FURUNO

Installation Manual
ECDIS
Model FMD-3100

(Product Name: ELECTRONIC CHART DISPLAY AND INFORMATION SYSTEM)

For PCU-3010

This manual provides the installation procedures for this equipment. For the initial settings, see the following document.

- For the [Common Installation Setting] menu: See the Instruction Manual (TIE-44841).
- For other initial setting menu: See the Adjustment Manual (AME-44841).

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(YOSH) FMD-3100(PCU-3010)

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⚠ SAFETY INSTRUCTIONS

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

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

⚠ Warning, Caution ⃠ Prohibitive Action ❗ Mandatory Action

⚠ WARNING

ELECTRICAL SHOCK HAZARD

Do not open the equipment unless totally familiar with electrical circuits and service manual.
Only qualified personnel are allowed to work inside the equipment.

❗ **Turn off the power at the mains switch-board before beginning the installation.**
Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

❗ **Be sure that the power supply is compatible with the voltage rating of the equipment.**
Connection of an incorrect power supply can cause fire or damage the equipment.

❗ **Use only the specified power cable.**
Fire or damage to the equipment can result if a different cable is used.

❗ **Do not install the units of the system where they may get wet from rain or water splash, or in a dusty environment.**
Water in the units can result in fire, electrical shock, or damage the equipment.

⚠ WARNING

Attach protective earth securely to the ship's body.
The protective earth (grounding) is required for the AC power supply to prevent electrical shock.

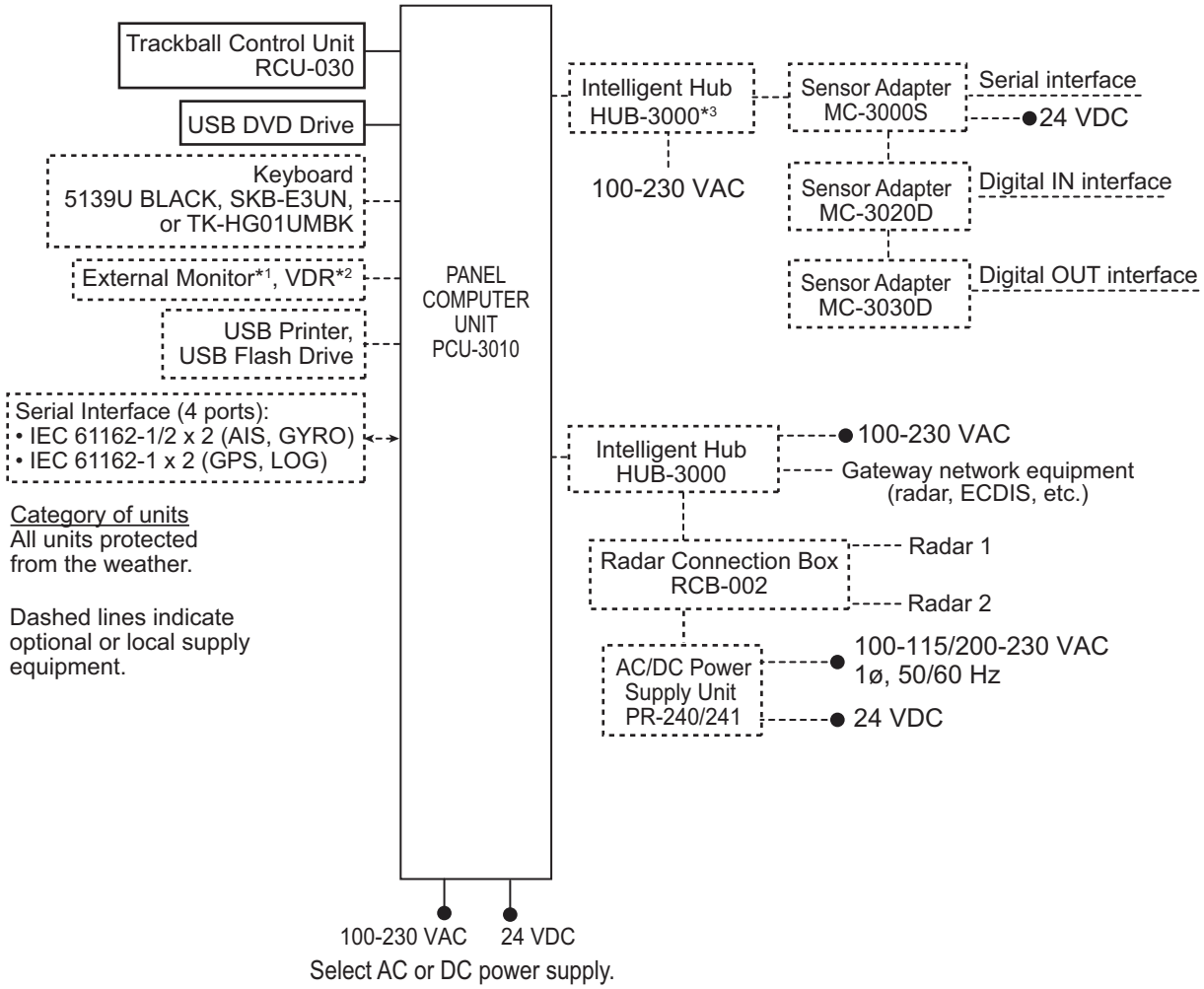
⚠ CAUTION

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

Unit	Standard compass	Steering compass
Panel Computer Unit (PCU-3010)	0.95 m	0.6 m
Trackball Control Unit (RCU-030)	0.5 m	0.3 m
Intelligent HUB (HUB-3000)	1.20 m	0.75 m
Switching HUB (HUB-100)	1.00 m	0.60 m
Sensor Adapter (MC-3000S)	2.05 m	1.35 m
Sensor Adapter (MC-3020D)	1.05 m	0.70 m
Sensor Adapter (MC-3030D)	0.90 m	0.60 m
Radar Connection Box (RCB-002)	1.45 m	0.95 m

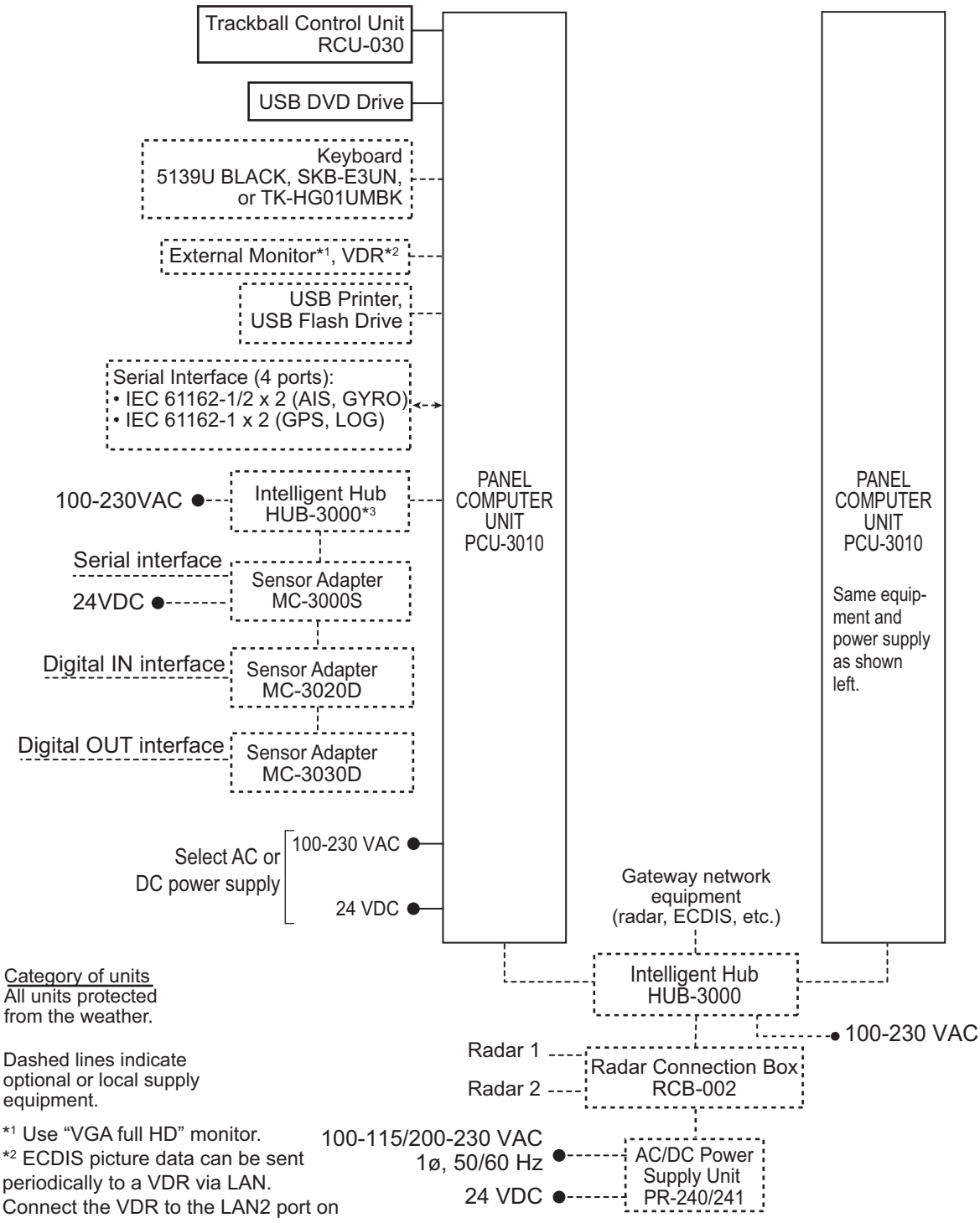
SYSTEM CONFIGURATION

Single workstation



*1 Use “VGA full HD” monitor.
*2 ECDIS picture data can be sent periodically to a VDR via LAN.
Connect the VDR to the LAN2 port on the Panel PC to send the data.
*3 For IEC 61162-450 Ed.1 complying network, use Switching Hub HUB-100.

Multiple workstations (Maximum 3)



Category of units
All units protected from the weather.

Dashed lines indicate optional or local supply equipment.

*1 Use “VGA full HD” monitor.
*2 ECDIS picture data can be sent periodically to a VDR via LAN. Connect the VDR to the LAN2 port on the Panel PC to send the data.
*3 For IEC 61162-450 Ed.1 complying network, use Switching Hub HUB-100.

EQUIPMENT LIST

Standard Supply

Name	Type	Code No.	Qty	Remarks
Panel Computer Unit	PCU-3010	-	1	
Trackball Control Unit	RCU-030	-	1	
Installation Materials	CP24-03102	001-567-110	1	For PCU-3010
Accessories	FP24-01030	000-038-691	1	DVD drive

Optional Supply

Name	Type	Code No.	Remarks
Radar Connection Box	RCB-002	-	For connection of external radar
Sensor Adapter	MC-3000S	-	Serial control unit
	MC-3020D	-	Digital IN
	MC-3030D	-	Digital OUT
Intelligent HUB	HUB-3000	-	
Switching HUB	HUB-100	-	
AC/DC Power Supply Unit	PR-240	-	
	PR-241	-	
Ferrite Core	OP86-11	001-594-450	For PR-241
Case Gasket	OP24-28	001-169-970	For MC-3000S
	OP24-29	001-169-960	For MC-3020D/3030D
Flush Mount Kit	OP24-38	001-263-190	For RCU-030
Cable Clamp	OP24-58	001-562-560	For PCU-3010
Hood	OP24-60	001-562-580	For PCU-3010
Keyboard	OP24-41	001-263-250	For PCU-3000/PCU-3010, with keyboard (5139U or 5139U BLACK)
	OP24-62	001-590-780	For PCU-3000/PCU-3010, with keyboard (SKB-E3UN)
	OP24-71	001-658-190	For PCU-3000/PCU-3010, with-keyboard (TK-HG01UMBK)
Bracket	OP24-59	001-562-570	For PCU-3010
USB Dongle	EC-3000/3005	001-570-740	For PCU-3010
Crimping Tool	CRIMPFOX 10S	001-206-920	For ferrule
Installation Materials	CP03-28900	000-082-658	LAN cable, 10 m
	CP03-28910	000-082-659	LAN cable, 20 m
	CP03-28920	000-082-660	LAN cable, 30 m
	CP24-02900	001-208-050	LAN cable, 10 m, for HUB-3000
	CP24-02910	001-208-060	LAN cable, 20 m, for HUB-3000
	CP24-02920	001-208-070	LAN cable, 30 m, for HUB-3000

Name	Type	Code No.	Remarks
Cable Assy.	3COX-2P-6C 5M	001-077-230-10	For external monitor, VDR, 5m
	MC1.5-W-L600	001-187-470-10	Between sensor adapters, 0.6 m
	MC1.5-W-L1000	001-187-480-10	Between sensor adapters, 1 m
	MC1.5-W-L2000	001-187-490-10	Between sensor adapters, 2 m
	MC1.5-W-L3000	001-187-500-10	Between sensor adapters, 3 m
	MJ-A10SPF0020A-050+	001-283-370-00	For Non-FURUNO radars, 5 m
	MJ-A10SPF0020A-100+	001-283-380-00	For Non-FURUNO radars, 10 m
	MJ-A10SPF0020A-200+	001-283-390-00	For Non-FURUNO radars, 20 m
	MJ-A10SPF0020A-300+	001-283-400-00	For Non-FURUNO radars. 30 m
Operator's Manual	OME-44841-*	000-196-492-1*	English
LOP Instruction Manual	E42-01411-*	000-190-356-1*	English

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1. MOUNTING

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.

1.1 Panel Computer Unit (PCU-3010)

The PCU-3010 can be flush-mounted or desktop-mounted (optional).

Mounting considerations

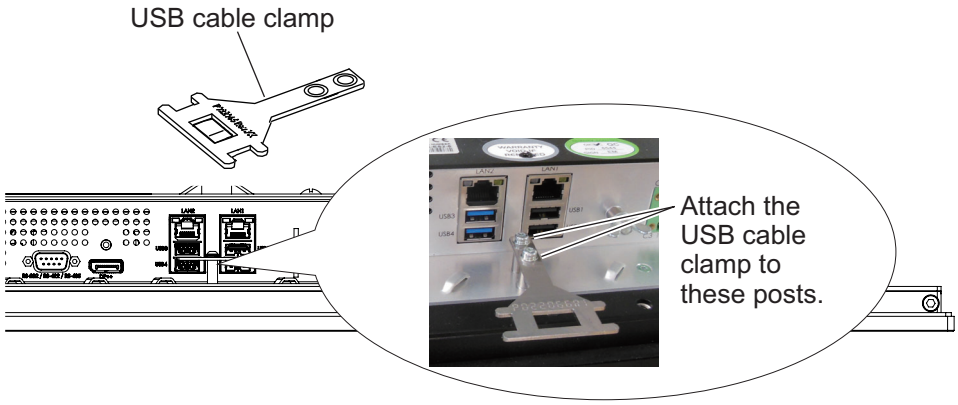
When selecting a desktop mounting location, keep the following points in mind:

- Locate the PCU away from heat sources. The cabinet can build up heat inside, causing undue wear to electrical components.
- Choose the mounting location while considering the length of cable between the PCU and other equipment to be connected.
- Do not cover the air intakes near the connectors at the base of the PCU.
- Leave at least 50 mm clearance around the rear air vents of the unit to allow heat dissipation.
- Locate the PCU away from areas which may be subject to splash or rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space around the equipment to facilitate maintenance.
- Keep in mind the desired location of the trackball unit. Make sure there is enough room to install the Trackball Control Unit near the PCU.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Vibration at the mounting location should be minimum.
- Alarm and alert buzzer sounds are generated from a speaker on the face of the PCU. To avoid sound dampening, do not place any object in front of the PCU. Ensure the speaker hole is kept free of dust and water.

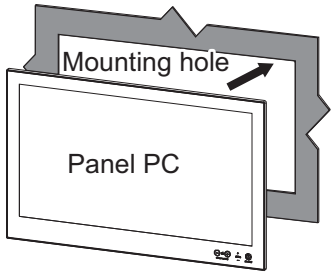
1.1.1 Flush mounting

You will need a Torx screwdriver (T10, T25) to complete this procedure.

1. Attach the USB cable clamp to the PCU using the Torx screws supplied.

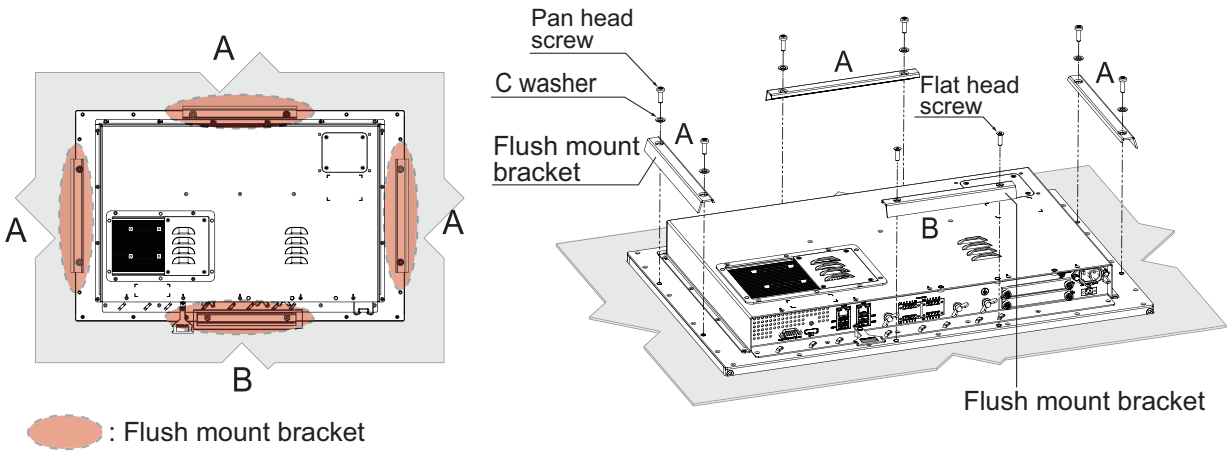


2. Make a cutout in the mounting location, referring to the outline drawings at the back of this manual.
3. Connect all cables to their appropriate slot on the PCU. Take care to leave enough slack in the cables to allow access for maintenance and repair.
4. Slide the unit into the cutout. Take care to not to bend or squash any cabling.



Note: User controls and ports should be facing downwards.

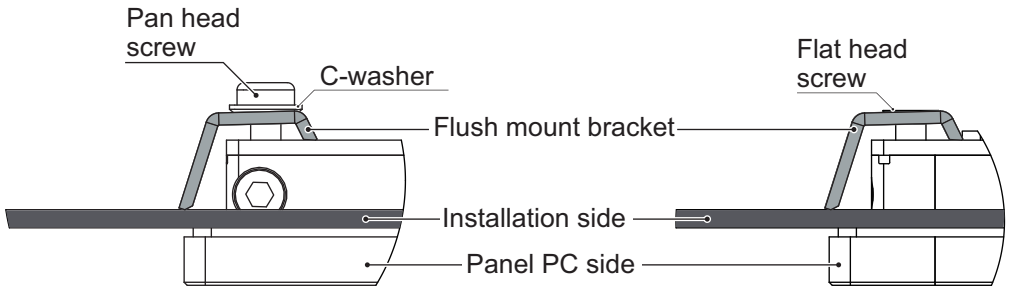
5. Taking care not to confuse the bracket types (see figure below), fasten each bracket into place, referring to the figure below.



- “A" flush mount bracket: Use pan head screws (M5×16) and C washer.
- "B" flush mount bracket: Use flat head screws (M5×16). Only the "B" flush mount bracket (for the lower part) has different lengths and screw holes.

Installation side (rear side)

Fasten the flush mount brackets as shown below.

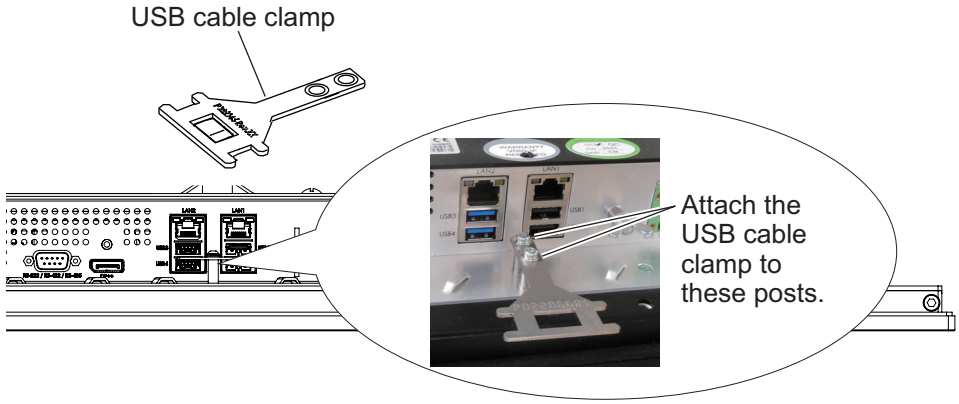


"A" flush mount bracket *"B" flush mount bracket*

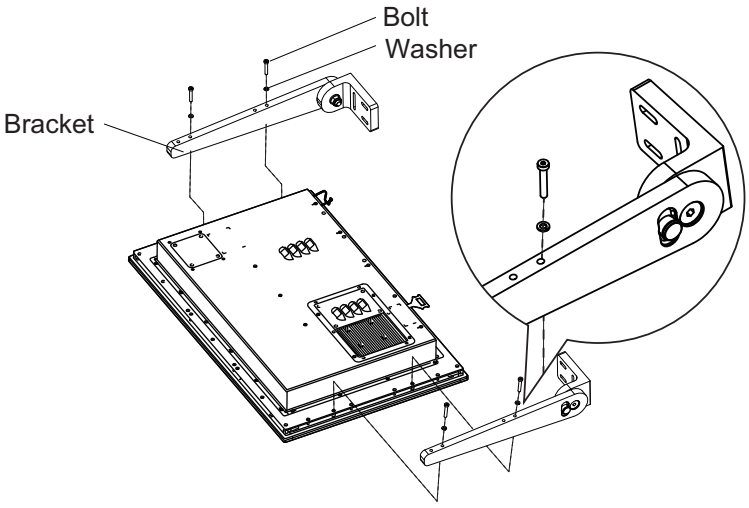
1.1.2 Desktop mounting (optional)

You will need a Torx screwdriver (T10) and a 4mm hexagon wrench to do this procedure.

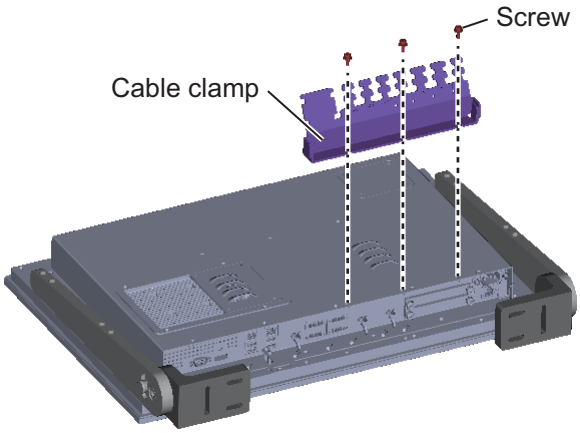
1. Attach the USB cable clamp to the PCU using the supplied screws (2 pcs.).



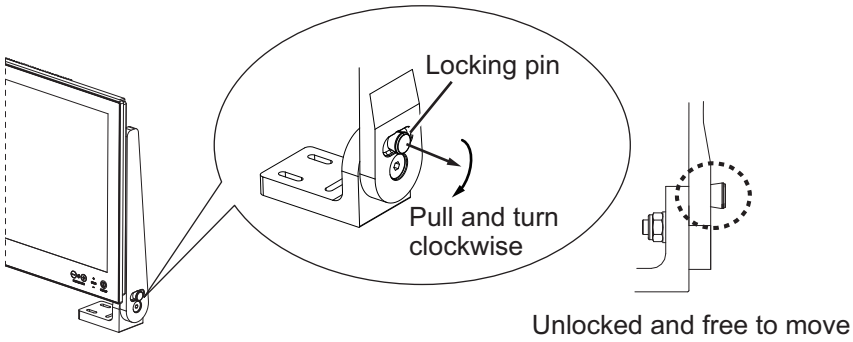
2. Attach the brackets to the PCU-3010, referring to the figure below. It is essential that the brackets are attached using the bottom screw holes, as shown in the diagram below. Failure to do so will result in undue vibrations.
   Note: Ensure the PCU-3010 is placed face-down on a soft, clean area to prevent damage to the screen.



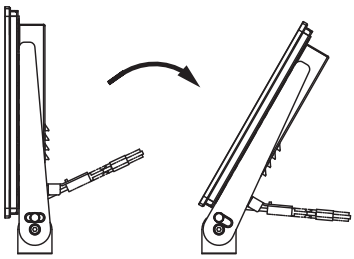
3. Attach the cable clamp (supplied) to the rear of the PCU-3010 using the supplied screws (M5×12, 3 pcs.).



4. Referring to the figure below, tilt the PCU 90° rearwards by unlocking the brackets. Hold the unit in place, then pull and turn the locking pins clockwise, one at a time, to set the pin in the unlock position.

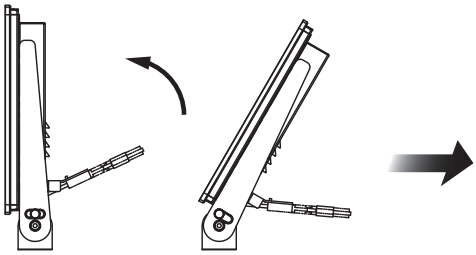


5. After tilting the PCU turn the locking pin counter clockwise to lock the bracket in place.

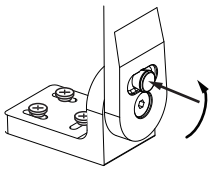


6. Attach the footings of the brackets in place at the mounting location using the self-tapping screws (ϕ6×30, 6 pcs.) included in the mounting kit.

7. Referring to the figure below, set the PCU upright at a comfortable viewing angle, then turn the locking pin counterclockwise to lock the brackets in place.



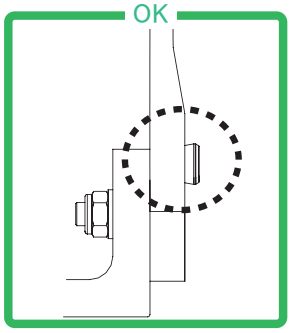
Unlock, tilt and lock



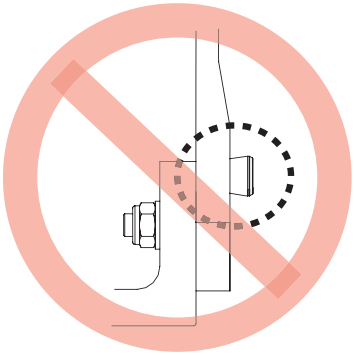
Push in locking pin firmly.

CAUTION

Be sure that the brackets are locked in place securely with the locking pins, to prevent bodily injury or damage to the equipment.



Locked in place



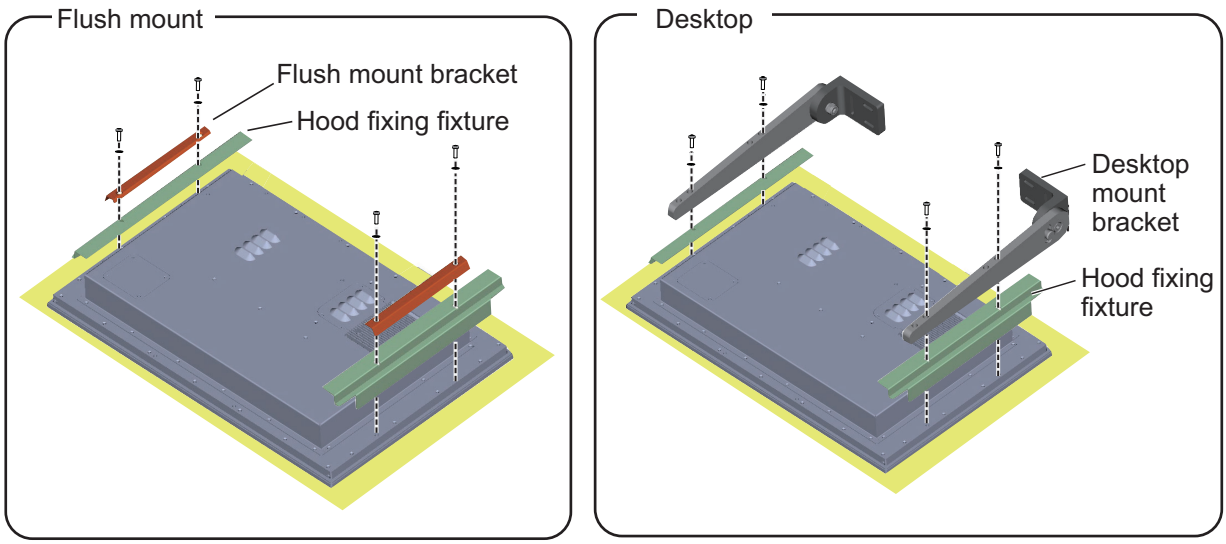
Unlocked and free to move

1.1.3 How to attach the hood (optional)

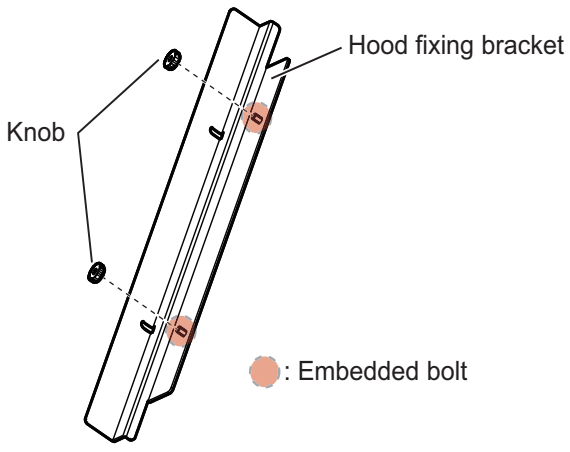
Follow the procedure below to install the optional hood (type: OP24-60). You will need these tools.

Flush-mounting: T25 Torx screwdriver
Desktop mounting: 4 mm hex wrench

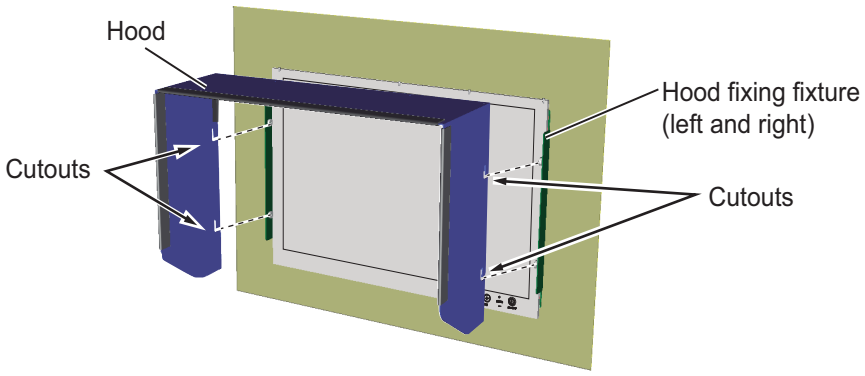
1. Referring to the figure below, fit the hood reinforcement fixture to the back of the PCU-3010.
   Flush-mounting: Install the hood fixing fixture with the flush mount brackets.
   Desktop mounting: Install the hood fixing fixture with the desktop mount brackets.
   Note: The screws and washers to fix the hood fixing fixture are supplied with the PC-3010.



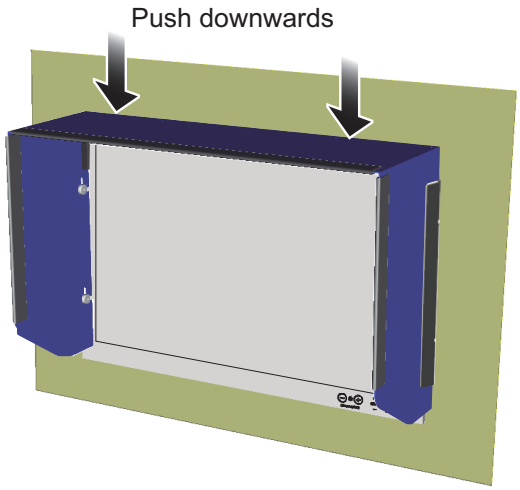
2. Screw in knurled knobs (4 pieces) loosely from the inside onto the embedded bolts of the hood fixing brackets (2 pieces).



3. Using the cutouts in the hood, set the hood in place between the knobs and the hood fixing fixtures.



4. Referring to the figure below, push the hood down to align the cutouts with the knobs.



5. Fasten the knobs to secure the hood in place.

1.1.4 How to install the keyboard (optional)

For OP24-41/OP24-71

To install the optional keyboard (contained in OP24-41/OP24-71), do the following procedure.

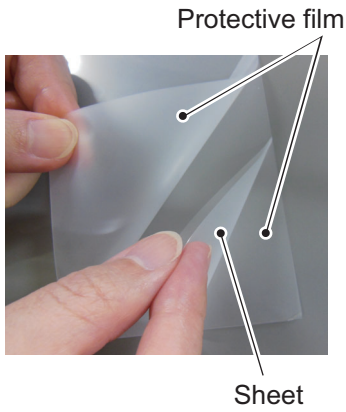
	Keyboard type
OP24-41	5139U BLACK
OP24-71	TK-HG01UMBK

1. Stick the smaller velcro tape (Fastener, 4 pcs., supplied with the optional kit) to the four corners of the rear of the keyboard.
2. Fit the larger velcro tape (Fastener, 4 pcs., supplied with the optional kit) to the smaller tape.
3. Remove the protective film from the larger velcro tape.
4. Fit the keyboard at the installation location.

For OP24-62

To install the optional keyboard (Type: SKB-E3UN, contained in OP24-62), do the following procedure.

1. Referring to the following steps, fit the static electricity prevention sheet (included as optional kit) to the keyboard, then fix the keyboard at the installation location using the double-sided tape (Tape V/H, supplied with the optional kit).
   1) Remove the protective film from one side of the supplied double-sided tape, then stick the tape to the 4 edges of the rear of the keyboard.
   2) Remove the protective film on both sides of the sheet, then fit the sheet to the keyboard.
      Note: The sheet is extremely thin and should be handled with care.
   3) Remove the protective film from the double-sided tape on the rear of the keyboard, then fix the sheet to the tape.

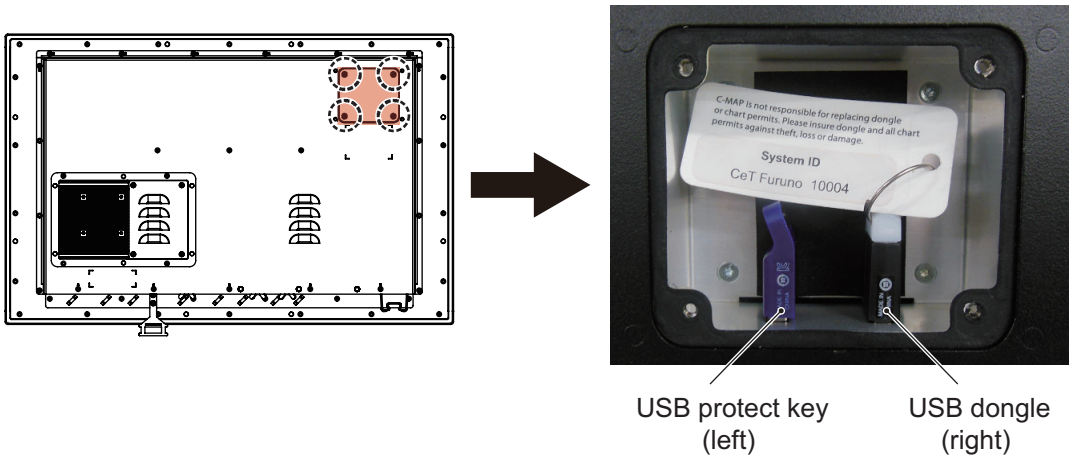


2. Stick the smaller velcro tape (Fastener, 5 pcs., supplied with the optional kit) to the four corners of the rear of the keyboard and to the EMI core.
3. Fit the larger velcro tape (Fastener, 5 pcs., supplied with the optional kit) to the smaller tape.
4. Remove the protective film from the larger velcro tape.
5. Fit the keyboard at the installation location.
6. Depending on the installation location and environment, move and then fit the EMI cores as required.
   The following points should be observed when moving the EMI cores:
   - Do not remove or disconnect the USB cable.
   - Do not apply undue stress or weight to the base of the cable connection on the keyboard.
   - The EMI core must not be suspended freely as this puts strain on the cable.
   - Re-wrap the cable around the EMI core a total of 6 times. The cable should pass through the EMI core a total of 7 times.

1.1.5 How to replace the USB protect key and USB dongle

You will need a Torx screwdriver (T10) to do the replacement.

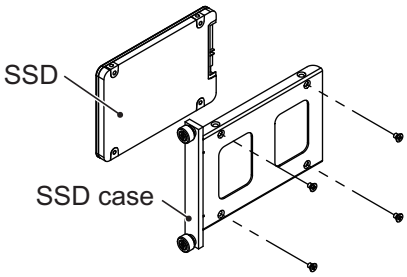
Turn off the power BEFORE replacing the USB protect key (ENC chart use) and USB dongle (C-MAP chart use). Unfasten the four screws circled in the figure below to open the lid. The USB protect key is on the left; the USB dongle on the right.

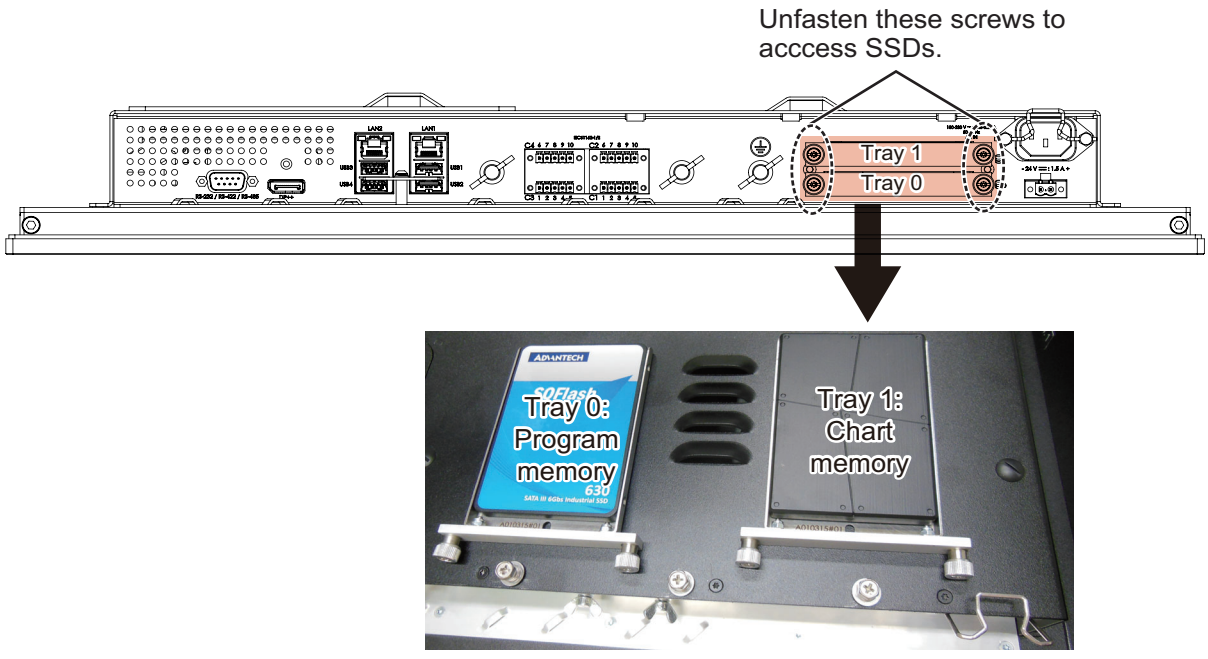


1.1.6 How to replace an SSD

You will need a Phillips-head screwdriver (PH2) to do the replacement.

Remove the SSD case from the SSD slot. Unfasten the screws circled in the figure below, then remove the SSD.Be sure to insert SSDs into their correct slots to prevent possible equipment malfunction.
Tray 0: program memory (4 GB)
Tray 1: chart memory (64 GB)





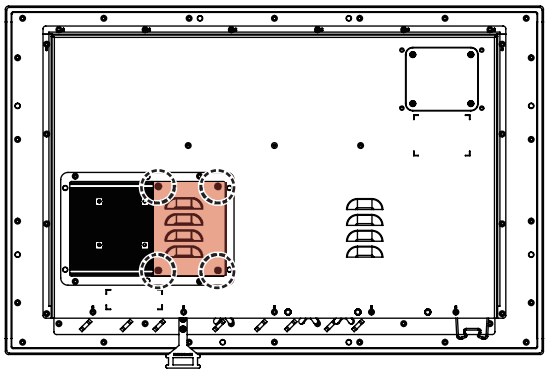
1.1.7 How to replace the fan

The life of the fan is approximately five years. Replace the fan when any of the following occurs.

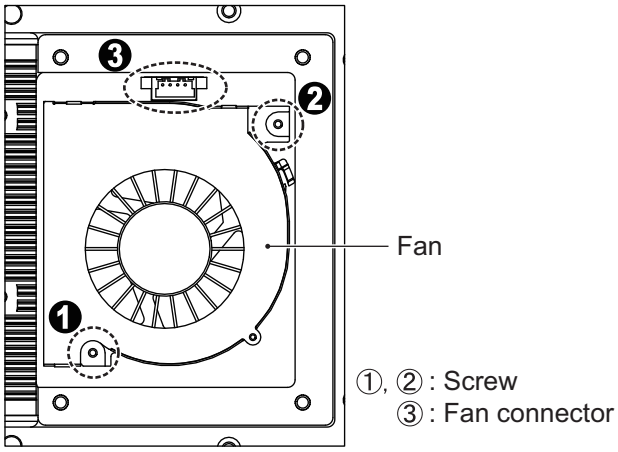
- The recommended replacement interval of five years has passed.
- The fan emits strange noises when the processor unit is powered.
- The Alert 30002 "Processor Unit Fan1 Fan No Rotation" is generated.

You will need a Torx screwdriver (T10) to do the replacement.

1. Turn off the power to the FMD-3100.
2. On the rear panel, unfasten the four screws fixing the fan cover.



3. Referring to the figure below, unfasten two fixing screws and disconnect the fan connector, in that order, to remove the fan.



4. Connect the fan connector of the new fan.
5. Set the fan to the unit, then fasten the two fixing screws.
6. Close the fan cover.

1.2 Trackball Control Unit (RCU-030)

The Trackball Control Unit (RCU-030) can be mounted on a desktop in two configurations.

- Desktop with mounting plate (Standard installation)
- Flush mounted inside a console (Optional)

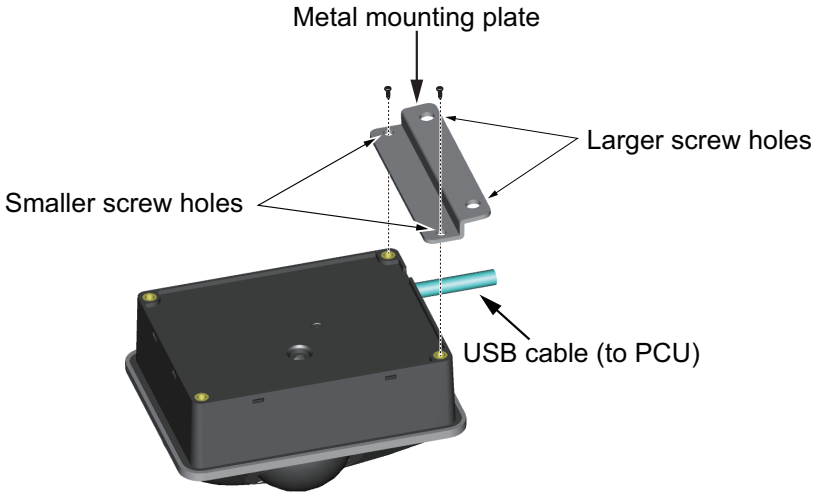
Mounting considerations

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

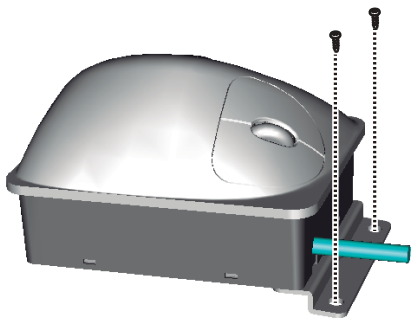
- Select a location where the unit can be operated conventionally.
- Locate the unit away from heat sources. The cabinet can build up heat inside, causing undue wear to electrical components.
- Locate the unit away from areas which may be subject to water splash and rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space around the equipment to facilitate maintenance.
- Consider the length of the signal cable and the distance between the unit and the PCU. Leave enough slack in the cable to allow for maintenance.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.

1.2.1 Desktop mounting (with metal mounting plate)

1. Fix the metal mounting plate (supplied) to the bottom of the unit using two washer head screws (M4×10, supplied), referring to the figure below.



2. Fix the unit to the mounting location using two self-tapping screws (ϕ5×20, supplied locally).



1.2.2 Flush mounting (optional)

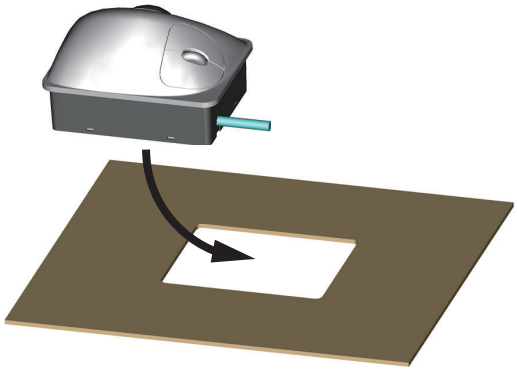
You can use the optional FM FIXTURE ASSEMBLY kit (OP24-38) to flush-mount the unit.

Type: OP24-38, Code No.: 001-263-190

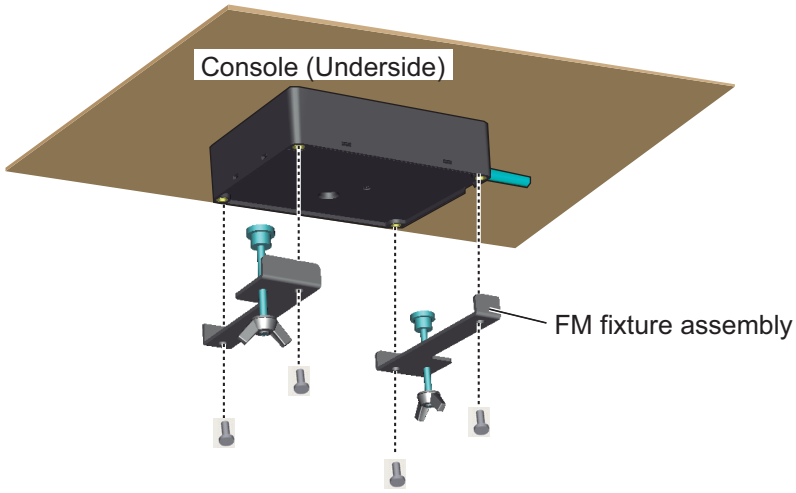
Name	Type	Qty
FM Fixture Assembly	OP24-38-1	2
Washer Head Screw	M4×10	4

Note: The flush mount location must have a thickness of at least 10 mm, with a maximum thickness of 20 mm.

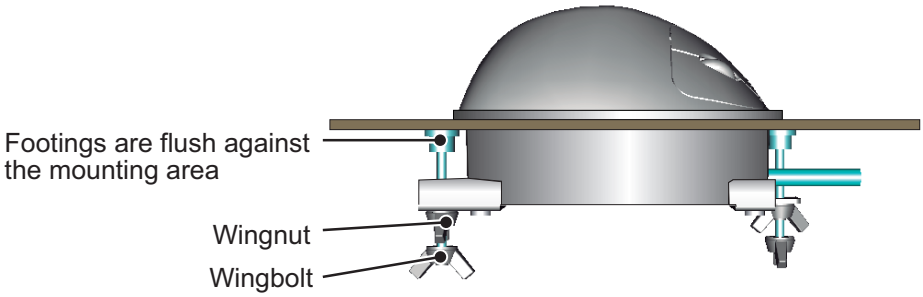
1. Referring the outline drawing at the back of the manual, mark and cut a hole in the position you wish to locate the unit.
2. Set the USB cable through the hole, then place the unit inside the hole.



3. Attach two FM (flush mount) fixture assembly to the unit's under side using four washer head screws (M4×10), both included in the kit.



4. Fasten the wingbolts until the footing is flush against the mounting area.



5. Tighten the wingnuts until the unit is firmly secured.

1.3 Sensor Adapter MC-3000S/3020D/3030D (Optional)

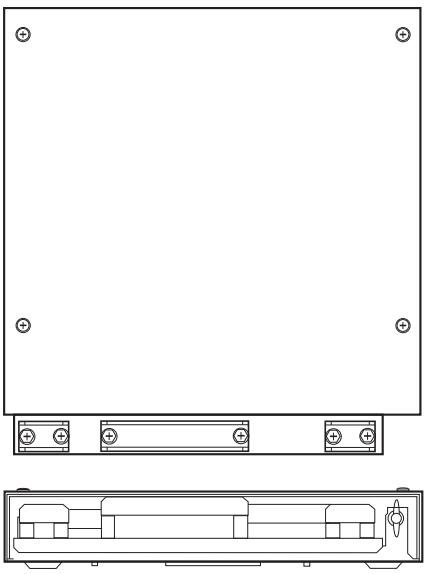
Mounting considerations

When you select a mounting location, keep in mind the following points:

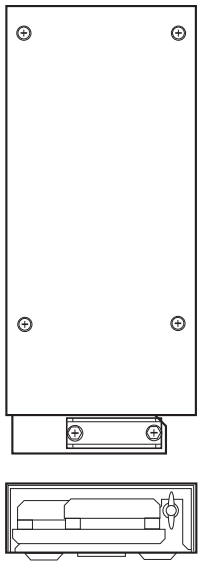
- Locate the equipment away from heat sources because of heat that can build up inside the cabinet.
- Take into account the length of the cables to connected to the equipment when choosing an installation location.
- Vibration at the mounting location should be minimum.
- Locate the equipment away from places subject to water splash and rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space around the equipment to facilitate maintenance.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Select the mounting location considering the numbers of the sensor adapters connected.
  A maximum of eight MC-3000S can be connected to a sensor network (for redundant connection:16). Maximum 10 sensor adapters (MC-3020D/3030D) can be connected to a single MC-3000S.
- Select the mounting location so that the length of cables among the sensor adapters (MC-3000S, 3020D and 3030D) is less than 6 m. If the length is more than 6 m, the equipment may not work properly.

How to mount the sensor adapter

1. Unfasten four binding screws to remove the cover from the Sensor Adapter.
2. Fasten four self-tapping screws (4x20, supplied) to fix the Sensor Adapter.
3. Reattach the cover.



MC-3000S



MC-3020D/3030D

1.4 Intelligent Hub HUB-3000 (Optional)

Use the optional Intelligent Hub HUB-3000 to connect gateway network or sensor network. Do not use this hub to connect other shipboard LAN gateway network or sensor network. Do not connect a PC to this network for other than maintenance.

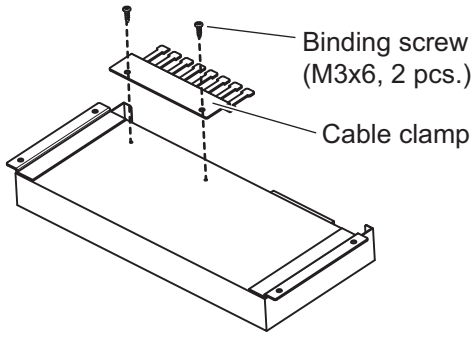
Mounting considerations

Keep the following points in mind when selection a mounting location:

- Locate the HUB-3000 away from heat sources. The cabinet can build up heat inside, causing undue wear to electrical components.
- Take into account the length of the cables to connected to the equipment when choosing an installation location.
- Locate the HUB-3000 away from areas which may be subject to splash or rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space at the rear of the HUB-3000 to facilitate maintenance.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Vibration at the mounting location should be minimum.

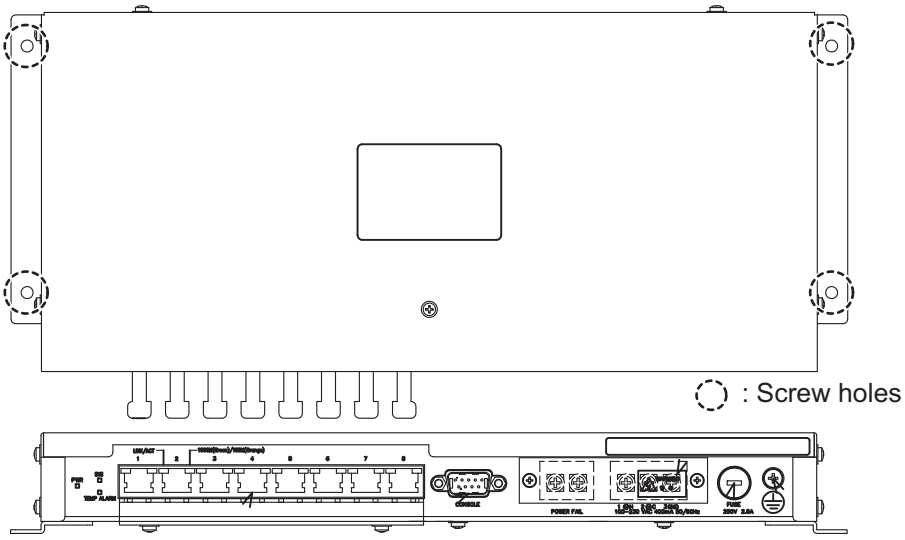
How to mount the intelligent hub HUB-3000

1. Use two binding screws (M3x6, supplied) to attach the cable clamp (supplied) to the bottom of the HUB-3000.



HUB-3000, bottom view

2. Fasten four self-tapping screws (4x20, supplied) to fix the unit in place.



1.5 Mounting the Switching Hub HUB-100 (Optional)

Use the optional Switching HUB HUB-100 to connect IEC61162-450 Ed.1 complying sensor network. Do not use this hub to connect other shipboard LAN gateway network or sensor network. Do not connect a PC to this network for other than maintenance.

For the mounting procedures, see the operator's manual for HUB-100 (Pub. No. OMC-35191).

Mounting considerations

Keep the following points in mind when selection a mounting location:

- Locate the HUB-100 away from heat sources. The cabinet can build up heat inside, causing undue wear to electrical components.
- The HUB-100 should be fixed firmly so that rough seas and vibrations do not cause the unit to move in any manner.
- Locate the HUB-1000 away from areas which may be subject to splash or rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space at the rear of the equipment to facilitate maintenance.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Vibration at the mounting location should be minimum.

1.6 Radar Connection Box RCB-002 (Optional)

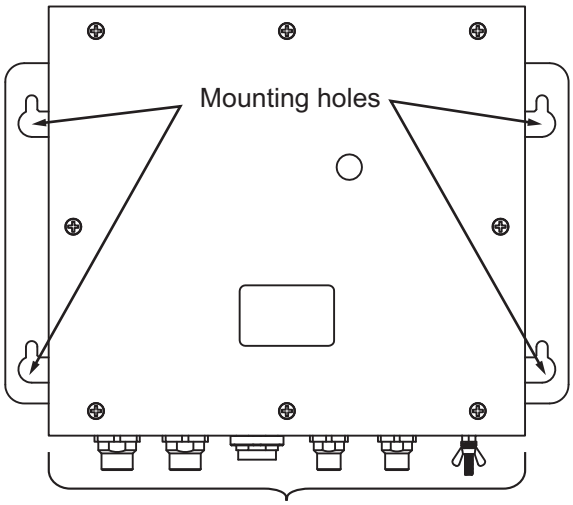
You can display signals from up to two external radars on the FMD-3100 by using the RCB-002. The RCB-002 must be connected via the Gateway Network.

Mounting considerations

Keep the following points in mind when selection a mounting location:

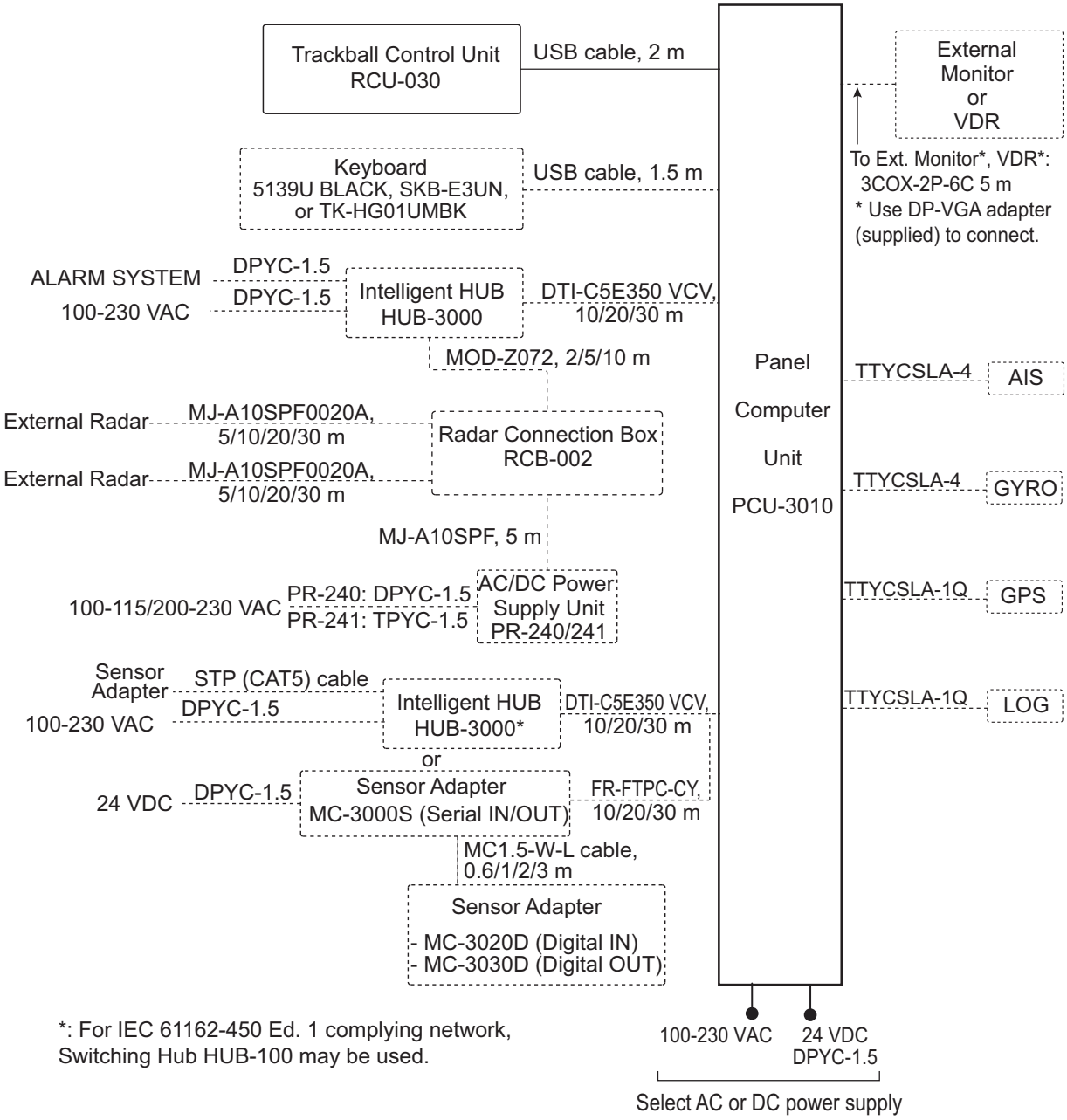
- Locate the RCB-002 away from heat sources. The cabinet can build up heat inside, causing undue wear to electrical components.
- Take into account the length of the cables to connected to the RCB-002 when choosing an installation location.
- The RCB-002 should be fixed firmly so that rough seas and vibrations do not cause the unit to move in any manner.
- Locate the RCB-002 away from areas which may be subject to splash or rain.
- Referring to the outline diagrams at the back of this manual, leave sufficient space at the rear of the RCB-002 to facilitate maintenance.
- A magnetic compass will be affected if the equipment is placed too close to the magnetic compass. Observe the compass safe distances at the front of this manual to prevent interference to a magnetic compass.
- Vibration at the mounting location should be minimum.

1. Referring to the outline drawing at the back of this manual, drill four holes (ϕ5×20) in the mounting location.
2. Secure the RCB-002 firmly in place using ϕ5×20 tapping screws. Make sure the RCB-002 is not subject to undue vibrations.



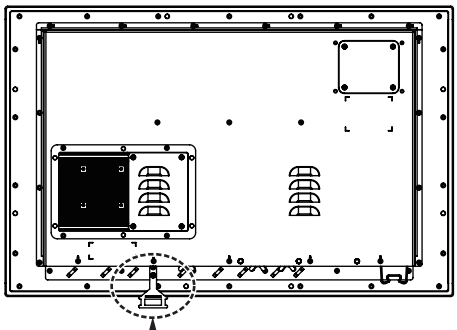
2. WIRING

The illustration on this page shows the general connection between the FMD-3100 and external equipment. For detailed information, see the interconnection diagram at the back of this manual. Many of the cables mentioned are JIS (Japan Industry Standard) cables. If not available locally, use the equivalent. See the cable guide in the Appendix for how to select equivalent cables.



Wiring considerations

- USB cable lengths should be within 5 m, with or without the USB extension cable. Full function cannot be guaranteed if the overall length exceeds 5 m.
- The PCU-3010 is not compatible with the USB 3.0 equipment.
- USB cables should be secured using the clamp highlighted in the figure below.



- LAN cable lengths between units should be within 50 m.
- The Display Port outputs FULL HD resolution. To connect an analog input device, use the DP-VGA adapter (supplied).
- If extension or division of the RGB cable is required, use the IMAGENICS type CIF-12H RGB divider.
- Ensure all grounding wires are connected between grounding terminals on each equipment and ship's earth.
- If a UPS (user supply) is connected to this equipment, ensure the grounding lamp does not light up.
- Use the following LAN cables for the network if they are available locally.
  - Sensor Network: Cat5 or better.
  - Gateway Network: Cat5e or better.
- If LAN cables are not available locally, use the optional LAN cables as below:
  - Sensor network - FR-FTPC-CY (Cat5 equivalent).
  - Gateway network - DTI-C5E350 VCV (Cat5e equivalent).
- ECDIS control unit RCU-024 and RCU-026 are not compatible with this equipment.
- To connect this equipment to a VR-3000/S, use the Display Port, with DP-VGA adapter (supplied). The Display Port outputs FULL HD resolution and requires a synchronizer to convert the output to UXGA.
- When connecting a digital input device, use our recommended DP-DVI adapter (manufacturer: Hatteland Technology, model: DPM2DVI-DF-A1 (SG300000198)).
- When connecting a VDR device via LAN, connect the VDR device to the LAN2 port.

Network and sensor considerations

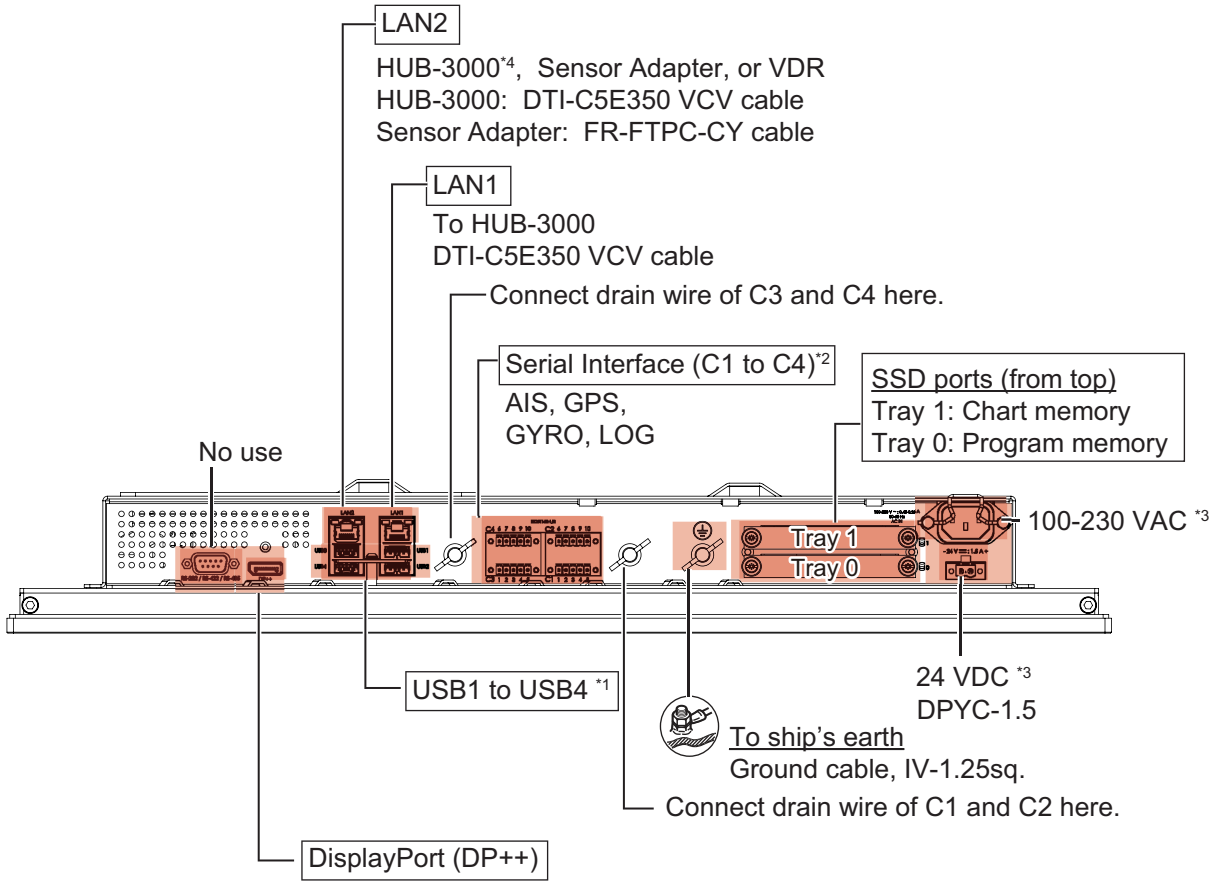
Consider the following points when installing the network.

- For IEC 61162-450 Ed.1 complying network, use the optional Switching Hub HUB-100. For IEC 61162-450 Ed.2 complying network, use the optional Intelligent Hub HUB-3000.
- Do not connect the shipboard LAN network to the HUB-100 or HUB-3000. Also, commercial PCs cannot be connected to the gateway network, other than for maintenance.
- Connect to other ECDIS units and radars (FEA-2xx7, FAR-2xx7 series, etc) using the gateway network.
- When constructing a network with two or more FMD-3xxx, a FAR-2xx7 series radar, and HUB-3000, the HUB-3000 querier must be configured. For how to set the HUB-3000 querier, see the instruction manual (TIE-44841).
- The FMD-3100 processor unit does not support IGMP snooping or CGMP enabled switch.
- The FMD-3100 does not have a router or repeater hub function.
- The Switching HUB HUB-100 does not support IGMP snooping or CGMP enabled switch.
- When you use IEC61162-450 compatible sensors, set [Transmission Group] on the [Common Installation Settings] menu. For how to set [Transmission Group], see the instruction manual (TIE-44841).
- To ensure the security of the FURUNO network, be sure to connect with non-FURUNO networks via the service gateway (tBOX810-83A-FL).
- At least one AMS device must be installed in the navigation equipment.

2.1 Panel Computer Unit PCU-3010

2.1.1 Connections to the PCU-3010

Referring to the figure below, connect the PCU to its respective peripherals.



*1

USB1	: RCU-030
USB2	: USB storage or DVD drive
USB3	: 5139U BLACK, SKB-E3UN, or TK-HG01UMBK (keyboard)
USB4	: Connect USB storage or DVD drive with ext. cable.

*2

C1 port	TTYCSLA-4 or TTYCSLA-1Q
C2 port	
C3 port	TTYCSLA-1Q
C4 port	

*3: Select AC or DC power supply.

*4: Use HUB-100 for IEC 61162-450 Ed. 1 complying network.

*5: Connnect with 3COX-2P-6C cable and supplied DP-VGA adapter.

*6: Connect with DVI-D/D S-LINK(5m) cable and Hatteland Technology make DP-DVI adapter DPM2DVI-DF-A1 (SG300000198).
(cable, adapter: arrange locally)

On USB cable connection

Fasten the USB cable to the cable clamp with a cable tie (width: 5 mm).

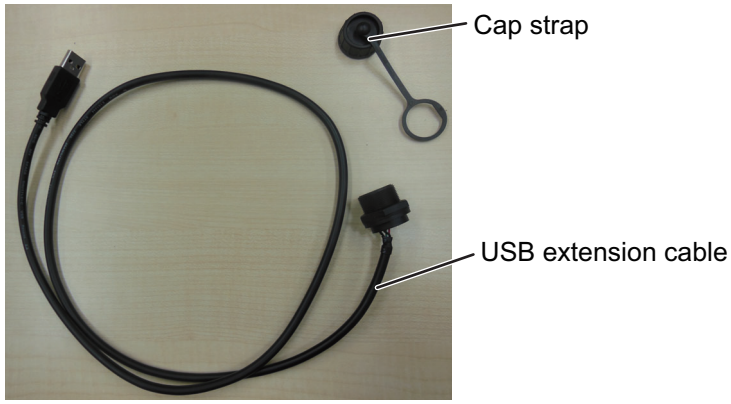
- The USB cable connected between USB1 and the Trackball Control Unit should be separately fastened to the cable clamp.
- Observe the following points with regards to the keyboard.
  - **When no keyboard is connected**, do not connect equipment to USB3. Further, separately fasten the extension cable from USB4 to the USB cable clamp, using a cable tie.
  - **When a keyboard is connected**, bind the keyboard cable together with the extension cable from USB4 to the USB cable clamp.

Depending on your power supply (applied voltage), choose the correct cabling for power input, referring to the table below.

Voltage	Cable	Description
230 VAC	TP52/TC01 cable	Type F “Schuko”, included with PCU-3010. EUR TYPE F IEC 
100 VAC	TP11/TC01 cable	Type B, included with PCU-3010. US TYPE B IEC 
24 VDC	DPYC-1.5 cable (JIS cable)	See paragraph 2.1.3 for how to fabricate the power cable.

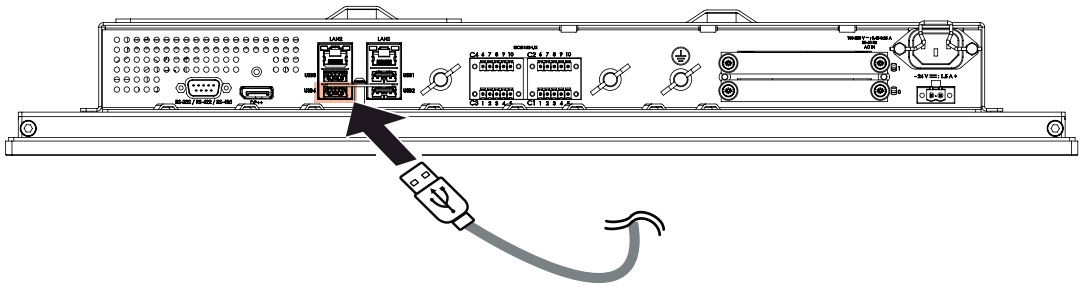
2.1.2 Connecting the flush mountable USB extension cable

You may require an extension from the USB port on the PCU. A 1m length USB extension cable is included with the PCU. When using another USB extension cable, make sure the total length is shorter than 5 m.



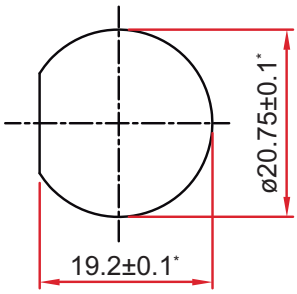
You can connect the flush-mounted extension cable by doing the following:

1. Connect the USB extension cable to the port USB4 on the PCU.



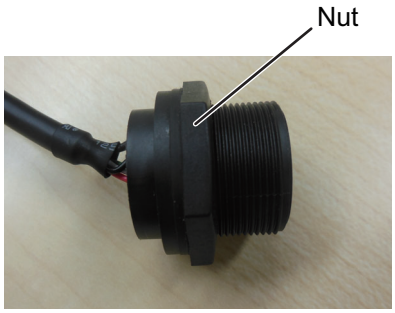
2. Referring to the figure below, make an installation hole where necessary.

Dimensions for installation hole

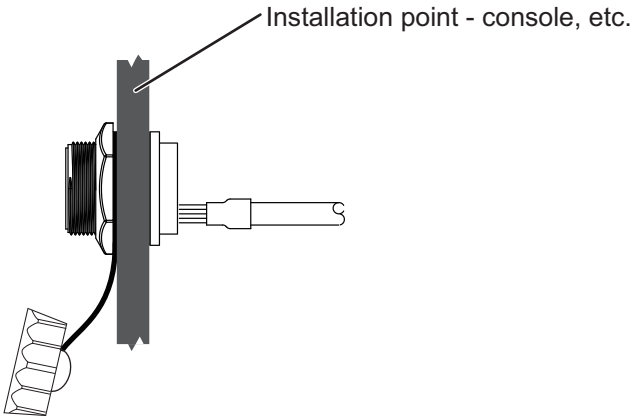


*Measurement units are in mm

3. Unfasten the nut.



4. Insert the cable into the installation hole from the rear.
5. Place the cap strap, then tighten the nut to secure the cable. See the figure below.

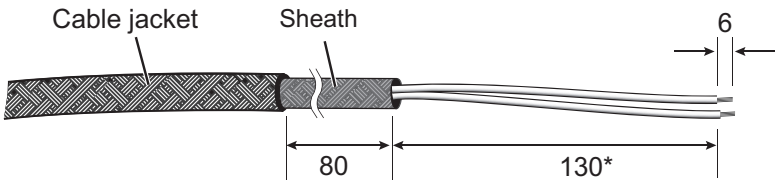


Note: Always screw the cap on when the extension cable is not in use.

2.1.3 Fabricating the power cables

For AC power, connect the unit with the supplied AC power cables. For DC power, fabricate DPYC-1.5 cable as shown below. Terminal block must also be fitted.

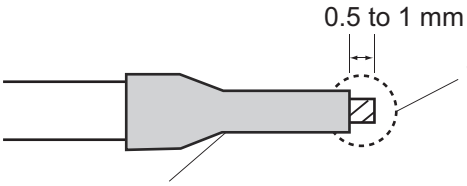
For cable clamp location, see paragraph 2.1.6.



* For flush mount installation, the length should be based on the installation location.

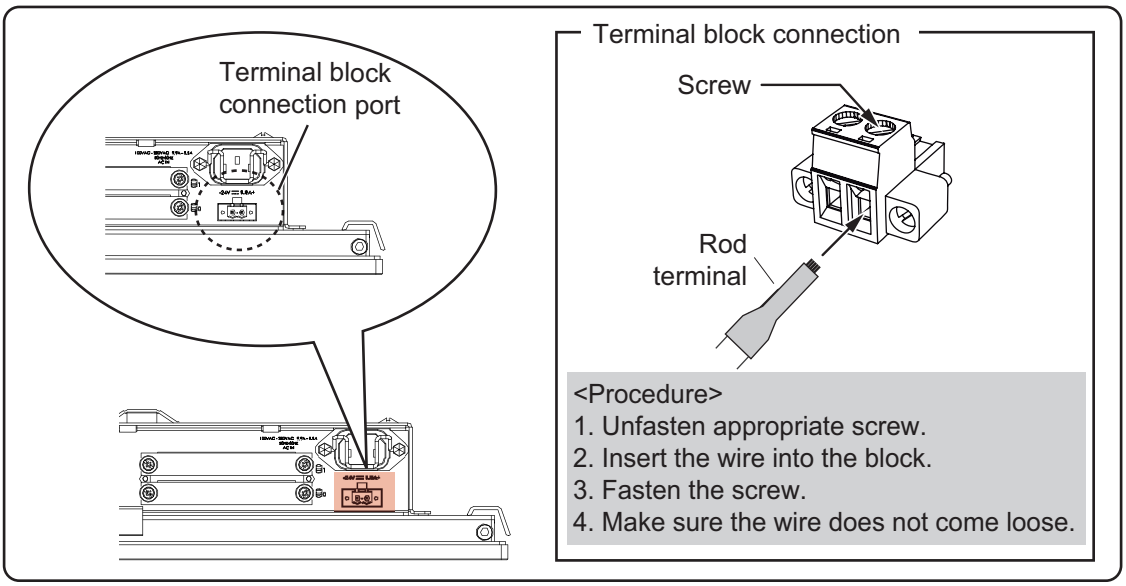
Attach rod terminal (type AI 1.5-6 BK) to each wire as shown below.

How to attach the rod terminal



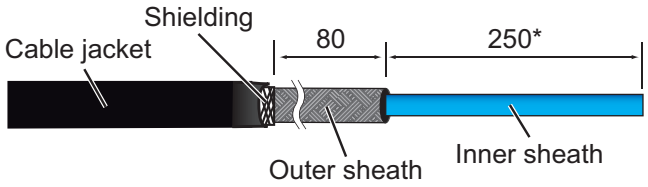
The core must protrude 0.5 to 1 mm past the rod terminal.

After attaching the rod terminal, use a crimping tool (CRIMPFOX 10S, option) to crimp.



2.1.4 Fabricating LAN cables

Fabricate the LAN cable (FR-FTPC-CY, DTI-C5E350 VCV), as shown below. (Wrap both edges of the armor with vinyl tape.) Confirm that the shield of the cable touches to the shell of the modular plug.



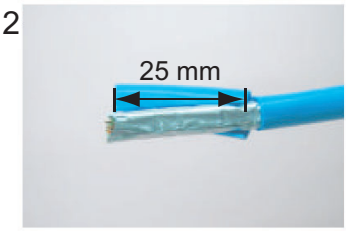
* For flush mount installation, the length should be based on the installation location.

Cover the cable jacket with insulated tape (20 mm width).

1

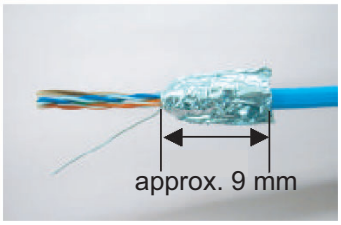
Expose inner sheath.

2



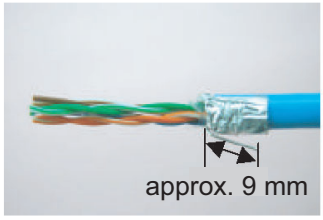
Remove the sheath by approx 25 mm. Be careful not to damage inner shield and cores.

3



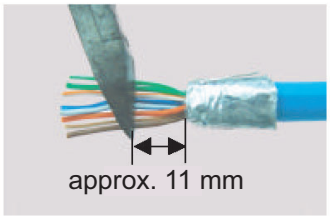
Fold back the shield, wrap it onto the outer sheath and cut it, leaving 9 mm.

4



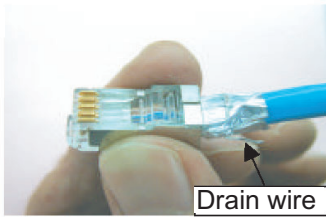
Fold back drain wire and cut it, leaving 9 mm.

5



Straighten and flatten the core in order and cut them, leaving 11 mm.

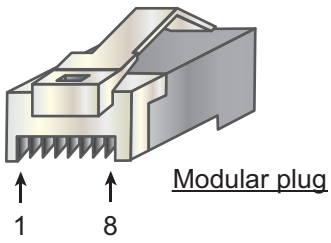
6



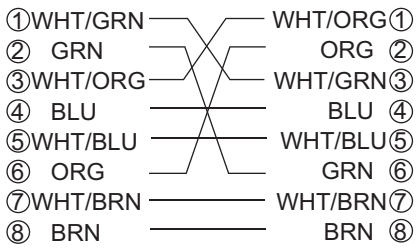
Insert the cable into the modular plug so that the folded part of the shield enters into the plug housing. The drain wire should be located on the tab side of the jack.

7

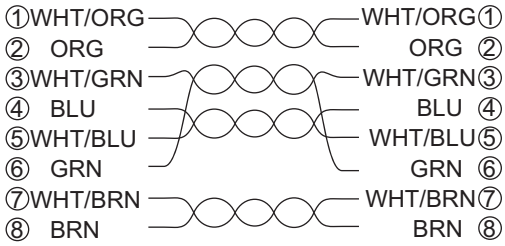
Using special crimping tool MPT5-8AS (PANDUIT CORP.), crimp the modular plug.
Finally check the plug visually.



[Cross cable]



[Straight cable]

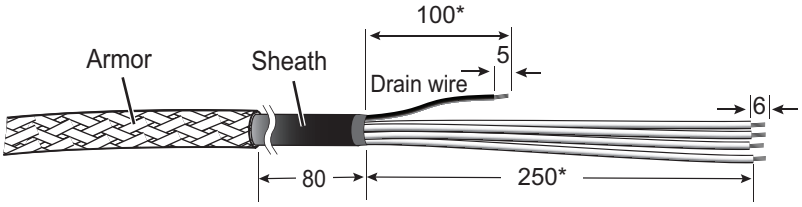


2.1.5 Fabricating, connecting TTYCSLA cable (JIS cable)

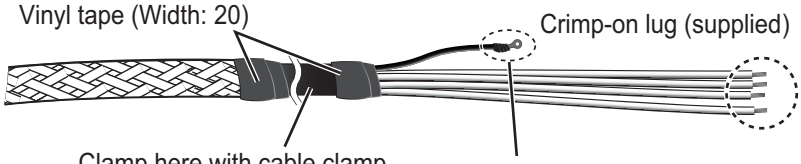
How to fabricate the TTYCSLA cable

Fabricate the TTYCSLA cables as shown below to connect them to the terminal block on the PCU-3010 (See the following page for how to connect wires to the terminal block.)

After fabricating the cable, attach the terminal block and EMI ferrite core (supplied). For how to attach the connector mount and EMI ferrite core, see the next page.



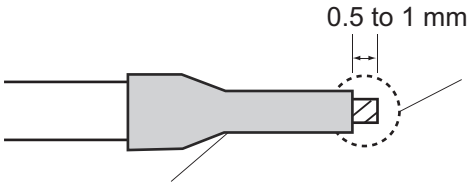
* For flush mount installation, the length should be based on the installation location.



Attach rod terminal (type AI 0.75-6 GY) to each wire as shown below.

Pass a heat shrink tube (local supply) onto the drain wire, then attach the crimp-on lug (supplied with the PCU-3010) to it.

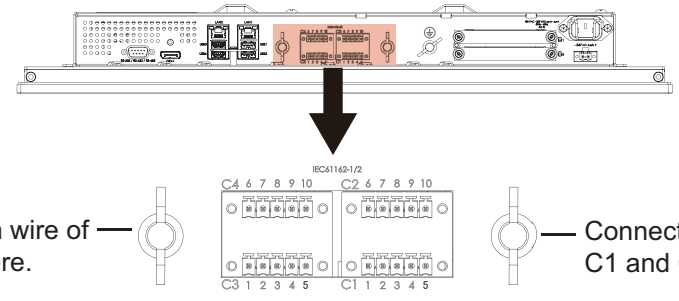
How to attach the rod terminal



The core must protrude 0.5 to 1 mm past the rod terminal.

After attaching the rod terminal, use a crimping tool (CRIMPFOX 10S, option) to crimp.

For flush mounted installations, connect the drain wires to respective terminal.

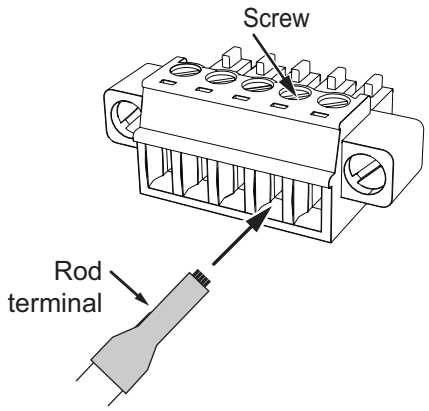


Connect drain wire of C3 and C4 here.

Connect drain wire of C1 and C2 here.

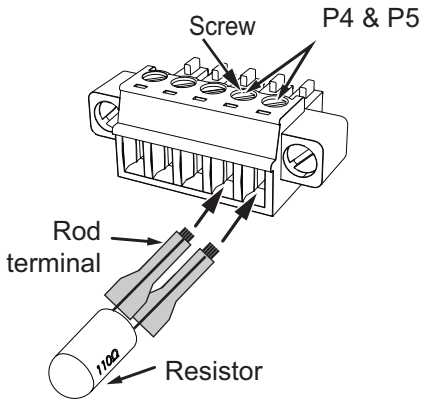
How to connect the TTYCSLA cable to the terminal block

Connectionfor IEC61162-1 lines



<Procedure>
1. Unfasten appropriate screw.
2. Insert the core wire into the block.
3. Fasten the screw.
4. Make sure the wire does not come loose.

Connection for IEC61162-2 lines



<Procedure>
1. Unfasten appropriate screw.
2. Insert the core wire with the resistor (supplied) into the connectors P4 & P5.
3. Fasten the screw.
4. Make sure the wire does not come loose.

How to attach the EMI ferrite core

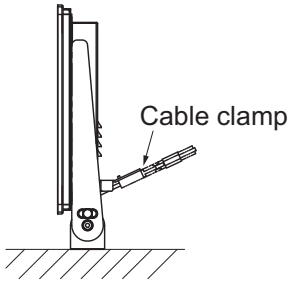
Attach the EMI ferrite core (supplied) to each connected cable group, as close to the Connector as possible, leaving the drain wire loose (See figure below).

How to set input/output specifications for terminal blocks C1 to C4

Port No.	PIN No.	Signal	In/ Out	Description	IEC61162-2	IEC61162-1
C1	1	TxD-	Out	Serial CH1,Output IEC61162-1/2	TTYCSLA-4	TTYCSLA-1Q
	2	TxD+	Out	Serial CH1,Output IEC61162-1/2		
	3	ISOGND	-	Isolation GND (CH1)		No connection
	4	RxD-	In	Serial CH1,Input IEC61162-1/2		TTYCSLA-1Q
	5	RxD+	In	Serial CH1,Input IEC61162-1/2		
C2	6	TxD-	Out	Serial CH2,Output IEC61162-1/2	TTYCSLA-4	TTYCSLA-1Q
	7	TxD+	Out	Serial CH2,Output IEC61162-1/2		
	8	ISOGND	-	Isolation GND (CH2)		No connection
	9	RxD-	In	Serial CH2,Input IEC61162-1/2		TTYCSLA-1Q
	10	RxD+	In	Serial CH2,Input IEC61162-1/2		
C3	1	TxD-	Out	Serial CH3,Output IEC61162-1	-	TTYCSLA-1Q
	2	TxD+	Out	Serial CH3,Output IEC61162-1		
	3	ISOGND	-	Isolation GND (CH3)		No connection
	4	RxD-	In	Serial CH3,Input IEC61162-1		TTYCSLA-1Q
	5	RxD+	In	Serial CH3,Input IEC61162-1		
C4	6	TxD-	Out	Serial CH4,Output IEC61162-1	-	TTYCSLA-1Q
	7	TxD+	Out	Serial CH4,Output IEC61162-1		
	8	ISOGND	-	Isolation GND (CH4)		No connection
	9	RxD-	In	Serial CH4,Input IEC61162-1		TTYCSLA-1Q
	10	RxD+	In	Serial CH4,Input IEC61162-1		

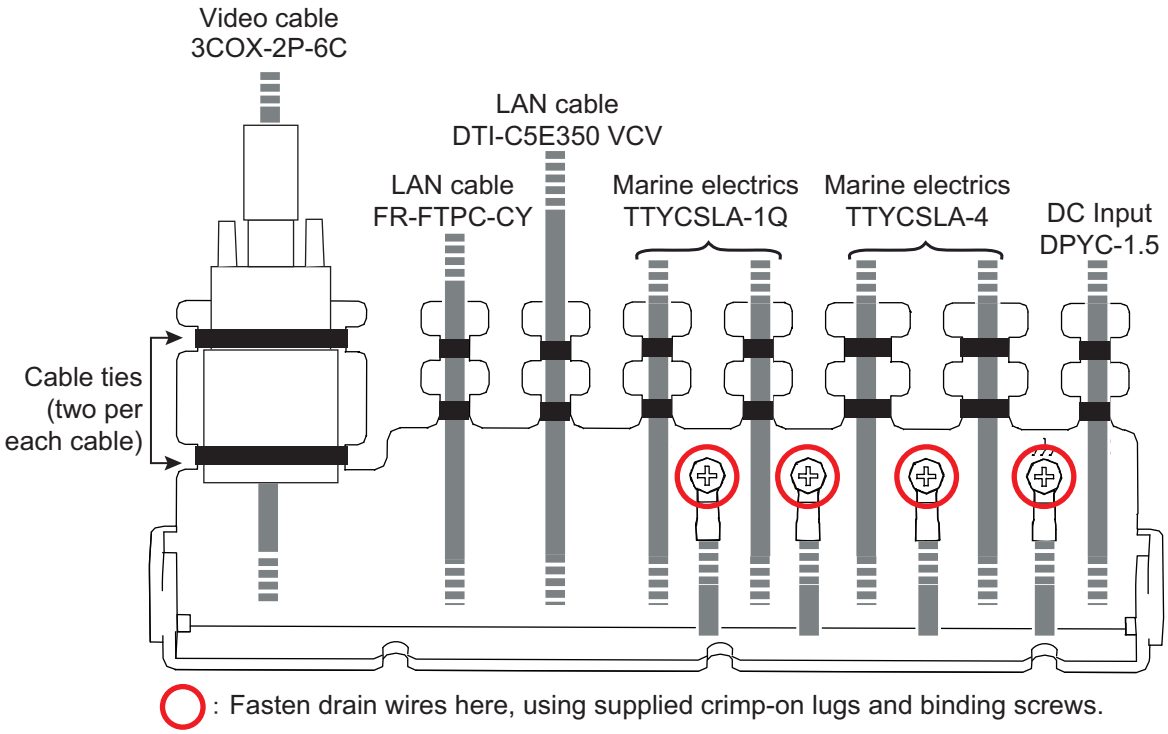
2.1.6 Securing cables to the cable clamp

When installing the unit with the desktop option, use the cable clamp to secure the electrical wiring, LAN cable, DC power cable, and video cable (3COX-2P-6C).



When not using the cable clamp, drain wires must be connected to the grounding point on the PCU-3010 (See the figure in paragraph 2.1.1).

When using the cable clamp, connect the drain wires of cables to the screws circled in the figure below. Fasten cables to the clamp with two cable ties for each cable. The cable ties should be 5mm in width.



2.1.7 Alert interface types and maximum number of alert interfaces

The PCU-3010 has the following alert interface types and quantities:

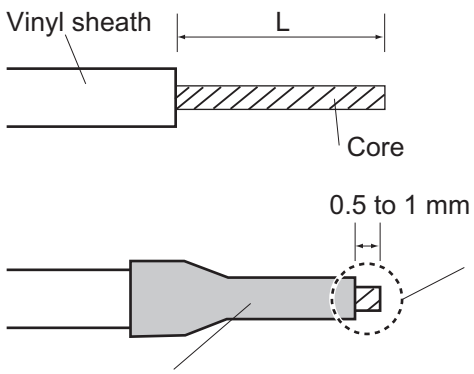
- IEC 61162-1/2 (2 ports)
- IEC 61162-1 (2 ports)
- IEC 61162-450 (1 port)

2.2 Sensor Adapters (Optional)

Maximum eight MC-3000S can be connected to a sensor network (for the redundant connection: 16). The MC-3000S (serial input/output, IEC61162-2/1, 4ch) can connect max. 10 sensor adapters using the MC1.5-W cables.

To connect the lines to the connector on the sensor adapter, use the rod terminal (ferrule type, supplied) to maintain performance. This fabrication requires the optional crimping tool (type: CRIMPFOX 10S).

How to attach ferrule-type lug



Ferrule-type lug	Length of "L"
AI 1.5-6 BK (BLK)	6 mm
AI 0.34-6 TQ (BLU)	
AI 0.75-6 GY (GREY)	
AI 1-6 RD (RED)	
AI 0.14-8 GY(GREY)	8 mm

For the relations between the connectors and rod terminals, see page AP-2. Also, the stickers attached on the reverse side of the covers show the detailed connections.

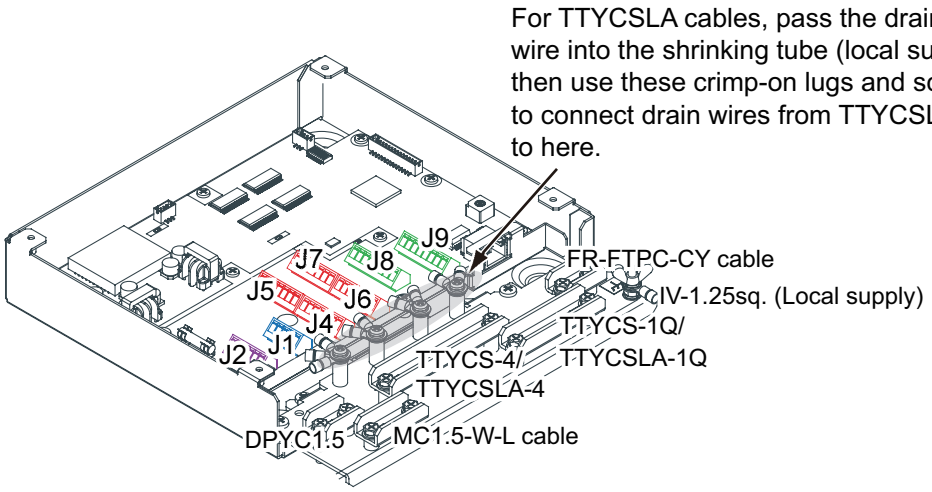
Use the MC1.5-W cable between the sensor adapters. Attach the cables to the applicable pins.

Pin No.	Cable color	Signal
1	Red	24V_OUT or 24V_IN
2	Black	24V_GND
3	White	MODBUS-A
4	Blue	MODBUS-B
5	Gray	GND

Note: The total length of the MC1.5-W cables should be less than 6 m to prevent malfunction.

2.2.1 MC-3000S connections

Unfasten four screws to remove the cover, pass the cables through the clamps and attach the cables to respective connectors. The shield part of the cable (or drain wire) must be fastened by (connected to) the clamp.



Note: Fasten the cable shield with the cable clamp.

How to set NC/NO output (J2)

The POWER FAIL signal on the connector J2 can be set to NC (normal close) output or NO (normal open) output as shown in the table below.

Pin#	Signal name	In/Out	Description	NO	NC
1	24V_IN	-	24 VDC	DPYC-1.5	
2	24V_GND	-	GND (24 VDC)		
3	PWR_FAIL_A	Out	Power fail output	TTYCS(LA)-1	No connection
4	PWR_FAIL_COM	Out	Power fail output		TTYCS(LA)-1
5	PWR_FAIL_B	Out	Power fail output	No connection	

How to set input specification (J4 to J9)

For connectors J4 to J7, the connections are different depending on the input specifications as shown below. Also, for J8 and J9, the signals which are input/output are shown.

Connector J4

Pin #	Signal name	In/ Out	Description	IEC61162-2	IEC61162-1
1	TD1-A	Out	Serial CH1, output IEC61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4
2	TD1-B	Out	Serial CH1, output IEC61162-1/2/modbus		
3	RD1-A	In	Serial CH1, input IEC61162-2/modbus		No connection
4	RD1-B	In	Serial CH1, input IEC61162-2/modbus		
5	ISOGND1	-	Isolation, GND (CH1)		
6	RD1-H	In	Serial CH1, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD1-C	In	Serial CH1, input IEC61162-1		

Connector J5

Pin #	Signal name	In/ Out	Description	IEC61162-2	IEC61162-1
1	TD2-A	Out	Serial CH2, output IEC61162-1/2/modbus	TTYCS(LA)-4	TTYCS(LA)-4
2	TD2-B	Out	Serial CH2, output IEC61162-1/2/modbus		
3	RD2-A	In	Serial CH2, input IEC61162-2/modbus		No connec-tion
4	RD2-B	In	Serial CH2, input IEC61162-2/modbus		
5	ISOGND2	-	Isolation, GND (CH2)		
6	RD2-H	In	Serial CH2, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD2-C	In	Serial CH2, input IEC61162-1		

Connector J6

Pin #	Signal name	In/ Out	Description	IEC61162-2	IEC61162-1
1	TD3-A	Out	Serial CH3, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD3-B	Out	Serial CH3, output IEC61162-1/2		
3	RD3-A	In	Serial CH3, input IEC61162-2		No connection
4	RD3-B	In	Serial CH3, input IEC61162-2		
5	ISOGND3	-	Isolation, GND (CH3)		
6	RD3-H	In	Serial CH3, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD3-C	In	Serial CH3, input IEC61162-1		

Connector J7

Pin #	Signal name	In/ Out	Description	IEC61162-2	IEC61162-1
1	TD4-A	Out	Serial CH4, output IEC61162-1/2	TTYCS(LA)-4	TTYCS(LA)-4
2	TD4-B	Out	Serial CH4, output IEC61162-1/2		
3	RD4-A	In	Serial CH4, input IEC61162-2		No connection
4	RD4-B	In	Serial CH4, input IEC61162-2		
5	ISOGND4	-	Isolation, GND (CH4)		
6	RD4-H	In	Serial CH4, input IEC61162-1	No connection	TTYCS(LA)-4
7	RD4-C	In	Serial CH4, input IEC61162-1		

Connector J8

Pin#	Signal name	In/Out	Description	Used cable
1	TD5-A	Out	Serial CH5, output IEC61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD5-B	Out	Serial CH5, output IEC61162-1	
3	RD5-H	In	Serial CH5, input IEC61162-1	
4	RD5-C	In	Serial CH5, input IEC61162-1	
5	TD6-A	Out	Serial CH6, output IEC61162-1	
6	TD6-B	Out	Serial CH6, output IEC61162-1	
7	RD6-H	In	Serial CH6, input IEC61162-1	
8	RD6-C	In	Serial CH6, input IEC61162-1	

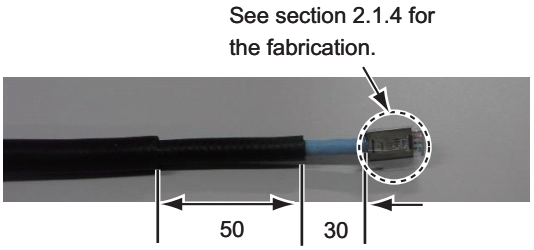
Connector J9

Pin#	Signal name	In/Out	Description	Used cable
1	TD7-A	Out	Serial CH7, output IEC61162-1	TTYCS-1Q or TTYCSLA-1Q
2	TD7-B	Out	Serial CH7, output IEC61162-1	
3	RD7-H	In	Serial CH7, input IEC61162-1	
4	RD7-C	In	Serial CH7, input IEC61162-1	
5	TD8-A	Out	Serial CH8, output IEC61162-1	
6	TD8-B	Out	Serial CH8, output IEC61162-1	
7	RD8-H	In	Serial CH8, input IEC61162-1	
8	RD8-C	In	Serial CH8, input IEC61162-1	

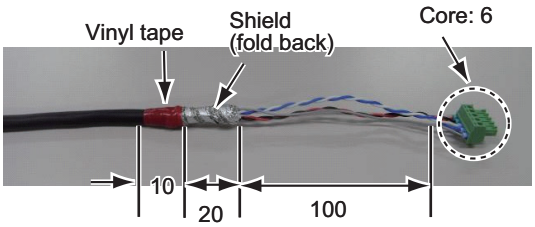
2.2.2 MC-3000S connection fabrications

Fabricate the cables to be connected to the MC-3000S referring to the figure below.

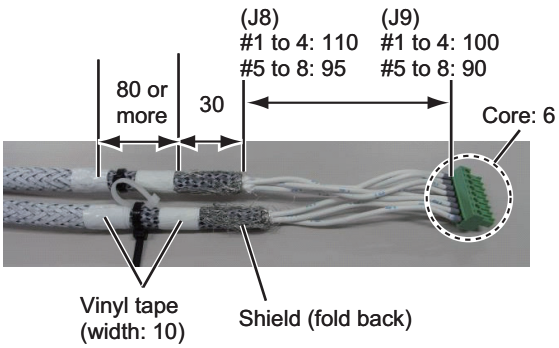
LAN cable (FR-FTPC-CY)



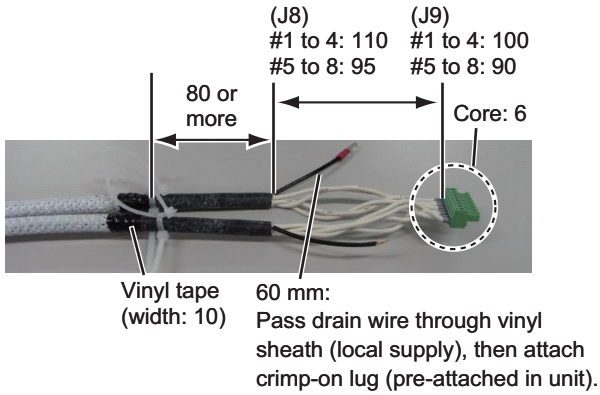
MC1.5-W-L600/1000/2000/3000 cable



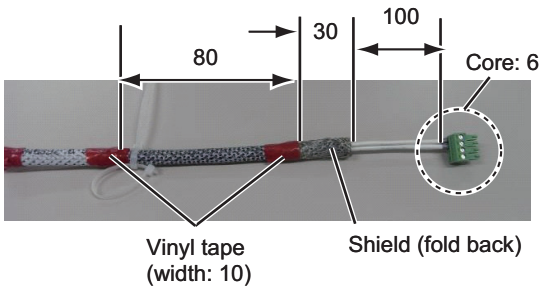
TTYCS-1Q cable



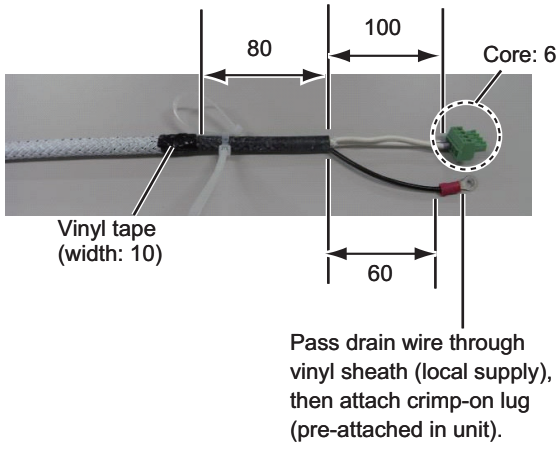
TTYCSLA-1Q cable



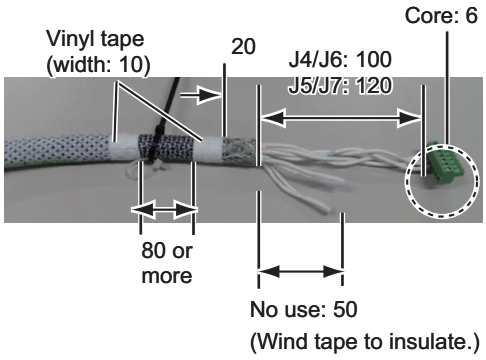
TTYCS-1 cable



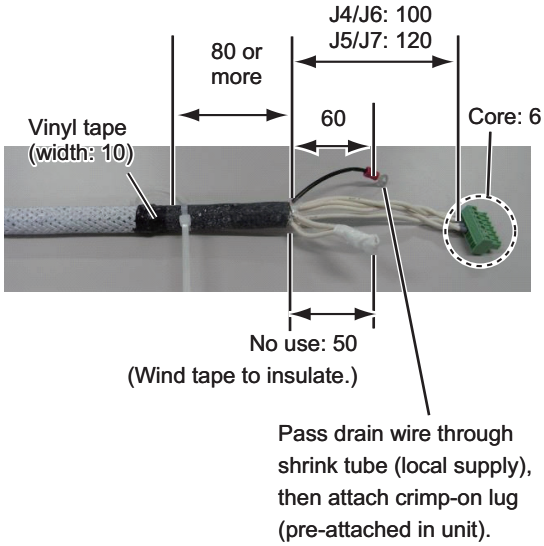
TTYCSLA-1 cable



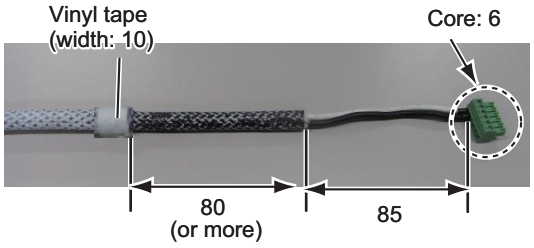
TTYCS-4 cable



TTYCSLA-4 cable

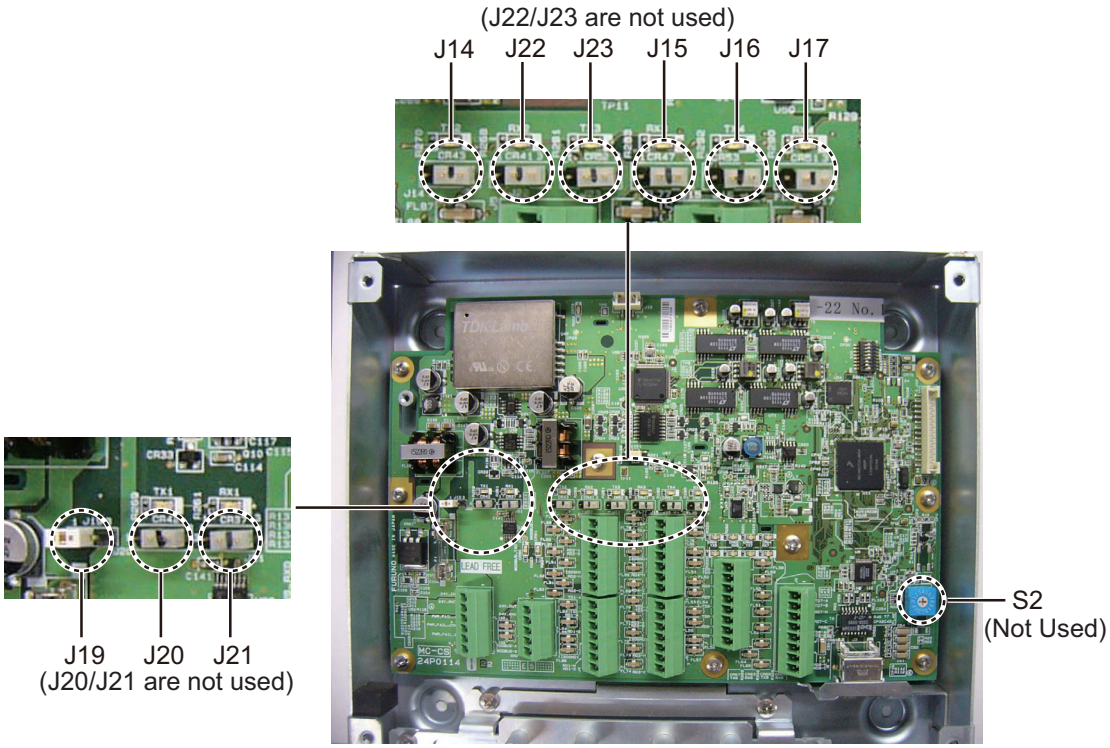


DPYC-1.5 cable



2.2.3 MC-3000S Jumper and MODBUS settings

Set the jumper blocks in the MC-CS Board (24P0114) referring to the tables that follow.



MC-CS Board (24P0114)

Setting termination resistors on the Jumper block:
Use the jumper block J19 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors should be set to ON. Use the MC-CS Board with the default setting because it becomes the “first” adapter in a series.

Jumper block J19		Connector J1
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Set the jumper blocks J14 through J17 to turn the termination resistors on connectors J4 through J7 respectively.

(Termination resistor ON)

- When setting the starting/ending terminal for the multipoint, or the multipoint is not connected (CH1 to 4).

(Terminal resistor OFF)

• When setting the terminal other than starting/ending for the multipoint (CH1 to 4).

Jumper block J14		Connector J4 (CH1)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J15		Connector J5 (CH2)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J16		Connector J6 (CH3)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

Jumper block J17		Connector J7 (CH4)
1-2	SHORT	Termination resistor: ON (default setting)
2-3	OPEN	
1-2	OPEN	Termination resistor: OFF
2-3	SHORT	

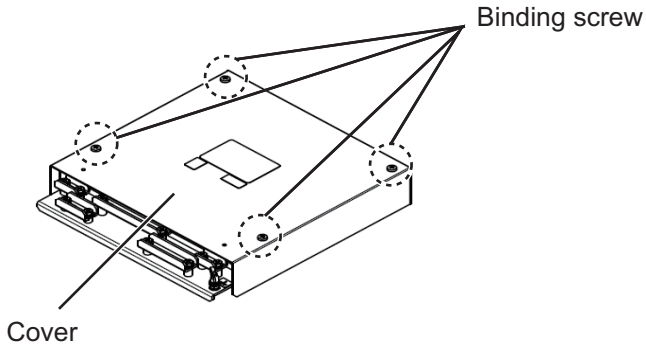
2.2.4 Waterproof case packing for MC-3000S (optional)

The optional kit OP24-28 protects the connectors on the MC-3000C to waterproofing standard IPX2.

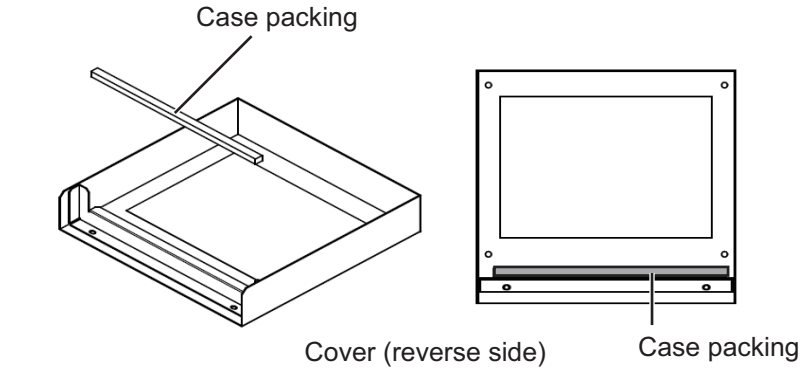
Case packing (type: OP24-28, code no.: 001-169-970)

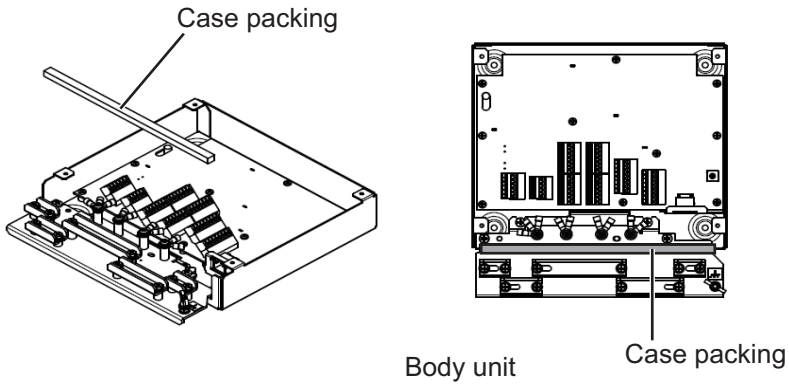
Name	Type	Code No.	Qty	Remarks
Case packing (serial)	21-014-2051	100-367-880-10	2	For MC-3000S

1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case packing, then attach the case packing to the reverse side of the cover and the body unit as shown below.

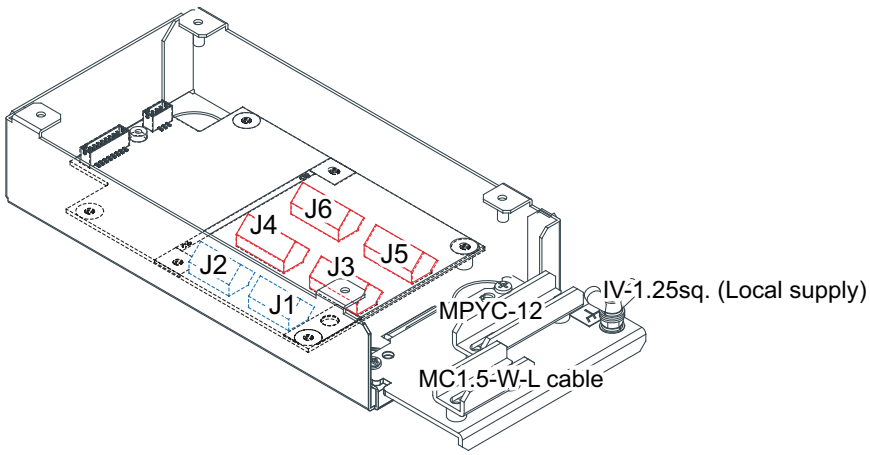




3. Attach the cover to the MC-3000S body unit.

2.2.5 MC-3020/3030D connections

- MC-3020D: Inputs digital signal (8ch contact input). Contact or voltage input is selectable (contact input requires jumper pins).
- MC-3030D: Outputs digital signal (8ch, normal open/close).



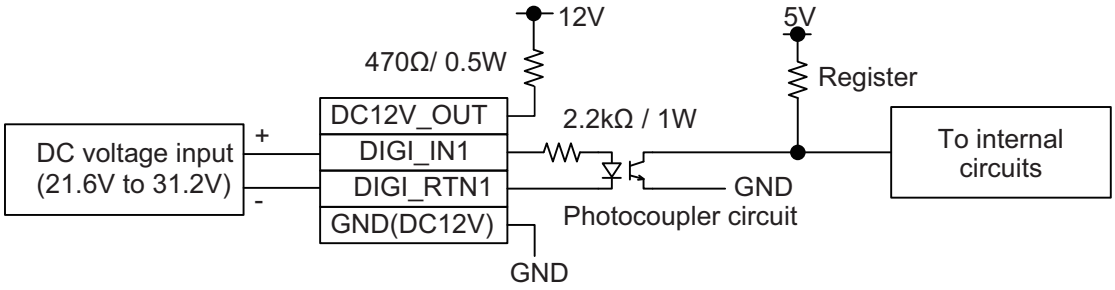
Note: Fasten the cable shield with the cable clamp.

MC-3020D/3030D

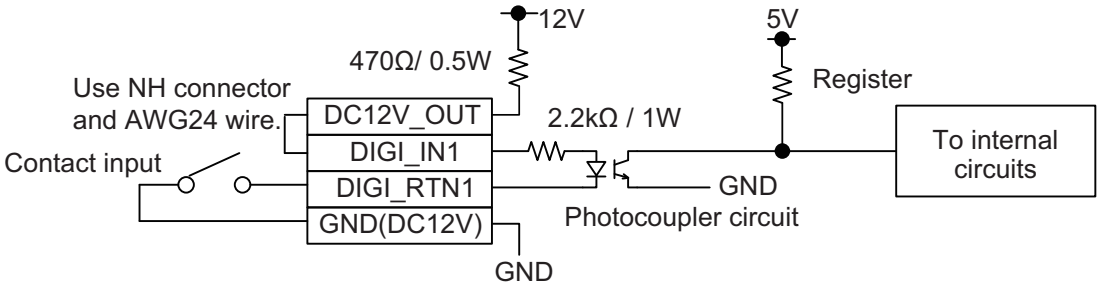
How to set ACK input (MC-3020D)

Use the connectors J3 to J6 on the MC-DIN Board (24P0116) to set the ACK input for ACK1 to ACK8 as shown below.

- Input circuit for voltage input



- Input circuit for contact input



Note: The input must not exceed the range of the input voltage, to prevent malfunction.
-Setting for voltage input: 21.6 V to 31.2 V
-Setting for contact input: Voltage cannot be input (contact signal only).

Connector J3

Pin #	Signal name	In/ Out	Remarks	ACK1 contact	ACK voltage	ACK2 contact	ACK2 voltage
1	DC12V_OUT	Out	ACK1 In	Pin #1-#2: short	No connection	Depending on ACK1 input	
2	DIGI_IN1	In			MPYC-12		
3	DIGI_RTN1	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK2 In	Depending on ACK2 input		Pin #1-#2: short	No connection
6	DIGI_IN2	In					MPYC-12
7	DIGI_RTN2	Out				MPYC-12	
8	GND (DC12V)	In					No connection

Connector J4

Pin #	Signal name	In/ Out	Remarks	ACK3 contact	ACK3 voltage	ACK4 contact	ACK4 voltage
1	DC12V_OUT	Out	ACK3 In	Pin#1-#2: short	No connection	Depending on ACK3 input-	
2	DIGI_IN3	In			MPYC-12		
3	DIGI_RTN3	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK4 In	Depending on ACK4 input		Pin #1-#2: short	No connection
6	DIGI_IN4	In					MPYC-12
7	DIGI_RTN4	Out				MPYC-12	
8	GND (DC12V)	In					No connection

Connector J5

Pin #	Signal name	In/ Out	Remarks	ACK5 contact	ACK5 voltage	ACK6 contact	ACK6 voltage
1	DC12V_OUT	Out	ACK5 In	Pin #1-#2: short	No connection	Depending on ACK5 input	
2	DIGI_IN5	In			MPYC-12		
3	DIGI_RTN5	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK6 In	Depending on ACK6 input-		Pin #1-#2: short	No connection
6	DIGI_IN6	In					MPYC-12
7	DIGI_RTN6	Out				MPYC-12	
8	GND (DC12V)	In					NO connection

Connector J6

Pin #	Signal name	In/ Out	Remarks	ACK7 contact	ACK7 voltage	ACK8 contact	ACK8 voltage
1	DC12V_OUT	Out	ACK1 In	Pin #1-#2: short	No connection	Depending on ACK7 input	
2	DIGI_IN7	In			MPYC-12		
3	DIGI_RTN7	Out		MPYC-12			
4	GND (DC12V)	In			No connection		
5	DC12V_OUT	Out	ACK2 In	Depending on ACK8 input		Pin #1-#2: short	No connection
6	DIGI_IN8	In					MPYC-12
7	DIGI_RTN8	Out				MPYC-12	
8	GND (DC12V)	In					NO connection

How to set alarm output (MC-3030D)

Use the connector J3 to J6 on the MC_OUT Board (24P0117) to select NC (normal close) or NO (normal open) for alarm output 1 to 8.

Connector J3

Pin #	Signal name	In/ Out	Remarks	Alarm1 NO Out	Alarm1 NC Out	Alarm2 NO Out	Alarm2 NC Out
1	A1	Out	Alarm1 Out	MPYC-12	No connection	-	
2	COM1				MPYC-12		
3	B1			No connection			
4	A2		Alarm2 Out	-		MPYC-12	No connection
5	COM2						MPYC-12
6	B2					No connection	

Connector J4

Pin #	Signal name	In/ Out	Remarks	Alarm3 NO Out	Alarm3 NC Out	Alarm4 NO Out	Alarm4 NC Out
1	A3	Out	Alarm3 Out	MPYC-12	No connection	-	
2	COM3				MPYC-12		
3	B3			No connection			
4	A4		Alarm4 Out	-		MPYC-12	No connection
5	COM4						MPYC-12
6	B4					No connection	

Connector J5

Pin #	Signal name	In/ Out	Remarks	Alarm5 NO Out	Alarm5 NC Out	Alarm6 NO Out	Alarm6 NC Out
1	A5	Out	Alarm5 Out	MPYC-12	No connection	-	
2	COM5				MPYC-12		
3	B5			No connection			
4	A6		Alarm5 Out	-		MPYC-12	No connection
5	COM6						MPYC-12
6	B6					No connection	

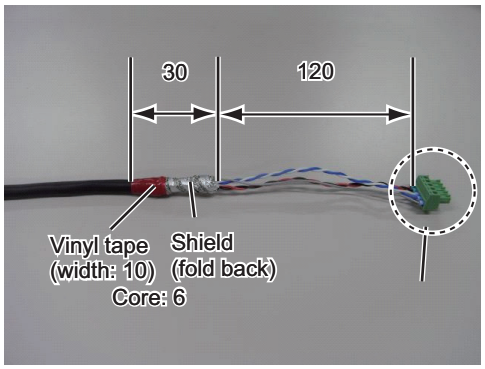
Connector J6

Pin #	Signal name	In/ Out	Remarks	Alarm7 NO Out	Alarm7 NC Out	Alarm8 NO Out	Alarm8 NC Out
1	A7	Out	Alarm7 Out	MPYC-12	No connection	-	
2	COM7				MPYC-12		
3	B7			No connection			
4	A8		Alarm8 Out	-		MPYC-12	No connection
5	COM8						MPYC-12
6	B8					No connection	

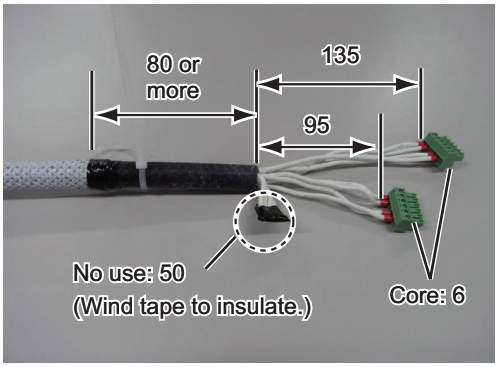
2.2.6 Cable fabrication for MC-3020D/3030D connections

Using the figures below for reference, fabricate the cables to be connected to the MC-3020D/3030D.

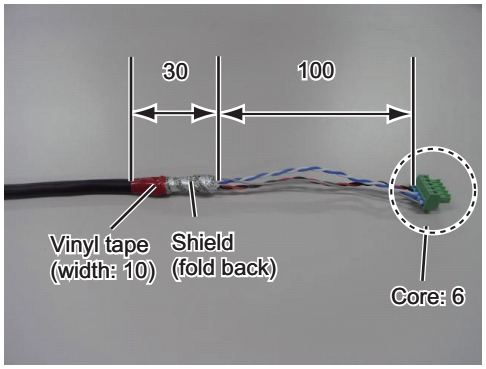
MC1.5-W-L600/1000/2000/3000 cable (Input)



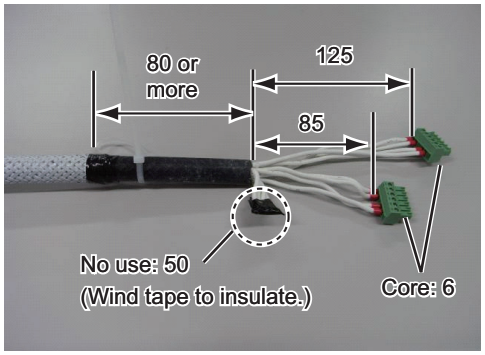
MPYC-12 cable (MC-3020D)



MC1.5-W-L600/1000/2000/3000 cable (Output)



MPYC-12 cable (MC-3030D)

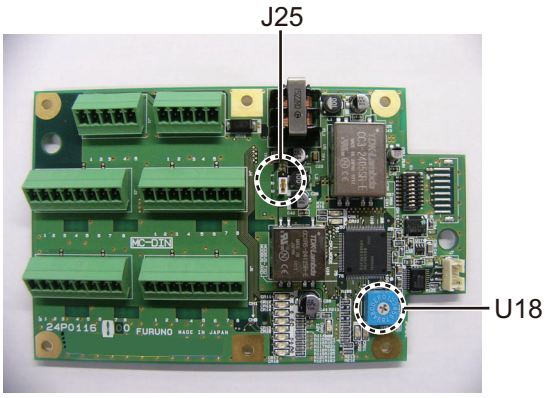


2.2.7 How to set jumper blocks in the sensor adapters

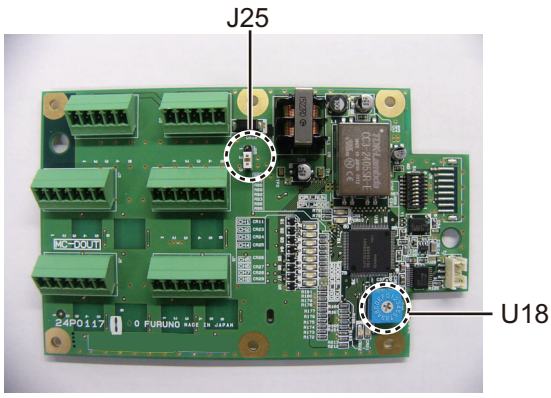
MC-3020D/3030D

This paragraph shows how to set the MC-DIN Board (24P0116, for MC-3020D) and MC-DOUT Board (24P0117, for MC-3030D).

Setting MODBUS addresses: Use the rotary switch (U18) to set the MODBUS address with a digit of number from "0". When multiple sensor adapters are connected to the MC-3000S, the same number cannot be used among them. (It is allowed to use the same number between the MC-3000S and a sensor adapter.)



MC-DIN Board (24P0116)



MC-OUT Board (24P0117)

Setting termination resistors on the Jumper block

Use the jumper block J25 to set the termination resistor on/off for the MODBUS communication on the connector J1. For the first and last sensor adapter in a series, their termination resistors should be set to ON. If not, communication between sensor adapters is not possible.

Jumper block J25		Connector J1
1-2	OPEN	Termination resistor: OFF (default setting)
2-3	SHORT	
1-2	SHORT	Termination resistor: ON
2-3	OPEN	

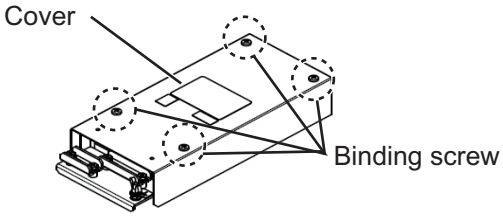
2.2.8 MC-3020D/3030D Waterproof case packing OP24-29 (Optional)

The optional kit OP24-29 protects the connectors on the MC-3020D/3030D to waterproofing standard IPX2.

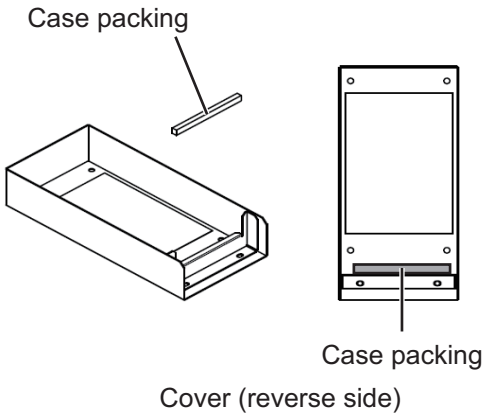
Case packing (type: OP24-29, code no.: 001-169-960)

Name	Type	Code No.	Qty	Remarks
Case packing (analog)	21-014-2052-2	100-367-961-10	2	MC-3020D/3030D

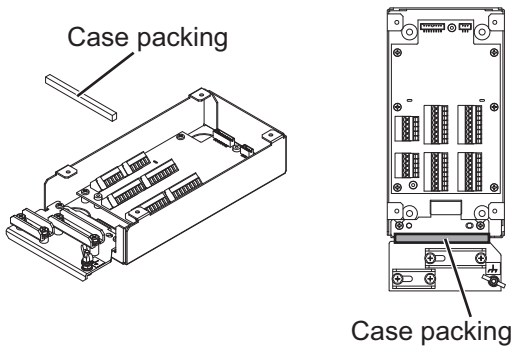
1. Unfasten four binding screws to remove the cover from the adapter.



2. Peel the paper from the case packing, then attach the case packing to the reverse side of the cover and the body unit as shown below.

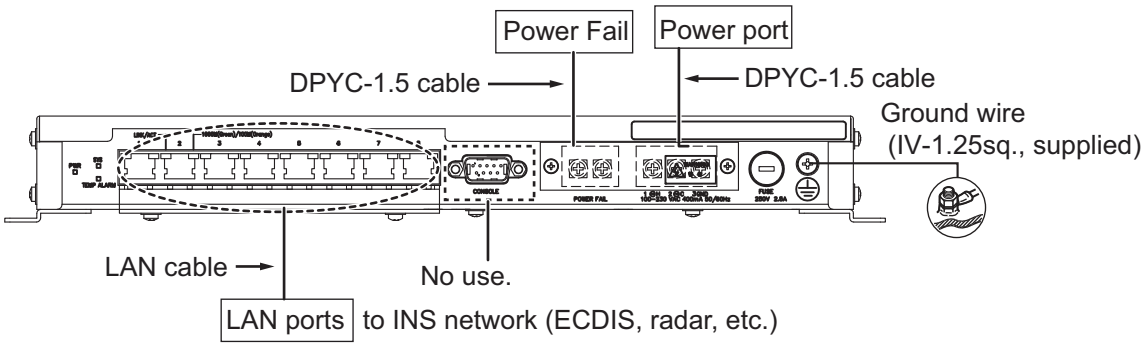


3. Attach the cover to the MC-3020D/3030D chassis.

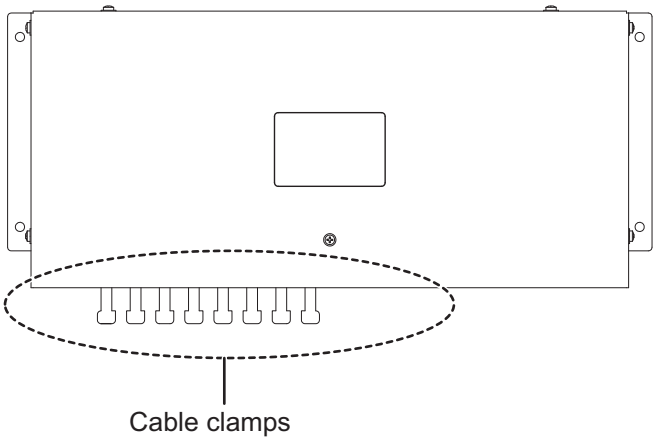


2.3 Intelligent HUB HUB-3000 (Optional)

Fix any LAN cables connected to the HUB-3000 to their respective cable clamps using cable ties (supplied).

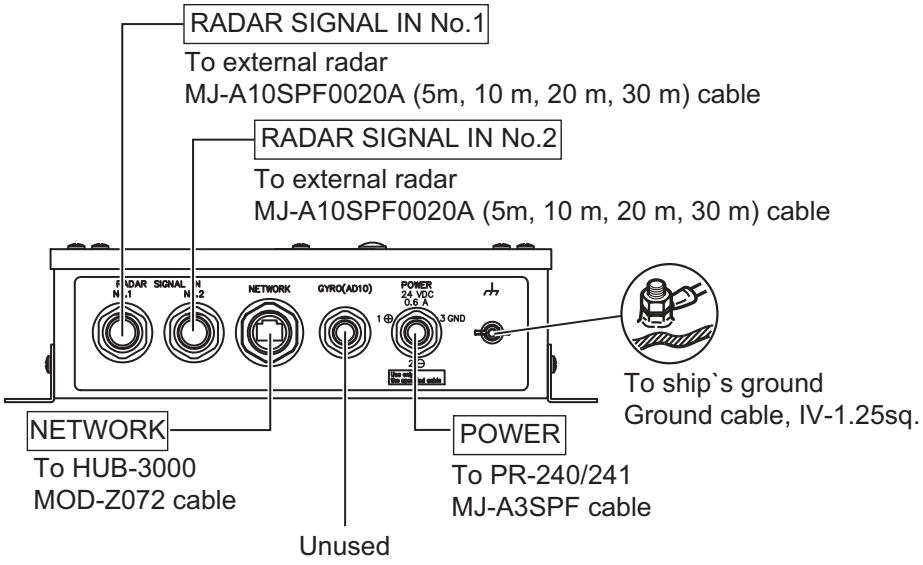


Attach the LAN cap (supplied) to the unused connector holes to provide waterproofing standard IPX2.



2.4 Radar Connection Box RCB-002 (Optional)

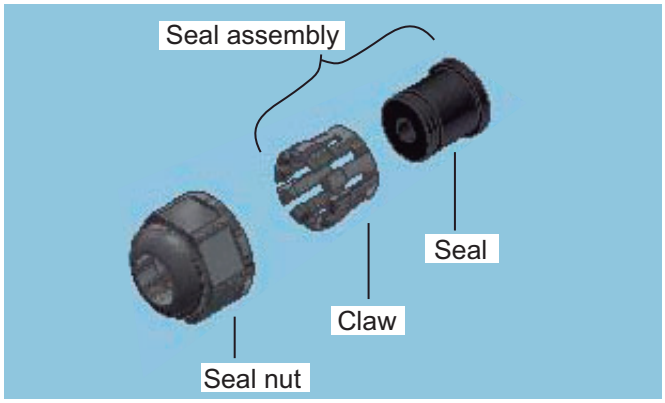
The Radar Connection Box (RCB-002) can connect a maximum of two radar systems to the PCU. Referring to the figure and table below, connect the respective equipment to the RCB-002.



Connecting LAN cables

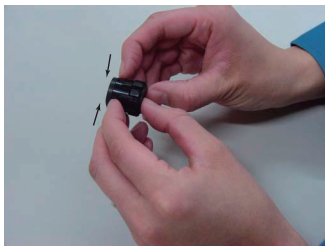
When connecting LAN cables (MOD-Z072) to the RCB-002, use the following procedure.

1. Unfasten and remove the sealing nut from the NETWORK port on the RCB-002, then remove the seal assembly. See the figure below for reference.



2. Dismantle the seal assembly as shown below.

Dismantling the seal assembly

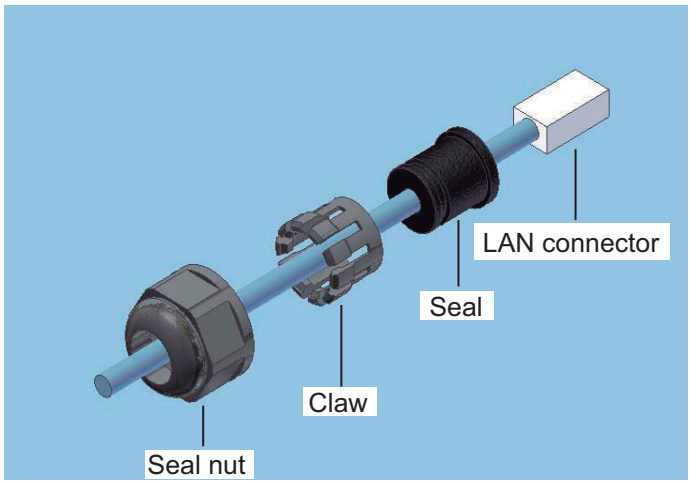


STEP 1:
Hold the fat end of the seal assembly with both thumbs while placing the index fingernails between the seal and the claw.

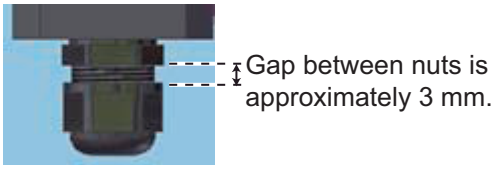
Use caution to avoid injury.

STEP 2:
Using the thumbs, gently push the seal out of the claw.

3. Referring to the figure below, pass the LAN cable through the seal nut, then the claw and finally the seal.



4. Connect the LAN cable to the connector.
5. Join the claw and seal to form the seal assembly, then firmly join the seal assembly to the LAN connector.
6. Fasten the seal nut and secure the cable. Continue to fasten the nut until the space between the two nuts is approximately 3 mm. See the figure below for reference.



2.4.1 Jumper settings for RCB-002

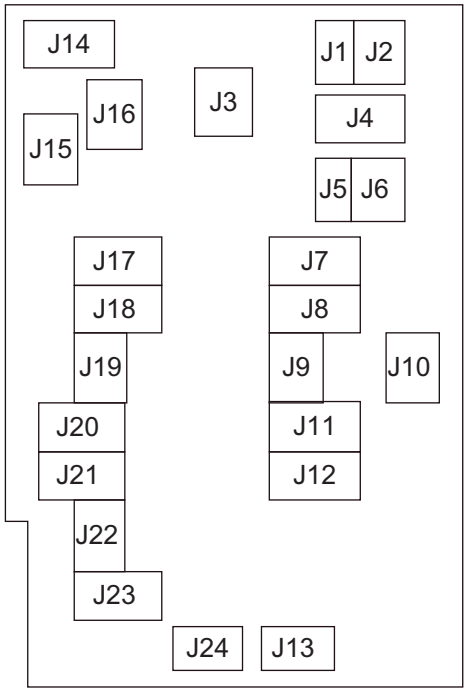
The RCB-002 is compatible with the following radars.

Maker	Model	Maker	Model
FURUNO*	• FAR-14×7 series • FAR-2××7 series • FAR-2××5 series • Model 1835	Japan Radio Company (JRC)	JMA-9100 series
		Tokyo Keiki Inc.	BR-3440 series
		*: FURUNO radars are only compatible with the CH2 (RADAR SIGNAL IN NO.2 port).	

Change the jumper settings on the RA/IF board (24P0140) according to the radar to be connected, referring the tables on the next page.

For details of the values for each jumper block on the RA/IF board (24P0140), see "RA/IF BOARD JUMPER VALUES" on page AP-7.

Jumper locations on the RA/IF board (24P0140)



CH1 settings (RADAR SIGNAL IN NO.1)

Using the table below for reference, change the jumper settings to suit the appropriate radar connection. Use the figure on the previous page for jumper locations.

Jumper	Radar to be connected	
	JMA-9100 series	BR-3440 series
J1	#2-3: short	
J2	#3-6: short	
J3	#2-6: short	#1-5: short
J4	#1-2: short	
J5	#2-3: short	
J6	#3-6: short	
J10	#3-7: short	#2-6: short
J13	#1-2: short	#2-3: short

CH2 settings (RADAR SIGNAL IN NO.2)

Using the table below for reference, change the jumper settings to suit the appropriate radar connection. Use the figure on the previous page for jumper locations.

Jumper	Radar to be connected		
	FURUNO radars	JMA-9100 series	BR-3440 series
J7	#2-3: short	#1-2: short	
J8	#1-2: short	#2-3: short	
J9	#1-4: short	#3-6: short	
J11	#2-3: short	#1-2: short	
J12	#1-2: short	#1-2: short	
J14	#2-3: short	#1-2: short	
J15	#2-3: short	#1-2: short	
J16	#2-6: short	#2-6: short	#1-5: short
J17	#2-3: short	#1-2: short	
J18	#1-2: short	#2-3: short	
J19	#1-4: short	#3-6: short	
J20	#2-3: short	#1-2: short	
J21	#2-3: short	#1-2: short	
J22	#3-7: short	#3-7: short	#2-6: short
J23	#2-3: short	#1-2: short	
J24	#1-2: short	#1-2: short	#2-3: short

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APPX. 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

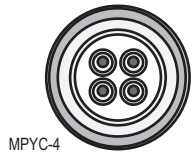
Y: Anticorrosive vinyl sheath

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 3 4 5 6
EX: TTYCYSLA - 4
Designation type — # of twisted pairs

1 2 3 4
MPYC - 4
Designation type — # of cores

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	TTYCSLA-1	0.75mm²	1.11mm	9.4mm
DPYC-2.5	2.5mm²	2.01mm	12.8mm	TTYCSLA-1T	0.75mm²	1.11mm	10.1mm
DPYC-4	4.0mm²	2.55mm	13.9mm	TTYCSLA-1Q	0.75mm²	1.11mm	10.8mm
DPYC-6	6.0mm²	3.12mm	15.2mm	TTYCSLA-4	0.75mm²	1.11mm	15.7mm
DPYC-10	10.0mm²	4.05mm	17.1mm	TTYCY-1	0.75mm²	1.11mm	11.0mm
DPYCY-1.5	1.5mm²	1.56mm	13.7mm	TTYCY-1T	0.75mm²	1.11mm	11.7mm
DPYCY-2.5	2.5mm²	2.01mm	14.8mm	TTYCY-1Q	0.75mm²	1.11mm	12.6mm
DPYCY-4	4.0mm²	2.55mm	15.9mm	TTYCY-4	0.75mm²	1.11mm	17.7mm
MPYC-2	1.0mm²	1.29mm	10.0mm	TTYCY-4SLA	0.75mm²	1.11mm	19.5mm
MPYC-4	1.0mm²	1.29mm	11.2mm	TTYCYSLA-1	0.75mm²	1.11mm	11.2mm
MPYC-7	1.0mm²	1.29mm	13.2mm	TTYCYSLA-4	0.75mm²	1.11mm	17.9mm
MPYC-12	1.0mm²	1.29mm	16.8mm	TTPYCSLA-1	0.75mm²	1.11mm	9.2mm
TPYC-1.5	1.5mm²	1.56mm	12.5mm	TTPYCSLA-1T	0.75mm²	1.11mm	9.8mm
TPYC-2.5	2.5mm²	2.01mm	13.5mm	TTPYCSLA-1Q	0.75mm²	1.11mm	10.5mm
TPYC-4	4.0mm²	2.55mm	14.7mm	TTPYCSLA-4	0.75mm²	1.11mm	15.3mm
TPYCY-1.5	1.5mm²	1.56mm	14.5mm				
TPYCY-2.5	2.5mm²	2.01mm	15.5mm				
TPYCY-4	4.0mm²	2.55mm	16.9mm				

APPX. 2 ROD TERMINALS

PCU-3010

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable	
				IEC61162-2	IEC61162-1
C1	1	TxD-	AI 0.75-6 GY	TTYCSLA-4	TTYCSLA-1Q
	2	TxD+			
	3	ISOGND			No connection
	4	RxD-			TTYCSLA-1Q
	5	RxD+			
C2	6	TxD-	AI 0.75-6 GY	TTYCSLA-4	TTYCSLA-1Q
	7	TxD+			
	8	ISOGND			No connection
	9	RxD-			TTYCSLA-1Q
	10	RxD+			
C3	1	TxD-	AI 0.75-6 GY	-—	TTYCSLA-1Q
	2	TxD+			
	3	ISOGND			No connection
	4	RxD-			TTYCSLA-1Q
	5	RxD+			
C4	6	TxD-	AI 0.75-6 GY	-—	TTYCSLA-1Q
	7	TxD+			
	8	ISOGND			No connection
	9	RxD-			TTYCSLA-1Q
	10	RxD+			

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
24V IN	-—	24V+	AI 1.5-6 BK	DPYC-1.5
	-—	24V-	AI 1.5-6 BK	

MC-3000S, MC-CS Board (24P0114)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_VOUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_IN	AI 1.5-6 BK (black)	DPYC-1.5
	2	24V_GND		
	3	PWR_FAIL-A	AI 0.75-6 GY (Gray)	TTYCS-4 TTYCSLA-4
	4	PWR_FAIL-COM		
	5	PWR_FAIL-B		
	6	NC	-	-

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4	1	TD1-A	AI 0.75-6 GY (Gray)	TTYCS-4 TTYCSLA-4
	2	TD1-B		
	3	RD1-A		
	4	RD1-B		
	5	ISOGND1		
	6	RD1-H		
	7	RD1-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5	1	TD2-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD2-B		
	3	RD2-A		
	4	RD2-B		
	5	ISOGND2		
	6	RD2-H		
	7	RD2-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6	1	TD3-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD3-B		
	3	RD3-A		
	4	RD3-B		
	5	ISOGND3		
	6	RD3-H		
	7	RD3-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J7	1	TD4-A	AI 0.75-6 GY (gray)	TTYCS-4 TTYCSLA-4
	2	TD4-B		
	3	RD4-A		
	4	RD4-B		
	5	ISOGND4		
	6	RD4-H		
	7	RD4-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J8	1	TD5-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD5-B		
	3	RD5-H		
	4	RD5-C		
	5	TD6-A		TTYCS-1Q TTYCSLA-1Q
	6	TD6-B		
	7	RD6-H		
	8	RD6-C		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J9	1	TD7-A	AI 0.75-6 GY (gray)	TTYCS-1Q TTYCSLA-1Q
	2	TD7-B		
	3	RD7-H		
	4	RD7-C		
	5	TD8-A		TTYCS-1Q TTYCSLA-1Q
	6	TD8-B		
	7	RD8-H		
	8	RD8-C		

MC-3020D, MC-DIN Board (24P0116)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J3*	1	DV12V_OUT1	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN1		
	3	DIGI_RTN1		
	4	GND		
	5	DC12V_OUT2		
	6	DIGI_IN2		
	7	DIGI_RTN2		
	8	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4*	1	DV12V_OUT3	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN3		
	3	DIGI_RTN3		
	4	GND		
	5	DC12V_OUT4		
	6	DIGI_IN4		
	7	DIGI_RTN4		
	8	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5*	1	DV12V_OUT5	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN5		
	3	DIGI_RTN5		
	4	GND		
	5	DC12V_OUT6		
	6	DIGI_IN6		
	7	DIGI_RTN6		
	8	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6*	1	DV12V_OUT7	AI 1-6 RD (red)	MPYC-12
	2	DIGI_IN7		
	3	DIGI_RTN7		
	4	GND		
	5	DC12V_OUT8		
	6	DIGI_IN8		
	7	DIGI_RTN8		
	8	GND		

*: Pin #1 and 5: no cable connection. However the jumper connection is necessary between #1 and 2 and #5 and 6 depending on the input specification.

MC-3030D, MC-DOUT Board (24P0117)

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J1	1	24V_IN	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J2	1	24V_OUT	AI 0.34-6 TQ (blue)	MC1.5-W-Lxxx
	2	24V_GND		
	3	MODBUS-A	AI 0.14-8 GY (gray)	
	4	MODBUS-B		
	5	GND		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J3	1	A1	AI 1-6 RD (red)	MPYC-12
	2	COM1		
	3	B1		
	4	A2		
	5	COM2		
	6	B2		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J4	1	A3	AI 1-6 RD (red)	MPYC-12
	2	COM3		
	3	B3		
	4	A4		
	5	COM4		
	6	B4		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J5	1	A5	AI 1-6 RD (red)	MPYC-12
	2	COM5		
	3	B5		
	4	A6		
	5	COM6		
	6	B6		

Connector #	Pin #	Signal name	Rod terminal to use	Connected cable
J6	1	A7	AI 1-6 RD (red)	MPYC-12
	2	COM7		
	3	B7		
	4	A8		
	5	COM8		
	6	B8		

APPX. 3 RA/IF BOARD JUMPER VALUES

The values for each jumper block on the RA/IF board (24P0140) are shown below.

CH1/CH2 signal settings

J1/J8 HD-TERM	
1-2	1.2 kΩ
2-3	OFF

J2/J9 HD-PULL UP	
1-4	5V IN
2-5	OC (560Ω)
3-6	OC (1 kΩ)

J3/J16 VID-TERM	
1-5	75Ω
2-6	50Ω
3-7	1.2 kΩ
4-8	100 kΩ

J4/J12 HD-POLARITY	
1-2	NORMAL
2-3	REVERSE

J5/J18 BP-TERM	
1-2	1.2 kΩ
2-3	OFF

J6/J19 BP-PULL UP	
1-4	5V IN
2-5	OC (560Ω)
3-6	OC (1 kΩ)

J10/J22 TRG-TERM	
1-5	50Ω
2-6	75Ω
3-7	180kΩ
4-8	1.2 kΩ

J13/J24 BP-PULSE NUM	
1-2	2048
2-3	1024

Input bypass settings (CH2 only)

J7/J11 HD-INTERFACE	
1-2	ADJUST
2-3	BYPASS

J14/J15 VID-INTERFACE	
1-2	ADJUST
2-3	BYPASS

J17/J20 BP-INTERFACE	
1-2	ADJUST
2-3	BYPASS

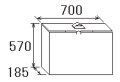
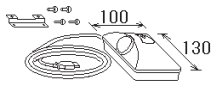
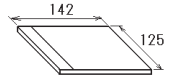
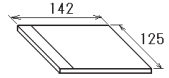
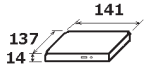
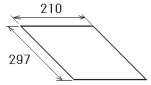
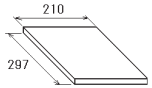
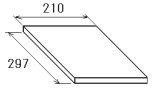
J21/J23	
1-2	ADJUST
2-3	BYPASS

PACKING LIST

24AN-X-9851 -19 1/1

FMD-3100-E ,FMD-3100-J

A-1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾊﾟﾈﾙPC部箱詰品 PANEL COMPUTER UNIT COMPLETE SET		PCU-3010-* 000-037-184-00 **	1
ﾄﾗｯｸﾎﾞｰﾙ操作部 TRACKBALL CONTROL UNIT		RCU-030 000-024-900-00 **	1
付属品 ACCESSORIES			
DVD-R書込品 FMD-3100 INSTALL DVD		2450112- 001-567-120-00	1 (*3)
DVD-R書込品 FMD-3100 INSTALL DVD		2450112- 001-624-690-00	1 (*3)
DVDﾄﾞﾗｲﾌﾞ DVD DRIVE		DVSM-PLV8U2-BKB 000-197-328-11	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP24-03102 001-567-110-00	1
図書 DOCUMENT			
ﾄﾞﾝｸﾞﾙｲﾝﾌｫﾒｰｼｮﾝｼｰﾄ DONGLE INFORMATION SHEET		999-999-085-0*	1 (*)
取扱説明CD OPERATOR'S MANUAL CD		FMD310X O/M *CD-ROM* 000-196-491-1*	1
装備要領書（英） INSTALLATION MANUAL (EN)		IME-44841-* 000-196-497-1*	1 (*1)
装備要領書（和） INSTALLATION MANUAL (JP)		IMJ-44842-* 000-199-425-1*	1 (*2)

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。
1.CODE NUMBER ENDING WITH "**" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL.
2.(*1)の書類は、英文仕様専用。(*2)の書類は、和文仕様専用。
2.(*1) MARKED DOCUMENTS ARE FOR ENGLISH SET ONLY.(*2) MARKED DOCUMENTS ARE FOR JAPANESE SET ONLY.
3.(*)は、ﾀﾞﾐｰｺｰﾄﾞに付き、注文できません。
3.(*) THIS CODE CANNOT BE ORDERED.
4.(*3):仕様により選択。和文(-J)仕様は00156712000、それ以外は00162469000になります。
4.(*3) : SELECT ONE ACCORDING TO SPECIFICATIONS : 00156712000 FOR JAPANESE(-J) SPEC ONLY.

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

C4484-Z01-V

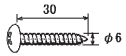
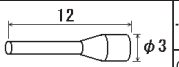
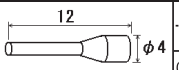
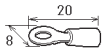
A-2

FURUNO

CODE NO.	001-567-110-00	24AN-X-9404 -1
TYPE	CP24-03102	1/1

工事材料表

INSTALLATION MATERIALS

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		6X30 SUS304 CODE NO. 000-162-614-10	6	
2	ﾌｪﾙｰﾙ(ﾎﾞｳﾀﾝｼ) FERRULE CRIMPING TERMINAL		AI 0,75-6 GY CODE NO. 000-176-411-11	22	
3	ﾌｪﾙｰﾙ(ﾎﾞｳﾀﾝｼ) FERRULE CRIMPING TERMINAL		AI 1,5-6 BK AI 1,5-6 BK CODE NO. 000-176-412-11 000-176-412-10	3	
4	圧着端子 CRIMP-ON LUG		FV1.25-4(LF) RED K CODE NO. 000-166-666-11	6	

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 UPPERPRODUCT. QUALITY IS THE SAME.

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

FURUNO ELECTRIC CO ., LTD.

C4484-M04-B

FURUNO

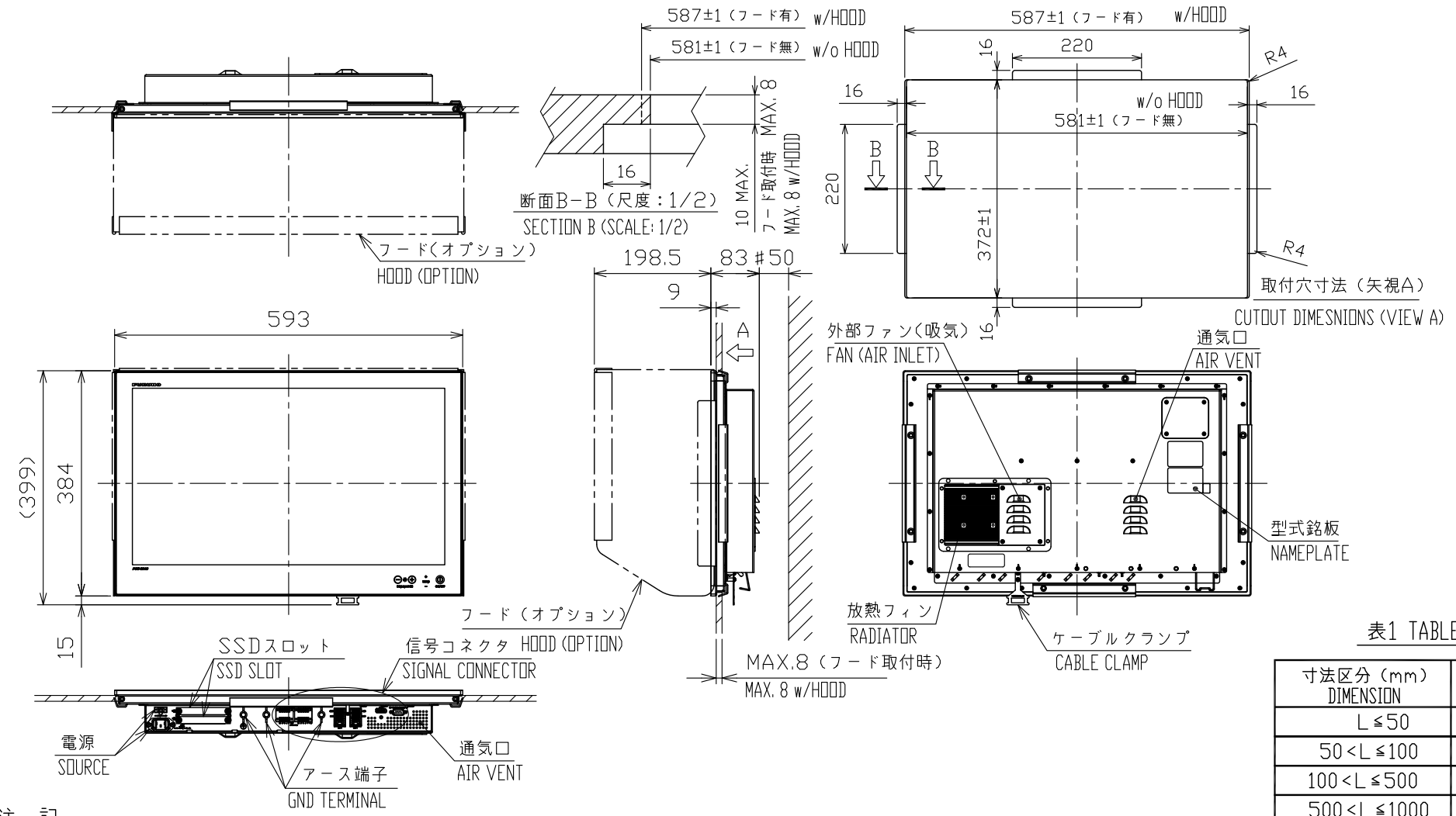


表1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4

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。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.

DRAWN 26/Dec/2019 T.YAMASAKI		TITLE PCU-3010
CHECKED 26/Dec/2019 H.MAKI		名称 パネルPC部（埋込装備）
APPROVED 26/Dec/2019 H.MAKI	FMD-3100	外寸図
SCALE 1/10 MASS 11.2 ±10% kg	質量はケーブル・オプションを含まず。 MASS DOES NOT INCLUDES CABLE/OPTION.	NAME PANEL COMPUTER UNIT (FLUSH MOUNT)
DWG.No. C4484-G06- D	REF.No. 24-016-101G-3	OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

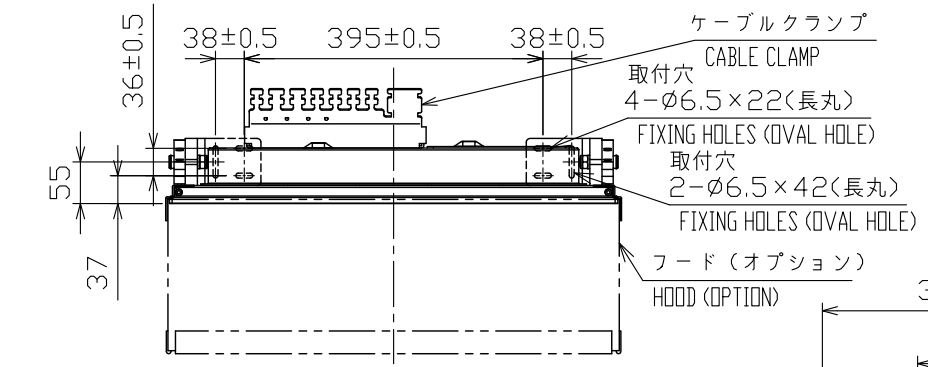
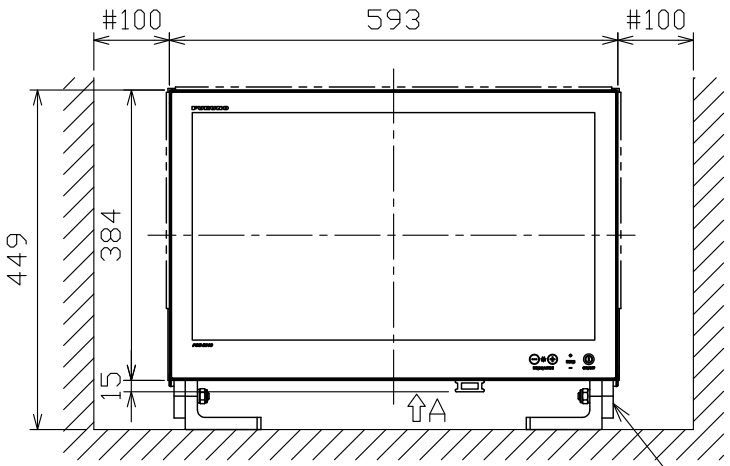
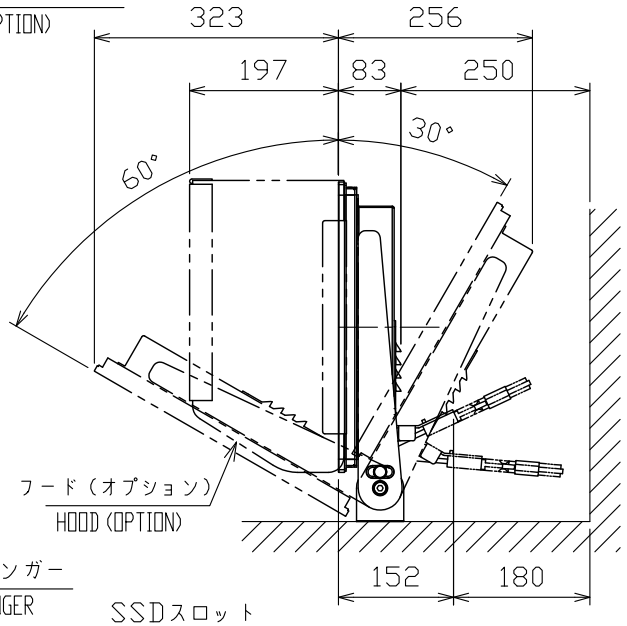
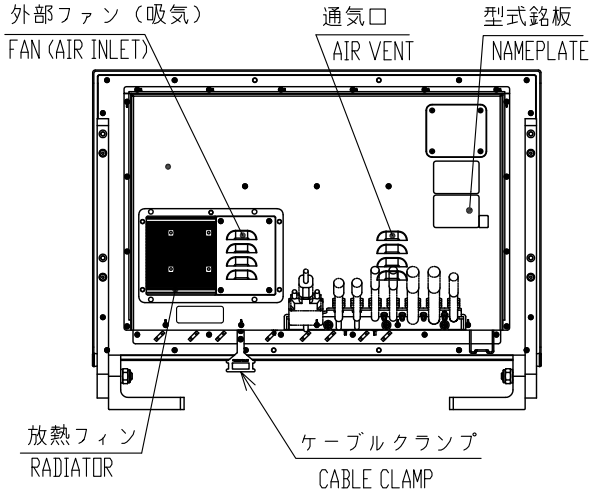


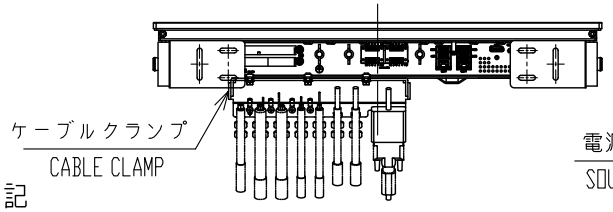
表1 TABLE 1

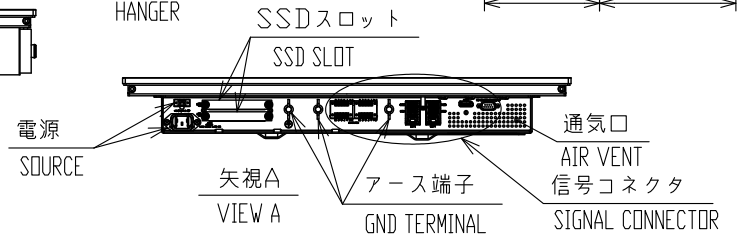
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4











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。

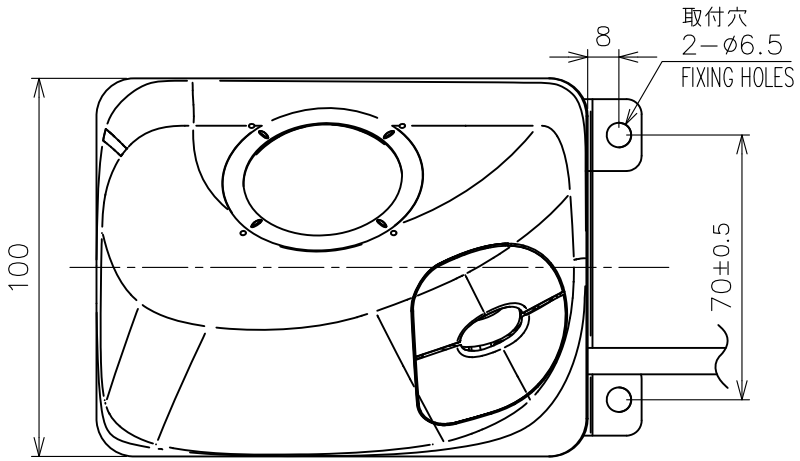
3）取付用ネジはトラスタッピンネジ呼び径6×30またはM6ボルトを使用のこと。

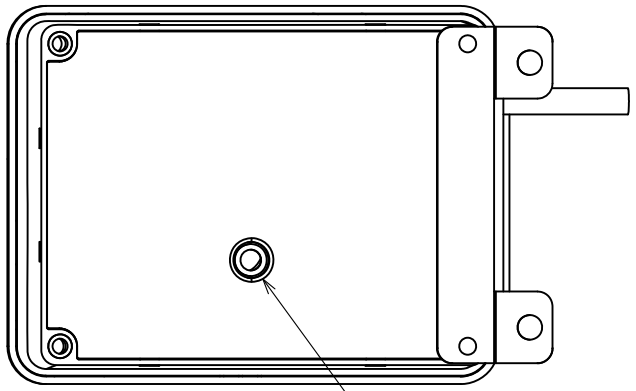
NOTE

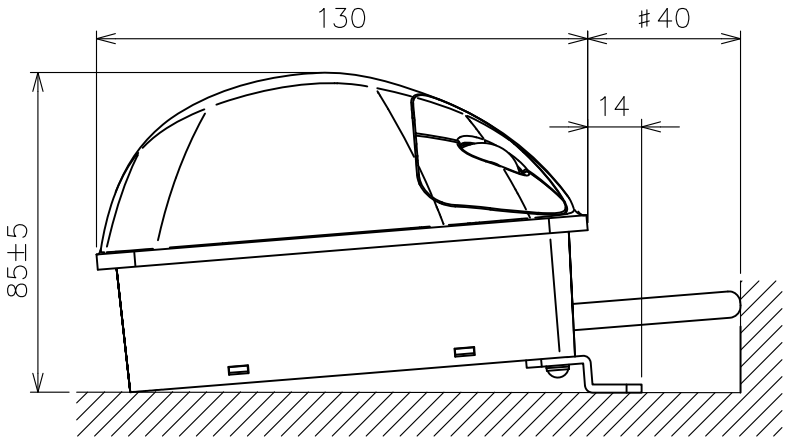
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø6x30 OR M6 BOLTS FOR FIXING THE UNIT.

DRAWN 26/Dec/2019 T.YAMASAKI		TITLE	PCU-3010
CHECKED 26/Dec/2019 H.MAKI		名称	パネルPC部（卓上装備）
APPROVED 26/Dec/2019 H.MAKI	FMD-3100		外寸図
SCALE 1/10 MASS 13.3 ±10% kg	質量はケーブル・オプションを含まず。 MASS DOES NOT INCLUDES CABLE/OPTION.	NAME	PANEL COMPUTER UNIT (TABLETOP MOUNT)
DWG.No. C4484-G07-D	REF.No. 24-016-201G-3		OUTLINE DRAWING

FURUNO







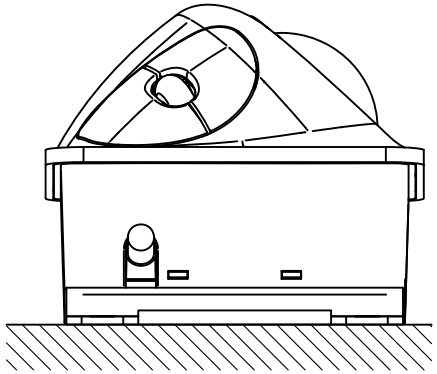


表1 TABLE 1

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

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/Nov/2013 T.YAMASAKI		TITLE	RCU-030
CHECKED 6/Nov/2013 H.MAKI		名称	トラックボール操作部（取付金具）
APPROVED 7/Nov/2013 H.MAKI	FMD-3100		外寸図
SCALE 1/2 MASS 0.4 ±10% kg	質量は2mケーブルを含む。 MASS INCLUDES 2m CABLE.	NAME	TRACKBALL CONTROL UNIT (FIXTURE MOUNT)
DWG.No. C4484-G01- A	REF.No. 24-016-110G-0		OUTLINE DRAWING

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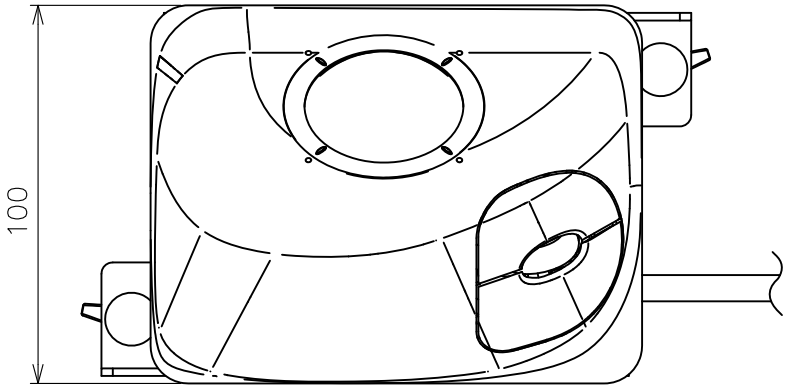
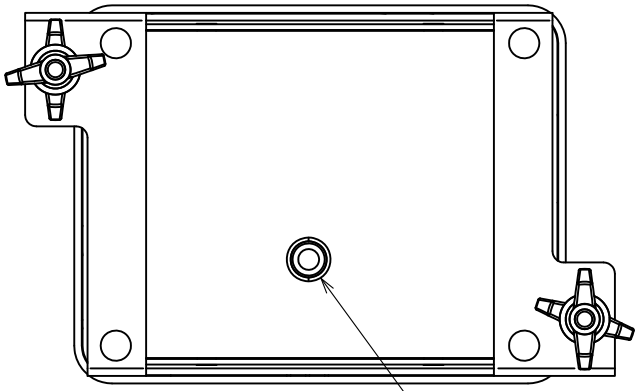
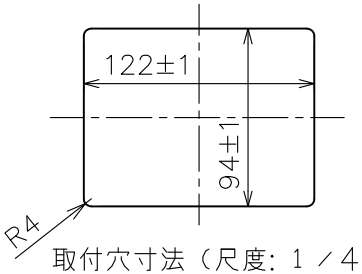


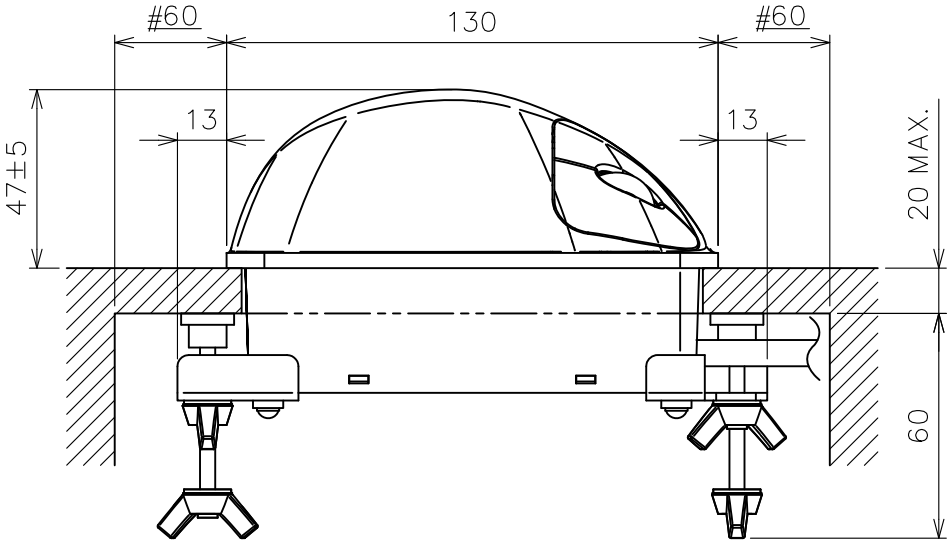


底面図
BOTTOM VIEW

水抜き穴
DRAIN



取付穴寸法（尺度: 1 ／4）
CUTOUT DIMENSIONS (SCALE: 1/4)



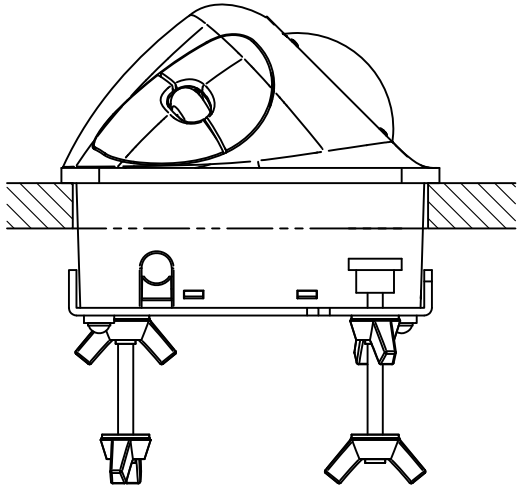


表1 TABLE 1

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

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。

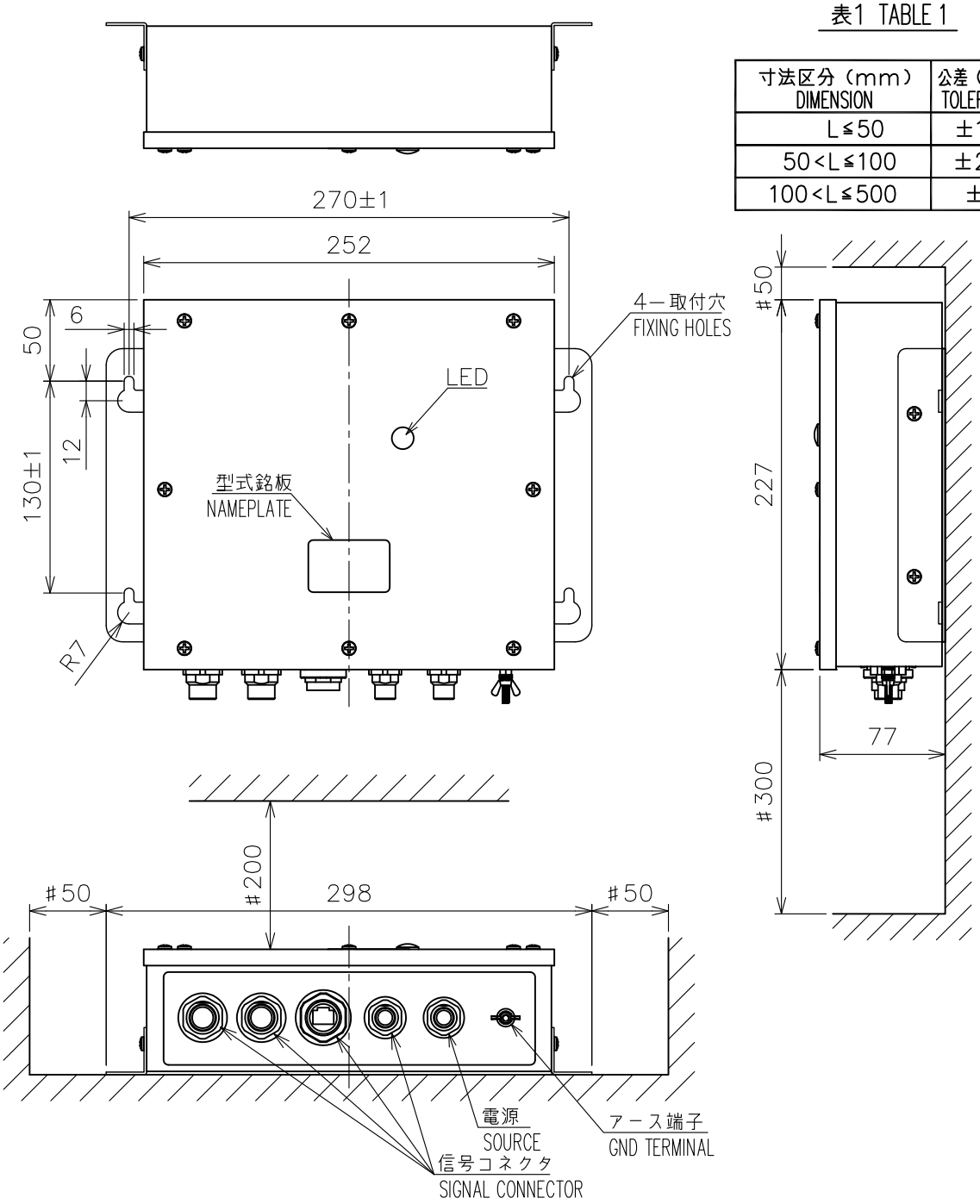
NOTE　1.　TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
　　2.　#: MINIMUM SERVICE CLEARANCE.

DRAWN 6/Nov/2013 T.YAMASAKI		TITLE	RCU-030
CHECKED 6/Nov/2013 H.MAKI		名称	トラックボール操作部（埋込装備）
APPROVED 7/Nov/2013 H.MAKI	FMD-3100		外寸図
SCALE 1/2 MASS 0.5 ±10% kg	質量は2mケーブルを含む。 MASS INCLUDES 2m CABLE.	NAME	TRACKBALL CONTROL UNIT (FLUSH MOUNT)
DWG.No. C4484-G02- A	REF.No. 24-016-120G-0		OUTLINE DRAWING

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

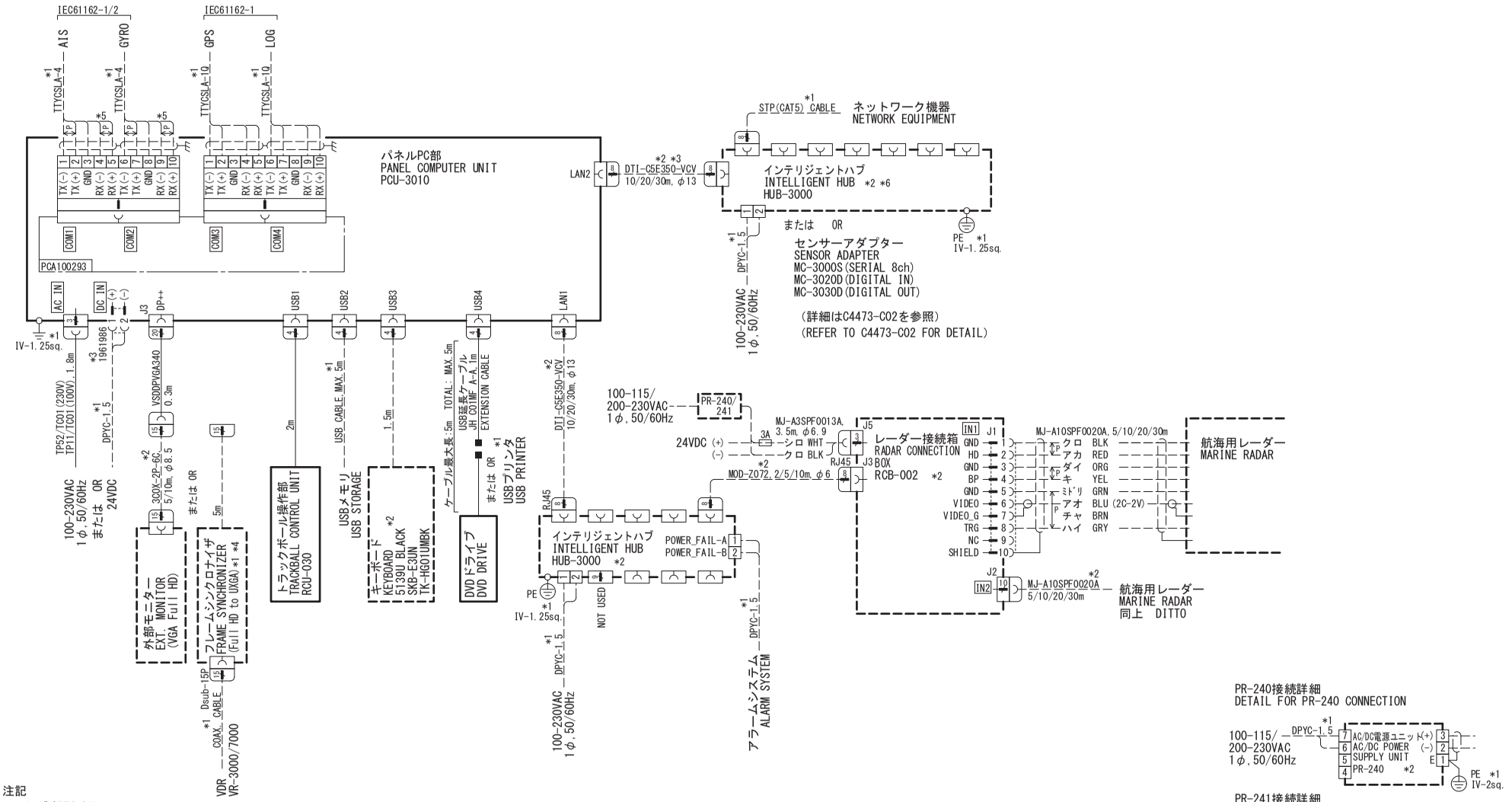


注　記　1）　指定外の寸法公差は表１による。
　　2）　＃印寸法は最小サービス空間寸法とする。
　　3）　取付用ネジはトラスタッピンネジ呼び径５ｘ２０を使用のこと。
　　4）　壁掛装備は、必ずコネクタが下方となるよう取付けること。

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.
　　4.　FOR BULKHEAD MOUNT, FACE THE CONNECTORS DOWMNWARD.

DRAWN 22/Aug/2019 T.YAMASAKI		TITLE	RCB-002/002A
CHECKED 22/Aug/2019 H.MAKI		名称	レーダー接続箱（壁掛・卓上装備）
APPROVED 22/Aug/2019 H.MAKI	KQ-900 FMD-3100		外寸図
SCALE 1/4 MASS 3.0 ±10% kg		NAME	RADAR CONNECTION BOX (BULKHEAD/ TABLETOP MOUNT)
DWG. No. C4484-G03- C	REF. No. 24-016-130G-1		OUTLINE DRAWING

FURUNO

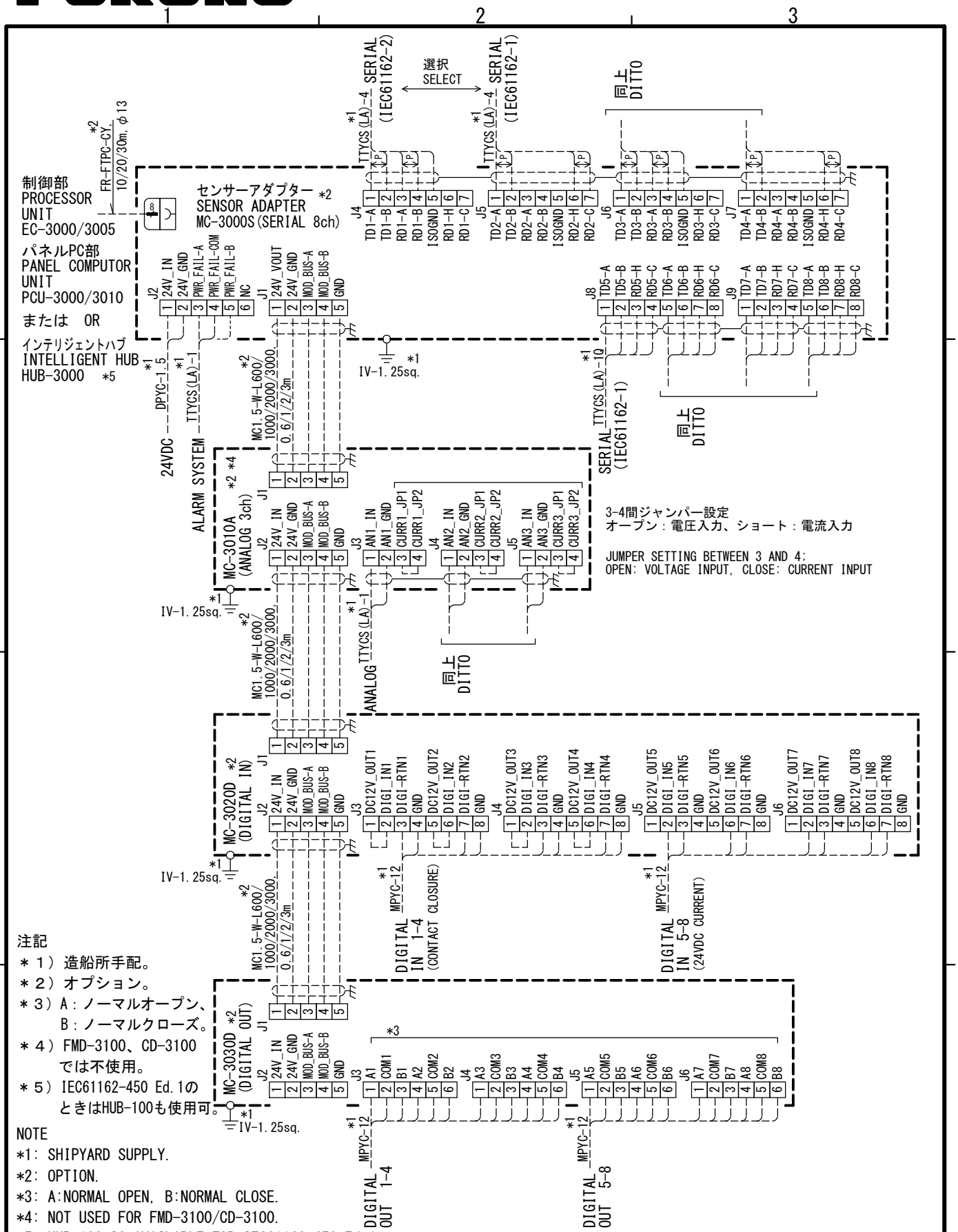


注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは現地にて取付け。
＊４）推奨：IMAGENICS RS-1500Aなど。
＊５）IEC61162-2のとき、RX(+)とRX(-)の間に終端抵抗が必要。
IEC61162-1では、3、8番ピンのアイソレートグランドは不要。
＊６）IEC61162-450 Ed.1でネットワークを構成するときは、HUB-100も使用可。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: FIT CONNECTORS AT LOCAL.
*4: RECOMMENDED: IMAGENICS RS-1500A, ETC.
*5: IEC61162-2 REQUIRES A TERMINATOR BETWEEN RX(+) AND RX(-).
IEC61162-1 DOES NOT REQUIRE ISOLATE GROUND AT 3 OR 8 PINS.
*6: HUB-100 ALSO AVAILABLE WHEN THE NETWORK FOR IEC61162-450 Ed.1 IS USED.

DRAWN 13/Dec/2023 T.YAMASAKI		TITLE	FMD-3100 (PCU-3010)
CHECKED 13/Dec/2023 H.MAKI		名称	電子海図情報表示装置
APPROVED 30/Apr/2024 A.Murao			相互結線図
SCALE	MASS kg	NAME	ECDIS
DWG No. C4484-C02- L	REF.No. 24-016-6001-6		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配。
＊２）オプション。
＊３）A：ノーマルオープン、
　　B：ノーマルクローズ。
＊４）FMD-3100、CD-3100
　　では不使用。
＊５）IEC61162-450 Ed.1の
　　ときはHUB-100も使用可。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: A:NORMAL OPEN, B:NORMAL CLOSE.
*4: NOT USED FOR FMD-3100/CD-3100.
*5: HUB-100 IS AVAILABLE FOR IEC61162-450 Ed.1.

DRAWN 19/Jun/2023 T.YAMASAKI			TITLE MC-3000S/3010A/3020D/3030D
CHECKED 19/Jun/2023 H.MAKI		CD-3x00	名称 センサーアダプター
APPROVED 21/Jun/2023 H.MAKI		FAR-3xxx SER. FMD-3x00/3005	相互結線図
SCALE	MASS kg		NAME SENSOR ADAPTER
DWG.No. C4473-C02- L		REF.No. 24-014-6003-2	INTERCONNECTION DIAGRAM