Slide switch

- ON (upward): Allow digital signal from external equipment to control on/off of the display unit.

- OFF (downward): Set this position for analog RGB signal.

Note: Turn the slide switch off when you connect equipments to both the DVI and RGB ports.

Upward: Default setting
(Slide switch ON)

Downward
(Slide switch OFF)
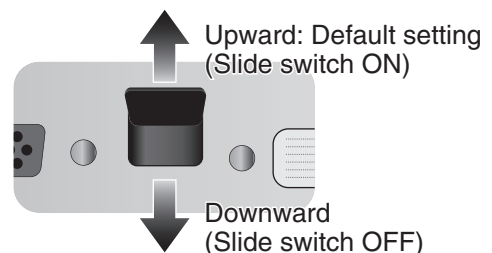
*²: BRILL CTRL port

This is not available. Please do not remove the sticker on the connector.

How to fix composite signal cable

Fix the cables for the composite signal at the fixing terminal with the cable tie to prevent a loose connection.

1. Pass the cable tie (supplied) through the side of the fixing terminal.
2. Set the cable in the cable tie and pull the tie.
3. Cut off the excess cable tie with nippers.

Fixing terminal
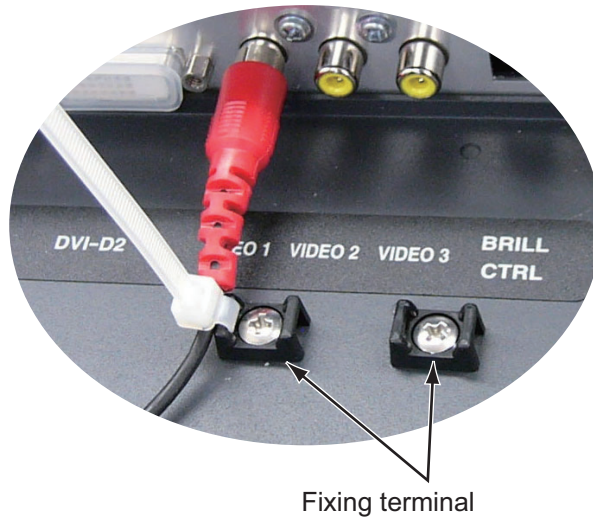
2. ADJUSTMENTS

Adjust the MU-150HD according to the equipment connected.

2.1 RGB/DVI Setting

You can adjust the screen from the [RGB], [DVI-D1] and [DVI-D2] ports separately. Turn on external equipment and adjust the display unit as follows.

1. Select the signal to adjust at the DISP selection window. See section 3.4.

    1) Press the **DISP** key.

    2) Press the **DISP** key again to select [RGB], [DVI1] or [DVI2].

2. Press the **MENU** key to show the menu.
   The main menu closes automatically when there is no operation for one minute.

3. Press the ◄ or ► key to select [RGB], [DVI1] or [DVI2].
   The current setting (the cursor) is shown in orange. The menu items depend on the selected menu. The same items are contained on [DVI1] and [DVI2] setting menus.
   Note: The menus in grey are not available because of no signal.

```
RGB  DVI1  DVI2  VIDEO1  VIDEO2  VIDEO3  OSD  SYSTEM    ← Menu

H_SIZE            640
V_SIZE            480
PHASE              16   (1~32)
CONTRAST           32   (1~64)
H_POSITION         50   (1~99)
V_POSITION         20   (1~40)
R_LEVEL            31   (1~64)
G_LEVEL            31   (1~64)                          ← Menu item
B_LEVEL            31   (1~64)
TEMPERATURE      7000K  (5500K/6500K/7000K/8000K)
B STRETCH         OFF   (OFF, 1~10)
W STRETCH         OFF   (OFF, 1~10)
DISP MODE        FULL   (FULL/NORMAL)
SHARPNESS           5   (1~10)
```

RGB setting menu

```
RGB  DVI1  DVI2  VIDEO1  VIDEO2  VIDEO3  OSD  SYSTEM    ← Menu

CONTRAST           32   (1~64)
H_POSITION         25   (1~50)
V_POSITION         20   (1~40)
R_LEVEL            31   (1~64)
G_LEVEL            31   (1~64)
B_LEVEL            31   (1~64)                          ← Menu item
TEMPERATURE      7000K  (5500K/6500K/7000K/8000K)
B STRETCH         OFF   (OFF, 1~10)
W STRETCH         OFF   (OFF, 1~10)
DISP MODE        FULL   (FULL/NORMAL)
SHARPNESS           1   (1~10)
```

DVI setting menu

4. Press the ▲ or ▼ key to select the menu item to adjust.

2. ADJUSTMENTS

5. Press the ◄ or ► key to adjust the setting.

6. Press the **MENU** key to close the menu.

RGB/DVI menu descriptions

Menu item	Function	Setting
H_SIZE	Adjusts the image size horizontally. Horizontal size: ◄ (narrow), ► (wide)	Depending on in-put signal
V_SIZE	Adjusts the image size vertically. Vertical size: ◄ (narrow), ► (wide)	
PHASE**	Adjusts the sample timing so that the flicker disappears and the text is clear.	1 to 32
CONTRAST	Increases or decreases the contrast level. ◄ (darken), ► (brighten)	1 to 64
H_POSITION	Moves the image position horizontally. ◄ (leftward), ► (rightward)	1 to 99 (RGB), 1 to 50 (DVI1, DVI2)
V_POSITION	Moves the image position vertically. ◄ (upward), ► (downward)	1 to 40
R_LEVEL	Adjusts the red color level. ◄ (weaken), ► (strengthen)	1 to 64
G_LEVEL	Adjusts the green color level. ◄ (weaken), ► (strengthen)	1 to 64
B_LEVEL	Adjusts the blue color level. ◄ (weaken), ► (strengthen)	1 to 64
TEMPERATURE	Adjusts the color temperature. 5500K (the most reddish), 8000K (the most bluish)	5500K, 6500K, 7000K, 8000K
B STRETCH	Emphasizes the black color. [OFF] (standard), ◄ (weaken),► (strengthen)	OFF, 1 to 10
W STRETCH	Emphasizes the white color. [OFF] (standard), ◄ (weaken),► (strengthen)	OFF, 1 to 10
DISP MODE*	Selects the displaying method. [FULL]: Shows the input signal on entire screen. [NORMAL]: Shows the input signal with original aspect ratio.	FULL, NORMAL
SHARPNESS**	Sharpens the edge horizontally. ◄ (soften characters and lines), ► (sharpens characters and lines)	1 to 10

*: When inputting SXGA, a circle may be displayed as an ellipse because the aspect ratio differs. In this case, select [NORMAL] from the [DISP MODE] menu item on the [RGB], [DVI1], or [DVI2] menus. The right and left on the screen are left blank, but this is normal.

**: If the characters are not clear, adjust [PHASE] and [SHARPNESS].

17

2.2　Video Composite Signal Setting

You can adjust the VIDEO1, 2 or 3 signal from the VIDEO1, VIDEO2 and VIDEO3 ports separately. The VIDEO1, 2 or 3 signal is displayed in the PIP window also.

1. Select the signal to adjust at the DISP selection window.

2. Press the **MENU** key to show the menu.

3. Press the ◄ or ► key to select [VIDEO1], [VIDEO2] or [VIDEO3].
   The same items are contained on [VIDEO1], [VIDEO2] and [VIDEO3] setting menus.

RGB DVI1 DVI2 VIDEO1 VIDEO2 VIDEO3 OSD SYSTEM
PIP_SIZE   5   (1~10)
CONTRAST   32   (1~64)
R_LEVEL   31   (1~64)
G_LEVEL   31   (1~64)
B_LEVEL   31   (1~64)
TEMPERATURE   7000K (5500K/6500K/7000K/8000K)
B STRETCH   OFF (OFF, 1~10)
W STRETCH   OFF (OFF, 1~10)

[VIDEO1] (2 or 3) setting menu

4. Press the ▲ or ▼ key to select the menu item to set.

5. Press the ◄ or ► key to adjust the setting.

6. Press the **MENU** key to close the menu.

VIDEO menu descriptions

Menu item	Function	Setting
PIP_SIZE	Adjusts the size of picture-in-picture window. **Note:** This setting is available when the PIP window is displayed.	1 (47 mm x 31 mm) to 10 (235 mm x 160 mm)
CONTRAST	Increases or decreases the contrast level.	1 to 64
R_LEVEL	Adjusts the red color level.	1 to 64
G_LEVEL	Adjusts the green color level.	1 to 64
B_LEVEL	Adjusts the blue color level.	1 to 64
TEMPERATURE	Adjusts the color temperature.	5500K, 6500K, 7000K, 8000K
B STRETCH	Emphasizes the black color.	OFF, 1 to 10
W STRETCH	Emphasizes the white color.	OFF, 1 to 10

(Refer to "RGB/DVI menu descriptions" on page 17.)

2.3 The Menu Window Setting

2.3.1 How to adjust the menu window

You can adjust the position and transparency of the menu window on the [OSD] (On Screen Display) menu.

1. Press the **MENU** key to show the menu.

2. Press the ◀ or ▶ key to select [OSD].

```
RGB  DVI1  DVI2  VIDEO1  VIDEO2  VIDEO3  OSD  SYSTEM

H_POSITION          11   (1~22)
V_POSITION          21   (1~23)
TRANSLUCENT      OFF   (OFF/ON)
PIP SW TIME         OFF   (OFF, 5~20)
PIP SKIP              OFF   (OFF, V1/V2/V3)

CUSTOM NAME
RGB            = RGB_____
DVI1           = DVI1_____
DVI2           = DVI2_____
VIDEO1         = VIDEO1_____
VIDEO2         = VIDEO2_____
VIDEO3         = VIDEO3_____
```

OSD menu

3. Press the ▲ or ▼ key to select the menu item to set.

4. Press the ◀ or ▶ key to adjust the setting.

5. Press the **MENU** key to close the menu.

OSD menu description

Menu item	Function	Setting
H_POSITION	Moves the menu window horizontally. ◀ (leftward), ▶ (rightward)	1 to 22
V_POSITION	Moves the menu window vertically. ◀ (upward), ▶ (downward)	1 to 23
TRANSLUCENT	Adjusts the transparency of the background color on the menu window. [OFF]: Blue, [ON]: Translucent **Note: Alpha blending technology is used for transparency effects.**	OFF, ON
PIP SW TIME	Switches the screen image on the PIP window among VIDEO1, VIDEO2 and VIDEO3 at the interval (5 to 20 seconds) selected here. When [OFF] is selected, this function is not available.	OFF, 5 to 20
PIP SKIP	Selects which video signals to skip in the PIP window when PIP SW TIME is active. OFF: VIDEO1, VIDEO2 and VIDEO3 are shown in turn. V1: VIDEO1 is skipped. VIDEO2 and VIDEO3 are shown alternately. V2: VIDEO2 is skipped. VIDEO1 and VIDEO3 are shown alternately. V3: VIDEO3 is skipped. VIDEO1 and VIDEO2 are shown alternately.	OFF, VI, V2, V3
CUSTOM NAME	See paragraph 2.3.2.	

2.3.2 How to change the signal name

You can change the signal name ("RGB", "DVI1" or "VIDEO1" etc.) to a name (ex. the equipment name) which is easy to understand. The changed name is shown in the DISP selection window, PIP selection window and the indication shown at the upper right of the screen. See section 3.4 and section 3.5

1. Press the **MENU** key to show the main menu.

2. Press the ◀ or ▶ key to select [OSD].

```
RGB DVI1 DVI2 VIDEO1 VIDEO2 VIDEO3 OSD SYSTEM

H_POSITION          11  (1~22)
V_POSITION          21  (1~23)
TRANSLUCENT        OFF  (OFF/ON)
PIP SW TIME        OFF  (OFF, 5~20)
PIP SKIP           OFF  (OFF, V1/V2/V3)

CUSTOM NAME
RGB               = RGB_____
DVI1              = DVI1_____
DVI2              = DVI2_____
VIDEO1            = VIDEO1_____
VIDEO2            = VIDEO2_____
VIDEO3            = VIDEO3_____
```

Signal name area
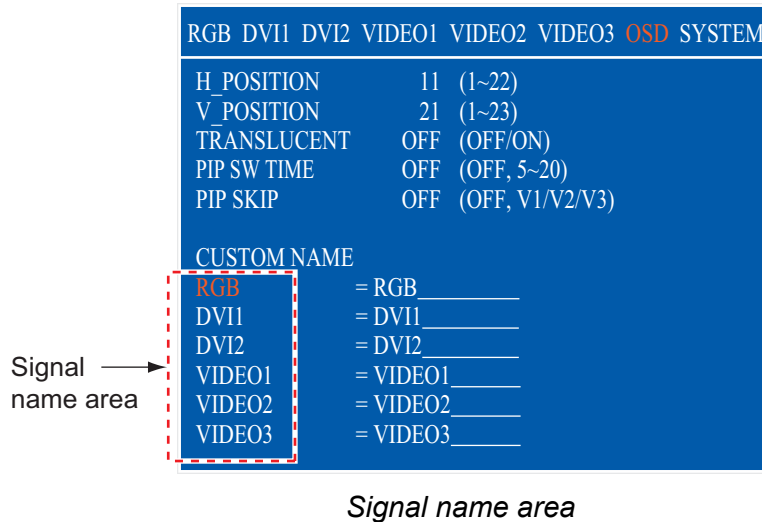
Signal name area

3. Press the ▲ or ▼ key to select the signal to change its name in the signal name area. In the example above, RGB is selected.

4. Press the ▶ key to select the character to change. In the example below, "G" of RGB is selected.

```
CUSTOM NAME
RGB               = RGB_____
DVI1              = DVI1_____
DVI2              = DVI2_____
VIDEO1            = VIDEO1_____
VIDEO2            = VIDEO2_____
VIDEO3            = VIDEO3_____
```
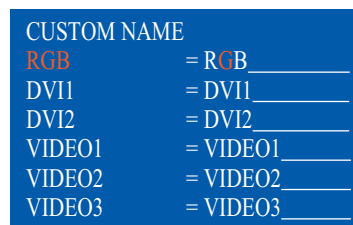
5. Press the ▲ or ▼ key to select appropriate alphanumeric character. In the example below, "5" is selected.
   You can set up to ten characters. "A to Z", "0 to 9", "–", ".", " " (space) are available.

```
CUSTOM NAME
RGB               = R5B_____
DVI1              = DVI1_____
DVI2              = DVI2_____
VIDEO1            = VIDEO1_____
VIDEO2            = VIDEO2_____
VIDEO3            = VIDEO3_____
```
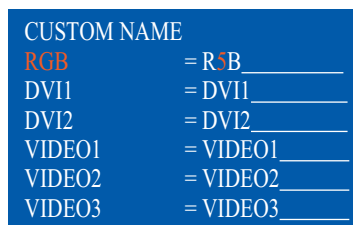
6. To change another signal name, press the ◀ key several times to return the cursor to the signal name area. Repeat steps 3 to 5.

7. Press the **MENU** key to close the menu.

3. OPERATION

3.1 Controls

*: It is available when the slide switch at the bottom of rear side is OFF.

- Power On/Off.*
- Display the brilliance adjustment window.

Open/Close the menu.

Select the signal to display.

Light sensor (According to the ambient light.)

- Select the menu and menu items.
- Adjust the setting.
- Move the PIP window.

Display the PIP setting window.

Lamp (Lights when power on.)
Green: The signal is input.
Orange: No signal.

3.2 How to Turn the Power On/Off

This section shows how to turn on/off the display unit and the key lock function.

3.2.1 Turn on/off the power

How to turn on/off the power depends on the setting of the slide switch. The slide switch is set when the display unit is installed. See section 1.7.

Note 1: When you restart the display unit, wait at least three seconds before powering the unit.

Note 2: The screen refreshes slower in low temperature ambient.

Slide switch "ON"

The external equipment connected to the DVI port (DVI-D1 or DVI-D2) can power on/off the display unit.

Note 1: You can not turn on the power with the ⏻/**BRILL** key on MU-150HD.

Note 2: When you connect the cables to both DVI-D1 and DVI-D2 ports, turn off the power of the connected equipments to turn off the display unit.

Slide switch "OFF"

1. Press the ⏻/**BRILL** key to turn on the display unit.

2. Press and hold the ⏻/**BRILL** key for three seconds to turn off the display unit. While you hold the key, the display shown right appears.

> SHUT DOWN
> This monitor will shut down in three seconds.

3.2.2 Lock the operation

You can lock the display unit to prevent operation. Any key (except the ⏻/**BRILL** key) will be inoperative.

1. While you hold the **PIP** key, turn on the display unit. Press and hold the **PIP** key for more than five seconds.
   Note: When the slide switch is "ON", turn on the connected external equipment while pressing the **PIP** key to turn on the display unit.

2. To cancel the lock, turn off the display unit and then turn it on while you hold the **PIP** key. Press and hold the **PIP** key more than five seconds.

3.3 How to Adjust the Display Brilliance

You can adjust the display brilliance as follows:

Note: The auto dimmer must be off to use this feature. See paragraph 3.6.1.

1. Press the ⏻/**BRILL** key momentarily to show the BRILL adjustment window.

   The window shown right disappears if there is no operation for five seconds.

> BRILL   46

2.   Press the ◄ or ► key to adjust the brilliance (available range: 1 to 50).

You can also adjust the brilliance by pressing the ⏻/**BRILL** key repeatedly.

3.   Press the ▲ or ▼ key to close the window.

Note 1: If you turn off the display unit with the minimum brilliance, you may become difficult to
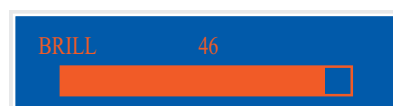
watch the screen because of the ambient light at the next start. In this case, press the ⏻/**BRILL**
key repeatedly.

Note 2: When you use the display unit for FAR-21x7 series, you can adjust the brilliance from the
FAR-21x7 series. (see paragraph 3.6.2.)

3.4   How to Select the Source for Main Picture

Select the signal to display on the entire screen as follows:

1.   Press the **DISP** key to show the DISP selection window.
The signal names are shown as you customized at paragraph 2.3.2 on the window.This win-
dow disappears if there is no operation for five seconds.
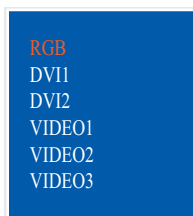
DISP selection window (Default setting)

2.   Press the ▲ or ▼ key to select a signal.
You can also select the signal by pressing the **DISP** key continuously.
[RGB]: The signal from the RGB port is displayed.
[DVI1], [DVI2]: The signal from the selected DVI port is displayed.
[VIDEO1] - [VIDEO3]: The external video from the selected VIDEO port is displayed.

3.   Press the ◄ or ► key to close the window.
The name of the selected signal appears at the right top corner for five seconds after the DISP
selection window disappears. If there is no signal, "NO SIGNAL" appears.

3.5   How to Select the Source for the PIP Window

Select the source for the PIP (picture-in-picture) window as follows. The PIP window is available
on the RGB, DVI1 or DVI2 display.

PIP window

1. When the RGB, DVI1 or DVI2 display appears, press the **PIP** key.
    The PIP selection window appears. The signal names are shown as you customized at paragraph 2.3.2 on the window. This window disappears if there is no operation for five seconds.

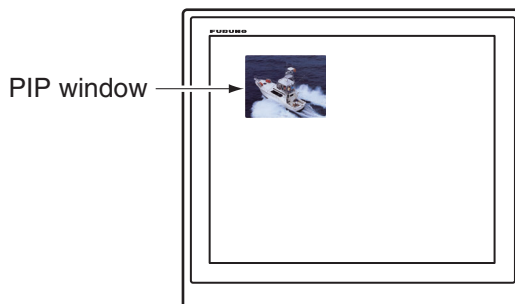VIDEO1
VIDEO2
VIDEO3
OFF

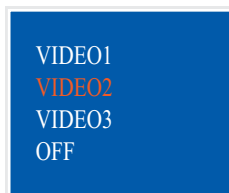*PIP selection window (Default setting)*

2. Press the ▲ or ▼ key to select the VIDEO port required.
    [VIDEO1] (2 or 3) can also be selected by pressing the **PIP** key continuously. When you select the [VIDEO1], [VIDEO2] or [VIDEO3], the PIP window is displayed. To close the PIP window, select [OFF].

3. Press the ◄ or ► key to close the PIP setting window.

4. You can move the PIP window by pressing the arrow keys when the menu is closed.

Note 1: To show the VIDEO1, VIDEO2 and VIDEO3 pictures alternately, set the cycle time (5 -20 sec) with [PIP SW TIME] on the [OSD] menu. In this case, the above setting is invalid. See paragraph 2.3.1.

Note 2: You can adjust the size of the PIP window on the [VIDEO1] (2 or 3) menus. See section 2.2.

3.6   SYSTEM Menu

You can set the brilliance control and clear the memory on the [SYSTEM] menu. Also, you can check the signal status and the program number on the [SYSTEM] menu.

3.6.1   How to set the auto dimmer

The auto dimmer feature automatically adjusts the brilliance according to lighting conditions detected by the light sensor on the front panel. Also, you can select the interval in which the brilliance is adjusted.

Note: Do not put any objects in front of the light sensor.

1. Press the **MENU** key to show the main menu.

2. Press the ► key to select [SYSTEM].

The message "Input Signal Searching. Please Wait." is displayed and then the [SYSTEM] menu shown right is displayed.

RGB DVI1 DVI2 VIDEO1 VIDEO2 VIDEO3 OSD SYSTEM

AUTO DIMMER   OFF   (OFF, 1~5)
EXT BRILL CTRL   OFF   (OFF ／ DVI1 ／ DVI2 ／ USB)
DEFAULT RESET   NO

INFORMATION
RGB   : 1280*1024   Fh : 80kHz   Fv : 75Hz
DVI1   : 640*480   Fh : 31kHz   Fv : 60Hz
DVI2   : NO SIGNAL
VIDEO1   : NTSC
VIDEO2   : PAL
VIDEO3   : NO SIGNAL
PROGRAM NO. : X.XX

Signal status and Program number

24

3.   Press the ▲ or ▼ key to select [AUTO DIMMER].

4.   Press the ◀ or ▶ key to select the adjustment interval.

[OFF]: Not adjusted automatically   [3]: Every minute
[1]: Every two seconds   [4]: Every three minutes
[2]: Every 30 seconds   [5]: Every five minutes

5.   Press the **MENU** key to close the menu.

3.6.2   How to adjust the brilliance from the external equipment

When FAR-21x7 series is connected to the [DVI-D1] or [DVI-D2] port, you can adjust the brilliance of the display unit from the FAR-21x7 series connected.

Note: The auto dimmer must be off to use this feature.

1.   Press the **MENU** key to show the main menu.

2.   Press the ▶ key to select [SYSTEM].

3.   Press the ▲ or ▼ key to select [EXT BRILL CTRL].

4.   Press the ◀ or ▶ key to set the desired input item.
     [OFF]: You can not adjust the brilliance from the external equipment.
     [DVI1]: When the DVI1 is displayed, the brilliance signal from DVI-D1 port controls this display's brilliance. The ⏻ /**BRILL** key is available for the screen other than the DVI1.
     [DVI2]: When the DVI2 is displayed, the brilliance signal input from DVI-D2 port controls this display's brilliance. The ⏻ /**BRILL** key is available for the screen other than the DVI2.
     [USB]: This is not available.

5.   Press the **MENU** key to close the menu.

3.6.3   How to clear the memory

You can clear the memory to restore the default settings.

1.   Press the **MENU** key to show the main menu.

2.   Press the ▶ key to select [SYSTEM].

3.   Press the ▲ or ▼ key to select [DEFAULT RESET].

4.   Press the ▶ key.
     The display is changed to "YES" from "NO".

    Note: To cancel, press the ◀ key. The display is changed to "NO" from "YES".

5.   Press the ▶ key to select "reset".

4. MAINTENANCE, TROUBLESHOOTING

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

Routine maintenance

Regular maintenance is important for good performance. Check the following on a regular basis to keep the equipment in good condition.

• Check that the connectors at the bottom of the display unit are tightly fastened.
• Check the ground wire and ground terminal for rust. Clean if necessary. Confirm that the ground wire is tightly fastened.
• Remove dust and dirt from the display unit with a dry, soft cloth. Do not use chemical cleaners to clean any part of the display unit. They can remove paint and markings.
• Wipe the LCD carefully to prevent scratching, using LCD cleaning cloth (supplied as accessory). To remove dirt or salt deposits, use an LCD cleaner, wiping slowly with tissue paper so as to dissolve the dirt or salt. Change paper frequently so the salt or dirt will not scratch the LCD. Do not use solvents such as thinner, acetone or benzene for cleaning. Also, do not use degreaser or antifog solution, as they can strip the coating from the LCD.

Fuse replacement

The fuse in the fuse holder on the power cable protects the equipment from internal fault. If the fuse blows, find the cause before you replace it. If the fuse blows again after replacement, request service.

⚠ WARNING
Use the proper fuse.
Use of a wrong fuse can cause fire or damage to the equipment.

Name	Type	Code Number
Fuse	FGBO-A 125V 5A PBF	000-155-853-10

LCD replacement

The life of the LCD is approximately 60,000 hours. The actual numbers of hours depends on ambient temperature and humidity. When the brilliance cannot be raised sufficiently, replace the LCD.

Fan replacement

The life of the fan is approximately 40,000 hours. The actual numbers of hours depends on ambient temperature. When the fan cannot be rotated sufficiently, the message "FAN1 ERROR" is shown. Turn off the power and contact your dealer to request replacement of the fan.

4.2 Troubleshooting

See the following table to find the possible causes and the actions to restore normal operation. If repair of the equipment is necessary, report the result of the troubleshooting to the service technician.

Troubleshooting

Case	Remedy
You can not turn on the power.	• Check the setting for the slide switch. See section 1.7. • Check the battery voltage with a multimeter. • Check the fuse on the power cable. • Fasten the power cable tightly.
You can not turn off the power.	• Press and hold the ⏻/**BRILL** key for eight seconds. • When the slide switch is set to ON, turn off the external equipment connected.
No picture	• Fasten the cables tightly. • Check the input signal. See section 3.6.
You can not operate any key except the ⏻/**BRILL** key.	Cancel the key lock function. See paragraph 3.2.2.

SPECIFICATIONS OF MARINE DISPLAY
MU-150HD

1   GENERAL

1.1	Display	15-inch color LCD
1.2	Effective area	304 x 228 mm approx.
1.3	Resolution	XGA (1024 x 768)
1.4	Brightness	1,000 cd/m^2 typical
1.5	Contrast	600: 1
1.6	View angle	160° typical (left/right and up/down: 80° or more)
1.7	Input signal	
	RGB analog	1 port, Non-interlace, RGB signal: 0.7 Vp-p, Sync. signal: TTL level
	DVI-D	2 port, DVI-standard, VESA DDC2B
	Composite	3 port, NTSC/PAL-standard, Video signal: 0.7 Vp-p

2   POWER SUPPLY

12-24 VDC (10.8-31.2 V): 2.8-1.4 A

3   ENVIRONMENTAL CONDITION
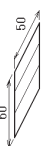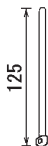
3.1	Ambient temperature	-15°C to +55°C
3.2	Relative humidity	93% at 40°C
3.3	Degree of protection	IP56 (CFR46, front panel), IP22 (chassis)
3.4	Vibration	IEC 60945-4

4   UNIT COLOR

N2.5

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FURUNO

CODE NO.	001-175-940-00	26AD-X-9501 -9
TYPE	FP26-00401	1/1

ACCESSORIES

NO.	NAME	OUTLINE	DESCRIPTIONS	Q'TY	REMARKS
1	LCD CLEANING CLOTH	140 × 90	19-028-3125-7 / CODE NO. 100-360-677-10	1	

DIMENSIONS IN DRAWING FOR REFERENCE ONLY.

C4456-F01-K

FURUNO

工事材料表 INSTALLATION MATERIALS

CODE NO.	001-080-770-00	26AD-X-9402 -0
TYPE	CP26-01302	1/1

MU-150HD

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ヒューズ ハリマーク FUSE LABEL	60 × 50	03-153-1312-0 ROHS / CODE NO. 100-292-140-10	1	
2	F゙マウントスポ゙ンジ H15 FLUSH MOUNTING SPONGE H 15	372	26-005-2123-0 / CODE NO. 100-351-280-10	2	
3	F゙マウントスポ゙ンジ V15 FLUSH MOUNTING SPONGE V 15	294	26-005-2124-0 / CODE NO. 100-351-290-10	2	
4	コンベ゙ックス CONVEX	125	CV-125N / CODE NO. 000-172-164-10	4	
5	+トヘ゛セLﾑB WASHER HEAD SCREW *B*	10, φ4	M4X10 SUS304 / CODE NO. 000-163-836-10	6	

型式/コード番号が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. DIMENSIONS IN DRAWING FOR REFERENCE ONLY.

（略図の寸法は、参考値です。）

FURUNO ELECTRIC CO ., LTD.

C4456-M02-A

FURUNO

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

表2 TABLE 2

フード、ガラス押え HOOD/FIXTURE	B (mm)	D (mm)
なし BLANK	6	364
あり ATTACHED	7	368
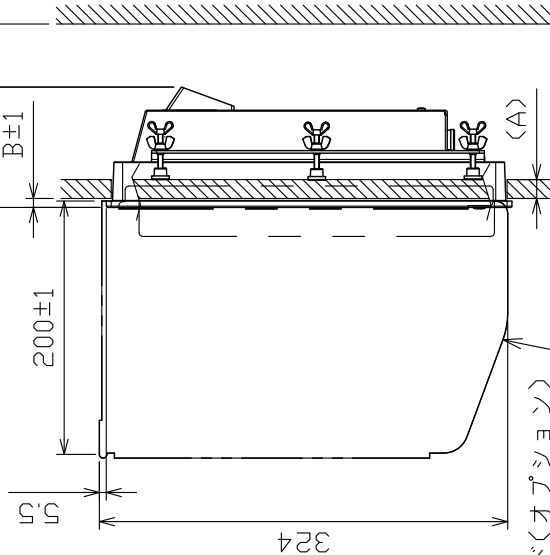
D±1
314±1
R9

取付穴寸法
CUTOUT DIMENSIONS

排気孔
AIR OUTLET

型式銘板
NAMEPLATE

#50
96
B±1
200±1
5
324
〈A〉

フード（オプション）
HOOD (OPTION)

#60
17
383
372
322
17
#60

ガラス押え（オプション）
GLASS FIXTURE (OPTION)

信号コネクタ
SIGNAL CONNECTOR

アース端子
GND TERMINAL

吸気孔
AIR VENT

電源コネクタ
SOURCE

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. THE BULKHEAD THICKNESS(A): 10≤A≤20.

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）壁の厚さ〈A〉は最小10mm、最大20mmとする。
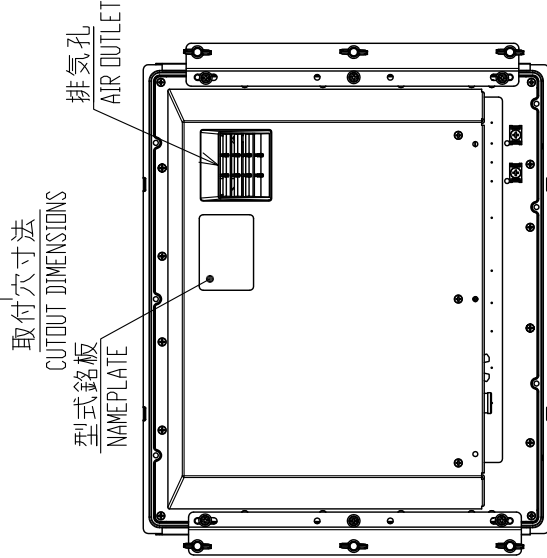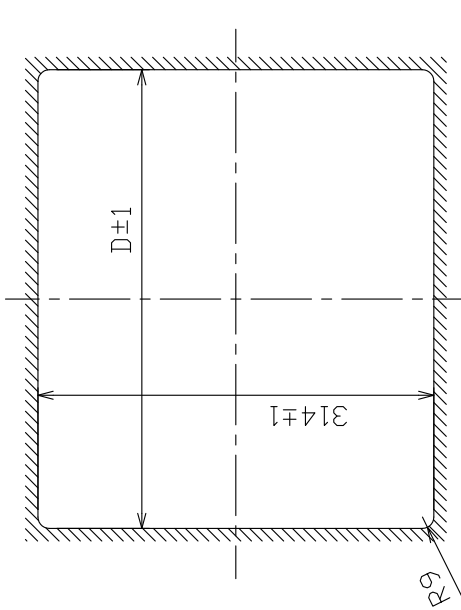
DRAWN	5/Jul/2019	I.YAMASAKI
CHECKED	5/Jul/2019	H.MAKI
APPROVED	8/Jul/2019	H.MAKI

TITLE MU-150HD (-CV15)
名称 15型カラーLCD表示器（埋込装備S）
外寸図
NAME MARINE DISPLAY (FLUSH MOUNT S)
OUTLINE DRAWING

質量はオプションを含みます。
MASS W/O OPTION.

SCALE 1/6　MASS 5.4 kg ±10%
DWG.No. C4456-G01-D
REF.No. 26-005-2005-3

FURUNO ELECTRIC CO., LTD.

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

取付穴寸法
CUTOUT DIMENSIONS

370

382±0.5

320

332±0.5

4-取付穴位置
PILOT HOLES

排気孔
AIR OUTLET

型式銘板
NAMEPLATE

GLASS FIXTURE (OPTION)
ガラス押え (オプション)

#60

#50

94

#50

OP26-4
前面固定用パネル (オプション)
COSMETIC PANEL (OPTION)

吸気孔
AIR INLET

電源コネクタ
SOURCE

取付穴 4-Φ7
FIXING HOLES

346

9

#60

396

382±0.5

372

アース端子
GND TERMINAL

332±0.5

322

信号コネクタ
SIGNAL CONNECTOR
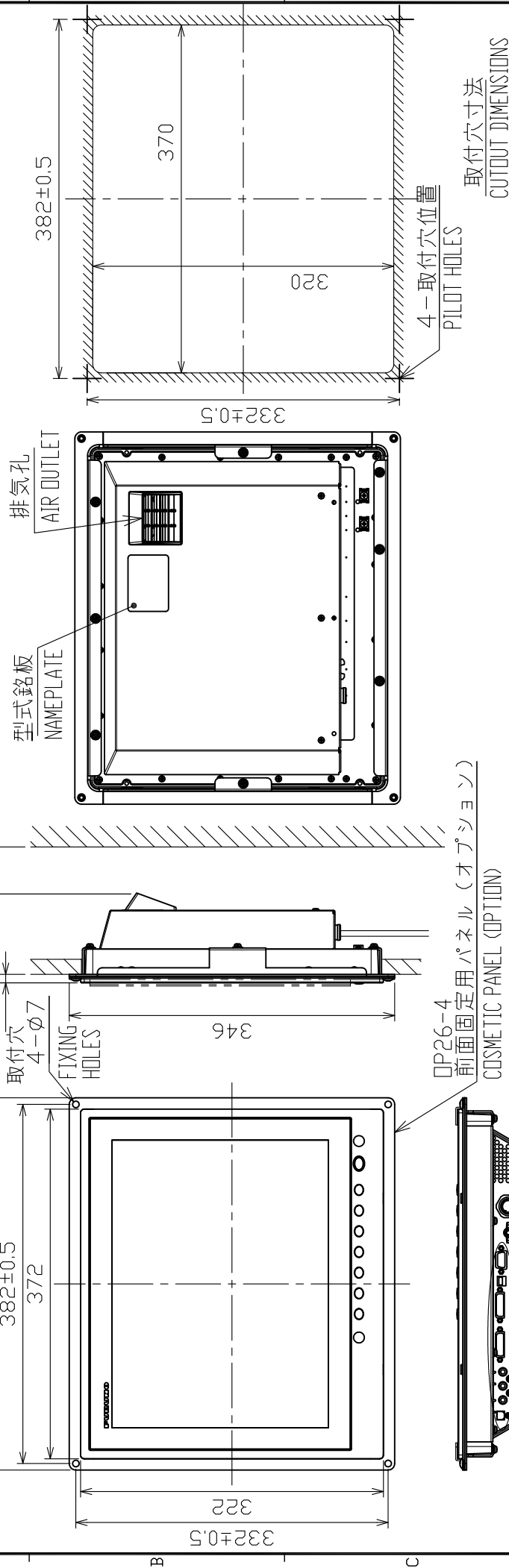
NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø5x20 FOR FIXING THE UNIT.
4. OPTIONAL HOOD IS NOT APPLICABLE.

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5×20を使用のこと。
4) オプションのフード装着は不可。

DRAWN	5/Jul/2019	T.YAMASAKI
CHECKED	5/Jul/2019	H.MAKI
APPROVED	8/Jul/2019	H.MAKI

TITLE MU-150HD (-CV15)
名称 15型カラーLCD表示器 (埋込装備F)
外寸図
NAME MARINE DISPLAY (FLUSH MOUNT F)
OUTLINE DRAWING

質量はオプションを含みます。
MASS W/O OPTION.

SCALE	1/6	MASS	5.4	±10% kg

DWG.No. C4456-G03-E
REF.No. 26-005-230G-3

FURUNO ELECTRIC CO., LTD.

D-3

FURUNO

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

排気孔 AIR INLET
型式銘板 NAMEPLATE

A

信号コネクタ SIGNAL CONNECTOR
アース端子 GND TERMINAL
矢視A VIEW A

電源コネクタ SOURCE
吸気孔 AIR INLET

247±5
96
200±5
44±5

376±5
383±5
504±5

#150
158

フード (オプション) HOOD (OPTION)

取付穴 4-φ7 FIXING HOLES
ガラス押え (オプション) GLASS FIXTURE (OPTION)
フード (オプション) HOOD (OPTION)

300±0.5
383±5
120±0.5
16±5
199

#80
370±0.5
372
354
392
322
#80
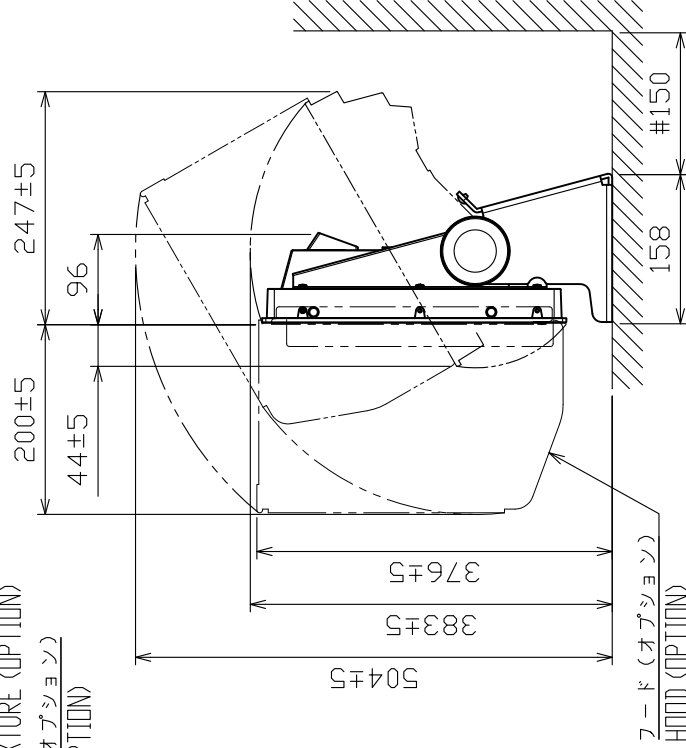
注記 1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付用ネジはトラスタッピンネジ呼び径5×20を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # MINIMUM SERVICE CLEARANCE.
3. THE BULKHEAD THICKNESS(A): 10≤A≤20.

TITLE MU-150HD (-CV15)
名称 15型カラーLCD表示器 (卓上装備)
外寸図
NAME MARINE DISPLAY (TABLETOP MOUNT)
OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

DRAWN 5/Jul/2019 T.YAMASAKI
CHECKED 5/Jul/2019 H.MAKI
APPROVED 8/Jul/2019 H.MAKI
質量はオプションを含みます。MASS W/O OPTION.
SCALE 1/8 MASS 7.4 kg ±10%
DWG.No. C4456-G02-E
REF.No. 26-005-210G-4

FURUNO

レーダー制御部
RADAR PROCESSOR UNIT
RPU-013 (FAR-2117ser.)
MFD8/12
MPU001 (MFDBB)   *3

DVI-D   J3
1 DVIOTX2_N
2 DVIOTX2_P
3 A_GND
4 NC
5 NC
6 NC
7 NC
8 NC
9 DVIOTX1_N
10 DVIOTX1_P
11 A_GND
12 NC
13 NC
14 Vcc
15 GND
16 NC
17 DVIOTXD_N
18 DVIOTXD_P
19 A_GND
20 NC
21 A_GND
22 DVIOTXC_P
23 DVIOTXC_N
24

レーダー制御部
RADAR PROCESSOR UNIT
RPU-021 (FAR-1417/1427)

輝度制御用
FOR BRILL. CONTROL

DVI-D   J14/J15
24

USB   J12/J13
1 VBUS
2 D-
3 D+
4 GND

DVI-D/D S-LINK5M/10M *2
5/10m, φ7
P

DVI-D/D S-LINK5M *2
5m, φ7

USB CABLE MAX. 5m

15型カラーLCD表示器
MARINE DISPLAY
MU-150HD

DVI-D1   J3
1 TMDS_DATA2_N
2 TMDS_DATA2_P
3 TMDS_DATA2_SHIELD
4 NC
5 NC
6 DDC_CLOCK
7 DCD_DATA
8 NC
9 TMDS_DATA1_N
10 TMDS_DATA1_P
11 TMDS_DATA1_SHIELD
12 NC
13 NC
14 5V_P
15 GND
16 HOT_PLUG_DETECT
17 TMDS_DATA0_N
18 TMDS_DATA0_P
19 TMDS_DATA0_SHIELD
20 NC
21 NC
22 TMDS_CLOCK_SHIELD
23 TMDS_CLOCK_P
24 TMDS_CLOCK_N

POWER   J1
1 (+)
2 (-)
3 SHIELD

RGB   J2
1 RED
2 GREEN
3 BLUE
4 NC
5 GND
6 GND
7 GND
8 NC
9 GND
10 NC
11 GND
12 NC
13 HSYNC_N
14 VSYNC_N
15 NC

DVI-D2   同上 DITTO
BRILL CTRL   J4
24

J6
1 VBUS
2 D-
3 D+
4 GND

*1
1V-1.25sq.

VIDEO01   J5   RCA *1
VIDEO02   RCA *1
VIDEO03   RCA *1

12-24VDC   MJ-A3SPF0017-050ZC, 5m   MJ-A3SPF
シロ WHT
クロ BLK
5A

*2
3COX-2P-6C.5/10m, φ8.5

魚群探知機
ソナー
レーダー
プロッタ
ECHO SOUNDER
SONAR
RADAR
PLOTTER

VIDEO DEVICE   COAX. CABLE (3D2V/2.5C2V) *1
VIDEO DEVICE   COAX. CABLE (3D2V/2.5C2V) *1
VIDEO DEVICE   COAX. CABLE (3D2V/2.5C2V) *1

注記
＊1）造船所手配。
＊2）オプション。
＊3）輸出仕様のみ。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: FOR EXPORT ONLY.

DRAWN 2/Nov/2018 T. YAMASAKI
CHECKED 2/Nov/2018 H. MAKI
APPROVED 5/Nov/2018 H. MAKI
SCALE   MASS   kg
DWG No. C4456-C01- F   REF. No. 26-005-5000-1

TITLE MU-150HD
名称 15型カラーLCD表示器
相互結線図
NAME MARINE DISPLAY
INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO Worldwide Warranty for Pleasure Boats (Except North America)

This warranty is valid for products manufactured by Furuno Electric Co. (hereafter FURUNO) and installed on a pleasure boat. Any web based purchases that are imported into other countries by anyone other than a FURUNO certified dealer may not comply with local standards. FURUNO strongly recommends against importing these products from international websites as the imported product may not work correctly and may interfere with other electronic devices. The imported product may also be in breach of the local laws and mandated technical requirements. Products imported into other countries as described previously shall not be eligible for local warranty service.

For products purchased outside of your country please contact the national distributor of Furuno products in the country where purchased.

This warranty is in addition to the customer´s statutory legal rights.

1. Terms and Conditions of Warranty

FURUNO guarantees that each new FURUNO product is the result of quality materials and workmanship. The warranty is valid for a period of 2 years (24 months) from the date of the invoice, or the date of commissioning of the product by the installing certified dealer.

2. FURUNO Standard Warranty

The FURUNO standard warranty covers spare parts and labour costs associated with a warranty claim, provided that the product is returned to a FURUNO national distributor by prepaid carrier.

The FURUNO standard warranty includes:

- Repair at a FURUNO national distributor
- All spare parts for the repair
- Cost for economical shipment to customer

3. FURUNO Onboard Warranty

If the product was installed/commissioned and registered by a certified FURUNO dealer, the customer has the right to the onboard warranty.

The FURUNO onboard warranty includes

- Free shipping of the necessary parts
- Labour: Normal working hours only
- Travel time: Up to a maximum of two (2) hours
- Travel distance: Up to a maximum of one hundred and sixty (160) KM by car for the complete journey

4. Warranty Registration

For the Standard Warranty - presentation of product with serial number (8 digits serial number, 1234-5678) is sufficient. Otherwise, the invoice with serial number, name and stamp of the dealer and date of purchase is shown.

For the Onboard Warranty your FURUNO certified dealer will take care of all registrations.

5. Warranty Claims

For the Standard Warranty - simply send the defective product together with the invoice to a FURUNO national distributor. For the Onboard Warranty – contact a FURUNO national distributor or a certified dealer. Give the product´s serial number and describe the problem as accurately as possible.

Warranty repairs carried out by companies/persons other than a FURUNO national distributor or a certified dealer is not covered by this warranty.

6. Warranty Limitations

When a claim is made, FURUNO has a right to choose whether to repair the product or replace it.

The FURUNO warranty is only valid if the product was correctly installed and used. Therefore, it is necessary for the customer to comply with the instructions in the handbook. Problems which result from not complying with the instruction manual are not covered by the warranty.

FURUNO is not liable for any damage caused to the vessel by using a FURUNO product.

The following are excluded from this warranty:

a. Second-hand product

b. Underwater unit such as transducer and hull unit

c. Routine maintenance, alignment and calibration services.

d. Replacement of consumable parts such as fuses, lamps, recording papers, drive belts, cables, protective covers and batteries.

e. Magnetron and MIC with more than 1000 transmitting hours or older than 12 months, whichever comes first.

f. Costs associated with the replacement of a transducer (e.g. Crane, docking or diver etc.).

g. Sea trial, test and evaluation or other demonstrations.

h. Products repaired or altered by anyone other than the FURUNO national distributor or an authorized dealer.

i. Products on which the serial number is altered, defaced or removed.

j. Problems resulting from an accident, negligence, misuse, improper installation, vandalism or water penetration.

k. Damage resulting from a force majeure or other natural catastrophe or calamity.

l. Damage from shipping or transit.

m. Software updates, except when deemed necessary and warrantable by FURUNO.

n. Overtime, extra labour outside of normal hours such as weekend/holiday, and travel costs above the 160 KM allowance

o. Operator familiarization and orientation.

FURUNO Electric Company, March 1, 2011

FURUNO Warranty for North America

FURUNO U.S.A., Limited Warranty provides a twenty-four (24) months LABOR and twenty-four (24) months PARTS warranty on products from the date of installation or purchase by the original owner. Products or components that are represented as being waterproof are guaranteed to be waterproof only for, and within the limits, of the warranty period stated above. The warranty start date may not exceed eighteen (18) months from the original date of purchase by dealer from Furuno USA and applies to new equipment installed and operated in accordance with Furuno USA's published instructions.

Magnetrons and Microwave devices will be warranted for a period of 12 months from date of original equipment installation.

Furuno U.S.A., Inc. warrants each new product to be of sound material and workmanship and through its authorized dealer will exchange any parts proven to be defective in material or workmanship under normal use at no charge for a period of 24 months from the date of installation or purchase.

Furuno U.S.A., Inc., through an authorized Furuno dealer will provide labor at no cost to replace defective parts, exclusive of routine maintenance or normal adjustments, for a period of 24 months from installation date provided the work is done by Furuno U.S.A., Inc. or an AUTHORIZED Furuno dealer during normal shop hours and within a radius of 50 miles of the shop location.

A suitable proof of purchase showing date of purchase, or installation certification must be available to Furuno U.S.A., Inc., or its authorized dealer at the time of request for warranty service.

This warranty is valid for installation of products manufactured by Furuno Electric Co. (hereafter FURUNO). Any purchases from brick and mortar or web-based resellers that are imported into other countries by anyone other than a FURUNO certified dealer, agent or subsidiary may not comply with local standards. FURUNO strongly recommends against importing these products from international websites or other resellers, as the imported product may not work correctly and may interfere with other electronic devices. The imported product may also be in breach of the local laws and mandated technical requirements. Products imported into other countries, as described previously, shall not be eligible for local warranty service.

For products purchased outside of your country please contact the national distributor of Furuno products in the country where purchased.

WARRANTY REGISTRATION AND INFORMATION

To register your product for warranty, as well as see the complete warranty guidelines and limitations, please visit www.furunousa.com and click on "Support". In order to expedite repairs, warranty service on Furuno equipment is provided through its authorized dealer network. If this is not possible or practical, please contact Furuno U.S.A., Inc. to arrange warranty service.

FURUNO U.S.A., INC.
Attention: Service Coordinator
4400 N.W. Pacific Rim Boulevard
Camas, WA 98607-9408
Telephone: (360) 834-9300
FAX: (360) 834-9400

Furuno U.S.A., Inc. is proud to supply you with the highest quality in Marine Electronics. We know you had several choices when making your selection of equipment, and from everyone at Furuno we thank you. Furuno takes great pride in customer service.

FURUNO

FURUNO ELECTRIC CO., LTD.
9-52 Ashihara-cho, Nishinomiya, 662-8580, Japan
Tel: +81 (798) 65-2111   Fax: +81 (798) 65-1020
www.furuno.com

Publication No. DOCQA1001

EC Declaration of Conformity

C E

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

MARINE DISPLAY MU-150HD

(Model name, type number)

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

IEC 60945 Ed.4.0: 2002, clauses 9.2, 9.3, 10.3, 10.4, 10.5, 10.8 and 10.9
IEC 60945 Ed.3.0: 1996, clauses 10.2 and 10.3

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

For assessment, see

• EMC Test Report FLI 12-09-063, October 9, 2009 prepared by Furuno Labotech International Co., Ltd.

This declaration is issued according to the Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

On behalf of Furuno Electric Co., Ltd.

Yoshitaka Shogaki
Department General Manager
Quality Assurance Department

Nishinomiya City, Japan
April 20, 2016
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(Place and date of issue)   (name and signature or equivalent marking of authorized person)