

# *Installation Manual*

## *Multi Function Display*

### *Model TZT9/TZT14*

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# SAFETY INSTRUCTIONS

The installer must read the appropriate 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, may result in minor or moderate injury.

(Examples of symbols)



Warning, Caution



Prohibitive Action



Mandatory Action



## WARNING



**ELECTRICAL SHOCK HAZARD**  
Do not open the equipment unless totally familiar with electrical circuits.

Only qualified personnel should work inside the equipment.



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

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



**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.



**If your vessel is configured with an autopilot system, install an autopilot control unit (or emergency autopilot stop button) at each helm station, to allow you to disable the autopilot in an emergency.**

If the autopilot cannot be disabled, accidents may result.



## CAUTION



**Ground the equipment to prevent electrical shock and mutual interference.**



**Use the proper fuse.**

Use of an incorrect fuse may damage the equipment.



**The front panel is made of glass. Handle it with care.**

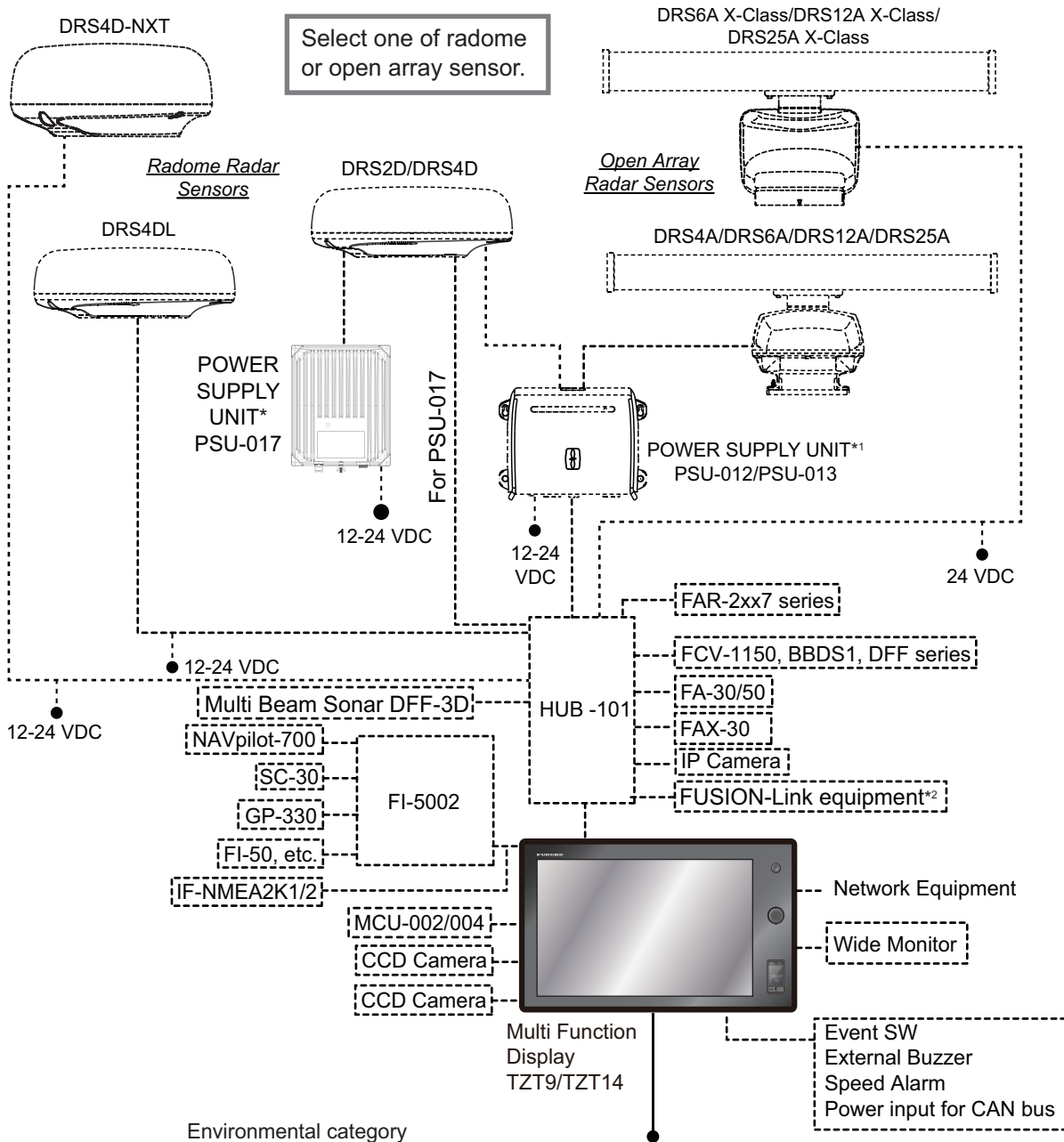
Injury can result if the glass breaks.

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

	Standard compass	Steering compass
TZT9	0.50 m	0.30 m
TZT14	0.64 m	0.40 m
MCU-002	0.05 m	0.05 m

# SYSTEM CONFIGURATION

Basic configuration is shown with solid line.



Environmental category

Sensor units: Exposed to the weather      12/24 VDC  
 All other units: Protected from the weather

\*1: A power supply is required for the following antenna units:  
 DRS2D/4D/4A/6A/12A: PSU-012  
 DRS25A: PSU-013  
 DRS2D/4D: PSU-017

\*2: FUSION MS-700 series only.

# EQUIPMENT LISTS

## Standard supply

Name	Type	Code No.	Qty	Remarks
Multi Function Display	TZT9	-	1	
	TZT14	-		
Installation Materials	CP19-01500	000-020-450	1	For TZT9
		000-022-431		
	CP19-01600	000-020-451	1	For TZT14
		000-022-432		
Accessories	FP19-01700	000-022-620	1	For TZT9
		000-022-621		
	FP19-01900	000-022-622	1	For TZT14
		000-022-623		
Spare Parts	SP19-01301	001-175-310	1	Fuses (for TZT9)
		001-201-370		
	SP19-01201	001-166-210	1	Fuses (for TZT14)
		001-201-420		

## Optional supply

Name	Type	Code No.	Remarks
Joint Box	TL-CAT-012	000-016-714-01	For LAN network
Remote Control Unit	MCU-002	-	
	MCU-004	-	
NMEA2000-Interface Unit	IF-NMEA2K1	-	
NMEA Data Converter	IF-NMEA2K2	-	
Network HUB	HUB-101	-	
Junction Box	FI-5002	-	
Rectifier	RU-3423	000-030-443	
	PR-62	000-013-484	100VAC
		000-013-485	110VAC
		000-013-486	220VAC
		000-013-487	230VAC
RU-1746B-2	000-030-439		

## EQUIPMENT LISTS

Name	Type	Code No.	Remarks
CAN bus Cable Assy	M12-05BM+05BF-010	001-105-750-10	w/connectors (light), 1 m
	M12-05BM+05BF-020	001-105-760-10	w/connectors (light), 2 m
	M12-05BM+05BF-060	001-105-770-10	w/connectors (light), 6 m
	M12-05BFFM-010	001-105-780-10	w/connector (light), 1 m
	M12-05BFFM-020	001-105-790-10	w/connector (light), 2 m
	M12-05BFFM-060	001-105-800-10	w/connector (light), 6 m
	CB-05PM+05BF-010	000-167-968-10	w/connectors (heavy), 1 m
	CB-05PM+05BF-020	000-167-968-10	w/connectors (heavy), 2 m
	CB-05PM+05BF-060	000-167-970-10	w/connectors (heavy), 6 m
	CB-05BFFM-010	000-167-971-10	w/connector (heavy), 1 m
	CB-05BFFM-020	000-167-972-10	w/connector (heavy), 2 m
	CB-05BFFM-060	000-167-973-10	w/connector (heavy), 6 m
	DVI-D Cable Assy.	DVI-D/D S-LINK 5M	001-132-960-10
DVI-D/D S-LINK 10M		001-133-980-10	24 pin, for video output, 10 m
External Buzzer	OP03-136	000-086-443	Buzzer: PKB5-3A40
Replacement Kit	OP19-9	001-233-680	For TZT9
	OP19-10	001-233-690	
	OP19-11	001-233-700	For TZT14
	OP19-12	001-233-710	
Network (LAN) Cable	MOD-Z073-030+	000-167-171-10	LAN cable, straight, 2 pairs, 3 m
	MOD-Z072-020+	001-167-880-10	LAN cable, cross-pair, 2 m
	MOD-Z072-050+	001-167-890-10	LAN cable, cross-pair, 5 m
	MOD-Z072-100+	001-167-900-10	LAN cable, cross-pair, 10 m
CAN bus Connector	SS-050505-FMF-TS001	000-168-603-10	Micro style: 3
	NC-050505-FMF-TS001	000-160-807-10	Mini style: 2, micro style: 1
	LTWMC-05BMMT-SL8001	000-168-604-10	Micro style, male, termination resistor
	LTWMN-05AMMT-SL8001	000-160-508-10	Mini style, male, termination resistor
	LTWMC-05BFFT-SL8001	000-168-605-10	Micro style, female, termination resistor
	LTWMN-05AFFT-SL8001	000-160-509-10	Mini style, female, termination resistor
	FRU-0505-FF-IS	001-077-830-10	w/inline terminator
MJ Cable Assy	MJ-A6SPF0016-005C	000-159-689-10	for FAX-30
Operator's Manual	OME-44700-*	000-176-016-1*	English
	OMJ-44700-*	000-176-015-1*	Japanese

# 1. MOUNTING

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## 1.1 Mounting Considerations



TZT9



TZT14

When selecting a mounting location for TZT9/14, keep the following in mind:

- The temperature at the mounting location shall be between  $-15^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$  (wireless LAN:  $0^{\circ}\text{C}$  and  $+55^{\circ}\text{C}$ ).
- The humidity at the mounting location shall be 93% or less at  $40^{\circ}\text{C}$ .
- Locate the unit away from exhaust pipes and ventilators.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal (comply with IEC 60945 Ed.4).
- Keep the unit away from electromagnetic field generating equipment such as motors and generators.
- For maintenance and checking purposes, leave sufficient space around the unit and leave slack in cables. Minimum recommended space is shown in the outline drawing for the display units.
- Do not mount the TZT9/14 on the overhead.
- A magnetic compass will be affected if the equipment is placed too close to it. Observe the compass safe distances shown in the SAFETY INSTRUCTIONS to prevent disturbance to the magnetic compass.

The TZT9/14 can be flush mounted in a console or panel, or mounted on a desktop.

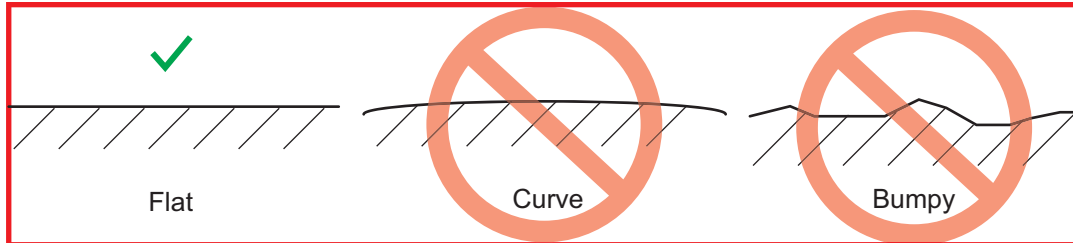
### **When removing the equipment**

If the equipment is removed from the vessel, cover the connector of the cable with the supplied cap to keep dust out of the connector.

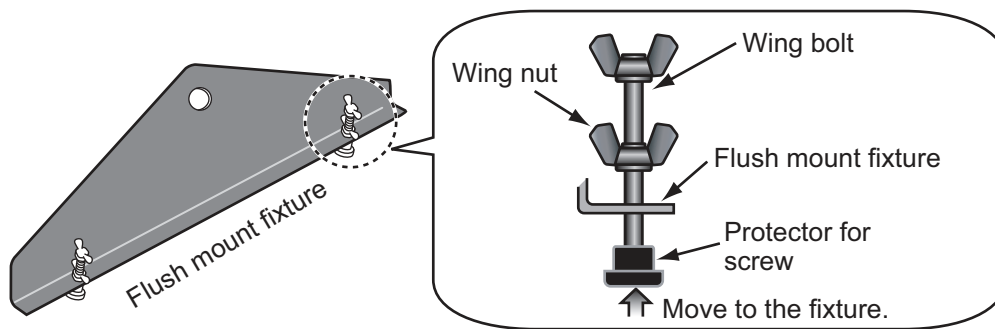
## 1.2 Flush Mounting

Referring to the figure below, select a flat mounting location. Read the installation instructions before starting. Pay particular attention to the notes; failure to follow these instructions may cause damage to the unit.

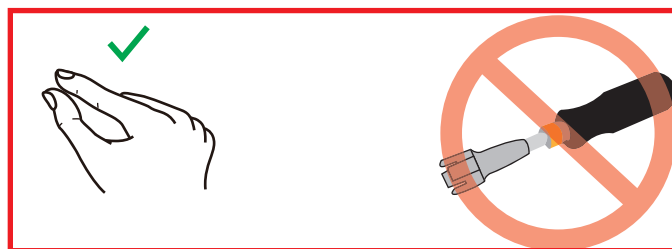
**Note:** Ensure the mounting location is flat, with no indents or protrusions, to allow a secure fit.



1. Prepare a cutout in the mounting location using the template (supplied) for the TZT9 or TZT14.
2. Screw the wing bolts and the wing nuts of the flush mount fixture so that the protector for screw moves to the flush mount fixture.



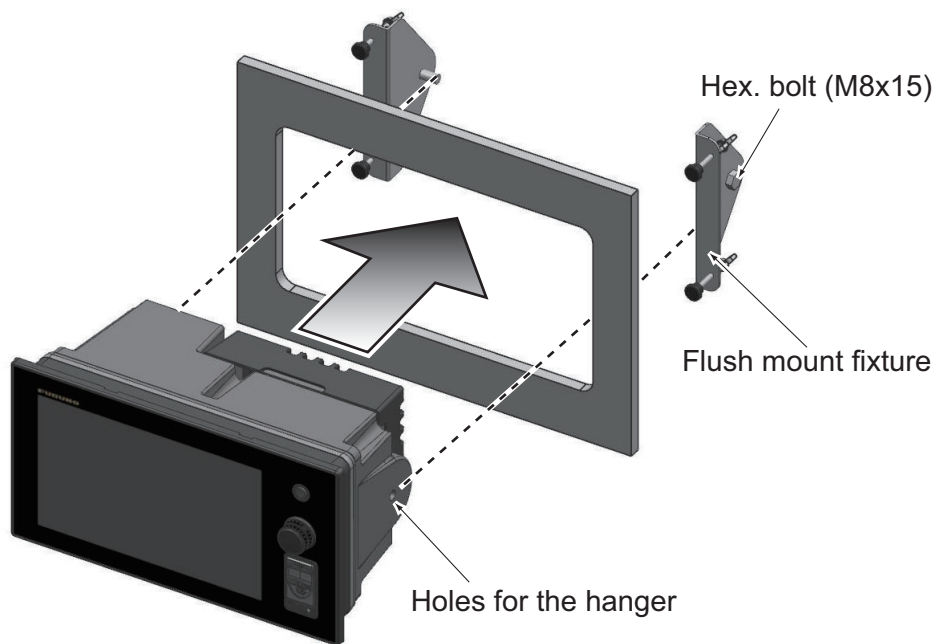
**Note:** Slowly screw the four wing bolts evenly with your hand. Do not use a tool to screw the wing bolts. A tool can be used to fasten the wing nuts; use caution so as not to damage the wings or thread.



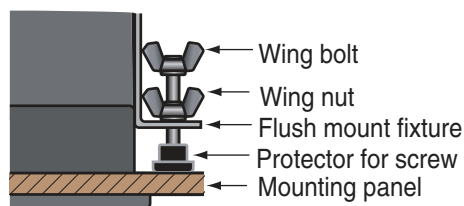
3. Connect all cables at the back of the TZT9/14. (See chapter 2.)
4. Set the TZT9/14 to the cutout.



5. Fasten the flush mount fixtures to the holes for the hanger at both sides of TZT9/14 with two hex. bolts (M8x15, supplied).



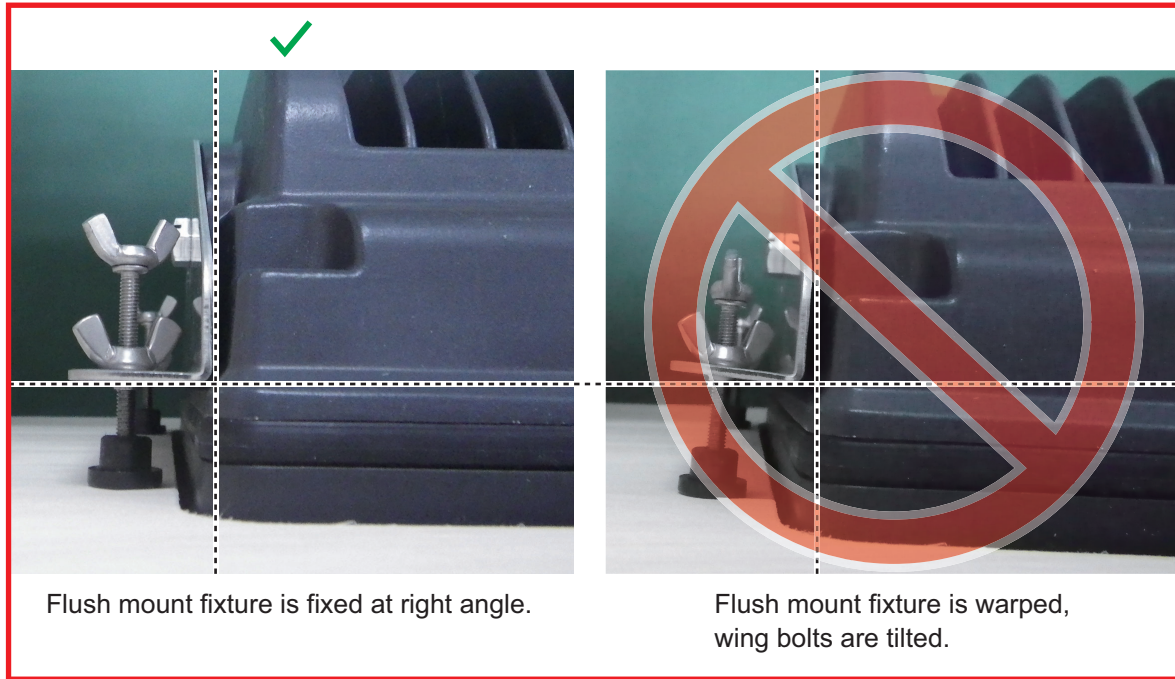
6. Fasten each wing bolt until the protector for the screw is firm against the mounting panel. Take care not to bend the flush mount fixture.
7. Fasten the wing nuts tightly.



*TZT9/14 with a fixing panel, top view*

**Note:** Use of excessive torque when fastening the wing bolts can cause the flush mount fixture to tilt or warp. Check that the flush mount fixtures and wing bolts are not tilted or warped, referring to the examples on the following page.

## 1. MOUNTING

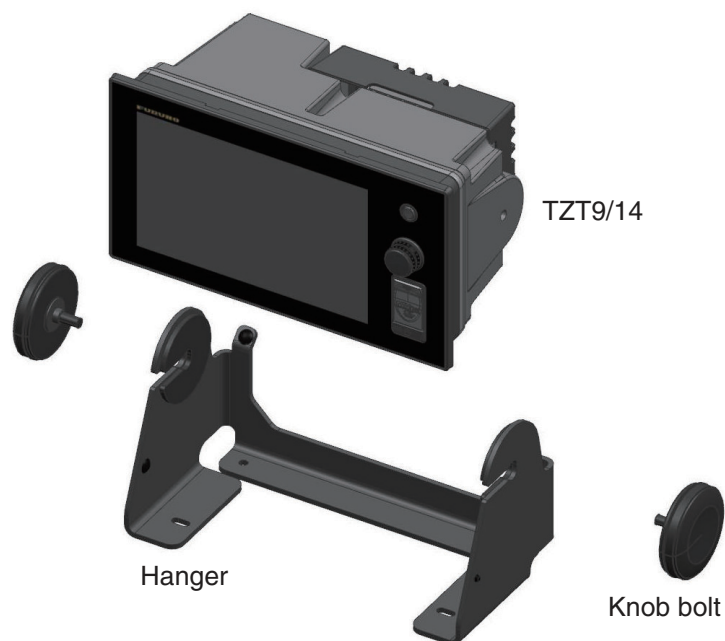


### 1.3 Desktop Mounting

Follow the procedure below to mount the TZT9 or TZT14 on a desktop.

**Note:** Remove the flush mounting sponges and flush mounting rubbers attached to the back of the TZT9 or TZT14. Take care that there is no rubber or sponge left on the back of the TZT9/TZT14.

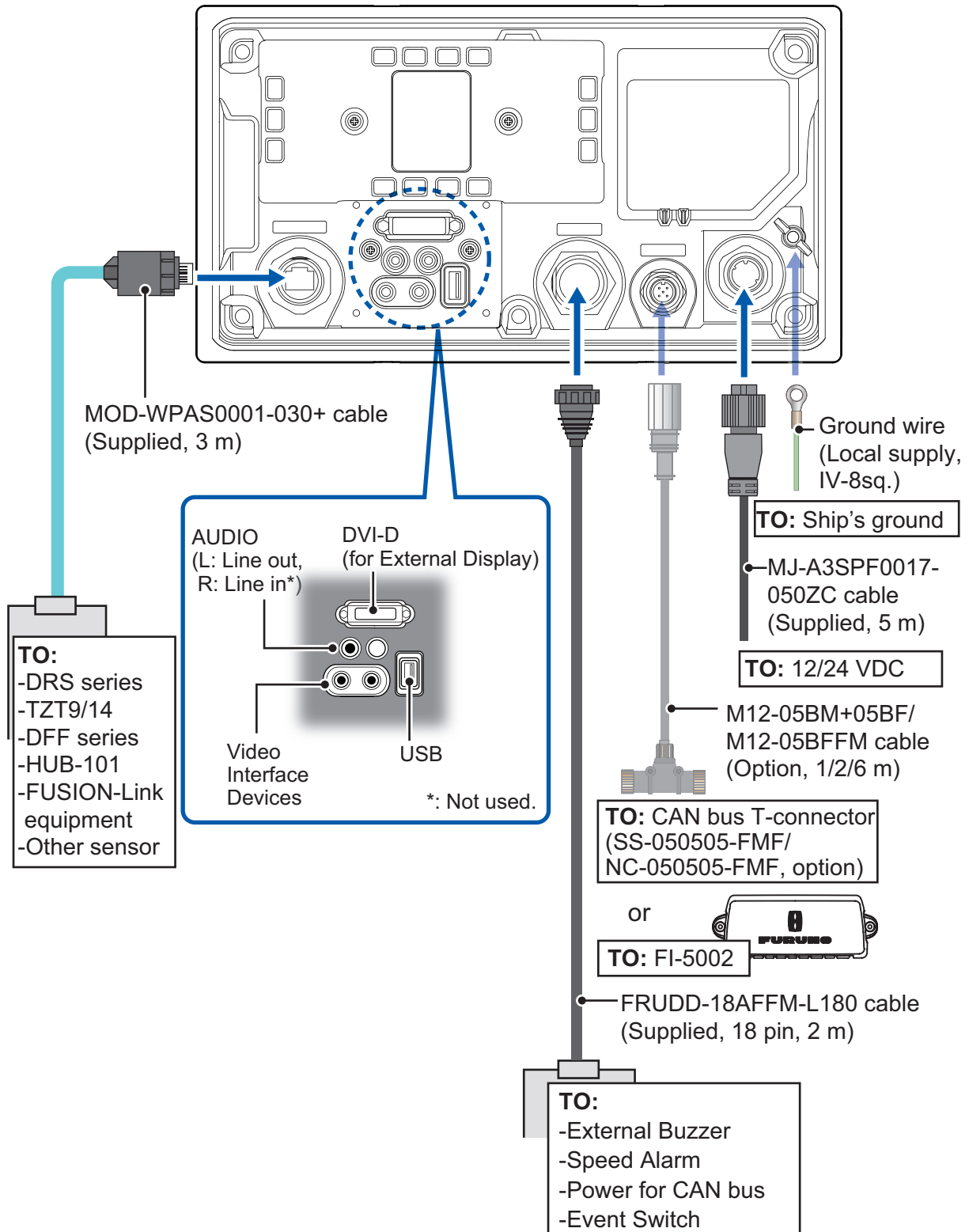
1. Fix the hanger by using self-tapping screws (supplied).
2. Screw knob bolts into the TZT9/14, set the unit to the hanger and tighten the knob bolts.



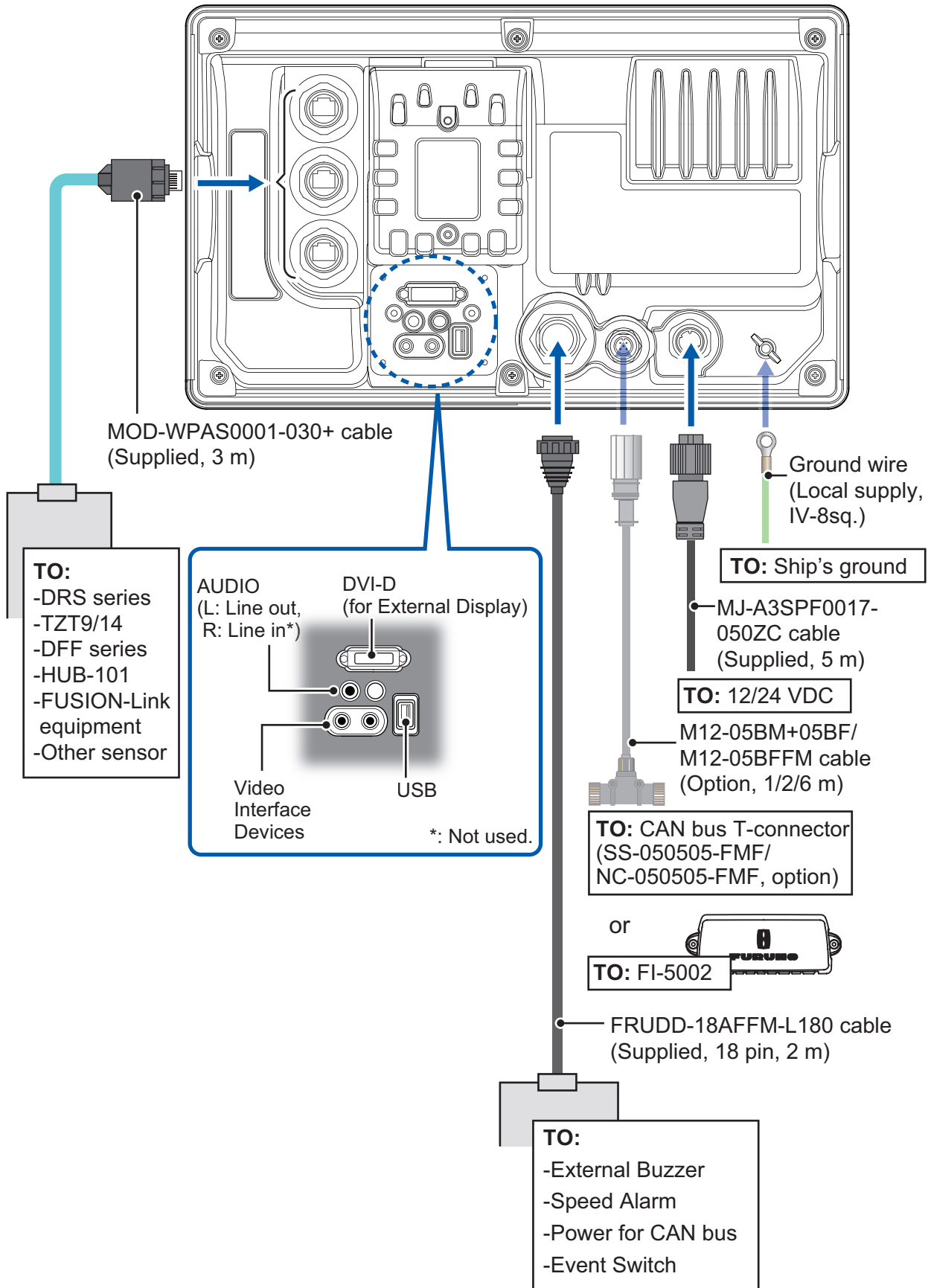
# 2. WIRING

## 2.1 Wiring Instructions

### TZT9

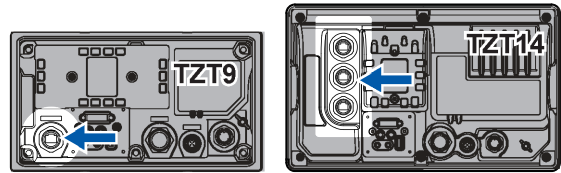


**TZT14**



### 2.1.1 NETWORK port(s)

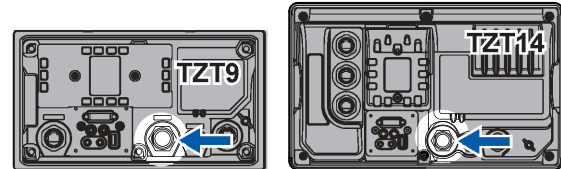
TZT9/14 (just like previous NavNets) uses standard TCP/IP Ethernet to share radar/sounder images and other navigation information from devices connected within the network system. In any single NavNet TZtouch network, a combination of up to **six** TZT9/14 may be connected to each other. All NavNet TZtouch network components have integrated regular RJ45 Ethernet port(s), one on TZT9 and three on TZT14. Connect MOD-WPAS0001-030+ cable (supplied).



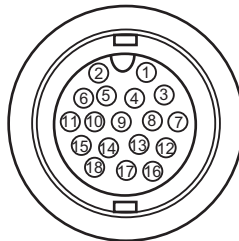
### 2.1.2 MULTI port

Use the cable assembly FRUDD-18AFFM-L180 (supplied, 2 m) for the event switch, external buzzer, speed alarm and the power for CAN bus.

This cable has an 18-pin connector. For example, a MOB contact closure input may be connected to pin 15 and 11\*.



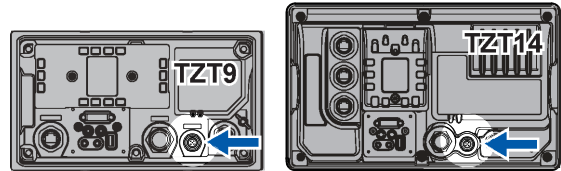
\*Note that any TZT9/14 interfaces to virtually any MOB system or event switch (point save) contact closure signal using these pins.



Pin No.	Color	Function	Remark (Port No.)
18	Light green	NET-C IN (0V)	CAN bus Power IN. When 12V DC power is applied to these pins, the CAN bus port will be powered (up to 1 ampere).
17	Pink	NET-S IN (+12V IN)	
16	Purple	Shield	
15	White	BUZZER or EVENT IN	External Buzzer Output or MOB/Event Input (Contact Closure)
14	Gray	SPEED-ALARM C	Speed alarm contact. Can trigger an external alarm or device when speed exceeds the limit specified.
13	Yellow	SPEED-ALARM H	
12	Black/White	+12V	External buzzer power ONLY (100mA Max)
11	Black	GND	GND for Event/MOB Input
10	Blue/White	-	For debug
9	Blue	-	
8	Green/White	-	
7	Green	-	
6	Orange/White	-	
5	Orange	GND	
4	Brown/White	DC_N	
3	Brown	PWR_SW	
2	Red/White	GND	
1	Red	GND	

### 2.1.3 CAN bus port

Every TZT9/14 has one CAN bus port (micro style connector). All TZT9/14 MUST be connected to the same CAN bus backbone. However, the TZT9/14 and DRS (radar sensor) CAN bus ports cannot be connected together. The TZT9/14 and DRS (radar sensor) use "Ethernet Bridging" to link the DRS CAN bus and the TZT9/14 CAN bus data. Refer to paragraph 2.2.1 for more information. Note that the TZT9/14 CAN bus port is not powered unless external power is applied to the FRUDD-18AFFM-L180 cable of MULTI port and must be connected to a properly configured CAN bus network.

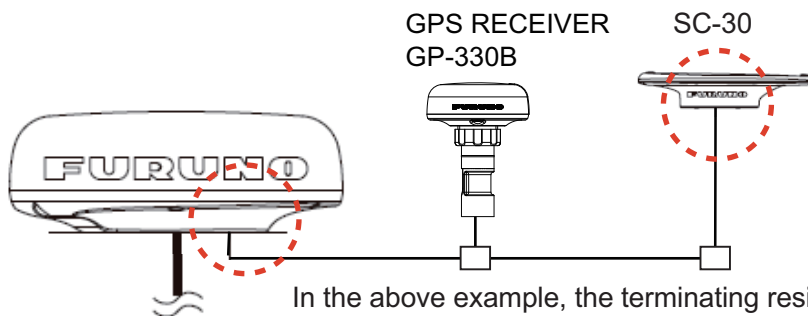
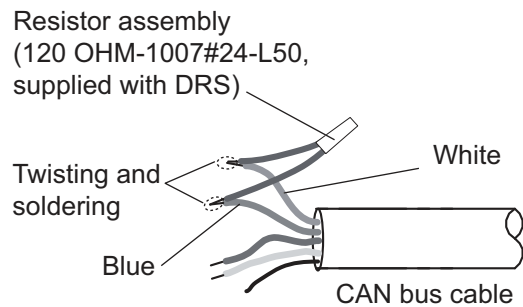


#### What is CAN bus?

CAN bus is a communication protocol that shares multiple data and signals through a single backbone cable. You can simply connect any CAN bus devices onto the backbone cable to expand your network onboard. With CAN bus, IDs are assigned to all the devices in the network, and the status of each sensor in the network can be detected. All the CAN bus devices can be incorporated into the NMEA2000 network. For detailed information about CAN bus wiring, see "FURUNO CAN bus Network Design Guide" (Type: TIE-00170) on Tech-Net.

#### DRS radar sensor

In addition to the CAN bus port found on the TZT9/14, all DRS radar sensors have one powered CAN bus port (terminal strip connector). You may directly connect various FURUNO CAN bus sensors to the DRS radar sensor without having to run a separate CAN bus cable to the mast. The total number of sensors that can be connected to the CAN bus DRS port without external power connection depends on power consumption. The DRS can supply up to 1 amp (20LEN) to the DRS CAN bus network. Note that the CAN bus network connected to the DRS is its own independent CAN bus backbone and needs to be terminated at both ends by a terminating resistor. A 120 Ohm resistor is standard supply with the DRS to terminate the CAN bus. For example, if you install a SC-30/GP-330B with the DRS CAN bus port, you must have two terminators on the backbone. One can be at the sensor and the other located inside the DRS as shown in the inset at right.



In the above example, the terminating resistors are necessary at DRS and SC-30.

Refer to the DRS Installation Manual for more information about connection.

**NMEA0183 equipment**

To connect an NMEA0183 equipment to TZT9/14, use the CAN bus network via the optional NMEA data converter IF-NMEA2K2 (or IF-NMEA2K1). This NMEA connection can accept a baud rate of 4800 or 38400.

Heading input to TZT9/14 allows functions such as Radar Overlay and course stabilization (North up, Course up, etc.) in the radar operating modes. The NMEA0183 heading refresh rate needs to be 100 ms in order for any radar function to work properly. NMEA0183 heading can be accepted on any CAN bus port at a baud rate up to 38400 bps. In other words, data sent (IF-NMEA) and received (TZT9/14) must use the same baud rate for each individual data port.

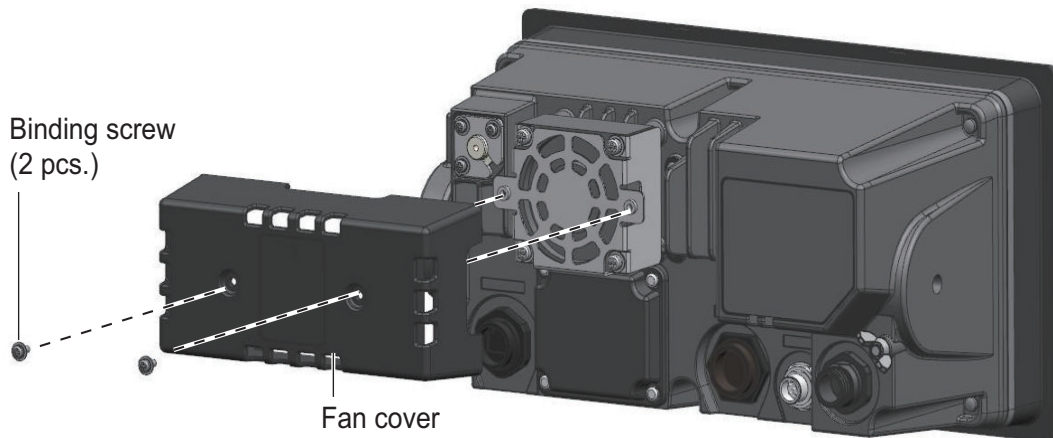
**Note:** Heading data from a CAN bus source/sensor is always at the correct refresh speed for the DRS ARPA function.

**2.1.4 VIDEO, DVI-D, AUDIO or USB ports****How to connect VIDEO, DVI-D, AUDIO or USB ports**

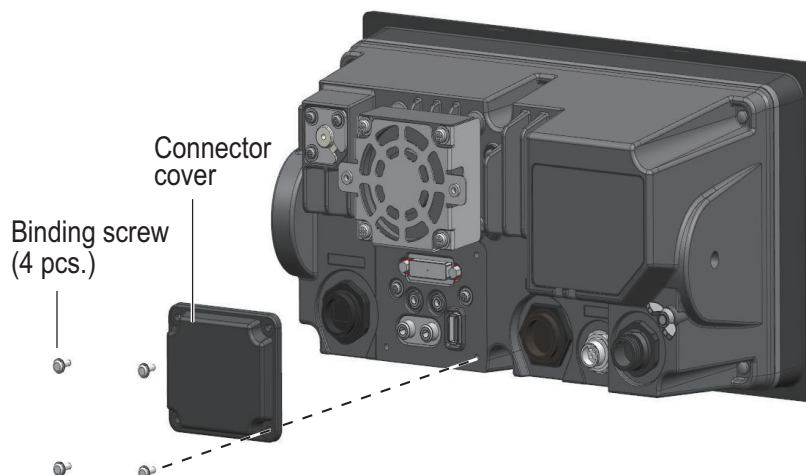
The above-mentioned ports are behind the connector cover on the rear panel. Access the ports and connect cables as shown in the procedure below.

**Note:** The display unit must be mounted in a console or indoors to do this connection because of reduced waterproofing.

1. For TZT9, unfasten two binding screws to remove the fan cover.

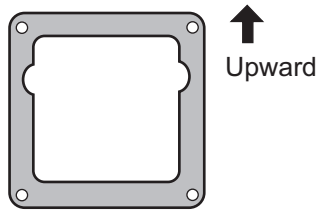


2. Unfasten four binding screws to remove the connector cover at the rear of the equipment.

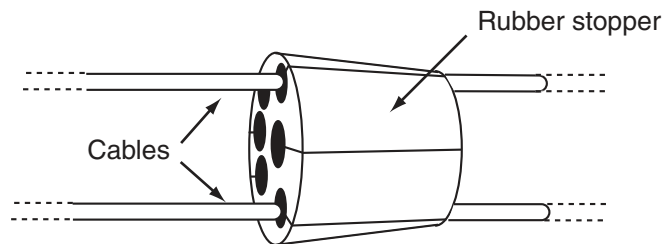


## 2. WIRING

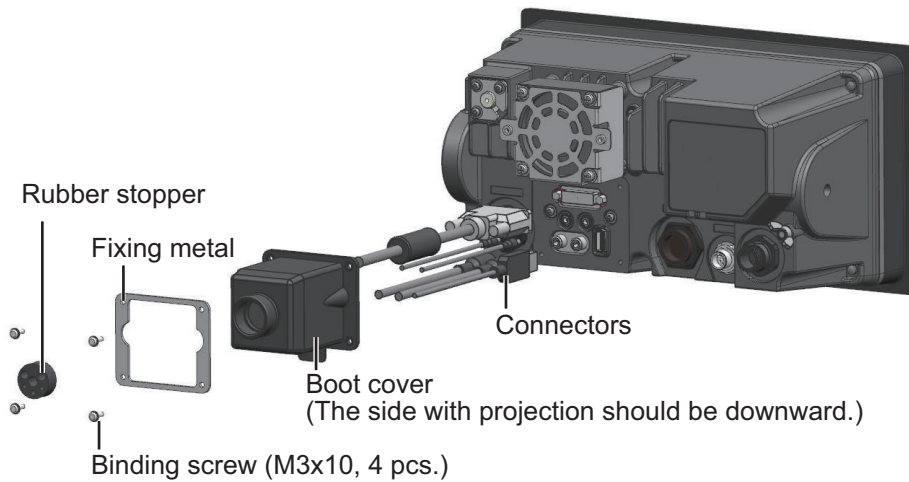
3. Pass DVI-D, VIDEO, AUDIO and/or USB cables through the fixing metal (supplied).  
Orient the fixing metal as shown below.



4. Attach each connector to the appropriate location at rear of the equipment
5. Pass cables through the slit on the boot cover.
6. Pass cables through appropriate holes in the rubber stopper. The largest hole is for the DVI-D cable.

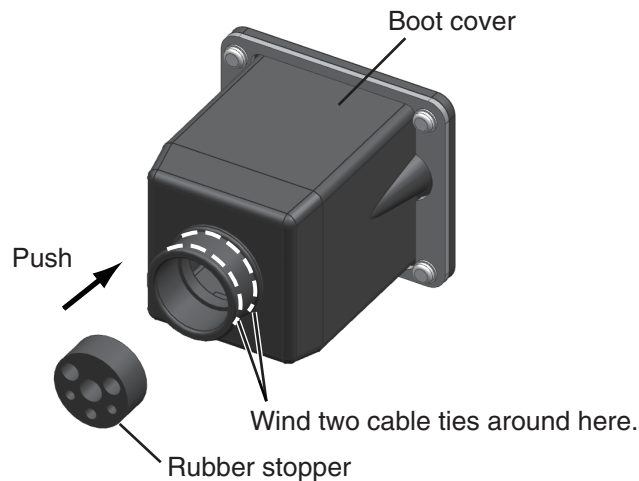


7. Use four binding screws (M3x10, supplied) to fasten the fixing metal and boot cover to the equipment.





8. Slide the rubber stopper into the hole of the boot cover, use two cable ties to fasten the stopper to the boot cover.



9. For TZT9, fasten two binding screws to re-attach the fan cover.

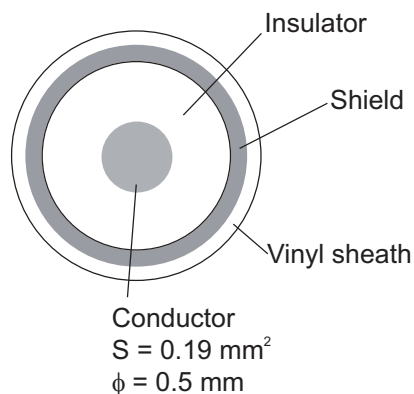
### **Video input**

TZT9/14 can use regular analog video inputs (PAL or NTSC) that connect to the TZT9/14 directly or use IP cameras that connect directly to the network HUB. IP cameras can be seen by all TZT9/14 connected to the NavNet TZtouch network, unlike analog video that can be viewed only on the equipment where the source is connected. Additionally some IP cameras can be controlled from TZT9/14.

### **Analog video**

The TZT9/14 units have two analog video inputs (PAL/NTSC) on 2 mm RCA (cinch) type connectors located on the rear of the equipment. For this connection, the following cable is necessary (local supply).

- 3C2V (Japan Industrial Standard (JIS), or the equivalent) coaxial cable (impedance: 75Ω)



### **IP camera**

IP cameras are network devices that connect directly to a HUB. Up to four IP cameras can be connected to one NavNet TZtouch network. At this time, only AXIS IP cameras that support MPEG4 video are functional in the network. For more details, see the operator's manual for AXIS models.

**DVI-D (external monitor)**

A DVI monitor can be connected to the TZT9/14 to repeat the screen at a remote location. The plug is DVI-D format and only a DVI monitor with VESA DDC (Display Data Channel) can be connected. The TZT9/14 uses the monitor information (EDID) given via DDC to output the video data with the appropriate resolution. (The TZT14 has an 1280x800 (WXGA) DVI-D output and the TZT9 has an 800x480 (WVGA) DVI-D output.) FURUNO offers two lengths of DVI cables, 5 m and 10 m.

**Note:** Use an external monitor that has the same aspect ratio as your equipment (TZT9: 5:3, TZT14: 16:10) to show the picture with proper size.

**USB port**

The TZT9/14 has one USB Ver. 2.0 port. This USB port can be used to connect a generic USB Touch Screen (compatible with Windows® 7 HID generic driver).

**Audio**

Outputs the audio line from the left-hand connector (Audio In is reserved for future development).

## 2.2 CAN bus/NMEA0183 Data Conversion and CAN bus Bridging

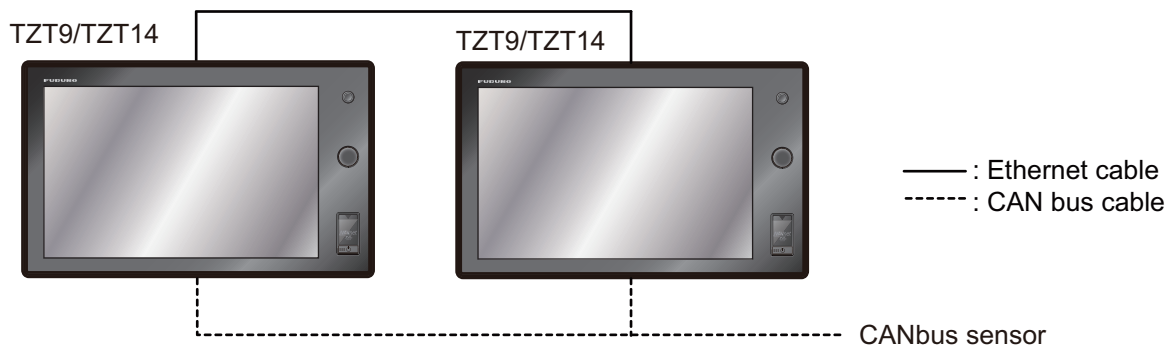
### 2.2.1 CAN bus networks/backbone

**Note:** The DRS4DL does not have a CAN bus port.

All DRS radar sensors have one CAN bus port (Terminal Block connector). You can directly FURUNO CAN bus sensors to the DRS radar without having to run another CAN bus cable up the mast. In this case, each separate CAN bus network (the DRS CAN bus and the ship CAN bus) will be "Bridged" together via the Ether Network. Note that the TZT9/14 and DRS CAN bus ports must not be connected together.

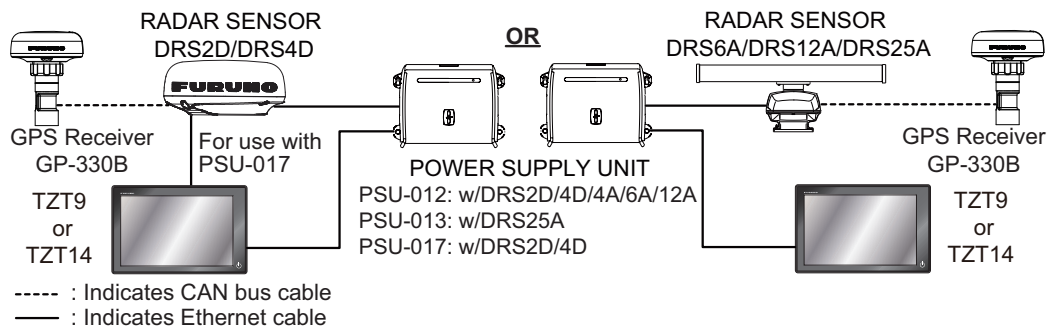
**Connection of multiple TZTs, no DRS radar sensor**

Connect multiple TZTs with Ethernet and CAN bus cables.



### Connection of TZT and DRS radar sensor

Connect TZT to DRS radar sensor with Ethernet cable.



## 2.2.2 CAN bus (NMEA2000) input/output

### Input PGN

No.	PGN	Description
01.	059392	ISO Acknowledgment
02.	059904	ISO Request
04.	060928	ISO Address Claim
06.	126208	NMEA-Request Group Function
07.		NMEA-Command Group Function
08.		NMEA-Acknowledge Group Function
11.	126992	System Time
12.	126996	Product Information
13.	127237	Heading/Track Control
14.	127245	Rudder
15.	127250	Vessel Heading
16.	127251	Rate of Turn
17.	127257	Attitude
18.	127258	Magnetic Variation
19.	127488	Engine Parameters, Rapid Update
20.	127489	Engine Parameters, Dynamic
21.	127505	Fluid Level
22.	128259	Speed, Water Referenced
23.	128267	Water Depth
24.	129025	Position, Rapid Update
25.	129026	COG & SOG, Rapid Update
26.	129029	GNSS Position Data
27.	129033	Time & Date
28.	129038	AIS Class A Position Report
29.	129039	AIS Class B Position Report
30.	129040	AIS Class B Extended Position Report
31.	129041	AIS Aids to Navigation (AtoN) Report
32.	129291	Set & Drift, Rapid Update
33.	129538	GNSS Control Status
34.	129540	GNSS Sats in View
35.	129793	AIS UTC and Date Report
36.	129794	AIS Class A Static and Voyage Related Data
37.	129795	AIS Addressed Binary Message

## 2. WIRING

No.	PGN	Description
38.	129797	AIS Binary Broadcast Message
39.	129798	AIS SAR Aircraft Position Report
40.	129801	AIS Addressed Safety Related Message
41.	129802	AIS Safety Related Broadcast Message
42.	129808	DSC Call Information
43.	129809	AIS Class B "CS" Static Data Report, Part A
44.	129810	AIS Class B "CS" Static Data Report, Part B
45.	130306	Wind Data
46.	130310	Environmental Parameters
47.	130311	Environmental Parameters
48.	130312	Temperature
49.	130313	Humidity
50.	130314	Actual Pressure
51.	130577	Direction Data
52.	130578	Vessel Speed Component

### Output PGN

The CAN bus output PGN setting (found under the [Initial Setup] menu) is global to the network. Note that only one TZT9/14 will output CAN bus data on the network at a time: the TZT9/14 which is powered ON first. If that display is turned OFF, another will take its place to output the data.

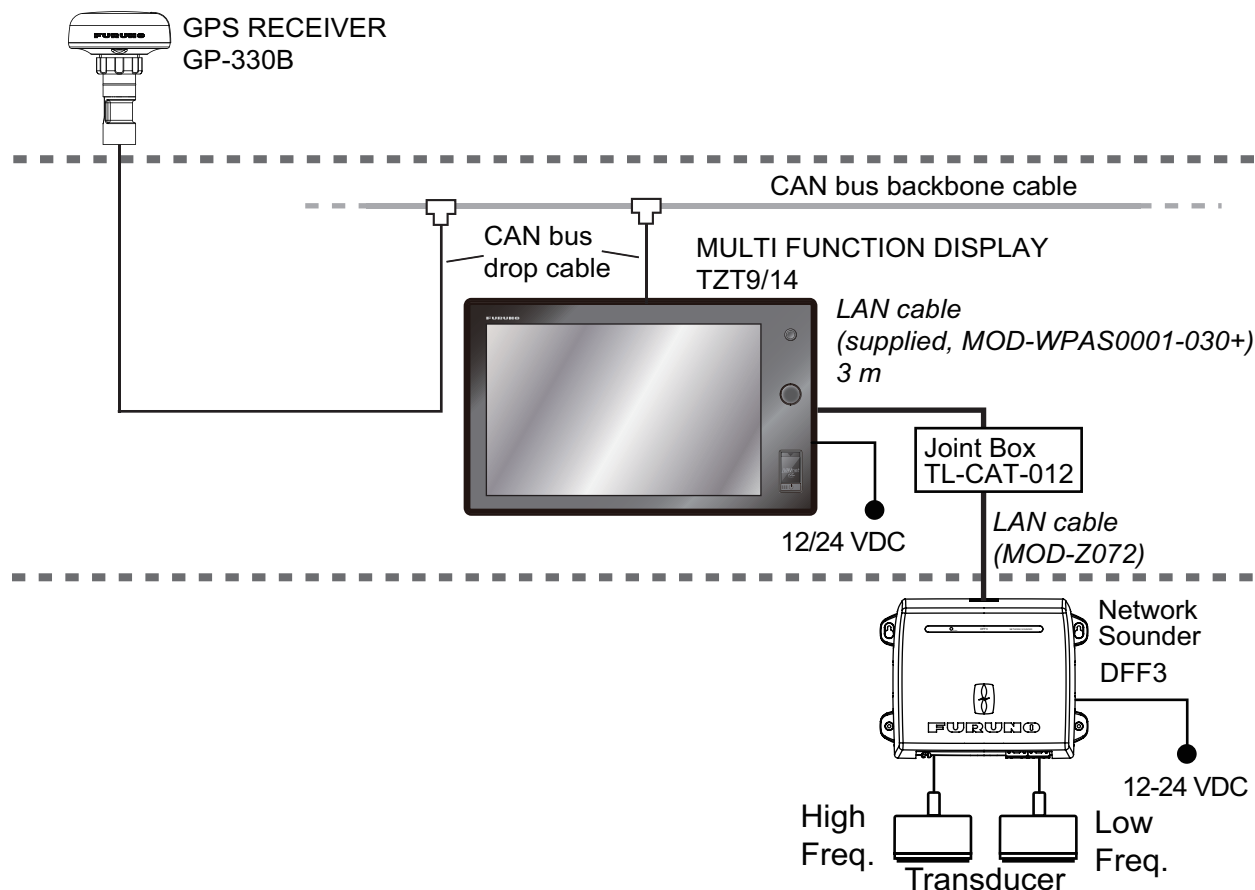
No.	PGN	Description	Remarks	Output cycle (msec)
01.	059392	ISO Acknowledgment	For Certification Level A/B Refusing output requirement	
02.	059904	ISO Request	For Certification Level A/B Requiring output	
04.	060928	ISO Address Claim	For Certification Level A/B • Address autonomy • Receiving output requirement	
05.	126208	NMEA-Request group function	For Certification Level A/+ $\alpha$ • Address autonomy • Receiving output requirement	
06.		NMEA-Command group function	For Certification Level A/+ $\alpha$ Changing the setting of other equipment	
07.		NMEA-Acknowledge group function	For Certification Level A/+ $\alpha$ Sending the confirmation for NMEA-Request group function and NMEA-Command group function	
08.	126464	PGN List-Transmit PGN's group function	For Certification Level A/+ $\alpha$ Receiving output requirement	
09.		PGN List-Received PGN's group function	For Certification Level A/+ $\alpha$ Receiving output requirement	
12.	126992	System Time		1000
13.	126996	Product Information	For Certification Level A/B Receiving output requirement	
14.	127250	Vessel Heading		100
15.	127251	Rate of Turn		100
16.	127257	Attitude		1000
17.	127258	Magnetic Variation		1000
18.	128259	Speed		1000
19.	128267	Water Depth		1000

No.	PGN	Description	Remarks	Output cycle (msec)
20.	128275	Distance Log		1000
21.	129025	Position, Rapid Update		100
22.	129026	COG & SOG, Rapid Update		250
23.	129029	GNSS Position Data		1000
24.	129033	Time & Date		1000
25.	129283	Cross Track Error		1000
26.	129284	Navigation Data		1000
27.	129285	Navigation-Route/WP Information	<ul style="list-style-type: none"> <li>• Outputs when waypoint is set/changed (own ship's position is required)</li> <li>• Outputs when receiving ISO request</li> </ul>	
28.	130306	Wind Data		100
29.	130310	Environmental Parameters		500
31.	130312	Temperature		2000
32.	130313	Humidity	Outputs when receiving the ISO request	
33.	130314	Actual Pressure		2000

## 2.3 Example NavNet TZtouch System Configurations

### Basic plotter/fish finder installation

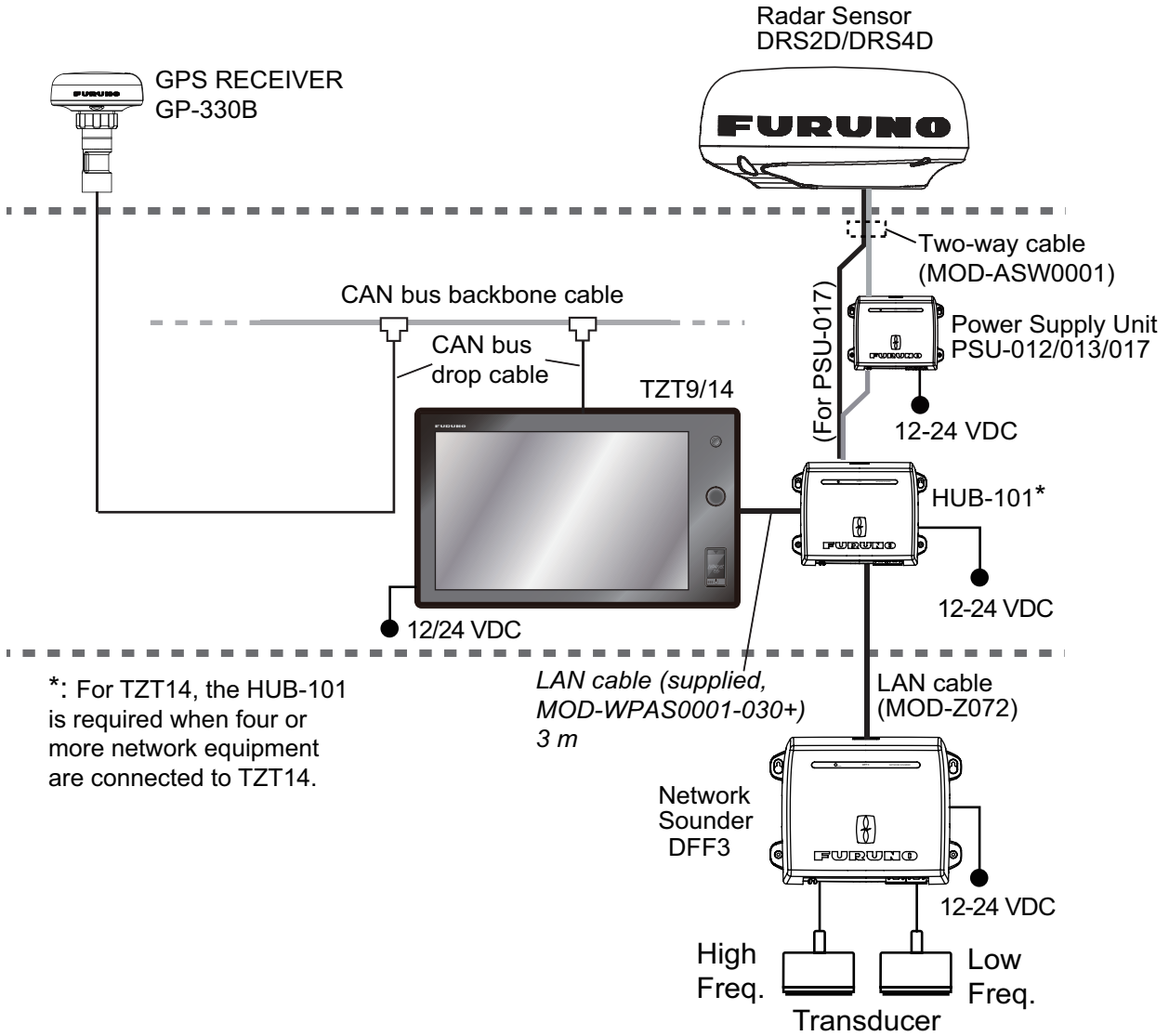
The FURUNO GP-330B is connected to the CAN bus backbone cable. The DFF series network sounder is directly connected to the LAN port of the TZT using the standard supply cable (3 m).



2. WIRING

**Basic plotter/radar/fish finder installation**

This is a single station plotter/radar/fish finder installation. Connection of multiple sensors, such as DFF3 and DRS series, requires the optional Ethernet Hub HUB-101. Also, the power supply unit PSU-012, PSU-013 or PSU-017 is required for the connection with DRS.



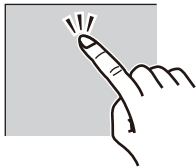

# 3. SETTING UP THE EQUIPMENT

This chapter shows you how to set up your system according to the equipment you have connected. You can do almost all operations on this equipment by just touching the display, following the instructions below.

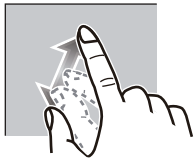

## Touch control description

The touch control depends on the screen type. The basic operations to use at the installation setting are in the following table.

### Operation by a finger

Operating by a finger		Function
Tap		<ul style="list-style-type: none"> <li>• Select a menu item.</li> <li>• Select an object.</li> <li>• Display the pop-up menu.</li> </ul>
Drag		<ul style="list-style-type: none"> <li>• Scroll the menu.</li> </ul>

### Operation by two fingers


Operation by two fingers		Function
Pinch	  <p>Zoom in                  Zoom out</p>	Change the radar range.

**Note:** When both Rotokey™ and touch control are available for the same function, this manual states the operation by touch control.

### 3. SETTING UP THE EQUIPMENT

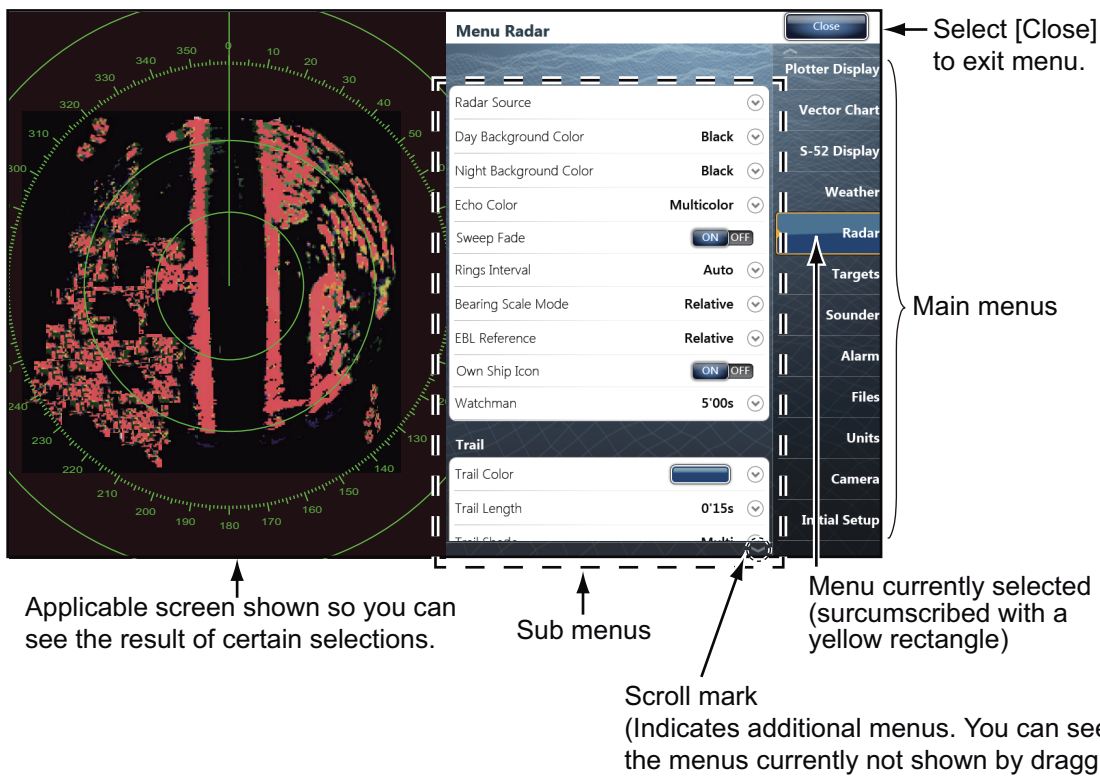
#### About menu operations

The following procedure shows how to use the menu system.

1. Press the  key to turn the power on.
2. After the display selection window appears (approx. 90 seconds), press the **Home** key to show the menu icon bar.



3. Select (tap) the [Menu] icon (  ) to open the main menu.




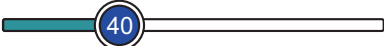


4. Drag the main menus on the right-hand side of the screen. The current selection is circumscribed with a yellow rectangle. The sub menus for the selected menu appear.

You can also select a menu by rotating the **RotoKey™**.

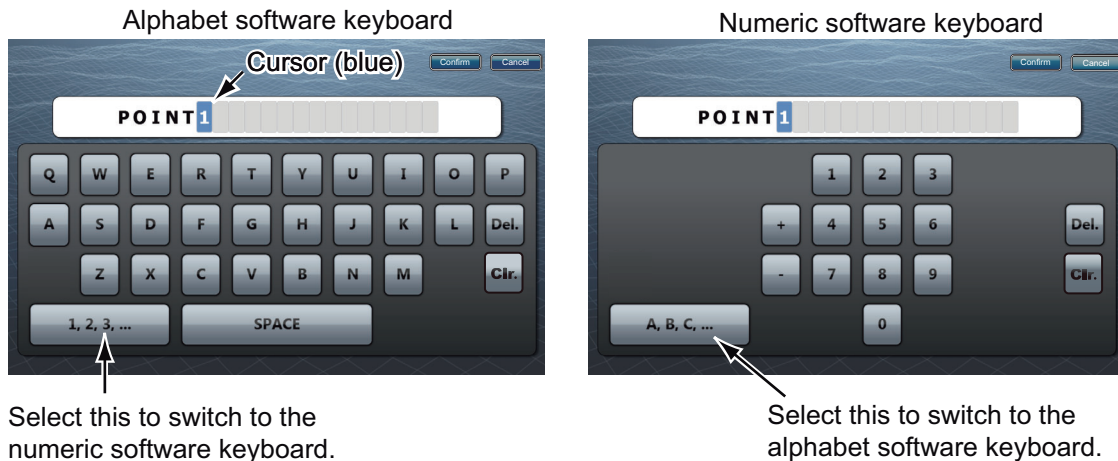
5. Select the menu item to set from the sub menu.  
There are four types of icons to indicate how to set a menu item, and each has the unique function as shown on the next page.



Icon	Description
	This icon means that menu item has some options. Touch it to show the option window (pull-down list).
	Touch the menu item with this icon to display the software keyboard, to enter alphanumeric data. For details, see "How to use the software keyboard" shown below.
	<ul style="list-style-type: none"> <li>Shows a sub menu.</li> <li>Switches a functions ON and OFF.</li> <li>Selects a color.</li> </ul>
	Drag the circle icon to adjust the setting value.


6. Select [Close] at the top right-hand side of the screen to exit the menu.

**(How to use the software keyboard)**



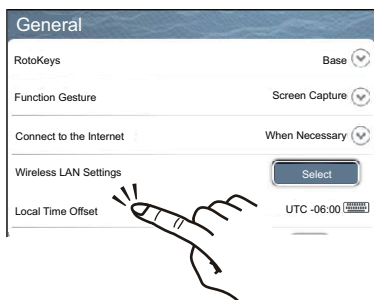
### 3.1 How to Set Time Difference, Time Format, Language and Units

Before setting up your equipment, set the time difference (between local time and UTC), time format, language and units to use on your equipment as shown below.

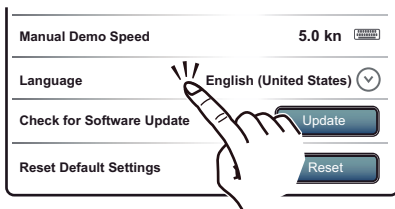
1. Press the **Home** key, then select [Menu] icon (  ) from the menu icon bar.
2. Select [General] on the main menu to show the [Menu General] sub menus.

### 3. SETTING UP THE EQUIPMENT

3. Select [Local Time Offset] to show the option window.



4. Select time difference between local time and UTC time, using the software keyboard, in 15-minute increments.
5. Select [Time Format].
6. Select 12 or 24 hour format. [Auto] automatically inserts AM or PM indication in the 24 hour clock, when the language is English.
7. Select [Language] to show its option window.



8. Select the language to use.
9. Drag the main menu to select [Units], and set the units to show on the display.

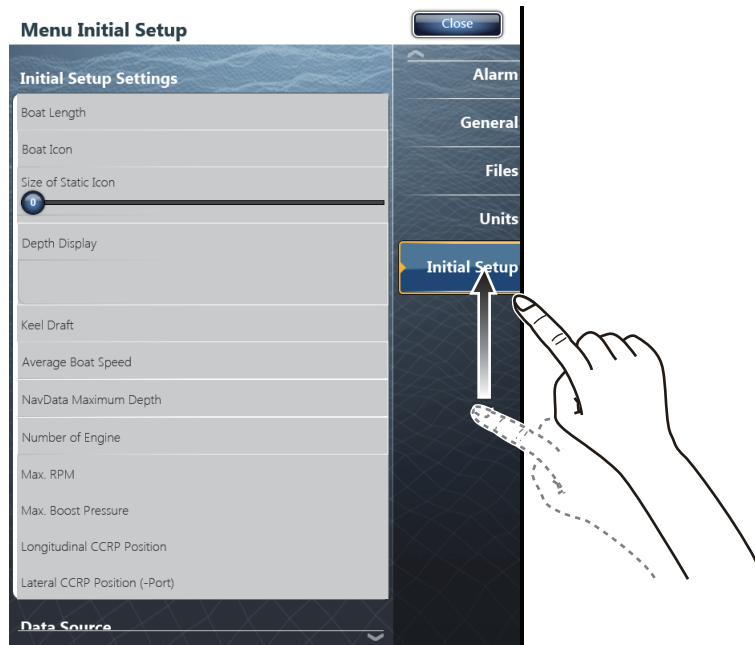
#### [Menu Units] sub menus

Menu item	Options
[Bearing Display]	[True], [Magnetic]
True Wind Calculation Reference	[Ground], [Surface]
[Position Format]	[DDD°MM.mmmm'], [DDD°MM.mmm'], [DDD°MM.mm'], [DDD°MM';SS.ss'], [DDD.dddddd°], [Loran C], [MGRS]
[Loran C Station & GRI]	[GRI] Select GRI code. [Master] - [First (Second) Slave] X: Upolu Point, Y: Kure Island [Correction First (Second) Slave] Enter a position offset to refine Loran C position.
[Range (Long)]	[Nautical Mile], [Kilometer], [Mile]
[Range (Short)]	[Foot], [Meter], [Yard]
[Short/Long Change Over]	Set the distance at which to change between short and long range. Set the long range here.
[Depth]	[Foot], [Meter], [Fathom], [Passi Braza]
[Height/Length]	[Foot], [Meter]
[Temperature]	[Fahrenheit Degree], [Celsius Degree]
[Boat Speed]	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]
[Wind Speed]	[Knot], [Kilometer per Hour], [Mile per Hour], [Meter per Second]
[Atmospheric Pressure]	[HectoPascal], [Millibar], [Millimeter of Mercury], [Inch of Mercury]
[Oil Pressure]	[KiloPascal], [Bar], [Pound per Square Inch]
[Volume]	[Gallon] (Gallon & Gallon/hour), [Liter] (Liter & Liter/hour)
[Reset Default Settings]	Restore default unit settings.

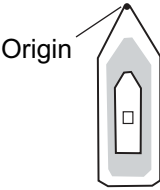
## 3.2 Menu Initial Setup

This section shows you how to set your system according to the sensors you have connected.

Drag the main menu, then select the [Initial Setup] to show the [Menu Initial Setup] sub menu.



*Menu Initial Setup*

Menu item	Description	Options (setting range)
[Boat Length]	Set the length of your boat.	5.0 to 9,999 ft
[Longitudinal GPS Position]	Enter the GPS antenna positioning bow-stern (Longitudinal) and port-star-board (Lateral) position from the origin.	
[Lateral GPS Position (-Port)]		
		
[Boat Icon]	Select the icon that best matches your boat.	[Sport Fishing], [Cruiser], [Sailboat], [Commercial]
[Size of Static Icon]	Set the size of static (such as own ship) icons.	50 to 150
[Depth Display]	Select the start point for depth measurement.	[Under Keel], [Under Sea Level]
[Keel Draft]	Set the keel draft.	0.0 to 99 ft
[Average Boat Speed]	Select your boat type to use for average speed calculation.	[Sailing], [Commercial], [Powerboat]
[Nav Data Maximum Depth]	Select the maximum depth for navigation data.	[Very Shallow] (under 10 m), [Shallow] (10 to 20 m), [Deep] (20 to 200 m), [Very Deep] (200 to 2000 m)

### 3. SETTING UP THE EQUIPMENT

#### Menu Initial Setup (Engine)

Menu Item	Description	Options (setting range)
[Number of Engine]	Select the number of engines on your boat.	[1], [2], [3], [4]
[Max. RPM]	Set the maximum rpm of your engine to show on the RPM display.	1000 to 20,000 rpm
[Red Zone RPM]	Set the starting value for the red zone area of the tachometer.	0 to 20,000 rpm
[Red Zone Oil Pressure]	Set the starting value for the red zone area of the oil pressure meter.	0 to 999 kPa
[Red Zone Temperature]	Set the starting value for the red zone area of the engine temperature indicator.	0°F to 999°F
[NickName Engine 1 to 4]	Change the nickname for engine 1 to 4.	

#### Menu Initial Setup (Fuel)

Menu Item	Description	Options (setting range)
[Number of Tank]	Select the number of fuel tanks on your boat.	[1], [2], [3], [4]
[NickName Tank 1 to 4]	Change the nickname for fuel tank 1 to 4.	

#### Menu Initial Setup (Use Fuel Tank for calculations)

Menu Item	Description	Options (setting range)
[Tank 1 to 4]	Select the tanks to calculate the fuel consumption.	[ON], [OFF]

#### Menu Initial Setup (Data Acquisition)

Menu Item	Description	Options (setting range)
[GP330B WAAS Mode]	Select [ON] to use the WAAS mode for the corresponding GPS antenna.	[ON], [OFF]
[WS200 WAAS Mode]		
[Data Source]	Select the source for each data to input to the system. If two or more sources are connected for a data, select one using the pull-down dialog box. The FURUNO products are shown at the upper part of the list.	
[Sensor List]	Show the information for sensors connected to your equipment. Also, you can set "Nickname" for them here.	
[PGN Output]	Select [ON] for the PGNs (Parameter Group Number, CAN bus (NMEA2000) message) to output from the CAN bus port.	
[Sky View]	Show the condition of GPS and GEO (WAAS) satellites. Number, bearing and elevation angle of all GPS and GEO satellites (if applicable) in view of your receiver appear.	

#### Menu Initial Setup (SC-30 Setup)

Menu item	Description	Options (setting range)
[WAAS Mode]	Select [ON] to use the WAAS mode.	
[Heading Offset]	Enter the offset value for heading.	-180° to +180°
[Pitch Offset]	Enter the offset value for pitching.	-180° to +180°
[Roll Offset]	Enter the offset value for rolling.	-180° to +180°

Menu Initial Setup (Calibration)

Menu item	Description	Options (setting range)
[Heading]	Offset heading data.	-180.0° to +180.0°
[Speed Through Water]	Calibrate speed data. Enter amount in percentage.	-50% to +50%
[Wind Speed]	Offset wind speed data. Enter amount in percentage.	-50% to 50%
[Wind Angle]	Offset wind angle data.	-180° to +180°
[Sea Surface Temperature]	Offset sea surface temperature data.	-10°C to +10 °C

Menu Initial Setup (Data Damping)

Menu item	Description	Options (setting range)
[COG & SOG]	Set data damping time. The lower the setting the faster the response to change.	0 to 59 seconds
[Heading]		
[Speed Through Water]		
[Wind Speed & Angle]		
[Rate of Turn]		

Menu Initial Setup (Browser Installation)

Menu item	Description	Option (setting range)
[FAX30 Browser]	Show the Facsimile Receiver FAX-30 display.	
[FA30 Browser]	Show the AIS Receiver FA-30 display.	
[FA50 Browser]	Show the AIS Receiver FA-50 display.	

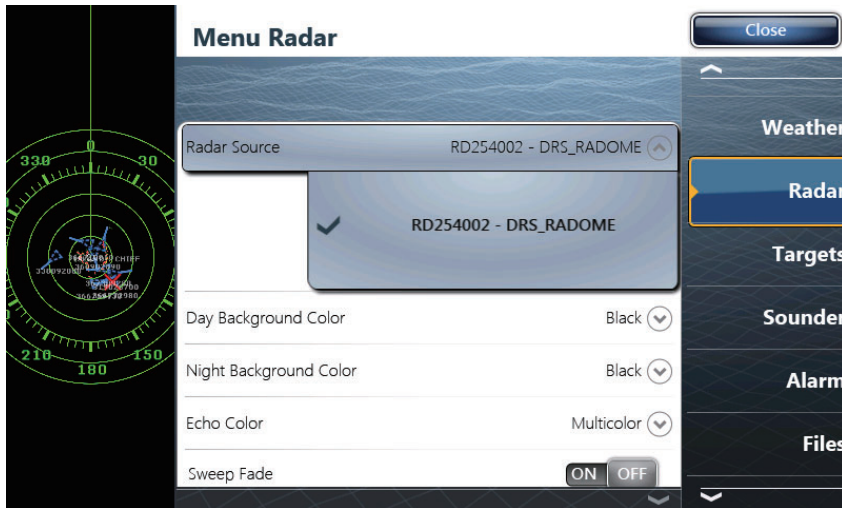
**Note:** The [External Touch Screen Mode] allows you to facilitate the operation of the TZT9/TZT14 when an external dual touch screen is connected to the MFD via the USB and DVI-D ports. When the [External Touch Screen Mode] is set to [ON], the contextual Rotokeys appear near the cursor and the dual gesture is set automatically to display the "Home" screen.

### 3.3 How to Set up the Radar

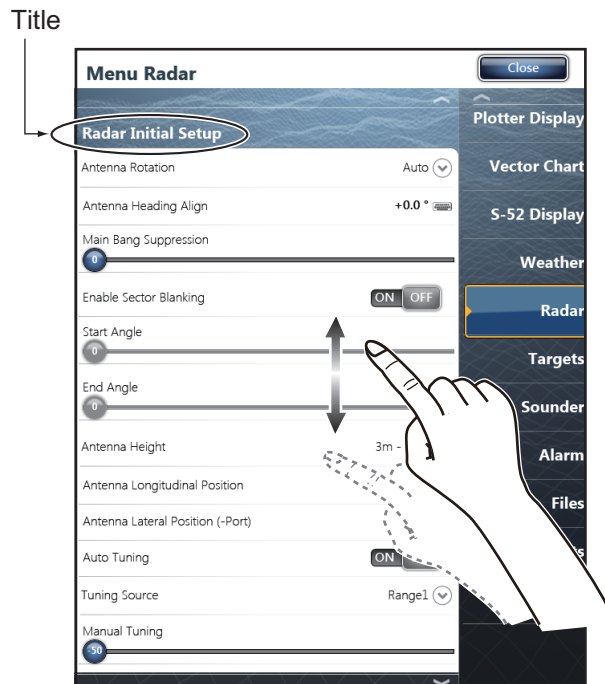
If you have a radar sensor, set the sensor's characteristics on the [Radar] menu. Open the [Menu Radar] sub menus. Drag the main menu to select [Radar].

1. Select [Radar Source] on the [Menu Radar] sub menus, then select the radar type connected.

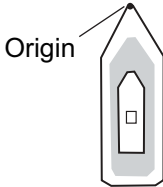
**Note:** If a DRS sensor is connected but does not appear in the [Radar Source] list, close the list and open it again. The name of the DRS sensor should appear with a check mark, as in the example below.



2. Drag the [Menu Radar] sub menus to find the menu item [Radar Initial Setup].



*Menu Radar (Radar Initial Setup)*

Menu item	Description	Options (setting range)
[Antenna Rotation]	Select the speed of antenna rotation.	[Auto], [24 RPM], [48 RPM]
[Antenna Heading Align]	See the topic of "How to align the antenna heading" shown below.	-180° to +180°
[Main Bang Suppression]	If main bang appears at the screen center, slide the circle icon so that the main bang disappears, while watching the radar echo at the left-hand side of the display.	0 to 100
[Enable Sector Blanking]	Up to two sectors may be selected for blanking (no transmission). Select [ON] to enable this feature. Set the start and end angles (0° to 359°).	[ON], [OFF]
[Enable Sector 2 Blanking]		[ON], [OFF]
[Antenna Height]	Select the height of the antenna above the waterline. This menu item is not available with the DRS4DL.	[5m], [7.5m], [10m], [15m], [20m], [25m], [30m], [35m], [40m], [45m], [50m]
[Antenna Longitudinal Position]	Enter the antenna positioning bow-stern (Longitudinal) and port-starboard (lateral) position from the origin.	
[Antenna Lateral Position (-Port)]		
[Auto Tuning]	Enable/disable auto tuning for the connected radar. This menu item is not available with the DRS4D-NXT.	[ON], [OFF]
[Tuning Source]	For dual-range display, select the range to use as the manual tuning source. This menu item is not available with the DRS4DL or DRS4D-NXT.	[Range1], [Range2]
[Manual Tuning]	Manually tune the radar. Not available when [Auto Tuning] is enabled. Also not available with the DRS4D-NXT.	[-50] to [50]
[Radar Monitoring]	Display various information regarding the connected radar.	
[Radar Optimization]	Automatically adjust magnetron output and tuning for the connected radar. For service technician only. Do not change these settings. This menu item is not available with the DRS4D-NXT. <b>Note:</b> Be sure to perform [Radar Optimization] after replacing the magnetron.	
[ARPA Advanced Settings]	For service technician only. Do not change these settings. This menu item is available when setting the radar in transmit. This menu item is not available with the DRS4DL.	
[TX Channel]	Select [1], [2] or [3], the channel where the interference is smallest. See the operator's manual for details. This menu item is only available with the DRS4D-NXT.	[Auto], [1], [2], [3]

### 3. SETTING UP THE EQUIPMENT

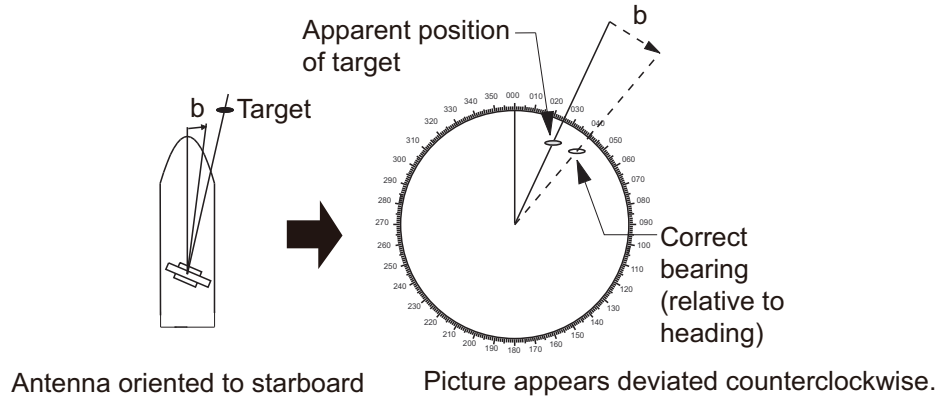
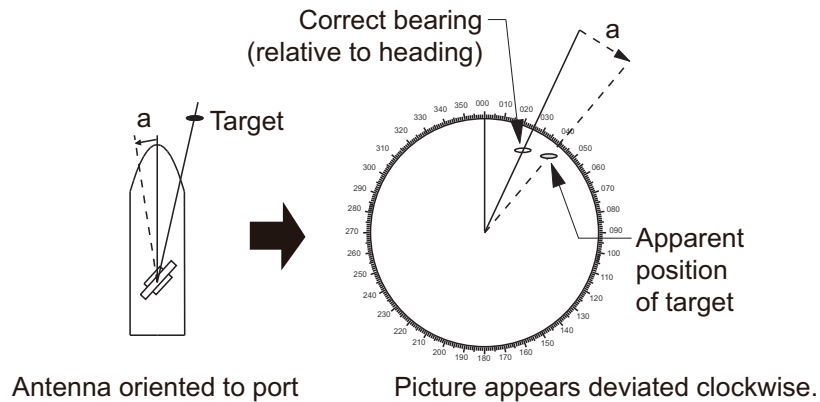
Menu item	Description	Options (setting range)
[Target Analyzer Mode]	You can emphasize rain clutter or target echoes when the target analyzer is active. Select [Rain] or [Target] as appropriate. See the operator's manual for details. This menu item is only available with the DRS4D-NXT, DRS6A-NXT.	[Rain], [Target]
[Auto acquire by Doppler]	When set to [ON], approaching targets (ships, rain clutter, etc.) within 3 NM from own ship are automatically acquired by the Doppler calculated from the radar echo. See the operator's manual for details. This menu item is only available with the DRS4D-NXT, DRS6A-NXT.	[ON], [OFF]
[Hardware Factory Default]	Resets the radar selected at [Radar Source] to factory default.	[OK], [Cancel]
[Reset Default Settings]	Resets the [Radar] menu settings to default.	[OK], [Cancel]



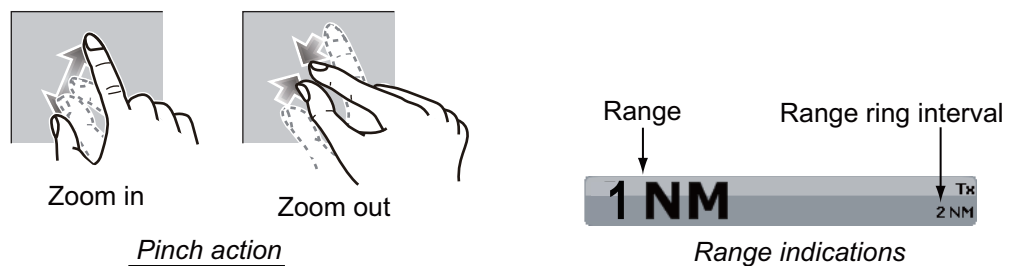
**How to align the antenna heading**

You have mounted the antenna unit facing straight ahead in the direction of the bow. Therefore, a small but conspicuous target dead ahead visually should appear on the heading line (zero degrees).

In practice, you will probably observe some small bearing error on the display because of the difficulty in achieving accurate initial positioning of the antenna unit. The following adjustment will compensate for the error.



- 1) Set your radar with 0.125 and 0.25 nm range and the head up mode. You can select a range by a pinch action. The range and range ring interval appear at the bottom left of the screen.



- 2) Turn the vessel's bow toward a target.
- 3) Press the **Home** key, then select [Menu] icon, [Radar], and [Antenna Heading Align] in that order to show the numeric software keyboard.
- 4) Key in the offset value so that the target becomes at the very top of the screen (setting range: +/- 0° to 180°, +: clockwise direction, -: counterclockwise direction), then tap [Save].
- 5) Confirm that the target echo is displayed at correct bearing on the screen.

## 3.4 How to Set up the Sounder

If you have a sounder (FCV-1150, BBDS1 or DFF series), set up the sounder as shown in this section. Drag the main menu to select [Sounder]. You can confirm the actual sounder display on the left-hand side of the screen while setting up.

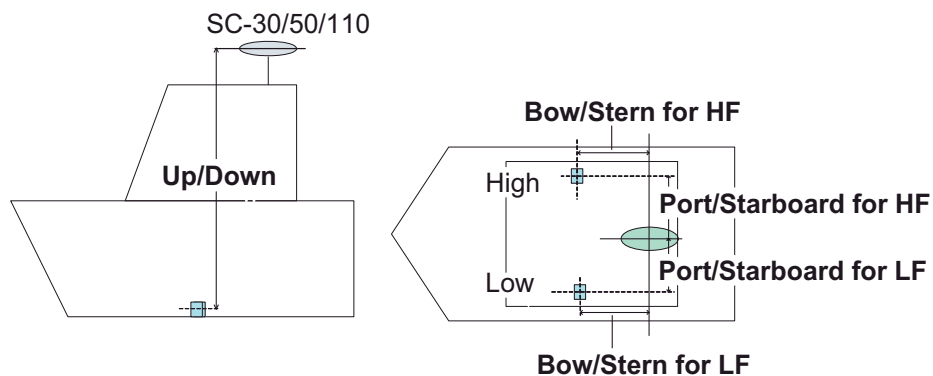
Drag the [Menu Sounder] sub menus to select [Sounder Initial Setup] on it.

Menu item	Description	Options (setting range)
[Zero line Rejection]	When you turn the zero line (transmission line) rejection off, the line is not shown, which allows you to see fish echoes near the surface. The width of the line changes with the transducer used and installation characteristics. If the width of the line is 1.4 m or more, select [ON].	[ON], [OFF]
[Zero line Range]	When [ON] is selected at [Zero line Rejection], set the effective area.	1.4 to 2.5 m
[Transducer Draft]	Set the distance between the transducer and the draft line to show the distance from the sea surface.	0.0 to 99.9 ft
[Salt Water]	Select [ON] in you use this equipment in salt water.	[ON], [OFF]
[Fish Finder Source]	Select the sounder used.	[SOUNDER-DFF1], [SOUNDER-DFF3], [SOUNDER-DFF1-UHD], [SOUNDER-BBDS1], [SOUNDER-FCV-1150]
[Transducer Setup]	Select the method to setup the transducer, manually or by selecting the model number. <b>Manual:</b> Enter high/low frequencies and TX power. <b>Model Number:</b> Select the type of the transducer connected.	[Manual], [Model Number]

### Motion sensor setting up

When you tap the [Transducer Setup], the [Motion Sensor] sub menus are shown beneath the [Transducer Setup] sub menus. If the satellite compass SC-30 or SC50/110 is connected, set the distance between the antenna unit (or sensor) of the satellite compass and transducer (high and low if connected) here.

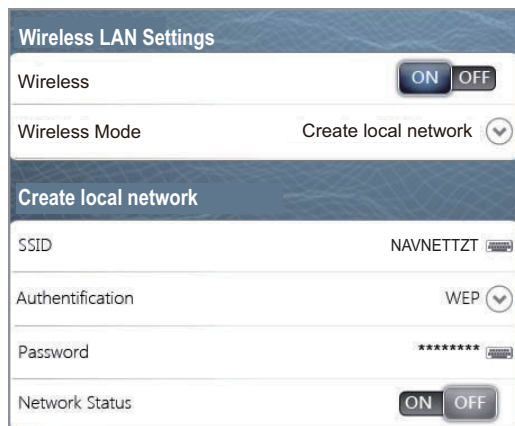
- **Motion Sensor Type:** Select [SC30] or [SC50-SC110] depending on the sensor connected.
- **Motion Sensor Antenna Position Bow/Stern HF (LF):** Set the distance from the antenna unit to the transducer in the bow-stern direction. If the transducer is located on the fore side, set a positive value.
- **Motion Sensor Antenna Position Up/Down HF (LF):** Set the distance from the transducer to the antenna unit in the vertical direction.
- **Motion Sensor Antenna Port/Starboard HF (LF):** Set the distance from the antenna unit to the transducer in the port-starboard direction. If the transducer is located on the starboard side, set a positive value.



### 3.5 Wireless LAN Setting

The TZT9/14 can be configured to create a wireless network ("Ad Hoc") or to connect to an existing wireless network. Connecting to an existing wireless network is very useful if you already have an Access Point setup on your boat, especially if you have Internet available. Simply connect the TZT9/14 and your smartphone or tablet to the existing wireless network. Since the TZT9/14 and smartphone/tablet device will be on the same network, you will be able to share data (using the "NavNet Viewer" App) as well as access the internet (for Weather downloads). Please note that in this configuration, the "NavNet Remote" App performance is inferior due to a larger amount of data being exchanged between the iPad and the MFD (through the access point). The "NavNet Viewer" App performance will not be affected in this mode, as the bandwidth usage is very low. If you do not have an existing wireless access point on your boat or if you want to achieve the best performance with the "NavNet Remote" App, we recommended you establish a "point-to-point" connection. This can be accomplished by configuring the MFD to create a WiFi network (Ad Hoc network). In this mode, the MFD becomes an Access Point (you can setup the network name and password) to which the phone/tablet can connect directly.

Create a wireless LAN network to use the application on your smartphone or tablet with the wireless LAN signal. Select [Wireless LAN Settings] on the [Menu General] sub menus.



*Wireless LAN Settings sub menus*

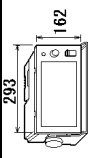


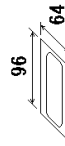

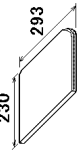


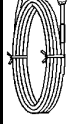
#### How to create a new Wireless LAN network

1. Select [ON] at [Wireless].
2. Select [Create local network] at [Wireless Mode].
3. Set items as shown below.

Item	Description	Options
[SSID]	Enter SSID (Service Set Identifier) to use.	Maximum 32 characters
[Authentication]	Select the authentication.	[Open], [WEP], [WPA2-PSK]
[Password]	Enter the password for connection to the LAN.	Numbers of the character depends on the selection at [Authentication].
[Network Status]	Select [ON] to connect with your tablet/ smartphone over wireless LAN network.	[ON], [OFF]




# PACKING LIST TZ19

19BC-X-9851-14 1/1


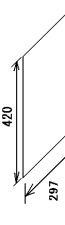





NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
<b>ユニット UNIT</b>			
マルチファンクションディスプレイ MULTI FUNCTION DISPLAY		TZ19-* 000-022-427-00**	1
<b>予備品 SPARE PARTS</b>			
予備品 SPARE PARTS		SPT9-01301 001-175-310-00	1
<b>付属品 ACCESSORIES</b>			
SDカード 書込み品 SD MEMORY CARD		1950188- 001-494-250-00	1 (*1)
WiFi_ARIバツッカー WiFi_ARI STICKER		19-031-1563-0 100-375-230-10	1 (*1)
ハードカバー 袋詰 HARD COVER		19-031-1061	1
書類ケース (NAV4) DOCUMENTS CASE		L293XW230XH18	1
付属品 ACCESSORIES		000-176-350-1*	1
フィルタークリーナー LCD CLEANING CLOTH		FPI9-01701 001-166-230-00 19-028-3125-6 100-360-676-10	1
<b>工事材料 INSTALLATION MATERIALS</b>			
ケーブル (フミビシ) LAN LAN CABLE ASSEMBLY		MOD-IMPAS0001-030+ 000-164-609-10	1

1.コード番号末尾の[\*\*]は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL  
2.付属品及び一部の図書は、書類ケースに収められています。  
ACCESSORIES AND A PART OF THE DOCUMENTS IS PUT IN THE DOCUMENTS CASE.

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

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ケーブル組品 CABLE ASSEMBLY		FRUDD-18AFFM-L180 000-164-608-10	1
ケーブル組品(MJ) CABLE ASSY.		MLG-43SPF0017-050ZC 000-157-995-10	1
工事材料 INSTALLATION MATERIALS		CP19-01501 001-166-220-00	1

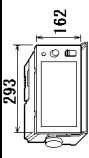


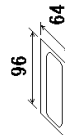


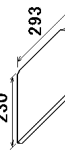

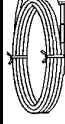
## 図書 DOCUMENT

ユーザー変更のお願い NOTIFICATION DOCUMENT		C42-01106-* 000-176-033-1*	1
フラッシュマウント型紙 FLASH MOUNTING TEMPLATE		C42-01104-* 000-176-021-1*	1
操作要領書 (多言) OPERATOR'S GUIDE (MLG)		MLG-44700-* 000-176-019-1*	1
埋め込み装備時の注意 NOTICE ON FLUSH MOUNTING		C42-01603-* 000-191-900-1*	1
取扱説明CD OPERATOR'S MANUAL CD		NAVNET4 O/M *CD-ROM* 000-191-476-1*	1
装備要領書 INSTALLATION MANUAL		IM*-44700-* 000-176-017-1* **	1
ユーザーハンドブック USER'S HANDBOOK		*42-01107-* 000-176-084-1* **	1

3.(\*)は和文仕様用です。  
\*1: FOR JAPANESE SET.




# PACKING LIST TZT9-J/E

19BC-X-9853-10 1/1


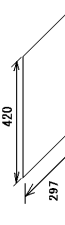





NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
<b>ユニット UNIT</b>			
マルチファンクションディスプレイ MULTI FUNCTION DISPLAY		TZT9-* 000-022-427-00**	1
<b>予備品 SPARE PARTS</b>			
予備品 SPARE PARTS		SPT9-01301 001-201-370-00	1
<b>付属品 ACCESSORIES</b>			
SDカード 書込み品 SD MEMORY CARD		1950188 001-494-250-00	1 (*1)
WiFi_ARIバスタッカー WIFI_ARIB STICKER		19-031-1563-0 100-375-230-10	1 (*1)
ハードカバー 袋詰 HARD COVER		19-031-1061	1
フィルタークリーナー LCD CLEANING CLOTH		001-209-320-00 19-028-3125-6	1
書類ケース (NAV4) DOCUMENTS CASE		L293XW230XH18 000-176-350-1*	1
付属品 ACCESSORIES		FP19-01701 001-201-410-00	1
<b>工事材料 INSTALLATION MATERIALS</b>			
ケーブル (ミミニ) LAN LAN CABLE ASSEMBLY		MOD-IMPAS0001-030+ 000-164-609-10	1

1.コード番号末尾の[\*\*]は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL  
2.付属品及び一部の図書は書類ケースに収められています。  
ACCESSORIES AND A PART OF THE DOCUMENTS IS PUT IN THE DOCUMENTS CASE.

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

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ケーブル組品 CABLE ASSEMBLY		FRUDD-18AFFM-L180 000-164-608-10	1
ケーブル組品(MJ) CABLE ASSY.		MJ-A3SPF0017-050ZC 000-157-995-10	1
工事材料 INSTALLATION MATERIALS		CP19-01501 001-201-380-00	1

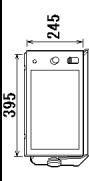
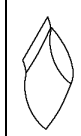
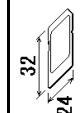
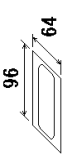

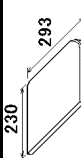

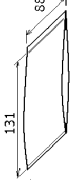
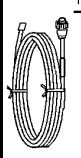
## 図書 DOCUMENT

ユーザー変更のお願い NOTIFICATION DOCUMENT		C42-01106-* 000-176-033-1*	1
フラッシュマウント型紙 FLASH MOUNTING TEMPLATE		C42-01104-* 000-176-021-1*	1
ユーザーハンドブック USER'S HANDBOOK		*42-01107-* 000-176-084-1*	1
取扱説明CD OPERATOR'S MANUAL CD		NAVNET4 O/M *CD-ROM* 000-177-290-1*	1
操作要領書 (多言) OPERATOR'S GUIDE (MLG)		MILG-44700-* 000-176-019-1*	1
装備要領書 INSTALLATION MANUAL		IM*-44700-* 000-176-017-1*	1
埋め込み装備時の注意 NOTICE ON FLUSH MOUNTING		C42-01603-* 000-191-900-1*	1

3.(\*)は和文仕様用です。  
\*1: FOR JAPANESE SET.


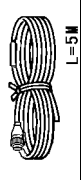

# PACKING LIST TZT14

1980-X-9852-14 1/1

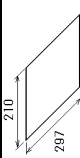
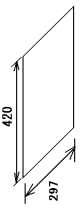
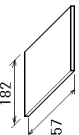
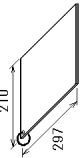
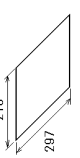

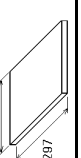
NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
<b>ユニット UNIT</b>			
マルチファンクションディスプレイ MULTI FUNCTION DISPLAY		TZT14- 000-022-429-00**	1
<b>予備品 SPARE PARTS</b>			
予備品 SPARE PARTS		SPT9-01201 001-166-210-00	1
<b>付属品 ACCESSORIES</b>			
SDカード 書込み品 SD MEMORY CARD		1950188- 001-494-250-00	1 (*1)
WiFi_ARIバツッカー WIFI_ARIB STICKER		19-031-1563-0 100-375-230-10	1 (*1)
ハードカバー 袋詰 HARD COVER		19-031-2061	1
書類ケース (NAV4) DOCUMENTS CASE		001-209-340-00 L293XW230XH18	1
付属品 ACCESSORIES		000-176-350-1*	1
フィルタークリーナー LCD CLEANING CLOTH		FPI9-01701 001-166-230-00 19-028-3125-6 100-360-676-10	1
<b>工事材料 INSTALLATION MATERIALS</b>			
ケーブル (7ミビシ) LAN LAN CABLE ASSEMBLY		MOD-IMPAS0001-030+ 000-164-609-10	1

1.コード番号末尾の「\*\*」は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL  
2.付属品及び一部の図書は、書類ケースに収められています。  
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(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ケーブル組品 CABLE ASSEMBLY		FRUDD-18AFFM-L180 000-164-608-10	1
ケーブル組品 (MJ) CABLE ASSY.		MJ-A3SPF0017-050ZC 000-157-995-10	1
工事材料 INSTALLATION MATERIALS		CP19-01601 001-166-240-00	1

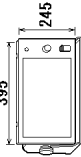

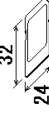
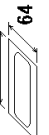




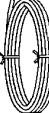
## 図書 DOCUMENT

ユーザー変更のお願い NOTIFICATION DOCUMENT		C42-01106-* 000-176-033-1*	1
フラッシュマウント型紙 FLASH MOUNTING TEMPLATE		C42-01105-* 000-176-022-1*	1
ユーザーハンドブック USER'S HANDBOOK		*42-01107-* 000-176-084-1*	1
操作要領書 (多言) OPERATOR'S GUIDE (MILG)		MILG-44700-* 000-176-019-1*	1
埋め込み装備時の注意 NOTICE ON FLUSH MOUNTING		C42-01603-* 000-191-900-1*	1
取扱説明CD OPERATOR'S MANUAL CD		MANVET4 O/M *CD-ROM* 000-191-476-1*	1
装備要領書 INSTALLATION MANUAL		IM*-44700-* 000-176-017-1*	1

3.(\*)は和文仕様用です。  
\*2: FOR JAPANESE SET.






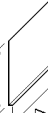

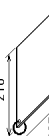

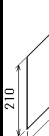
# PACKING LIST TZT14-J/E

1980-X-9854-10 1/1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
<b>ユニット UNIT</b>			
マルチファンクションディスプレイ MULTI FUNCTION DISPLAY		TZT14- 000-022-429-00**	1
<b>予備品 SPARE PARTS</b>			
予備品 SPARE PARTS		SP19-01201 001-201-420-00	1
<b>付属品 ACCESSORIES</b>			
SDカード 書込み品 SD MEMORY CARD		1950188- 001-494-250-00	1 (*1)
WiFi_ARIスタッカー WIFI_ARIB STICKER		19-031-1563-0 100-375-230-10	1 (*1)
ハードカバー 袋詰 HARD COVER		19-031-2061	1
フィルタークリーナー LCD CLEANING CLOTH		001-209-340-00 19-028-3125-6	1
書類ケース (NAV4) DOCUMENTS CASE		L293XW230XH18 000-176-350-1*	1
付属品 ACCESSORIES		FP19-01701 001-201-410-00	1
<b>工事材料 INSTALLATION MATERIALS</b>			
ケーブル (ミビシ) LAN LAN CABLE ASSEMBLY		MOD-IMPAS0001-030+ 000-164-609-10	1

1.コード番号末尾の[\*\*]は、選択品の代表コードを表します。  
CODE NUMBER ENDING WITH "\*\*" INDICATES THE CODE NUMBER OF REPRESENTATIVE MATERIAL  
2.付属品及び一部の図書は書類ケースに収められています。  
ACCESSORIES AND A PART OF THE DOCUMENTS IS PUT IN THE DOCUMENTS CASE.

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

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ケーブル組品 CABLE ASSEMBLY		FRUDD-18AFFM-L180 000-164-608-10	1
ケーブル組品 MJ CABLE ASSY.		MJ-43SPF0017-050ZC 000-157-995-10	1
工事材料 INSTALLATION MATERIALS		CP19-01601 001-201-430-00	1
<b>図書 DOCUMENT</b>			
ユーザー変更のお願い NOTIFICATION DOCUMENT		C42-01106-* 000-176-033-1*	1
フラッシュマウント型紙 FLASH MOUNTING TEMPLATE		C42-01105-* 000-176-022-1*	1
ユーザーハンドブック USER'S HANDBOOK		*42-01107-* 000-176-084-1*	1
取扱説明CD OPERATOR'S MANUAL CD		NAVNET4 O/M *CD-ROM* 000-177-290-1*	1
操作要領書 (多言) OPERATOR'S GUIDE (MLG)		MLG-44700-* 000-176-019-1*	1
装備要領書 INSTALLATION MANUAL		IM*-44700-* 000-176-017-1*	1
埋め込み装備時の注意 NOTICE ON FLASH MOUNTING		C42-01603-* 000-191-900-1*	1

3.(\*)は和文仕様です。  
\*1:FOR JAPANESE SET.



CODE NO.	001-166-220-00	198C-X-9401-3	1/1
TYPE	CP19-01501		

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	セルフタッピングネジ 1/2 SELF-TAPPING SCREW		SXZ0 SUS304 CODE NO. 000-162-608-10	4	
2	Fッパト金具組品 FLUSH MOUNT FIXTURE 9		CP19-01503 CODE NO. 001-178-970-00	2	
3	平垫金 FLAT WASHER		M8 SUS304 CODE NO. 000-167-464-10	2	
4	六角ナット HEXAGONAL HEAD BOLT		M8X15 SUS304 CODE NO. 000-162-976-10	2	
5	埋め込み準備時の注意 NOTICE ON FLUSH MOUNTING		C42-01603-# CODE NO. 000-191-900-1#	1	

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

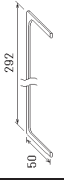

CODE NO.	001-166-240-00	198C-X-9402-3	1/1
TYPE	CP19-01601		

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	セルフタッピングネジ 1/2 SELF-TAPPING SCREW		SXZ0 SUS304 CODE NO. 000-162-608-10	4	
2	Fッパト金具14組品 FLUSH MOUNT FIXTURE 14		CP19-01603 CODE NO. 001-178-900-00	2	
3	平垫金 FLAT WASHER		M8 SUS304 CODE NO. 000-167-464-10	2	
4	六角ナット HEXAGONAL HEAD BOLT		M8X15 SUS304 CODE NO. 000-162-976-10	2	
5	埋め込み準備時の注意 NOTICE ON FLUSH MOUNTING		C42-01603-# CODE NO. 000-191-900-1#	1	

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

CODE NO.	001-171-870-00	198C-X-9403-1
TYPE	CP19-01502	1/1

**工事材料表**

INSTALLATION MATERIALS		略 図 OUTLINE	型名/規格 DESCRIPTIONS	数 量 Q T Y	用 途 / 備 考 REMARKS
番 号 NO.	名 称 NAME				
1	Fマウント用 9H SPONGE 9H FOR FLUSH MOUNT		19-031-1063-1 CODE NO. 100-368-401-10	2	
2	Fマウント用 9V F MOUNT RUBBER 9V		19-031-1068-0 CODE NO. 100-409-210-10	2	

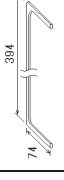
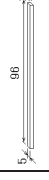
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO ELECTRIC CO . . LTD.

C4470-M02-B

CODE NO.	001-171-880-00	198C-X-9404-1
TYPE	CP19-01602	1/1

**工事材料表**

INSTALLATION MATERIALS		略 図 OUTLINE	型名/規格 DESCRIPTIONS	数 量 Q T Y	用 途 / 備 考 REMARKS
番 号 NO.	名 称 NAME				
1	Fマウント用 14H FLUSH MOUNTING SPONGE 14H		19-031-2063-1 CODE NO. 100-368-971-10	2	
2	Fマウント用 15V F MOUNT SPONGE 15V		19-032-2063-2 CODE NO. 100-397-562-10	2	

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

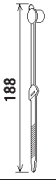
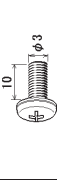
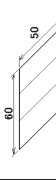


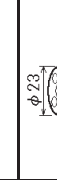

FURUNO ELECTRIC CO . . LTD.

C4471-M02-B

CODE NO.	001-166-230-00	198C-X-9501-3
TYPE	FP19-01701	1/1

## 付属品表

### ACCESSORIES

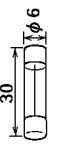
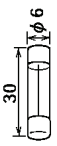
番号 NO.	名称 NAME	略図 OUTLINE	型名/規格 DESCRIPTIONS	数量 QTY	用途/備考 REMARKS
1	MJカ-7 大 LARGE MJ CABLE CAP		02-194-1221-1 R0HS CODE NO. 100-329-441-10	1	
2	シ-10 BINDERHEAD SCREW		03-176-1601-0 CODE NO. 100-349-050-10	4	
3	ヒ-50 FUSE LABEL		19-031-1561-0 CODE NO. 100-372-600-10	1	
4	コ-70 CONNECTOR BOOTS		19-031-1611-2 CODE NO. 100-368-692-10	1	
5	フ-70 BOOT FIXING PLATE		19-031-1612-0 CODE NO. 100-368-700-10	1	
6	カ-φ23 CABLE ADAPTER		19-031-1613-0 CODE NO. 100-371-410-10	1	
7	コ-150 CABLE TIE		04-150B CODE NO. 000-167-183-10	2	

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

FURUNO ELECTRIC CO., LTD.

C4470-F01-D

CODE NO.	001-166-210-00	198C-X-9301-0
TYPE	SP19-01201	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E			REMARKS/CODE NO.
		WORKING PER SET	PER VES	SPARE	
ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY	
1	ヒ-3 GLASS TUBE FUSE		FG80-A 125V 5A PBF	2	000-155-853-10
2	ヒ-3 GLASS TUBE FUSE		FG80 125V 10A PBF	2	000-155-826-10

MFR'S NAME	FURUNO ELECTRIC CO., LTD.	DWG NO.	C4470-P01-A	1/1
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(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)  
型式/コード番号が2段の場合、下段より上段に代わる過熱部品であり、どちらかが入っています。 なお、品質は変わりません。  
NO. TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

# FURUNO

CODE NO. 001-175-310-00 1980-X-3302-1 1/1  
 TYPE SP19-01301 BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E			REMARKS/CODE NO.
		QUANTITY WORKING PER SET	QUANTITY SPARE PER VESSEL	SETS PER VESSEL	
ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.		
1	E <sub>1</sub> -X <sup>*</sup> FUSE GLASS TUBE TYPE		FG80-A 125V 4A PBF	2	000-155-851-10
2	E <sub>1</sub> -X <sup>*</sup> GLASS TUBE FUSE		FG80-A 125V 7A PBF	2	000-164-965-10

MFR'S NAME FURUNO ELECTRIC CO., LTD. DWG NO. C4470-P02-B 1/1

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

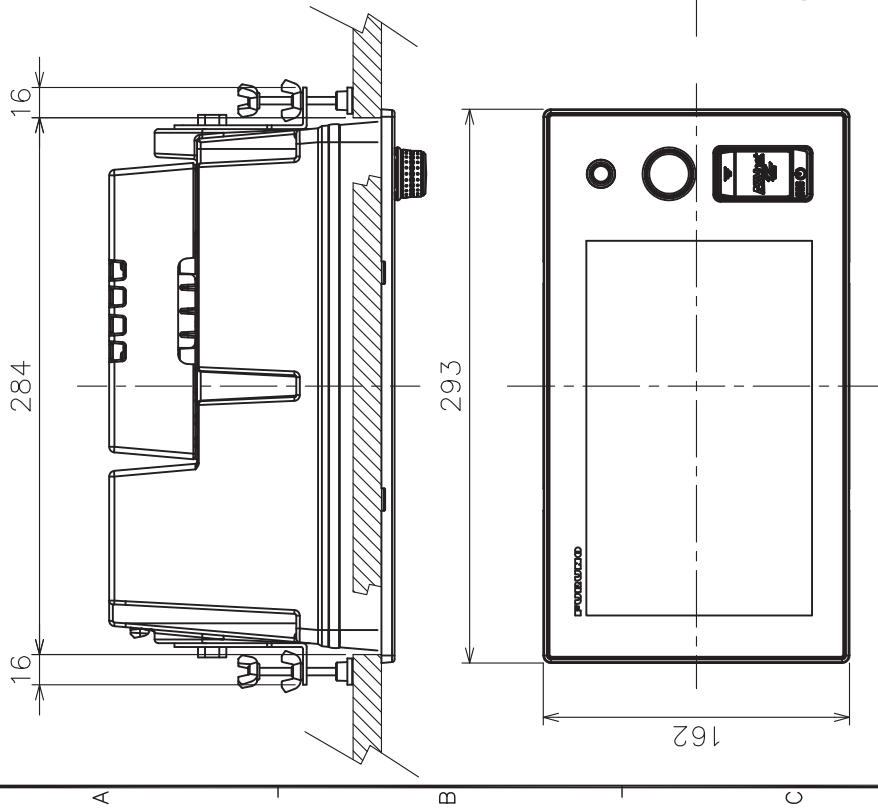
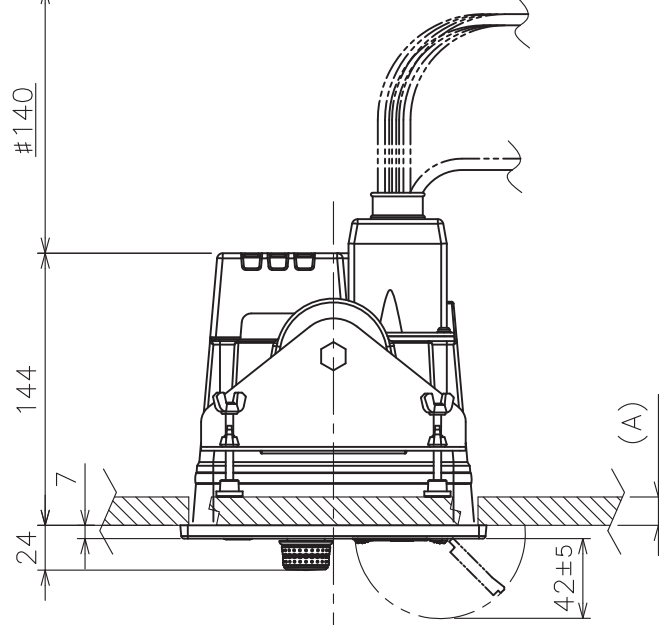
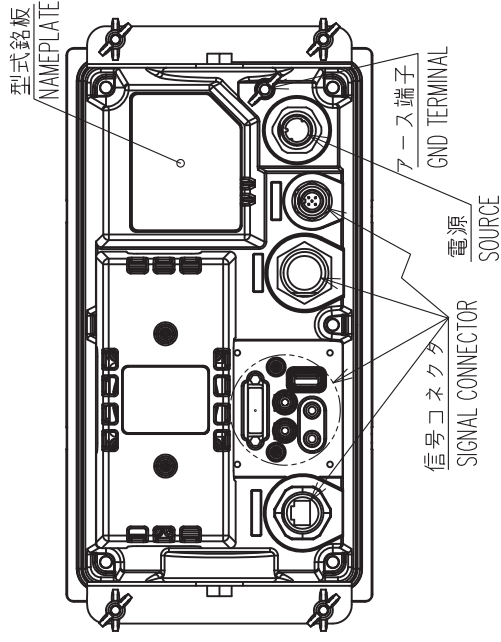


表 1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	$\pm 1.5$
$50 < L \leq 100$	$\pm 2.5$
$100 < L \leq 500$	$\pm 3$

取付穴寸法  
CUTOUT DIMENSIONS



注 記

- 1) 指定外の寸法公差は表 1 による。
- 2) # 印寸法は最小サービス空間寸法とする。
- 3) 壁の厚さ (A) は最小 10 mm、最大 25 mm とする

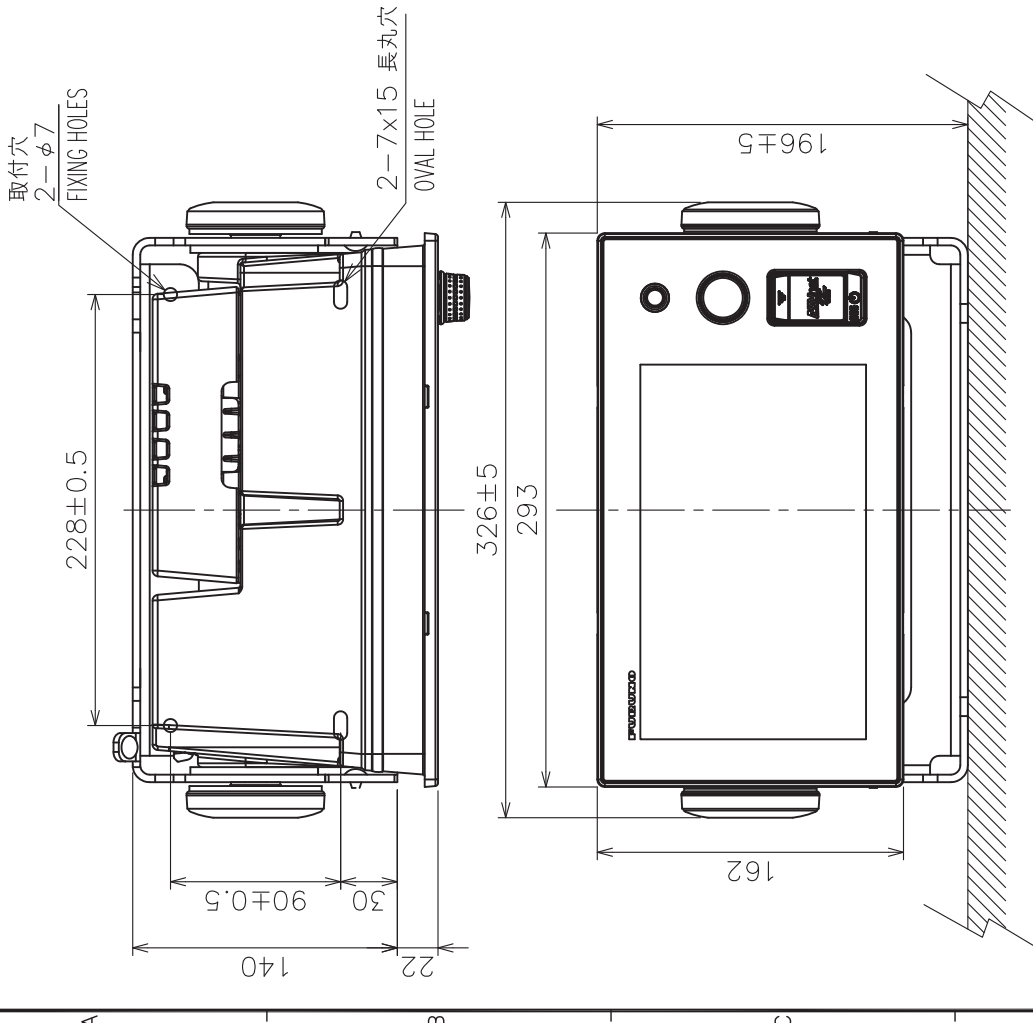
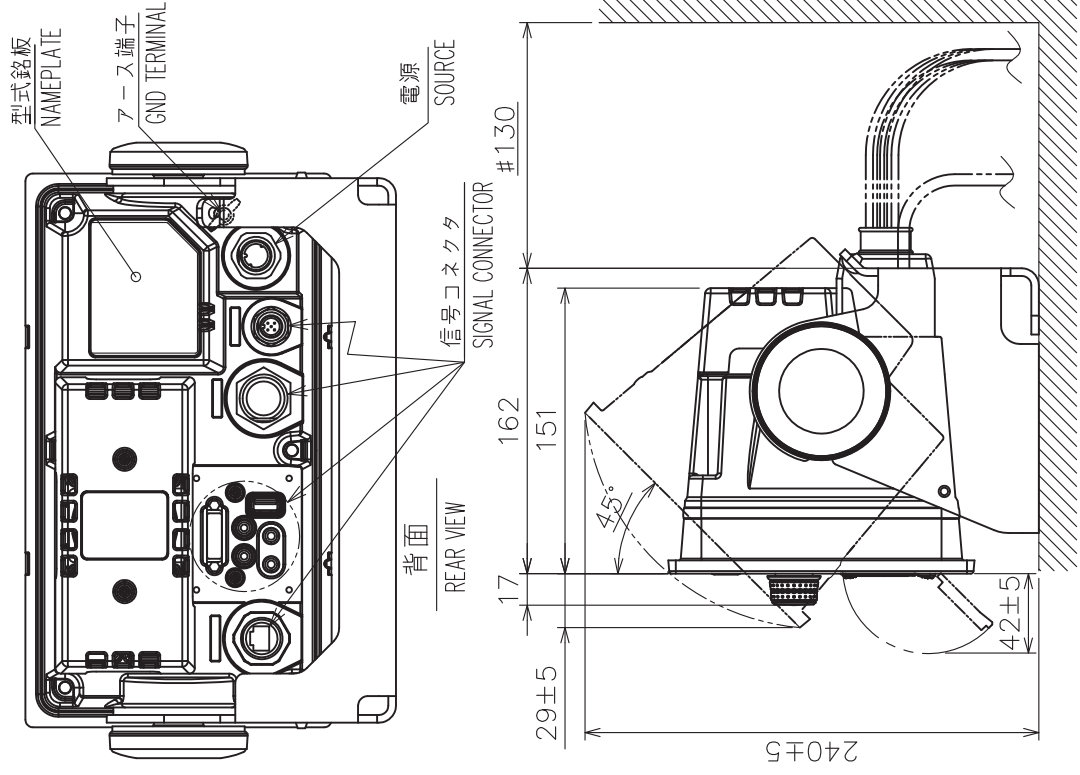
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS (A):  $10 \leq A \leq 25$ .

DRAWN	15/Mar/2012	T.YAMASAKI	TITLE	TZ19
CHECKED	15/Mar/2012	H.IMAKI	名称	マルチファンクションディスプレイ (埋込装備)
APPROVED	15/Mar/2012	Y.NISHIYAMA	外寸図	
SCALE	1/4	質量はケーブルを含みます。 MASS DOES NOT INCLUDE CABLE.	NAME	MULTI FUNCTION DISPLAY (FLUSH MOUNT)
DWG.No.	C4470-G01-B	REF.No.	19-031-100G-2	OUTLINE DRAWING

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

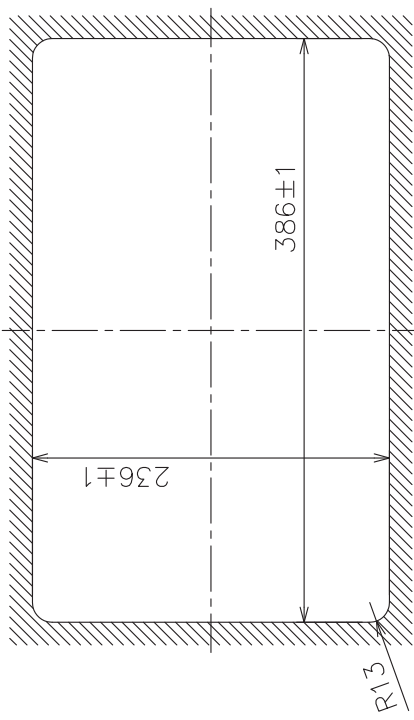


- 注記 1) 指定外の寸法公差は表 1 による。  
 2) # 印寸法は最小サービスペース寸法 (最小配線寸法) とする。  
 3) 取付用ネジは +トラスタップピンネジ呼び径 5×2.0 を使用のこと。
- NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.  
 2. # MINIMUM SERVICE CLEARANCE.  
 3. USE TAPPING SCREWS φ5×2.0 FOR FIXING THE UNIT.

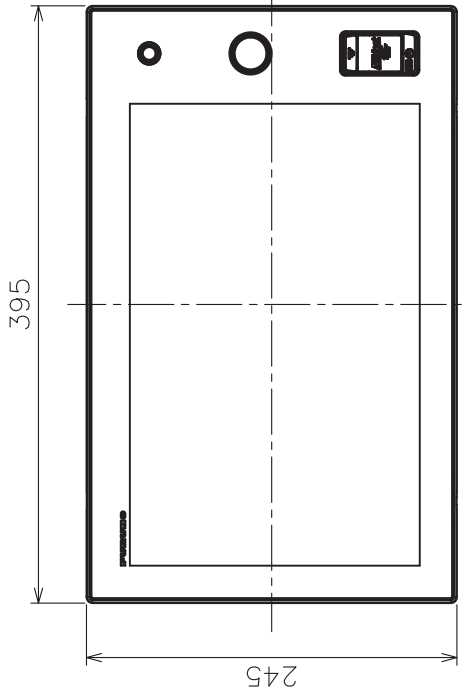
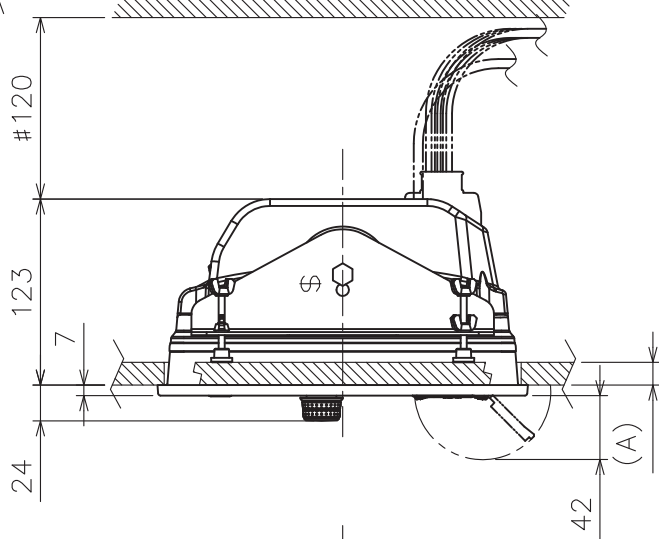
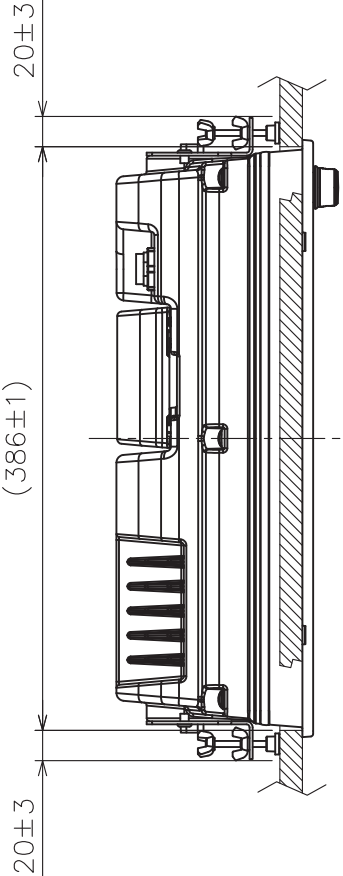
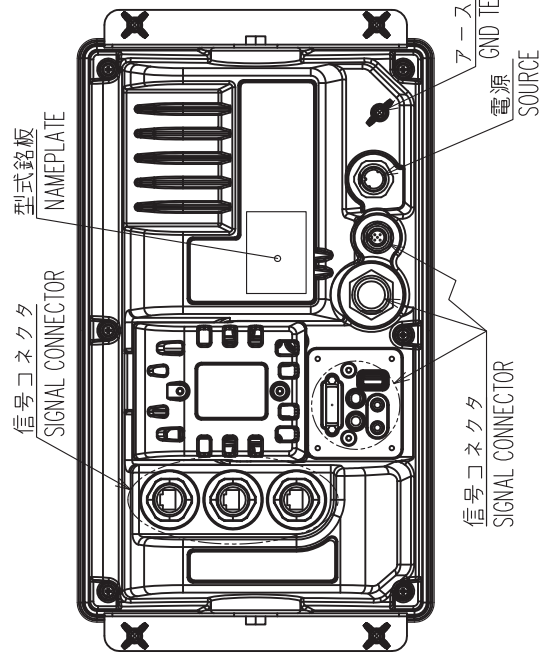
DRAWN	15/Mar/2012	T.YAMASAKI	TITLE	TZT9
CHECKED	15/Mar/2012	H.IMAKI	名称	マルチファンクションディスプレイ (卓上装備)
APPROVED	15/Mar/2012	Y.NISHIYAMA	外寸図	
SCALE	1/4	質量 4.8 ±10% kg	NAME	MULTI FUNCTION DISPLAY (TABLETOP MOUNT)
DWG.No.	C4470-G02-B	REF.No.	19-031-110G-2	OUTLINE DRAWING

表 1 TABLE 1

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



取付穴寸法図  
CUTOUT DIMENSIONS



注 記

- 1) 指定外の寸法公差は表 1 による。
- 2) #印は最小サービス空間寸法とする。
- 3) 壁の厚さ (A) は最小 5 mm、最大 25 mm とする。  
15 mm を境として F マウント金具の取付位置を変更する (\$ 部)。

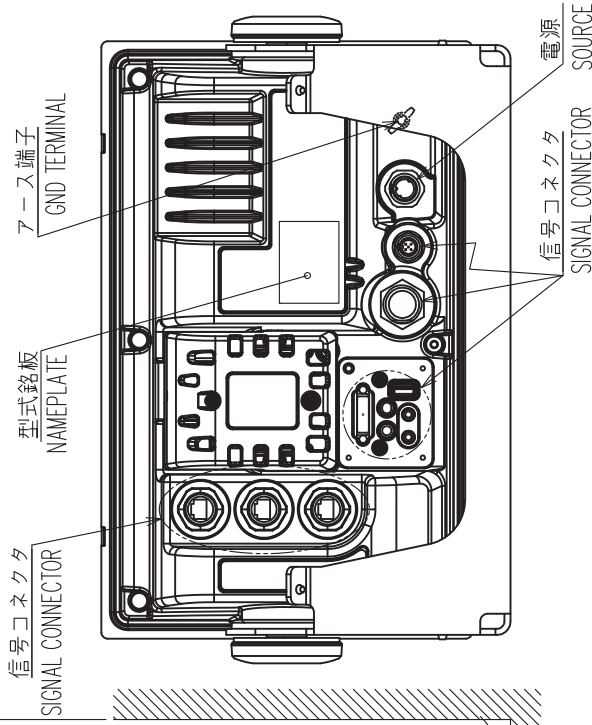
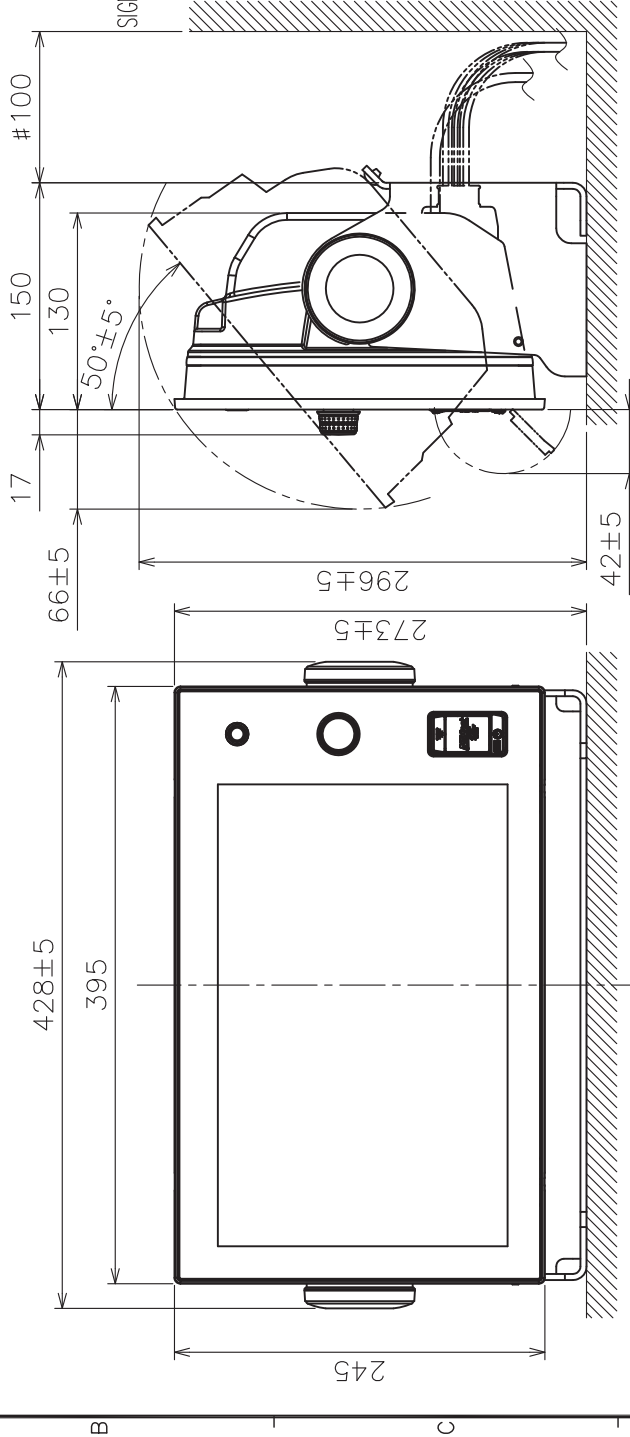
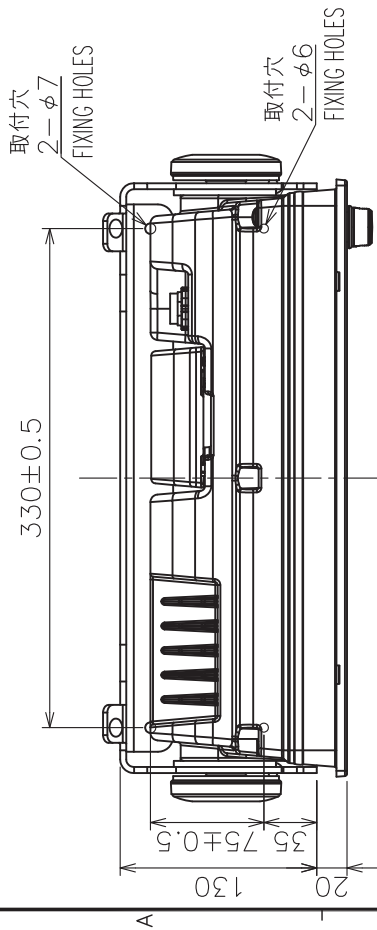
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # MINIMUM SERVICE CLEARANCE.
3. BULKHEAD THICKNESS (A): 5 ≤ A ≤ 25.  
REMount FIXTURE (\$) WHEN THE VALUE CROSSES OVER 15 mm.

DRAWN	15/Mar/2012	T. YAMASAKI	TITLE	TZ114
CHECKED	15/Mar/2012	H. MAKI	名称	マルチファンクションディスプレイ (埋込装置)
APPROVED	15/Mar/2012	Y. NISHIYAMA	外寸図	
SCALE	1/5	質量はケーブルを含みます。 #104 MASS DOES NOT INCLUDE CABLE.	NAME	MULTI FUNCTION DISPLAY (FLUSH MOUNT)
DWG.No.	C4471-G01-B	REF.No.	19-031-200G-2	OUTLINE DRAWING

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

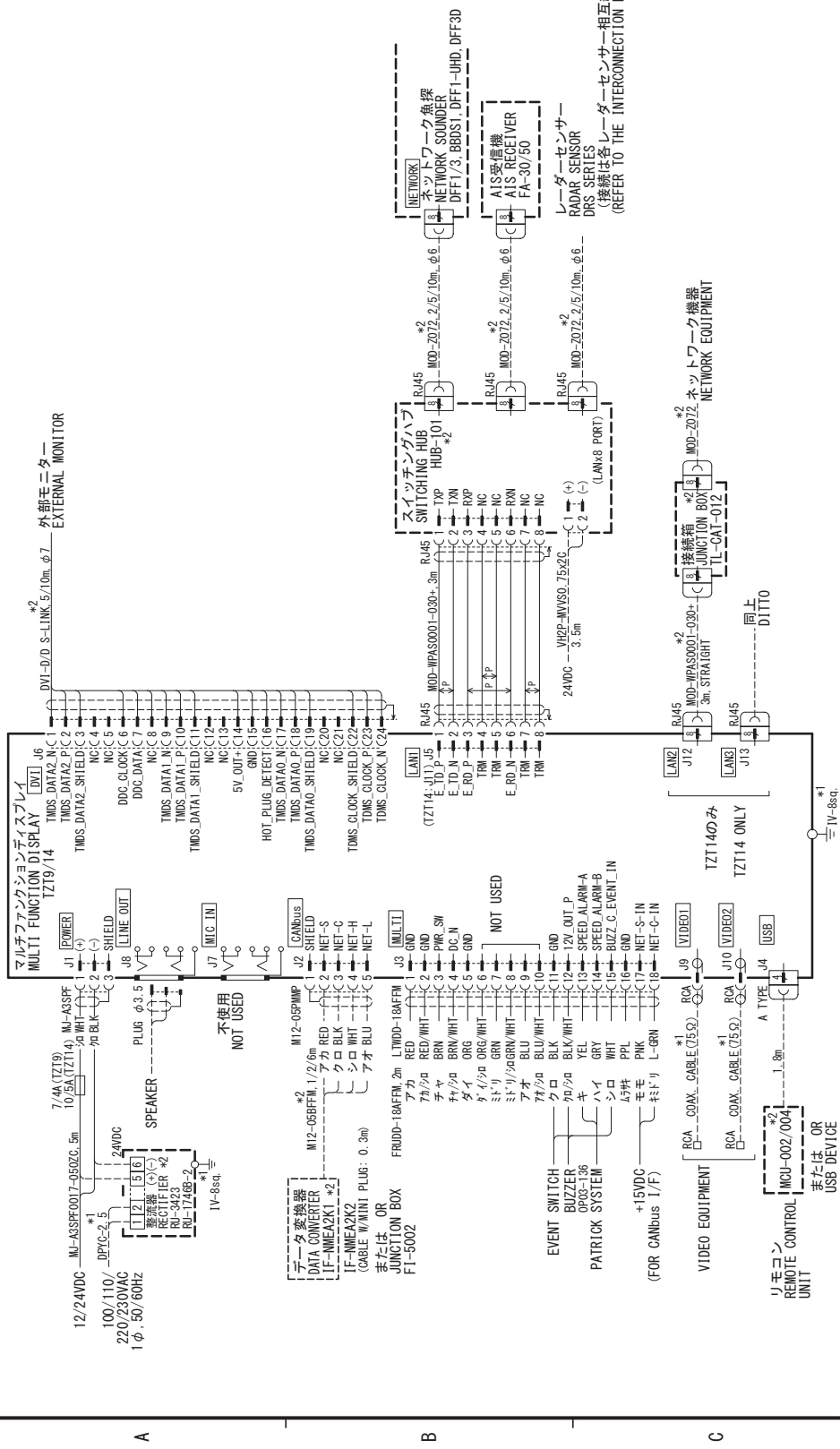
- 1) 指定外の寸法公差は表 1 による。
- 2) # 印寸法は最小サービスペース寸法 (最小配線寸法) とする。
- 3) 取付用ネジは + トラスタップピンネジ 5 × 2.0 を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. # : MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS φ5x2.0 FOR FIXING THE UNIT.

DRAWN	15/Mar/2012	T. YAMASAKI	TITLE	TZ114
CHECKED	15/Mar/2012	H. MAKI	名称	マルチファンクションディスプレイ (卓上装備)
APPROVED	15/Mar/2012	Y. NISHIYAMA	外寸図	
SCALE	1/5	質量 8.0 kg 寸法 104	NAME	MULTI FUNCTION DISPLAY (TABLETOP MOUNT)
DWG.No.	C4471-G02-B	REF.No.	19-031-210G-2	OUTLINE DRAWING





DRAWN	24/Mar/2017 I. YAMASAKI	TITLE	TZT19/14
CHECKED	24/Mar/2017 H. MAKI	名称	マルチファンクションディスプレイ
APPROVED	24/Mar/2017 H. MAKI	相互結線図	
SCALE	24/Mar/2017 H. MAKI	NAME	MULTI FUNCTION DISPLAY
DWG No.	04471-C01-J	REF. No.	19-031-5001-1
			INTERCONNECTION DIAGRAM

注記  
 \* 1) 造船所手配。  
 \* 2) オプション。  
 NOTE  
 \*1: SHIPYARD SUPPLY.  
 \*2: OPTION.





**ECF**

(Elemental Chlorine Free)

The paper used in this manual  
is elemental chlorine free.

**FURUNO ELECTRIC CO., LTD.**

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Nishinomiya, 662-8580, JAPAN

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