

# **FURUNO**

## **OPERATOR'S MANUAL**

*GPS RECEIVER*

MODEL **GP-330B**

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# IMPORTANT NOTICE

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- The descriptions in this manual are intended for readers with a solid knowledge of English.
- No part of this manual may be copied or reproduced without written permission.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications are subject to change without notice.
- Store this manual in a convenient place for future reference.
- FURUNO will assume no responsibility for the damage caused by improper use or modification of the equipment (including software) by an unauthorized agent or a third party.
- When it is time to discard this product it must be done according to local regulations for disposal of industrial waste. For disposal in the USA, refer to the Electronics Industries Alliance.
  
- The serial number for this equipment is recorded on the underside of the GPS receiver, which may not be visible depending on installation method. Record the serial number below for future use.

Serial No.





# SAFETY INSTRUCTION

The operator of this equipment must read these safety instructions before attempting to operate the equipment.



## WARNING

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



## CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



Warning, Caution



Prohibitive Action



Mandatory Action



## WARNING



**The input voltage shall be 12 VDC.**

Any other input voltage can damage the equipment.



**Always wear safety goggles and a dust mask when installing to avoid personal injury.**



## CAUTION



**Do not disassemble the unit.**

Disassembling the unit will damage the waterproof seal. Further, there are no user-serviceable parts inside.



**GPS position and velocity accuracies are controlled by the U.S. Department of Defense. Therefore, the position accuracy described in the specifications cannot be guaranteed.**



**No one navigation device should ever be solely relied upon for the navigation of a vessel.**

Always confirm position against all available aids to navigation, for safety of vessel and crew.



**The compass safe distance for standard and steering compasses is 0.30 m.**

Observe this distance to prevent interference to a magnetic compass.

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**Declaration of Conformity**

# FOREWORD

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## A Word to the Owner of the GP-330

Congratulations on your choice of the FURUNO GP-330B GPS Receiver. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

For 60 years FURUNO Electric Company has enjoyed an enviable reputation for quality marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

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

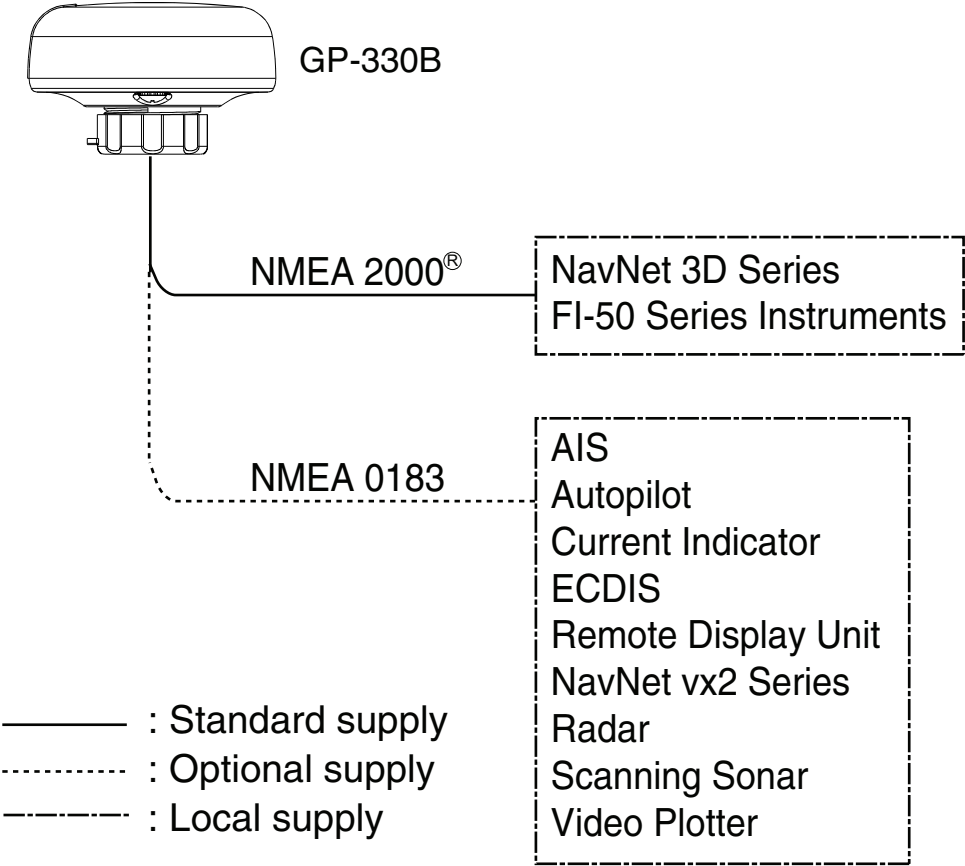
Thank you for considering and purchasing FURUNO equipment.

## Feature

The GP-330B is a high performance GPS Receiver designed for any type of vessel. This compact and cost-effective receiver offers extremely accurate position fixes, within 3 meters with the WAAS mode activated.

- 12 channels for receiving 12 satellites simultaneously
- Output in NMEA 2000<sup>®</sup> or NMEA 0183 format
- Position fixed within approx. 60 seconds after start up
- Position updated every second
- Space-saving installation
- Ideal position-fixing sensor for NavNet<sup>®</sup>3D series

# SYSTEM CONFIGURATION



# 1. INSTALLATION

## 1.1 Equipment Lists

Name	Type	Code No.	Qty	Remarks	
<b>Standard Supply</b>					
GPS Receiver	GP-330B		1		
Installation Materials	CP20-03200	000-012-581	1 set	With NMEA 2000 cable (6 m)	See packing list at back of manual.
	CP20-03210	000-012-582	1 set	No cable	
<b>Optional Supply</b>					
Cable Assy.	22-1025-02	000-168-883-10	1	6 m, for NMEA 2000®	
Cable Assy.	22-1025-06	000-168-884-10	1	10 m, for NMEA 2000®	
Cable Assy.	22-910-03	000-168-885-10	1	10 m, for NMEA 0183	
Cable Assy.	MJ-A7SPF/SRMD-100	000-144-534	1	10 m, straight, MJ7P(P)-MJ7P(J), for NMEA 0183	
Flush Mount Kit	GP-330B-FLUSH KIT	001-037-630	1		
Deck Mount Kit	GP-330B-DECK KIT	001-037-640	1		
Pipe Mount Kit	GP-330B-PIPE KIT	001-041-560	1		

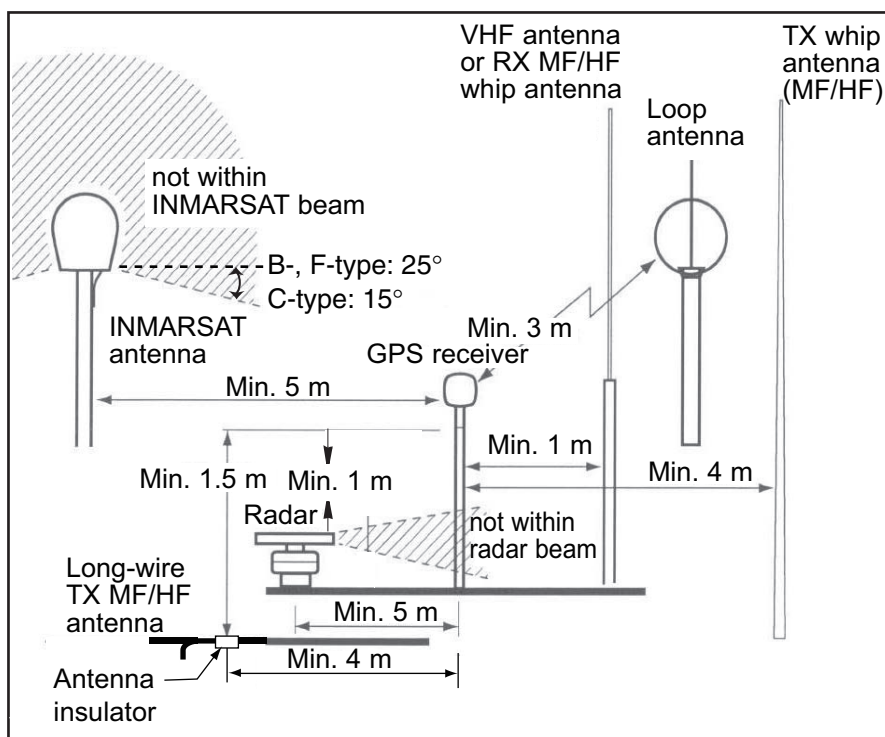
## 1.2 Tools & Materials

- Mounting hardware with standard 1-14" UNS (Pole/Rail Mount installation) threads
- Safety goggles
- Dust mask
- Screwdrivers (Pole/Rail Mount or Deck Mount installation)
- Teflon pipe thread tape, 1/2" wide (some installations)
- Pencil (some installations)
- Electric drill (some installations)
- Drill bits (some installations):
  - Pilot hole - 3 mm or 1/8"
  - Deck mount screw holes - 5.1 mm or #7
  - Deck mount cable hole - 25 mm or 1"
  - Flush mount stud holes - 6 mm or 1/4"
  - Flush mount cable hole - 38 mm or 1-1/2"
- Loctite®242® or other removable thread locker (Flush Mount installation)
- Cable ties (some installations)

## 1.3 Choosing the Mounting Location

For a reliable GPS signal, selecting the best location for the receiver is very important. It can be mounted on a pole, rail, or flat surface. Choose a location that balances the requirements below.

- The GPS receiver must have a clear view of the sky to the horizon in all directions. *Note* that frozen water spray may degrade reception.
- Referring to the figure below for distances, mount away from any VHF radio, satellite communications equipment, radar, or other antennas to avoid mutual interference.
- Mount above or below any radar beam. *Do not* mount within a radar beam.
- Mount reasonably level with the earth's surface -- *not* tilted to one side.
- *Do not* mount on top of a sailboat mast. The sway will cause jitter in the data.
- *Do not* mount where the GPS receiver could be a tripping hazard or tread upon.

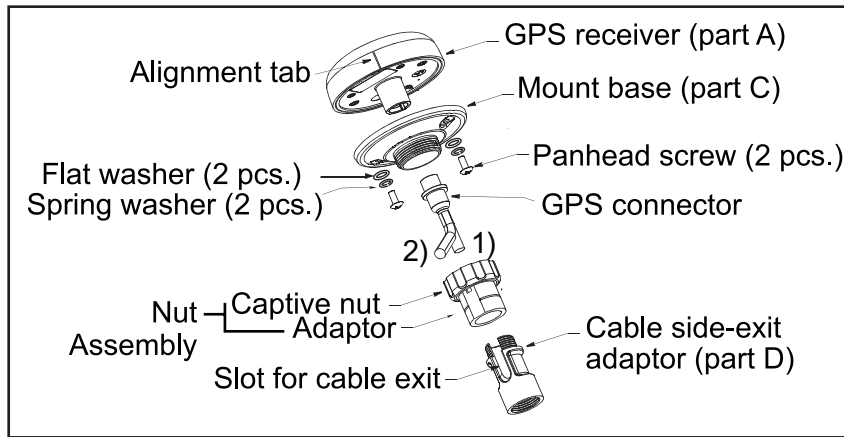




## 1.4 Mounting

### 1.4.1 Pole/Rail (Pipe) Mount

**CAUTION!** - Do not use the flush mount materials to mount the unit on a pole. Water may leak into the unit.

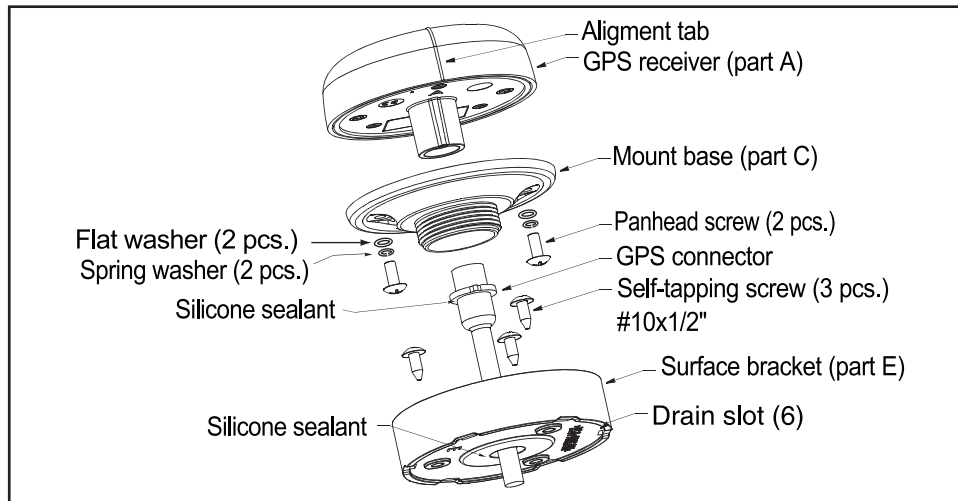


The nut assembly supplied has standard 1-14" UNS threads that can be screwed to a standard marine antenna mount, extension pole, or rail-mount bracket. Before beginning the installation, plan for securing the pole/rail bracket to the boat and purchase locally all the necessary hardware. It may be helpful to fasten the pole/rail bracket to the boat before proceeding.

1. Unscrew the mount base (part C) from the surface bracket (part E). (The surface bracket is not used in this installation. See the next page for part (E)).
2. Remove the label from the GPS receiver's socket (underside of receiver). The label may be discarded.  
Fasten the mount base (part C) to the GPS receiver (part A) with the supplied two panhead screws, flat washers and spring washers. The torque for the screws is 1.35 N•m.
3. Decide if you want the cable to exit through the center or along the side of the pole/rail bracket. Slide the nut assembly (captive nut and adaptor) onto the cable at the 9-pin *GPS* connector end. *Do not connect the GPS receiver at this time.*
  - 1) **Center exit:** Pass the *instrument* connector end of the cable down through the center of the pole. *Be sure to leave several inches of cable extending beyond the nut assembly.*
  - 2) **Side exit:** Place the cable side-exit adaptor (part D) over the cable. *Being sure the cable is passing through the slot in the side*, screw the nut assembly onto the adaptor. **Hand-tighten only.** *Do not* over tighten.  
**Note:** Use the adaptor supplied as it has smooth edges that will *not* chafe the cable. *Do not* use a purchased part.

**CAUTION:** if you use a thread locker, use teflon pipe thread tape. Do not use a liquid thread locker as it may weaken the plastic, causing it to swell and crack.
4. Screw the extension pole/rail bracket onto the nut assembly/cable side-exit adaptor. **Hand-tighten only.** *Do not* over tighten.
5. Remove the protective cap from the GPS connector on the cable. (Save the cap to protect the connector, when the receiver is removed.) Plug the cable firmly into the GPS receiver.
6. With the alignment tab on the GPS receiver facing forward, slide the captive nut upward and screw it onto the mount base. **Hand-tighten only.** *Do not* over tighten.

## 1.4.2 Deck Mount



See the outline drawing for mounting hole dimensions and fixing instructions

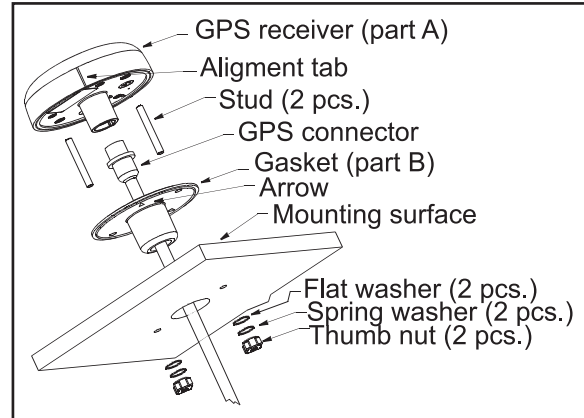
1. Unscrew the mount base (part C) from the surface bracket (part E) (see figure above). Remove the label from over the GPS receiver's socket. (The label may be discarded.) Fasten the mount base (part C) to the GPS receiver (part A) with the supplied panhead screws, flat washers and spring washers. The torque for the screws is 1.35 N•m.
2. Screw the surface bracket (part E) onto the mount base of the assembled GPS receiver. Use a pencil to extend the alignment tab onto the surface bracket. Unscrew the surface bracket.
3. At the selected location, position the surface bracket with the pencil mark facing forward. Using it as a template, mark the position for the three mounting screws and the center hole for the cable.
4. Using a 3 mm or 1/8" bit, drill the pilot holes. Using 5.1 mm or #7 bit, drill the three mounting holes. Drill the cable hole with a 25 mm or 1" bit.  
**Fiberglass**-Minimize surface cracking by running the drill in reverse until the gelcoat is penetrated.
5. At the location shown in the figure above, coat the surface bracket (part E) with silicone sealant.
6. Apply silicone sealant to the three #10 x 1/2" self-tapping screws to seal the deck. With the pencil mark facing forward, fasten the surface bracket in place. *Do not block the drain slots.* They will allow any water that accumulates inside the surface bracket to escape. **CAUTION:** Do not use a liquid thread locker as it may weaken the plastic, causing it to swell and crack.
7. Wrap pipe thread tape around the threads of the mount base two times to seal it tightly to the surface bracket.
8. Coat the part of the GPS connector shown in the figure on page 4 with silicone sealant. Pass the GPS connector end of the cable up through the hole in the surface bracket.
9. Remove the protective cap from the cable's GPS connector. (Save the cap to protect the connector, when the receiver is removed.) Plug the cable firmly into the GPS receiver.
10. Counterclockwise twist the cable three and one-half turns. Then screw the GPS receiver onto the installed surface bracket. **Hand-tighten only.** *Do not over tighten.*

## 1. INSTALLATION

### 1.4.3 Flush Mount

See the outline drawing for mounting hole dimensions and fixing instructions.

1. Remove the label from over the GPS receiver's socket. (The label may be discarded.) Apply *removable* thread locker to the two studs supplied. Screw the studs into the underside of the GPS receiver (part A).
2. Using the gasket (part B) as a template, position it at the selected mounting location *upside down* with the arrow facing forward. Mark the position for the two mounting holes and the center hole for the cable.
3. Using a 3 mm or 1/8" bit, drill the pilot holes. Using a 6 mm or 1/4" bit, drill the two mounting holes for the studs. Drill the cable hole with a 38 mm or 1-1/2" bit.  
**Fiberglass**-Minimize surface cracking by running the drill in reverse until the gelcoat is penetrated.
4. Pass the *instrument* connector-end of the cable through the center of the gasket and down through the center mounting hole in the boat.
5. Plug the cable firmly into the GPS receiver.
6. Orient the gasket with the arrow facing in the same direction as the alignment tab on the GPS receiver. Push the gasket onto the studs and slide it over the connector.  
**Note:** The gasket fits one way only. A groove in the gasket fits over the alignment tab on the connector.
7. With the GPS receiver alignment tab pointing forward, push the studs through the mounting surface. *Check to be sure the gasket is tucked under the lip of the unit.* From underneath the mounting surface, slide the flat washer and spring washer onto each stud. Fasten the studs with the thumb nuts. **Hand-tighten** only. *Do not* over tighten.
8. Coat the circumference of the GPS receiver with silicone sealant so that there is no space between the GPS receiver and the mounting surface.



## 2. WIRING, SETTINGS

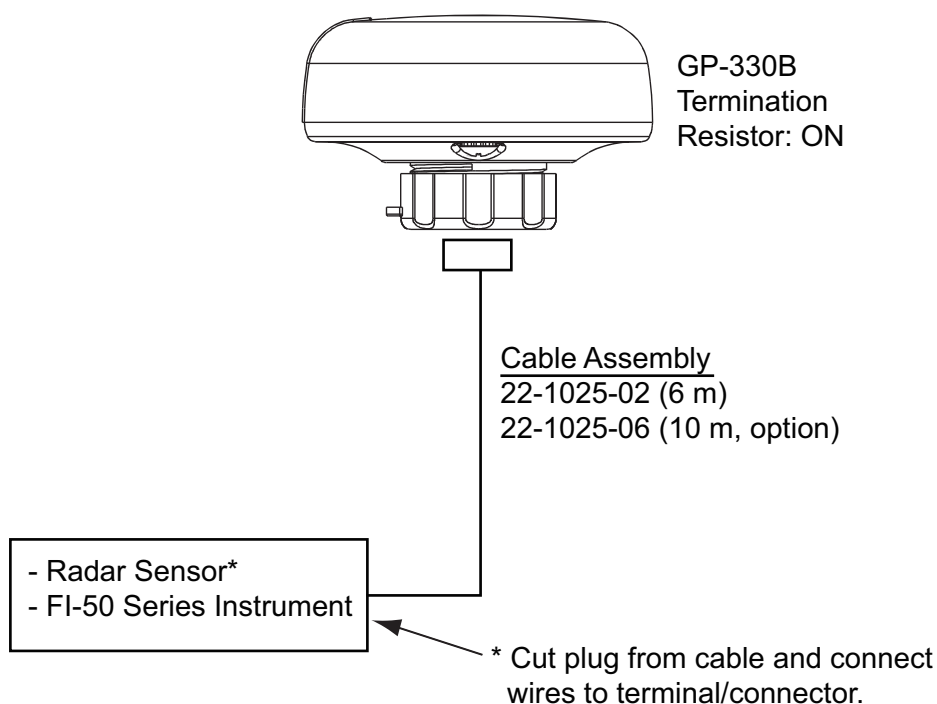
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### 2.1 NMEA 2000<sup>®</sup> Connection

The LEN (Load Equivalency Number) for this equipment is 3.

#### 2.1.1 Direct Connection

Insert the contact pin (supplied) into the #5 socket of the GPS Receiver connector to activate the termination resistor. (See page 8 for location of #5 socket.) Route the cable assembly to the NMEA 2000<sup>®</sup> device. Coil any excess cable and secure it with a cable tie to prevent damage. Connect the cable assembly to the NMEA 2000<sup>®</sup> device.

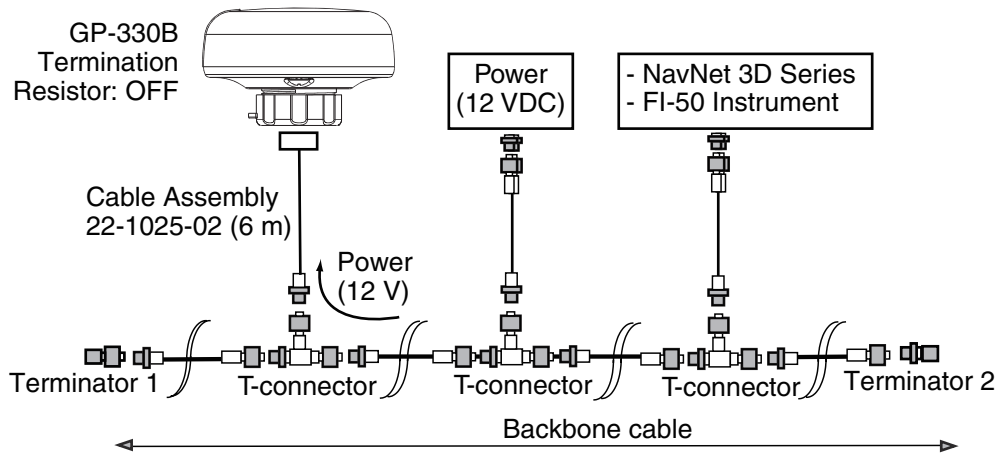


## 2.1.2 Network Connection

### Drop cable connection

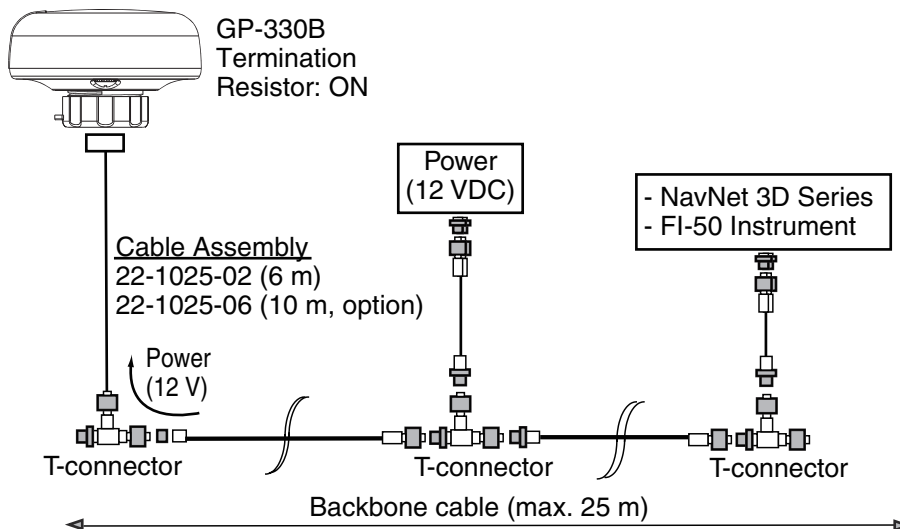
A drop cable is connected to a backbone cable with T-type connectors\*. The backbone cable is of the "light" type. Attach a terminator at the ends of the backbone cable. *Only two termination resistors are required on an NMEA 2000® network. More than two will degrade performance.*

\* Recommended type: LTWSS-050505-FMF-TS001 (LTW Technology, Inc.), or equivalent

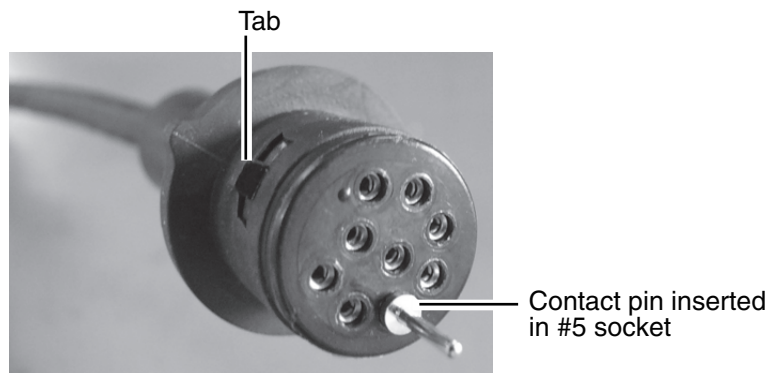


### Backbone cable connection

Use this connection method to connect the GP330B at the final node in the backbone cable. Use T-type connectors to connect equipment to the backbone cable.



Connect the GPS Receiver at the last node in the network. Insert the contact pin (supplied) into the #5 socket of the GPS Receiver connector to activate the termination resistor.

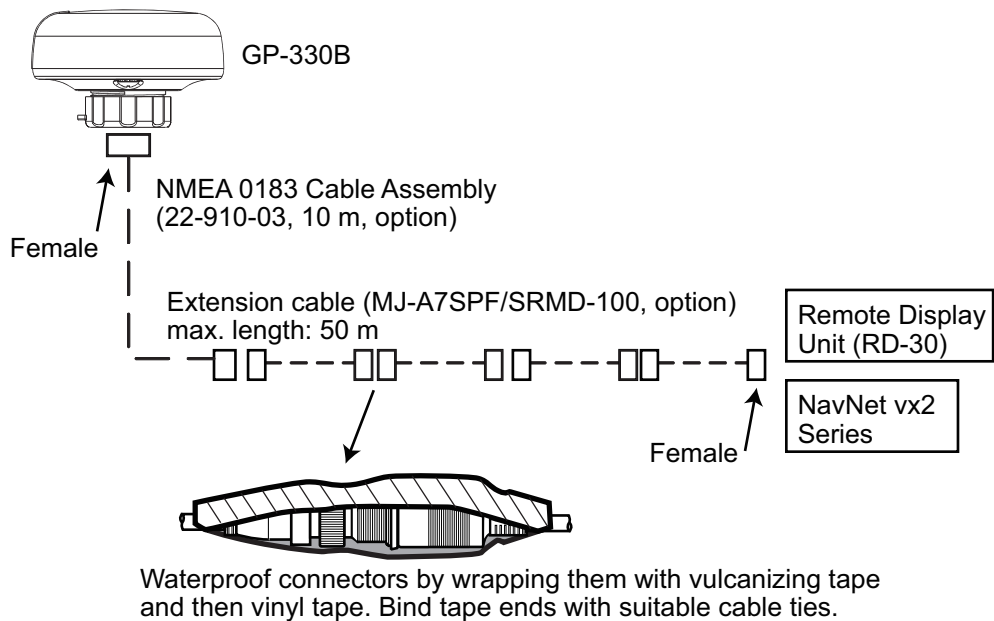


### 2.1.3 Routing and Connecting the Cable Assembly

Route the cable assembly to the NMEA 2000<sup>®</sup> device. Coil any excess cable and secure it with a cable tie to prevent damage. Connect the cable assembly to the NMEA 2000<sup>®</sup> device.

## 2.2 NMEA 0183 Connection

### Wiring outline



### Wiring procedure

Route the cable assembly to the display. Coil any excess cable and secure it with a cable tie to prevent damage. Connect the GPS Receiver to your NMEA 0183 display.

## 2.3 Settings for NavNet vx2

The following items in the NavNet vx2 menu system are applicable to the GP-330B. For details and operating procedure, see the Installation Manual for your NavNet vx2 model.

### **NAV SETUP menu**

Set POSITION SOURCE to GPS or ALL.

### **GPS SETUP menu**

- GEODETIC DATUM  
Select your chart type. WGS-84 is the GPS standard.
- ANTENNA HEIGHT  
Set the height of the GPS receiver unit above the sea surface.
- FIX MODE  
Select position fixing mode from 2D (three satellites in view) or 2D/3D (three or four satellites in view).
- COLD START  
Clear the Almanac currently stored in the GPS receiver to receive the latest Almanac.

### **WAAS SETUP menu**

- WAAS MODE  
Select ON to use the WAAS mode.
- WAAS SEARCH  
Select WAAS satellite search method, automatic or manual.
- CORRECTIONS DATA  
Select the type of message for WAAS connection, 00 for North America, 02 elsewhere.



WAAS settings effective from the version numbers shown below.


<b>C-MAP specification</b>		<b>NAVIO specification</b>	
Program No.	Model	Program No.	Model
1950026-03.02	Model 1804C-BB	1950025-03.02	Model 1804C-BB
1950024-03.02	Model 1804C	1950023-03.02	Model 1804C
1950028-03.02	Model 1704C	1950027-03.02	Model 1704C



# 3. MAINTENANCE, TROUBLESHOOTING

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 <b>CAUTION</b>
 <b>Do not disassemble the unit.</b>  Disassembling the unit will damage the waterproof seal. Further, there are no user-serviceable parts inside.

<b>NOTICE</b>
 <b>Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.</b>  Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

## 3.1 Maintenance

The GP-330B is virtually maintenance free. However, it is recommended to wipe it with a water-moistened cloth periodically to remove accumulated dirt and water deposits.

## 3.2 Troubleshooting

If position is not found within a reasonable amount of time, check the following items.

- Is there power to the GPS receiver? (Check unit that is supplying power to the GP-330B.)
- Are all the connections tight?
- Does the GPS receiver have a clear view of the sky?
- Is there interference from other antennas or instruments?
- Is cabling damaged?
- Is the cable-run free of kinks or damage?
- Is there damage to the GPS receiver?
- Is there ice on the GPS receiver?

# 4. TECHNICAL INFORMATION

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## 4.1 NMEA 0183 Sentences

### Transmitted NMEA 0183 Sentences

\$GPDTM*	Datum Reference
\$GPGGA*	GPS Fix Data
\$GPGLL*	Geographic Position -Latitude / Longitude
\$GPGSA	GNSS DOP and Active Satellites
\$GPGSV	GNSS Satellites in View
\$GPRMC*	Recommended Minimum Specific GNSS Data
\$GPVTG*	Course Over Ground and Ground Speed
\$GPZDA*	Time and Date

\* Default output

### Received NMEA 0183 Sentences and Commands

\$PAMTC,ALT	Setting related to the altitude of the sensor
\$PAMTC,BAUD	Change the baud rate from the nominal 4800 baud to 38400 baud
\$PAMTC,DATUM	Define local datum
\$PAMTC,EN	Enable/disable transmission of specific sentences, and change their rate of transmission
\$PAMTC,ERST	Reset the user portion of nonvolatile EEPROM to factory defaults
\$PAMTC,OPTION	WAAS ON/OFF. Set 2d/3d/Auto mode. Set WAAS Satellite. Set WAAS Tzz Parameter.
\$PAMTC,POST	Set Query Power On Self Test function
\$PAMTC,QPS	Query part number and serial number versions
\$PAMTC,QV	Query GPS hardware and firmware versions
\$PAMTC,RESET	Reset the GP-330B
\$PAMTC,SIM	Enable/disable Simulate Mode
\$PAMTX	Pause or resume all automatic transmission of messages
\$PFEC,pireq	Request to \$PFEC,pidat

## 4.2 NMEA 2000® PGN Commands

### Transmitted NMEA 2000® PGNs

PGN 059392	ISO Acknowledgment
PGN 060928	ISO Address Claim
PGN 065285	Proprietary: Boot State Acknowledgment
PGN 065287	Proprietary: Access Level
PGN 126208	Acknowledge Group Function
PGN 126464	PGN List - Transmit/Received PGN's Group
PGN 126720	Addressable Multi-Frame Proprietary
PGN 126992	System Time
PGN 126996	Product Information
PGN 126998	Configuration Information
PGN 127258	Magnetic Variation
PGN 129025	Position, Rapid Update
PGN 129026	COG & SOG, Rapid Update
PGN 129029	GNSS Position Data
PGN 129033	Time & Date
PGN 129044	Datum
PGN 129538	GNSS Control Status
PGN 129539	GNSS DOPs
PGN 129540	GNSS Sats in View

### Received NMEA 2000® PGNs

PGN 059904	ISO Request
PGN 060928	ISO Address Claim
PGN 126208	Request Group Function
PGN 126208	Command Group Function
PGN 126720	Addressable Multi-Frame Proprietary

## **SPECIFICATIONS OF GPS RECEIVER GP-330B**

### **1 GENERAL**

- |     |                          |  |
|-----|--------------------------|--|
| 1.1 | Receiving frequency      | 1575.42 MHz  |
| 1.2 | Tracking code            | C/A code, WAAS   |
| 1.3 | Number of channels       | GPS: 12 channels parallel, 12 satellites; WAAS: 2 channels |
| 1.4 | Position fixing method   | All in view, 8-state Kalman filter                         |
| 1.5 | Accuracy                 | GPS: 10m approx. (2drms)<br>WAAS: 3m approx. (2drms)       |
| 1.6 | Position fixing time     | 60 s typical (cold start)                                  |
| 1.7 | Tracking velocity        | 999 kt   |
| 1.8 | Position update interval | 1 s  |

### **2 INTERFACE**

- |     |                  |  |
|-----|------------------|--|
| 2.1 | Data format      | NMEA2000 or NMEA0183 Ver.3.1 (selected by cable)   |
| 2.2 | NMEA0183 format  |  |
|     | Output sentences | DTM, GGA, GLL, GSA, GSV, RMC, VTG, ZDA   |
| 2.3 | NMEA2000 format  |  |
|     | Input PGN        | 059904, 060928, 065280/281, 126028/208/720   |
|     | Output PGN       | 059392, 060928, 065285/287, 126208/464/720/992/996/998<br>127258, 129025/026/029/033/044/538/539/540, 130822/823/944 |

### **3 POWER SUPPLY**

12 VDC: 175 mA max.

### **4 ENVIRONMENTAL CONDITION**

- |     |                      |                |
|-----|----------------------|----------------|
| 4.1 | Ambient temperature  | -25°C to +55°C |
| 4.2 | Relative humidity    | 95% at 40°C    |
| 4.3 | Degree of protection | IP56           |
| 4.4 | Bearing vibration    | IEC 60945      |

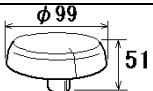
### **5 UNIT COLOR**

N9.5

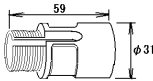
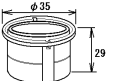
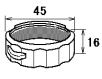
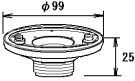
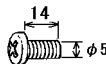


# PACKING LIST GP-330B-A

20BD-X-9851-5


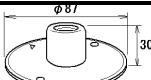
1/1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
<b>UNIT</b>			
GPS RECEIVER		GP-330B	1
		000-012-580-00	

## PIPE MOUNT KIT.


CABLE SIDE-EXIT ADAPTOR		04-673-01	1
		000-168-927-10	
ADAPTOR		04-564-01	1
		000-168-926-10	
CAPTIVE NUT		04-565-01	1
		000-168-925-10	
MOUNT BASE		04-670-01	1
		000-168-928-10	
PANHEAD SCREW		03-317-01	2
		000-160-544-10	
SPRING WASHER		03-314-01	2
		000-160-545-10	
FLAT WASHER		03-312-01	2
		000-160-546-10	

## FLUSH MOUNT KIT.


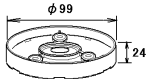
THUMB NUT		20-613-01	2
		000-168-934-10	
GASKET		04-672-01	1
		000-168-932-10	

(\*1),(\*2),(\*3)は、それぞれ組立てられています。

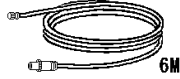
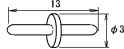
(\*1),(\*2),(\*3) PRE-ASSEMBLED.

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
STUD		03-282-01	2
		000-168-933-10	

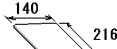
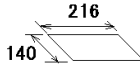
## DECK MOUNT KIT.

SELF-TAPPING SCREW		#10X1/2	3
		000-168-931-10	
SURFACE BRACKET		04-691-01	1
		000-168-930-10	

## INSTALLATION MATERIALS

CABLE ASSEMBLY		22-1025-02 *6M*	1
		001-073-580-10	
CONTACT PIN		05-251-01	2
		000-168-935-10	

## DOCUMENT

OPERATOR'S MANUAL (JP/EN)		OMC-44520-*	1
		000-168-896-1*	
FLUSH MOUNTING NOTICE		C42-01005-*	1
		000-174-531-1*	

(DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

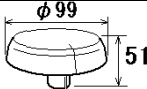
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.

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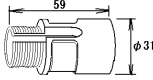
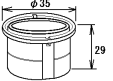
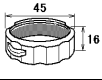
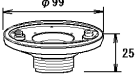
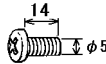


# PACKING LIST GP-330B-N

20BD-X-9852-4

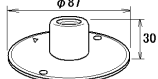
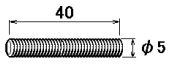
1/1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
<b>UNIT</b>			
GPS RECEIVER		GP-330B	1
		000-012-580-00	


## PIPE MOUNT KIT.

CABLE SIDE-EXIT ADAPTOR		04-673-01	1
		000-168-927-10	
ADAPTOR		04-564-01	1
		000-168-926-10	
CAPTIVE NUT		04-565-01	1
		000-168-925-10	
MOUNT BASE		04-670-01	1
		000-168-928-10	
PANHEAD SCREW		03-317-01	2
		000-160-544-10	
SPRING WASHER		03-314-01	2
		000-160-545-10	
FLAT WASHER		03-312-01	2
		000-160-546-10	


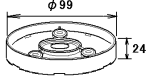
## FLUSH MOUNT KIT.

GASKET		04-672-01	1
		000-168-932-10	
STUD		03-282-01	2
		000-168-933-10	

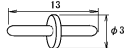
(\*1),(\*2),(\*3) PRE-ASSEMBLED.

NAME	OUTLINE	DESCRIPTION/CODE No.	Q' TY
THUMB NUT		20-613-01	2
		000-168-934-10	


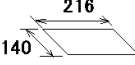
## DECK MOUNT KIT.

SELF-TAPPING SCREW		#10X1/2	3
		000-168-931-10	
SURFACE BRACKET		04-691-01	1
		000-168-930-10	

## INSTALLATION MATERIALS

CONTACT PIN		05-251-01	2
		000-168-935-10	

## DOCUMENT

OPERATOR'S MANUAL (JP/EN)		0MC-44520-*	1
		000-168-896-1*	
FLUSH MOUNTING NOTICE		C42-01005-*	1
		000-174-531-1*	

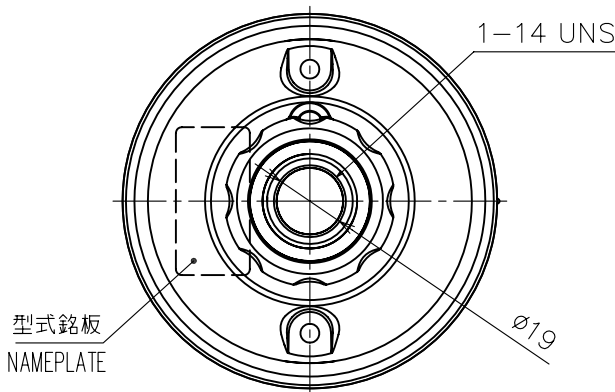
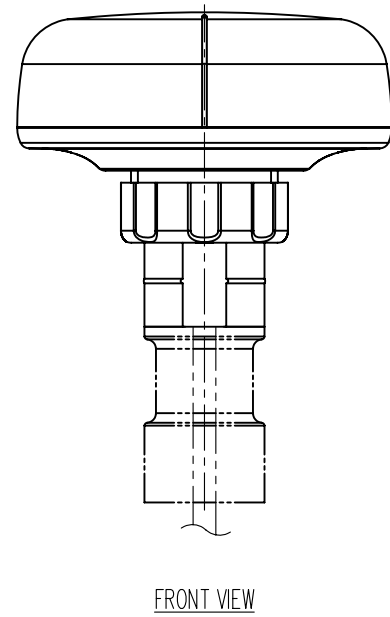
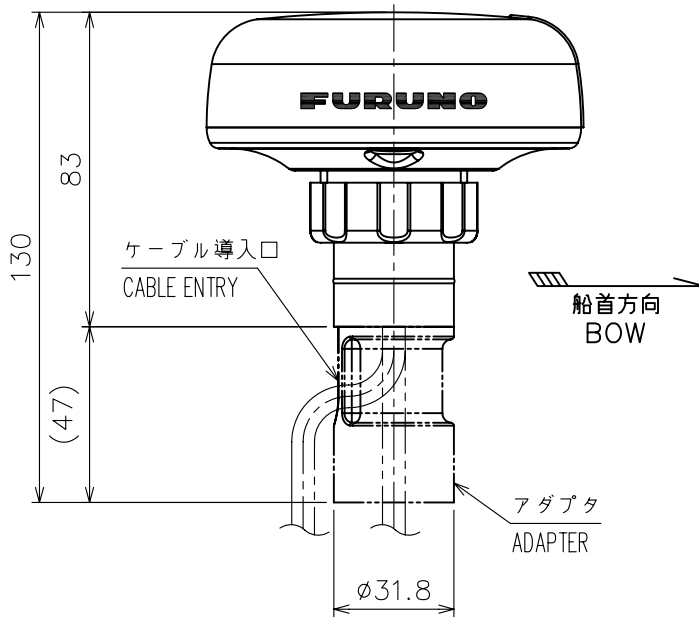
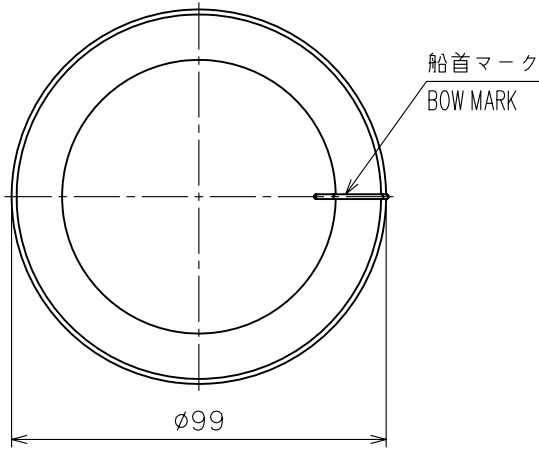
(DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

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

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表1 TABLE 1

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



注 記

1) 指定外の寸法公差は表1による。

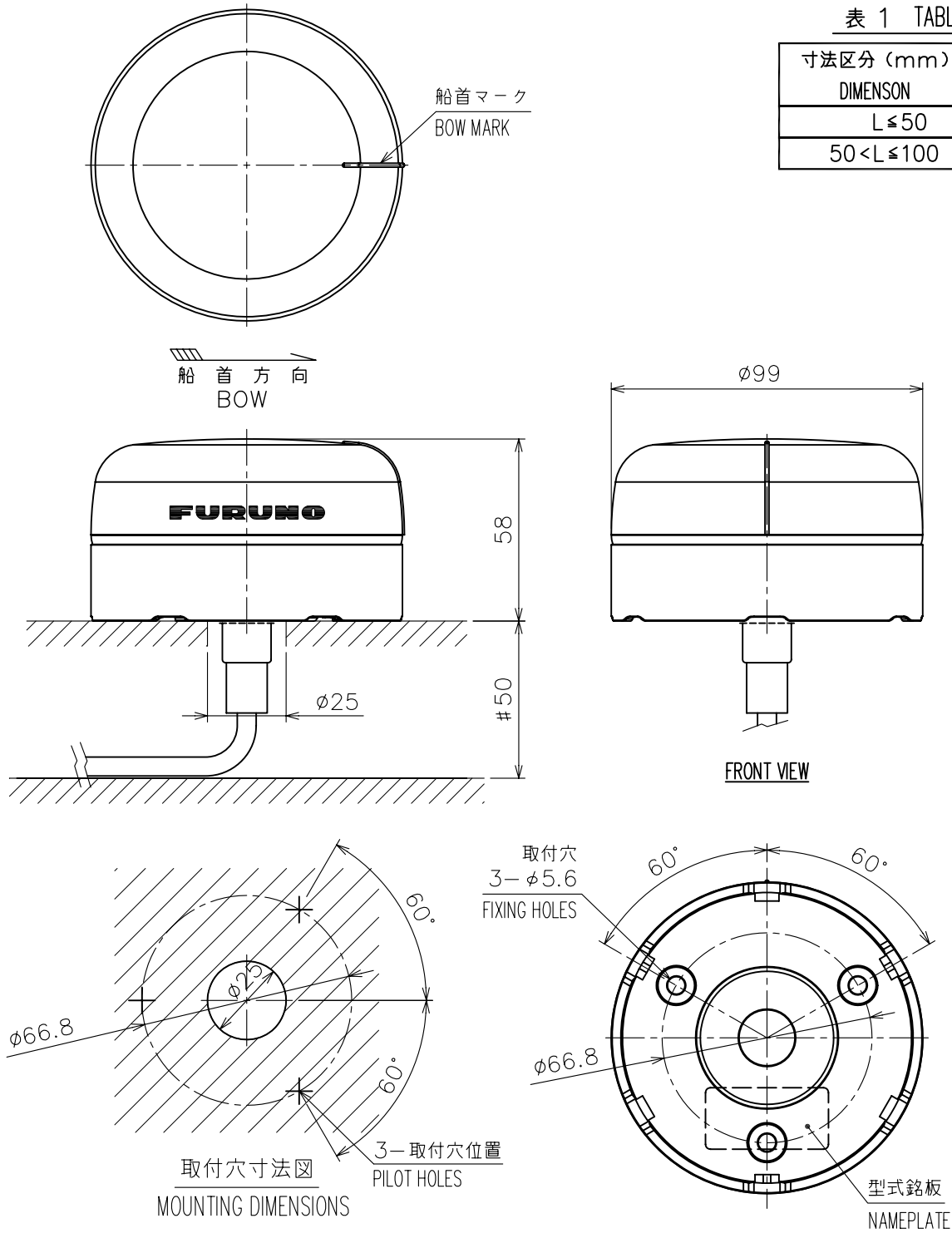
NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.

DRAWN	10/Mar/08 I. YAMASAKI	TITLE	GP-330B
CHECKED	10/Mar/08 T. TAKENO	名称	GPS受信機 (パイプ装備)
APPROVED	18/Mar/08 R. Esumi		外寸図
SCALE	1/2 MASS 0.18 $\pm 10\%$ kg	NAME	GPS RECEIVER (PIPE MOUNT)
DWG.No.	C4452-G01-A	REF.No.	20-034-100G-0
		OUTLINE DRAWING	

表 1 TABLE 1

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



- 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) 取付用ネジはタッピンネジ呼び径5を使用のこと。

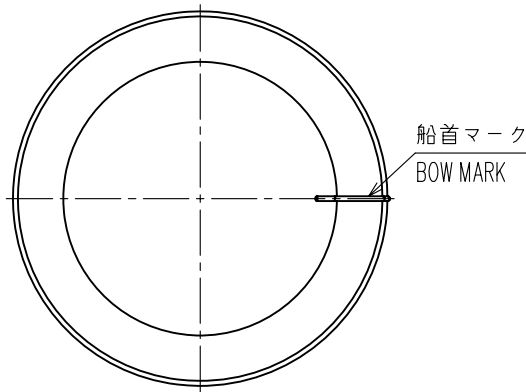
- NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
  2. #: MINIMUM SERVICE CLEARANCE.
  3. USE TAPPING SCREWS  $\phi 5$  FOR FIXING THE UNIT.

DRAWN	10/Mar/08 I. YAMASAKI	TITLE	GP-330B
CHECKED	10/Mar/08 T. TAKENO	名称	GPS受信機 (デッキ装備)
APPROVED	18/Mar/08 R. Esumi		外寸図
SCALE	1/2 MASS 0.22 $\pm 10\%$ kg	NAME	GPS RECEIVER (DECK MOUNT)
DWG.No.	C4452-G02-A	REF.No.	20-034-110G-0
		OUTLINE DRAWING	

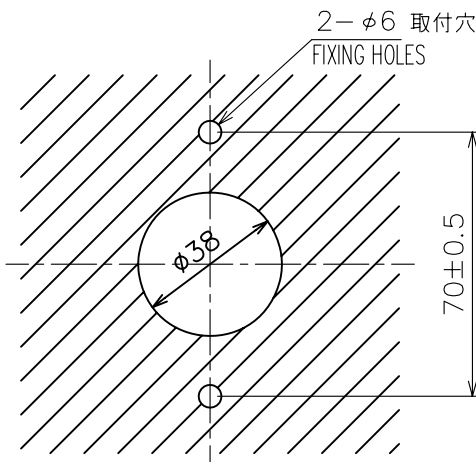
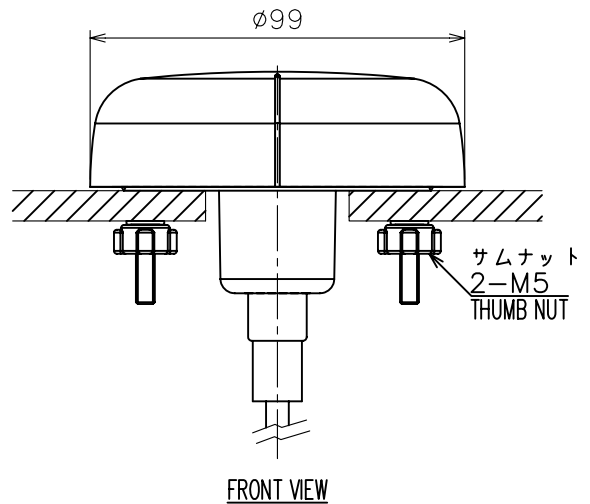
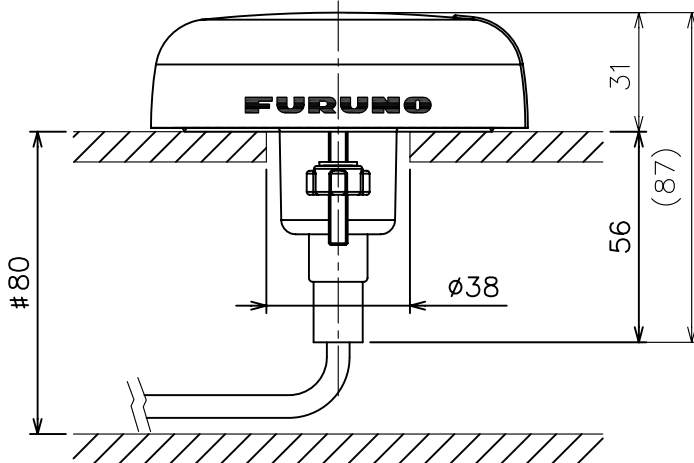


表 1 TABLE 1

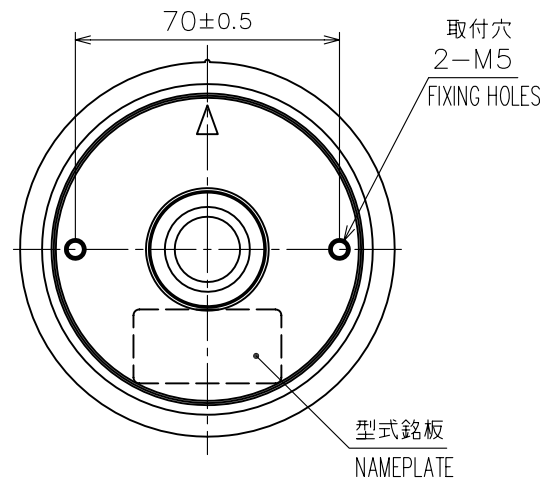
寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
$L \leq 50$	$\pm 1.5$
$50 < L \leq 100$	$\pm 2.5$



船首方向  
BOW



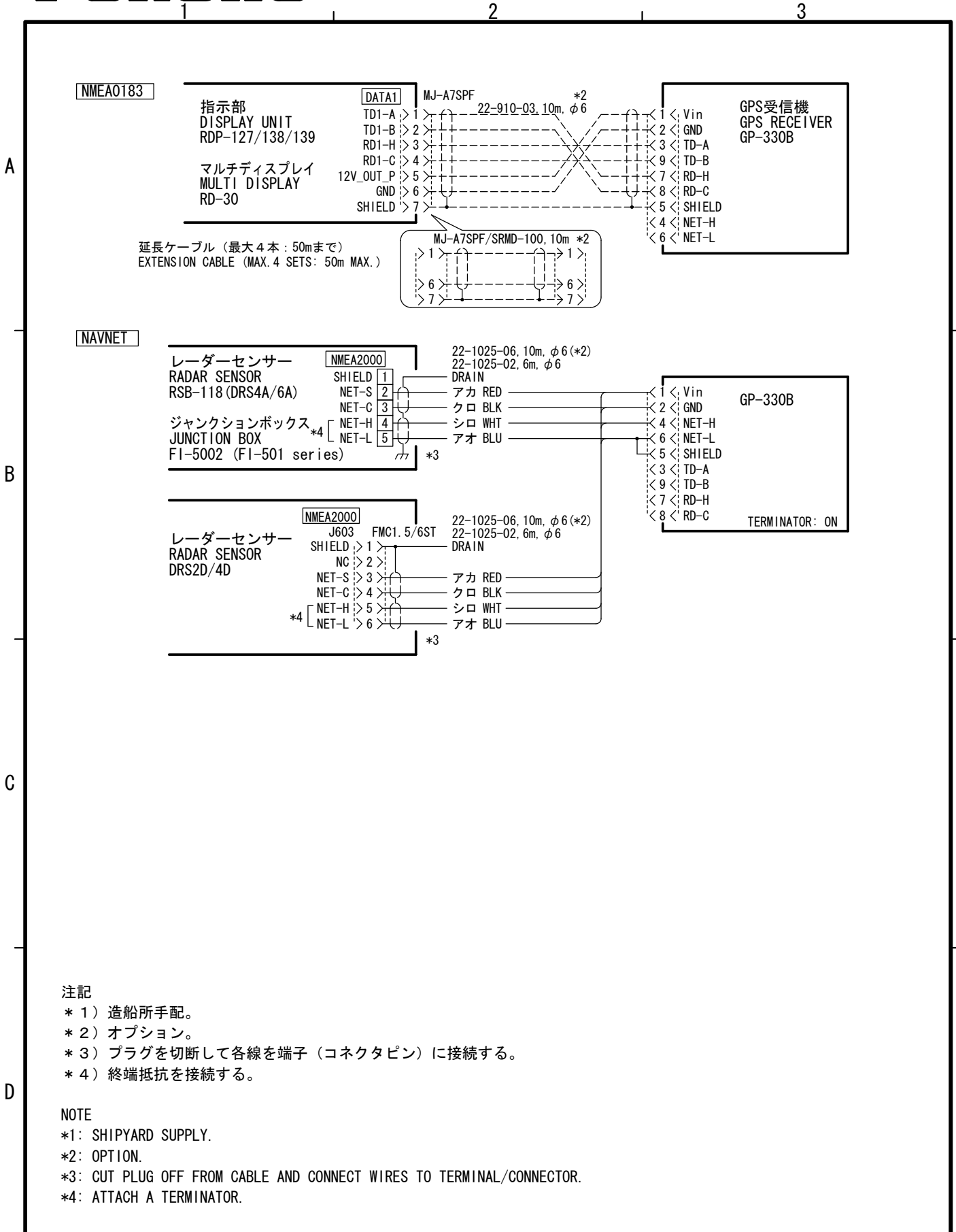
取付穴寸法図  
MOUNTING DIMENSIONS



- 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) 取付には M5 × 40 寸切り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 M5×40 STUD BOLTS FOR FIXING THE UNIT.

DRAWN	10/Mar/08 I. YAMASAKI	TITLE	GP-330B
CHECKED	10/Mar/08 T. TAKENO	名称	GPS受信機 (埋込装備)
APPROVED	18/Mar/08 R. Esumi		外寸図
SCALE	1/2 MASS 0.16 ±10% kg	NAME	GPS RECEIVER (FLUSH MOUNT)
DWG.No.	C4452-G03-A	REF.No.	20-034-120G-0
		OUTLINE DRAWING	



注記

- \* 1) 造船所手配。
- \* 2) オプション。
- \* 3) プラグを切断して各線を端子 (コネクタピン) に接続する。
- \* 4) 終端抵抗を接続する。

NOTE

- \*1: SHIPYARD SUPPLY.
- \*2: OPTION.
- \*3: CUT PLUG OFF FROM CABLE AND CONNECT WIRES TO TERMINAL/CONNECTOR.
- \*4: ATTACH A TERMINATOR.

DRAWN	18/Nov/2010 T. YAMASAKI	TITLE	GP-330B
CHECKED	18/Nov/2010 T. TAKAHASHI	名称	GPS受信機
APPROVED	18/Nov/2010 Y.NISHIYAMA		相互結線図
SCALE	MASS kg	NAME	GPS RECEIVER
DWG. No.	C4452-C01- C	REF. No.	INTERCONNECTION DIAGRAM