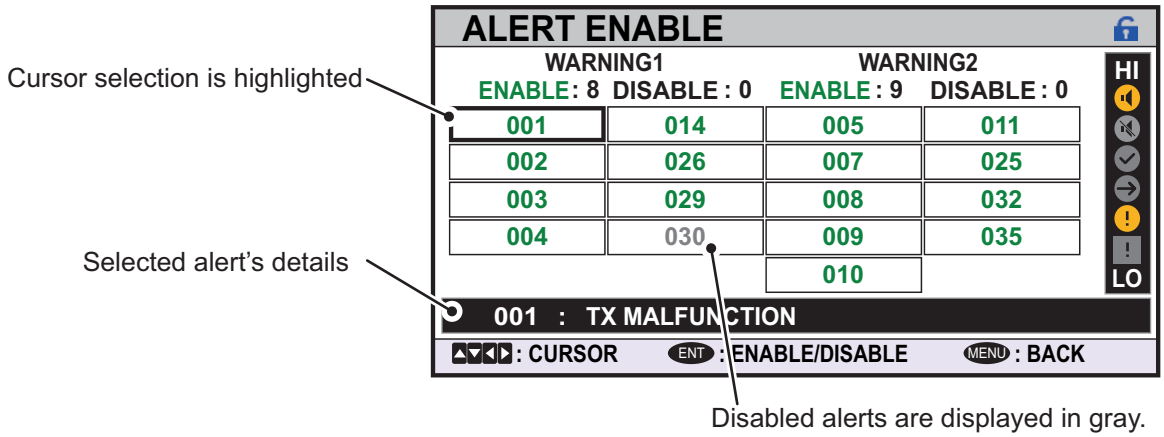
3.4 How to Enable and Disable Alerts

You can enable or disable alerts from the [ALERT ENABLE] menu. Disabling an alert in this menu will disable all related alerts for the disabled alert.

Note: All alerts are set to [ENABLE] by default.

1. Access the [INITIAL SET] menu, following the procedure outlined in "How to access the [INITIAL SET] menu" on page 3-1.
2. Select [ALERT ENABLE], then press the **ENT/ACK** key.

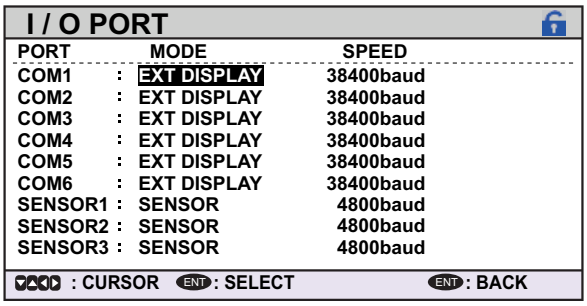


Active/unacknowledged alerts are displayed with an alert icon next to the alert ID.

3. Select an alert, then press the **ENT/ACK** key to enable or disable the alert. Enabled alerts are displayed in green color text, disabled alerts are displayed in gray color text.
4. Press the **MENU/ESC** key to return to the [INITIAL SET] menu.

3.5 How to Set Up the I/O Ports

1. Access the [INITIAL SET] menu, following the procedure outlined in "How to access the [INITIAL SET] menu" on page 3-1.
2. Select [I/O PORT], then press the **ENT/ACK** key.



Note: The figure above shows the default settings for all ports.

The available port settings are outlined in the table on the following page.

PORT	MODE	SPEED (baud)
COM1	EXT DISPLAY	4800, 38400
	LONG RANGE	4800, 38400
	BEACON	4800
	MONITOR	57600
	SERVICE	4800, 38400
	DISABLE	-
COM2 to COM3	Same as COM1.	Same as COM1.
COM4	EXT DISPLAY	4800, 38400
	LONG RANGE	4800, 38400
	SENSOR	4800, 38400
	BEACON	4800
	MONITOR	57600
	SERVICE	4800, 38400
	DISABLE	-
COM5 to COM6	Same as COM4.	Same as COM4.
SENSOR1	SENSOR	Fixed at 4800
	DISABLE	-
SENSOR2 & SENSOR3	Same as SENSOR1.	Same as SENSOR1.

Note 1: When [MODE] is set to [BEACON] or [MONITOR], speed settings are fixed at the default setting.

Note 2: For detailed information on data format and related speeds, see "DIGITAL INTERFACE" on page AP-2.

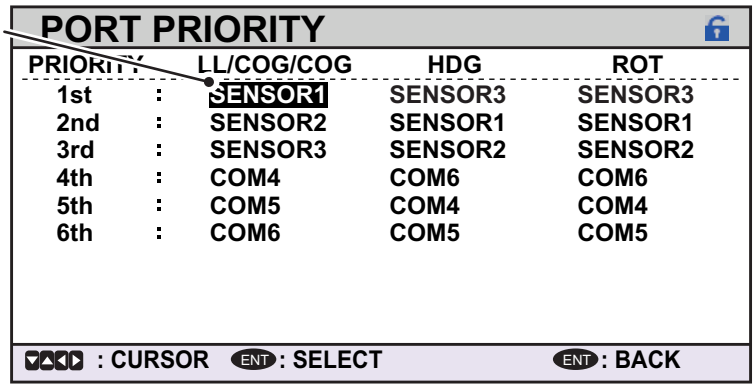
Mode definitions

MODE	Definition
EXT DISPLAY	External display (Radar, ECDIS, Pilot plug, etc.)
LONG RANGE	Long range communication device (Inmarsat C, etc.)
SENSOR	GPS, Gyrocompass, ROT, etc.
MONITOR	For FA-1702 Monitor Unit.
BEACON	For Beacon Receiver.
SERVICE	For service personnel only. Do not use.
DISABLE	Disable the port.

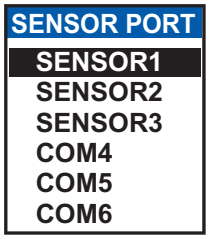
3.5.1 How to set port priority

1. Access the [INITIAL SET] menu, following the procedure outlined in "How to access the [INITIAL SET] menu" on page 3-1.
2. Select [PORT PRIORITY], then press the **ENT/ACK** key.

Selected item is highlighted in reverse video.

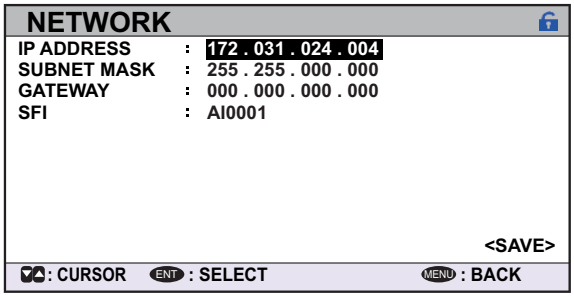


3. Select the sensor whose priority you want to adjust, then press the **ENT/ACK** key. The [SENSOR PORT] pop up window is displayed.
4. Select the appropriate port, then press the **ENT/ACK** key.
5. Repeat step 3 to step 4 for other port priorities.
6. Press the **MENU/ESC** key to return to the [INITAL SET] menu.

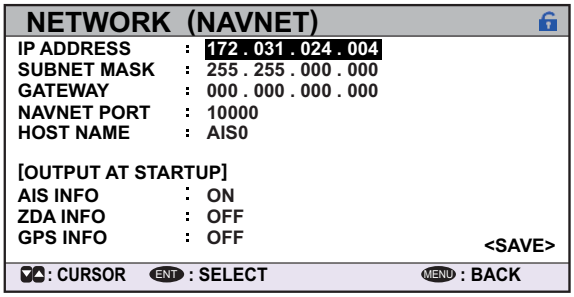


3.6 Network Set Up

1. Access the [INITIAL SET] menu, following the procedure outlined in "How to access the [INITIAL SET] menu" on page 3-1.
2. Select [NETWORK], then press the **ENT/ACK** key.



Standard network settings screen.



NAVNET network settings screen.

3. [IP ADDRESS] is selected. Press the **ENT/ACK** key to set the IP address for the FA-170 within the network.
4. Select and set [SUBNET MASK] and [GATEWAY] in a similar fashion. For NAVNET networks, go to step 5, for other network types, go to step 12.
5. Select [NAVNET PORT], then press the **ENT/ACK** key.
6. Input the NAVNET port which this unit is connected to, then press the **ENT/ACK** key.
7. Select [HOST NAME], then press the **ENT/ACK** key.
8. Input the name for this unit within the NAVNET network.
9. Select [AIS INFO], then press the **ENT/ACK** key.

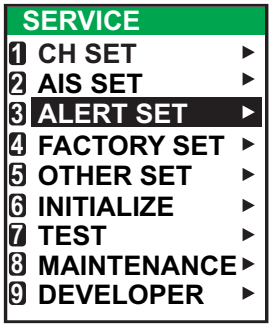
10. Select [ON] to enable AIS data output to the NAVNET network when this unit is turned on. Select [OFF] to disable AIS data output when this unit is turned on.
11. Set [ZDA INFO] and [GPS INFO] in the same manner as [AIS INFO], then go to step 14.
12. Select [SFI], then press the **ENT/ACK** key.
13. Set the [SFI] (System Function ID), then press the **ENT/ACK** key.
14. Confirm the settings are correct, then select [<SAVE>] and press the **ENT/ACK** key. A confirmation pop up is displayed.
    Note: If no changes are made to the settings, [<SAVE>] is not selectable.
15. Select [NO] to change the settings further. Select [YES] to accept the new settings, the unit now shuts down automatically to apply the new settings. When the unit is shut down, press the power key to restart the unit.

3.7 SERVICE Menu Operations

The [SERVICE] menu is password protected. Contact FURUNO for password details.

The following items require access to the SERVICE for initial setup:

- ALERT MODE settings
- Network protocol settings
- Restore Factory settings



3.7.1 How to access the SERVICE menu

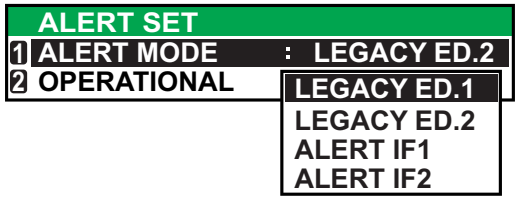
1. From the [MAIN] menu, select [SERVICE], then press the **ENT/ACK** key. The password input pop up appears.
2. Input the password then press the **ENT/ACK** key.

3.7.2 How to set the alert mode

The alert mode can be set according to the vessel's configuration. The available alert modes are: [LEGACY ED.1], [LEGACY ED.2], [ALERT IF1] and [ALERT IF2].

1. Access the [SERVICE] menu referring to the procedure outlined at the start of this section.
2. Select [ALERT SET], then press the **ENT/ACK** key.
3. Select [ALERT MODE], then press the **ENT/ACK** key.

   Note: The [OPERATIONAL] setting is for technical personnel only. Do not change this setting.



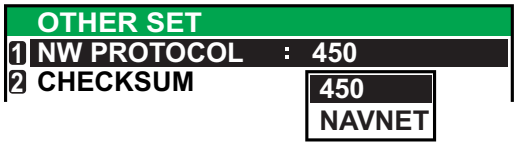
4. Select the appropriate [ALERT MODE] setting, then press the **ENT/ACK** key.
   Select [ALERT IF1] for vessels configured with AMS, [ALERT IF2] for vessels configured with BAM.
5. Press the **MENU/ESC** key to return to the [INTIAL SET] menu, or press the **DISP** key to close all open menus.

3.7.3 How to set the network protocol

Set the LAN network protocol according to your vessel's on-board network. [NAVNET] protocol should be used where a NavNet series unit is the LAN network hub. Select [450] for all other LAN networks.

1. Access the [SERVICE] menu referring to the procedure outlined at the start of this section.
2. Select [OTHER SET], then press the **ENT/ACK** key.
3. Select [NW PROTOCOL], then press the **ENT/ACK** key.

Note: The rest of the [OTHER SET] menu items are for technical personnel only. Do not change these setting.



4. Select the appropriate protocol, then press the **ENT/ACK** key. A confirmation pop up is displayed.
5. Select [YES] to accept the new setting, [NO] to cancel and return to the options. Selecting [YES] will restart the unit.

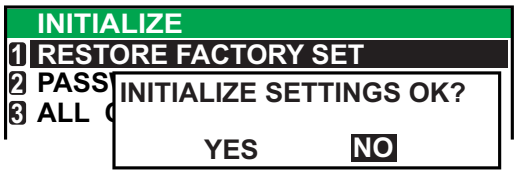
3.7.4 How to restore factory settings

This procedure resets the units to factory settings.

Be sure to set all appropriate settings from the [INITIAL SET] menu after completing this procedure.

1. Access the [SERVICE] menu referring to the procedure outlined at the start of this section.
2. Select [INTIALIZE], then press the **ENT/ACK** key.
3. Select [RESTORE FACTORY SET], then press the **ENT/ACK** key. The confirmation pop up window shown below-right is displayed.

Note: The rest of the [INTIALIZE] menu items are for technical personnel only. Do not change these settings.



4. Select the [YES] or [NO] as appropriate, then press the **ENT/ACK** key.
   [YES]: Accept the new settings and restart the unit.
   [NO]: Cancel and return to the options.

APPENDIX 1 JIS CABLE GUIDE

Cables listed in the manual are usually shown as Japanese Industrial Standard (JIS). Use the following guide to locate an equivalent cable locally.
JIS cable names may have up to 6 alphabetical characters, followed by a dash and a numerical value (example: DPYC-2.5).
For core types D and T, the numerical designation indicates the *cross-sectional Area (mm^2)* of the core wire(s) in the cable.
For core types M and TT, the numerical designation indicates the *number of core wires* in the cable.

1. Core Type

D: Double core power line
T: Triple core power line
M: Multi core
TT: Twisted pair communications (1Q=quad cable)

2. Insulation Type

P: Ethylene Propylene Rubber

3. Sheath Type

Y: PVC (Vinyl)

4. Armor Type

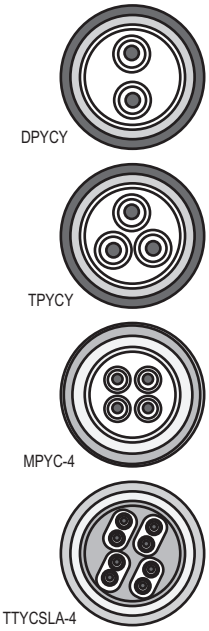
C: Steel

5. Sheath Type

Y: Anticorrosive vinyl sheath

6. Shielding Type

S: All cores in one sheath
-S: Indivisually sheathed cores
SLA: All cores in one shield, plastic tape w/aluminum tape
-SLA: Individually shielded cores, plastic tape w/aluminum tape



EX: TTYCYSLA - 4
(1 2 3 4 5 6)
Designation type — # of twisted pairs

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

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

Type	Core Area	Core Diameter	Cable Diameter	Type	Core Area	Core Diameter	Cable Diameter
DPYC-1.5	1.5mm²	1.56mm	11.7mm	TTYCS-1	0.75mm²	1.11mm	10.1mm
DPYC-2.5	2.5mm²	2.01mm	12.8mm	TTYCS-1T	0.75mm²	1.11mm	10.6mm
DPYC-4	4.0mm²	2.55mm	13.9mm	TTYCS-1Q	0.75mm²	1.11mm	11.3mm
DPYC-6	6.0mm²	3.12mm	15.2mm	TTYCS-4	0.75mm²	1.11mm	16.3mm
DPYC-10	10.0mm²	4.05mm	17.1mm	TTYCSLA-1	0.75mm²	1.11mm	9.4mm
DPYCY-1.5	1.5mm²	1.56mm	13.7mm	TTYCSLA-1T	0.75mm²	1.11mm	10.1mm
DPYCY-2.5	2.5mm²	2.01mm	14.8mm	TTYCSLA-1Q	0.75mm²	1.11mm	10.8mm
DPYCY-4	4.0mm²	2.55mm	15.9mm	TTYCSLA-4	0.75mm²	1.11mm	15.7mm
MPYC-2	1.0mm²	1.29mm	10.0mm	TTYCY-1	0.75mm²	1.11mm	11.0mm
MPYC-4	1.0mm²	1.29mm	11.2mm	TTYCY-1T	0.75mm²	1.11mm	11.7mm
MPYC-7	1.0mm²	1.29mm	13.2mm	TTYCY-1Q	0.75mm²	1.11mm	12.6mm
MPYC-12	1.0mm²	1.29mm	16.8mm	TTYCY-4	0.75mm²	1.11mm	17.7mm
TPYC-1.5	1.5mm²	1.56mm	12.5mm	TTYCY-4S	0.75mm²	1.11mm	21.1mm
TPYC-2.5	2.5mm²	2.01mm	13.5mm	TTYCY-4SLA	0.75mm²	1.11mm	19.5mm
TPYC-4	4.0mm²	2.55mm	14.7mm	TTYCYS-1	0.75mm²	1.11mm	12.1mm
TPYCY-1.5	1.5mm²	1.56mm	14.5mm	TTYCYS-4	0.75mm²	1.11mm	18.5mm
TPYCY-2.5	2.5mm²	2.01mm	15.5mm	TTYCYSLA-1	0.75mm²	1.11mm	11.2mm
TPYCY-4	4.0mm²	2.55mm	16.9mm	TTYCYSLA-4	0.75mm²	1.11mm	17.9mm
				TTYCSLA-7	0.75mm²	1.11mm	20.8mm

APPENDIX 2 DIGITAL INTERFACE

IEC61162-1/2 data sentences

IEC61162-1/2 format data is input or output from the data port COM1-COM6.

The table below shows the input/output data specifications for the transponder unit (FA-1701).

Port	Menu setting	Input/Output	Data format	Speed
COM1 to COM3	EXT DISPLAY	Input/output	IEC61162-2	38400bps
	LONG RANGE	Input/output	IEC61162-2	38400bps
	BEACON	Input	RTCM SC104	4800bps
COM4 to COM6	EXT DISPLAY	Input/output	IEC61162-2	38400bps
	LONG RANGE	Input/output	IEC61162-2	38400bps
	SENSOR	Input	IEC61162-2	38400bps
	BEACON	Input	RTCM SC104	4800bps
SENSOR1 to SENSOR3	SENSOR	Input	IEC61162-1	4800bps

Priority for input data/sentences

Sentence (Priority)	Contents
GNS>GLL>GGA>RMC	Position
VBW>RMC>VTG>OSD	Speed over ground
RMC>VTG>OSD	Course over ground
THS>HDT>OSD>AD-10 format	Heading
ROT> Calculated value	Rate of turn

Digital Interface (IEC 61162-1 Edition 4, IEC 61162-2)

Sentence data

Input sentences

ABM, ACA, ACK, ACM, ACN, AIQ, AIR, BBM, DTM, EPV, GBS, GGA, GLL, GNS, HBT, HDT, LRF, LRI, OSD, PIWWIVD, PIWWSPW, PIWWSSD, PIWWVSD, RMC, ROT, SPW, SSD, THS, VBW, VSD, VTG

Output sentences

ABK, ACA, ACS, ALC, ALF, ALR, ARC, EPV, HBT, LRI, LRF, LR1, LR2, LR3, NAK, SSD, TRL, TXT, PIWWIVD, PIWWSPR, PIWWSSD, PIWWVSD, VDM, VDO, VER, VSD

Transmission intervals

Sentence	Interval	Sentence	Interval
ABK	With each event	ACA	When requested, or with each event
ACS	Transmitted after ACA	ALC	30 seconds
ALF	When requested, or with each event	ALR	30 seconds
ARC	With each event	EPV	When requested, or with each event
HBT	50 seconds	LR1	With each event
LR2	With each event	LR3	With each event
LRF	With each event	LRI	With each event
NAK	With each event	PIWWIVD	When requested, or with each event
PIWWSPR	When requested, or with each event	PIWWSSD	When requested, or with each event
PIWWVSD	When requested, or with each event	SSD	When requested, or with each event
TRL	When requested, or with each event	TXT	When requested, or with each event
VDM	With each event	VDO	1 second or with each event
VER	When requested, or with each event, or powered on	VSD	When requested, or with each event

Load requirements as listener
Isolation: Provided
Input Impedance: Input Impedance: 110 ohms (130K ohms without jumper plug)
Max. Voltage: ±14 V to GNDiso
Threshold: ±0.2 V (A-B)

Output drive capability

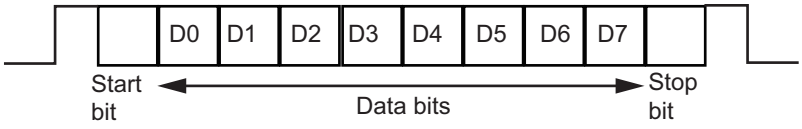
Differential driver output
R=50 ohm 2 v min.
R=27 ohm 1.5 V min.

Driver short-circuit current
60 mA min. 150 mA max.

Data transmission
Data is transmitted in serial asynchronous form in accordance with the standard referenced in 2.1 of IEC 61162-1/2. The first bit is a start bit and is followed by data bits, least-significant-bit as illustrated below.

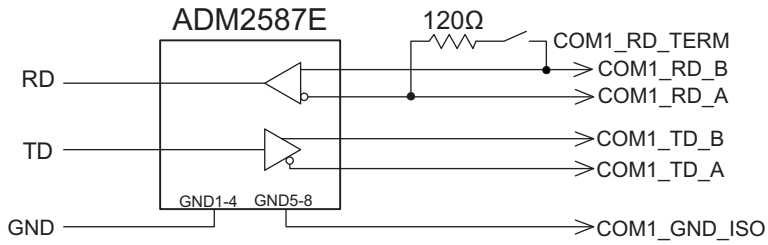
The following parameters are used:
Baud rate: 38.4 Kbps /4800 bps
Data bits: 8 (D7 = 0), parity none
Stop bits: 1

IEC61162-1:Edition 4.0 2010-11
IEC61162-2:First Edition 1998-09
IEC61162-450:Edition 1.0 2011-06

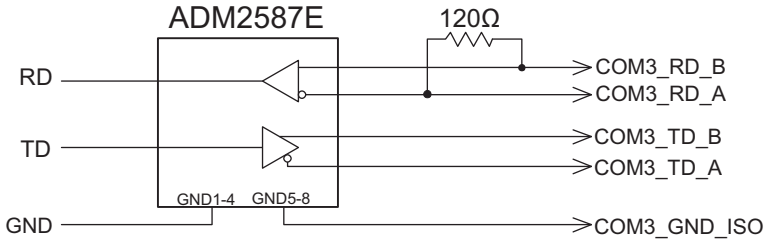


Serial & contact interface I/O circuit

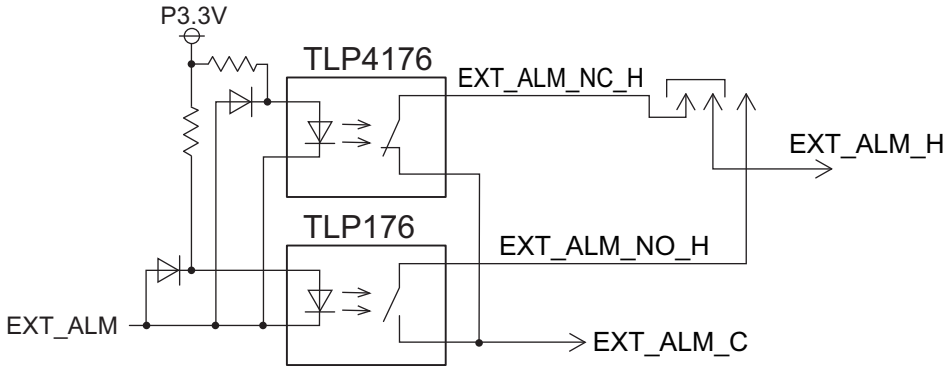
COM1, 2



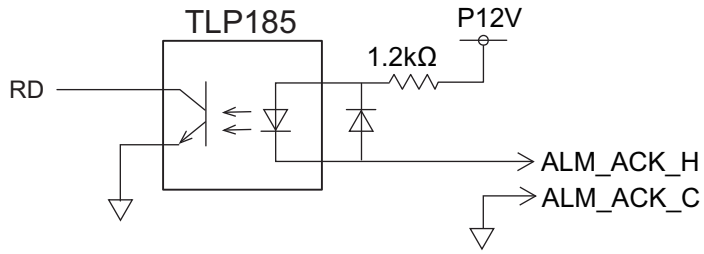
COM3 to COM6



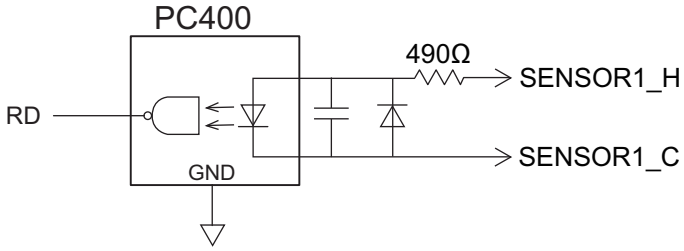
External



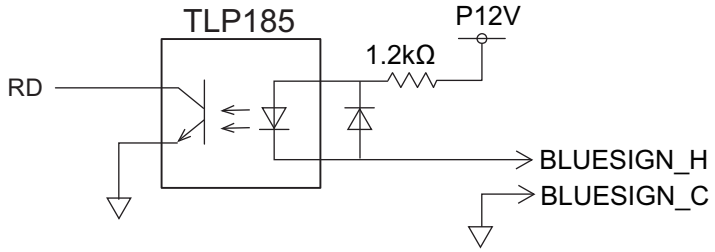
Alarm Acknowledge



Sensor



Blue Sign



Sentence description

Input sentences

ABM - Addressed binary and safety related message

!**ABM, x, x, x, xxxxxxxxx, x, x.x, s--s, x, *hh<CR><LF>
1 2 3 4 5 6 7 8

1. Total number of sentences needed to transfer the message (1 to 9)
2. Message sentence number (1 to 9)
3. Message sequence identifier (0 to 3)
4. The MMSI of destination AIS unit for the ITU-R M.1371 message (9 digits, NULL)
5. AIS channel for broadcast of the radio message (0 to 3, NULL)
6. VDL message number (6, 12, 25, 26, 70, 71, NULL), see ITU-R M.1371
7. Encapsulated data (1 to 63 bytes)
8. Number of fill-bits (0 to 5)

ACA - AIS regional channel assignment message

$**ACA,x,IIII.II, a,yyyyy.yy,a,IIII.II,a,yyyyy.yy,a,x,xxxx,x,xxxx,x,x,x,a,x,hhmmss.ss,*hh<CR><LF>
1 2 3 4 5 6 7 8 9 1011121314 15

1. Sequence number (0 to 9, NULL)
2. Region Northeast corner latitude (N, S, NULL)
3. Region Northeast corner longitude (E, W, NULL)
4. Region Southwest corner latitude (N, S, NULL)
5. Region Southwest corner longitude (E, W, NULL)
6. Transition Zone Size
7. Channel A
8. Channel A bandwidth
9. Channel B
10. Channel B bandwidth
11. Tx/Rx mode control
12. Power level control
13. Information source
14. In-use flag
15. Time of “in-use” change

ACK - Acknowledge

$**ACK,xxx,*hh<CR><LF>
1

1. Local alarm number (identifier) (000 to 999)

ACN(ACM) - Alert command

$**ACN(ACM),hhmmss.ss,aaa,x.x,x.x,c,a*hh<CR><LF>
1 2 3 4 5 6

1. Time
2. Manufacturer mnemonic code
3. Alert Identifier
4. Alert Instance (1 to 999999)
5. Alert command
   (A=acknowledge, Q=request/repeat information, O=responsibility transfer S=silence)
6. Sentence status flag

AIQ - Query sentence

$**AIQ,ccc,*hh<CR><LF>
1

1. Information requested (ACA*[3], IWWIVD*[1*2], IWWVSD*[1*2], IWWSSD*[1*2], PIWWIVD*[2], PIWWVSD*[2], PIWWSSD*[2], SSD, TRL, TXT, VER, VSD)
*[1]: Compatible with Tresco Inland ECDIS viewer.
*[2]: Valid only when AIS is in INLAND mode.
*[3]: When ACA is requested, ACS is also sent immediately after ACA.

AIR - AIS interrogation request

$**AIR,xxxxxxxxx,x.x,x,x.x,x,xxxxxxxxx,x.x,x, a, x.x, x.x, x.x *hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12

1. MMSI of interrogated station 1
2. ITU-R M.1371 message requested from station 1
3. Message sub-section
4. ITU-R M.1371 second message requested from station 1
5. Message sub-section
6. MMSI of interrogated station 2
7. ITU-R M.1371 message requested from station 2
8. Message sub-section
9. Channel used on request
10. No use. Response slot for Message ID 1.1 of Message 15
11. No use. Response slot for Message ID 1.2 of Message 15
12. No use. Response slot for Message ID 2.1 of Message 15

BBM - AIS broadcast binary message.

$**BBM,x,x,x,x,xx,s--s,x,*hh<CR><LF>
12 3 4 5 6 7

1. Total number of sentences needed to transfer the message (1 to 9)
2. Sentence number (1 to 9)
3. Sequential Message identifier (0 to 9)
4. AIS channel for broadcast of the radio message
5. VDL message no. (8, 14, 25, 26, 70 or 71, NULL)
6. Encapsulated data
7. Number of fill-bits, 0 to 5

DTM - Datum reference

$**DTM,ccc,a,x.x,a,x.x,a,x.x,ccc,*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Local datum (W84=WGS84, W72=WGS72, S85=SGS85, P90=PE90, User defined=999, IHO datum code, NULL)
2. Local datum subdivision code (NULL or one character)
3. Lat offset, min (-59.99999 to 59.99999)
4. N/S
5. Lon offset, min (-59.99999 to 59.99999)
6. E/W
7. Altitude offset, meters (no use)
8. Reference datum (W84=WGS84, W72=WGS72, S85=SGS85, P90=PE90)

EPV - Command or report equipment property value

$ **EPV,s,cc,c--c,x.x,c--c*hh<CR><LF>
1 2 3 4 5

1. Sentence status flag (C=Configuration command)
2. Equipment type
3. Unique indentifier (MMSI)
4. Property identifier for property to be set
5. Value of property to be set

GBS - GNSS satellite fault detection

$**GBS, hhmmss.ss, x.x, x.x, x.x, xx, x.x, x.x, x.x h, h, *hh<CR><LF>
1 2 3 4 5 6 7 8 9 10

1. UTC time of GGA or GNS fix associated with this sentence
2. Expected error in latitude (0.0 to 999.9)
3. Expected error in longitude (0.0 to 999.9)
4. Expected error in altitude (no use)
5. ID number of most likely failed satellite (no use)
6. Probability of missed detection for most likely failed satellite (no use)
7. Estimate of bias in meters on most likely failed satellite (no use)
8. Standard deviation of bias estimate (no use)
9. GNSS system ID
10 GNSS signal ID

GGA - Global positioning system (GPS) fix data

$**GGA, hhmmss.ss, llll.ll, a, yyyyy.yy, a, x, xx, x.x, x.x, M, x.x, M, x.x, xxxx,*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. UTC of position (0.00 to 235959.99)
2. Latitude (0.00000 to 9000.00000)
3. N/S
4. Longitude (0.00000 to 18000.00000)
5. E/W
6. GPS quality indicator
7. Number of satellites in use,00 to 12, may be different from the number in view (no use)
8. Horizontal dilution of precision (no use)
9. Antenna altitude above/below mean sea level (geoid) (no use)
10. Units of antenna altitude, m (no use)
11. Geoidal separation (no use)
12. Units of geoidal separation, m (no use)
13. Age of differential GPS data (no use)
14. Differential reference station ID, 0000 to 1023 (no use)

GLL - Geographic position - latitude/longitude

$**GLL,llll.lll,a,yyyyy.yy,a,hhmmss.ss,a,x,*hh<CR><LF>
1 2 3 4 5 6 7

1. Latitude (0.00000 to 9000.00000)
2. N/S
3. Longitude (0.00000 to 18000.00000)
4. E/W
5. UTC of position (0.00 to 235959.99)
6. Status (A=data valid)
7. Mode indicator (A=Autonomous, D=Differential, R=Real time kinematic, F=Float RTK, P=Precise)

GNS - GNSS fix data

$**GNS,hhmmss.ss,llll.ll,a,lllll.ll,a,c--c,xx,x.x,x.x,x.x,x.x,x.x,a*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13

1. UTC of position (0.00 to 235959.99)
2. Latitude (0.00000 to 9000.00000)
3. N/S
4. Longitude (0.00000 to 18000.00000)
5. E/W
6. Mode indicator (A=Autonomous, D=Differential, E=Estimated Mode, F=Float RTK, M=Manual Input Mode, N=No fix, P=Precise, R=Real Time Kinematic, S=Simulator Mode)
7. Total number of satellites in use (Not used)
8. HDOP (Not used)
9. Antenna altitude, meters (Not used)
10. Geoidal separation (Not used)
11. Age of differential data (Not used)
12. Differential reference station ID (Not used)
13. Navigational status indicator (S=Safe; C=Caution; U=Unsafe; V=Not valid)

HBT - Heart beat supervision

$--HBT, x. x, A, x*hh<CR><LF>
1 2 3

1. Configured repeat interval (1 to 999, NULL)
2. Equipment status (A/V)
3. Sequential sentence identifier (0 to 9, NULL)

HDT - Heading - true

$**HDT,xxx.x,T*hh<CR><LF>
1 2

1. Heading, degrees (0.000 to 359.999)
2. True (T, NULL)

LRF - Long-range function

$**LRF,x,xxxxxxxxx,c--c,c--c,c--c*hh<CR><LF>
1 2 3 4 5

1. Sequence number (0 to 9)
2. MMSI of requester
3. Name of requester (1 to 20 characters, NULL)
4. Function request
   (1 to 26 characters (Preceded by A, B, C, E, F, I ,O, P, U, W), NULL)
   A : Ship's name, call sign and IMO No.
   B : Date and time of message composition
   C : Position
   E : Course Over Ground
   F : Speed Over Ground
   I : Destination and Estimated Time of Arrival (ETA)
   O : Draught
   P : Ship/Cargo
   U : Ship's length, breadth and type
   W : Persons on board
5. Function reply status
   (1 to 26 characters (Preceded by 2, 3, 4), NULL)
   2: Information available and provided in the following LR1, LR2, LR3 sentence;
   3: Information not available from AIS unit;
   4: Information is available but not provided (i.e. restricted access determined by the ship's master)

LRI - Long-range interrogation

$**LRI,x,a,xxxxxxxxx,xxxxxxxxx,llll.ll,a,yyyyy.yy,a,llll.ll,a,yyyyy.yy,a*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Sequence number (0 to 9)
2. Control flag
3. MMSI of requestor
4. MMSI of destination
5. Latitude - N/S for north-east corner (0000.0000 to 9000.0000, NULL)
6. Longitude - E/W for north-east corner (0000.0000 to 18000.0000, NULL)
7. Latitude - N/S for south-west corner (0000.0000 to 9000.0000, NULL)
8. Longitude - E/W for south-west corner (0000.0000 to 18000.0000, NULL)

OSD - Own ship data

$**OSD, x.x, A, x.x, a, x.x, a, x.x, x.x, a *hh<CR><LF>
1 2 3 4 5 6 7 8 9

1. Heading, degrees true (0.00 to 359.99)
2. Heading status (A=data valid)
3. Vessel course, degrees true (0.00 to 359.99)
4. Course reference (B=Bottom tracking log, R=Radar tracking (of fixed target), P=Positioning system ground reference)
5. Vessel speed (0.00 to 999.999)
6. Speed refereence, (B/R/P) (See 4.)
7. Vessel set, degrees true, manually entered (Not used)
8. Vessel drift (speed), manually entered (Not used)
9. Speed units (K=km/h N=Knots S=statute miles/h)

RMC - Recommended minimum specific GPS/TRANSIT data

$**RMC, hhmmss.ss, A, llll.ll, a, yyyyy.yy, a, x.x, x.x, ddmmyy, x.x, a, a, a *hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13

1. UTC of position fix (0.00 to 235959.99)
2. Status (A=data valid)
3. Latitude (0000.0000 to 9000.0000)
4. N/S
5. Longitude (0000.0000 to 18000.0000)
6. E/W
7. Speed over ground, knots (0.00 to 999.99)
8. Course over ground, degrees true (0.00 to 359.99)
9. Date (010100 to 311299)
10. Magnetic variation, degrees E/W (Not used)
11. E/W (Not used)
12. Mode indicator (A= Autonomous, D= Differential, F=Float RTK, P=Precise, R=Real time kinematic)
13. Navigational status indication (S=Safe; C=Caution; U=Unsafe; V=Navigational status not valid, equipment is not providing navigational status indication, NULL)

ROT - Rate of turn

$--ROT,x.x,A*hh<CR><LF>
1 2

1. Rate of turn, deg/min, "-"=bow turns to port (-9999.99 to 9999.99)
2. Status (A=data valid)

SPW - Security password sentence

$ **SPW,ccc,c--c,x,c--c*hh<CR><LF>
1 2 3 4

1. Password protected sentence
2. Unique identifier (MMSI=000000000 to 999999999, NULL)
3. Password level (1=User defined,2=Administator)
4. Password (Maximum 32 characters, text only)

SSD - AIS ship static data

$**SSD,c--c,c--c,xxx,xxx,xx,xx,c, aa*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Ship's call sign (1 to 7 characters, NULL)
2. Ship's name (1 to 20 characters, NULL)
3. Pos. ref. point distance, "A," from bow (0 to 511 Meters, NULL)
4. Pos. ref. point distance, "B," from stern (0 to 511 Meters, NULL)
5. Pos. ref. point distance, "C," from port beam (0 to 63 Meters, NULL)
6. Pos. ref. point distance, "D," from starboard beam (0 to 63 Meters, NULL)
7. DTE indicator flag
8. Source identifier (2 characters, NULL)

THS - True heading and status

$--THS, x.x, a *hh<CR><LF>
1 2

1. Heading, degrees true (0.00 to 359.99)
2. Mode indicator (A=Autonomous)

VBW - Dual ground/water speed

$**VBW,x.x,x.x,x,x.x,x.x,x,x.x,x,x.x,x,*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10

1. (No use) Longitudinal water speed, knots (-9999.99 to 9999.99)
2. (No use) Transverse water speed, knots (-9999.99 to 9999.99)
3. (No use) Status: water speed, A=data valid V=data invalid
4. Longitudinal ground speed, knots (-999.999 to 999.999)
5. Transverse ground speed, knots (-999.999 to 999.999)
6. Status: ground speed (A=data valid, NULL)
7. (No use) Stern transverse water speed, knots (-9999.99 - 9999.99)
8. (No use) Status: stern water speed, A=data valid V=data invalid
9. (No use) Stern transverse ground speed, knots (-9999.99 - 9999.99)
10. (No use) Status: stern ground speed, A=data valid V=data invalid

VSD - AIS voyage static data

$--VSD,x.x,x.x,x.x,c--c,hhmmss.ss,xx,xx,x.x,x.x*hh<CR><LF>
1 2 3 4 5 6 7 8 9

1. Type of ship and cargo category (0 to 255, NULL)
2. Maximum present static draught (0 to 25.5m, NULL)
3. Persons on-board (0 to 8191, NULL)
4. Destination (1 to 20 characters, NULL)
5. Estimated UTC of arrival at destination (0 to 235959.99, NULL)
6. Estimated day of arrival at destination (00 to 31(UTC), NULL)
7. Estimated month of arrival at destination (00 to 12(UTC), NULL)
8. Navigational status (0 to 15, NULL)
9. Regional application flags (0 to 15, NULL)

VTG - Course over ground and ground speed

$--VTG, x.x, T, x.x, M, x.x, N, x.x, K, a,*hh <CR><LF>
1 2 3 4 5 6 7 8 9

1. Course over ground, degrees (0.00 to 359.99)
2. T=True (fixed)
3. (No use) Course over ground, degrees (0.0 to 359.99)
4. (No use) M=Magnetic (fixed)
5. Speed over ground, knots (0.00 to 999.99)
6. N=Knots (fixed)
7. Speed over ground (0.00 to 999.99)
8. K=km/h (fixed)
9. Mode indicator (A=Autonomous mode, D=Differential mode, P=Precise)

Output sentences

ABK - AIS addressed and binary broadcast acknowledgment

$**ABK,xxxxxxxxx,x,x.x,x,x,*hh<CR><LF>
1 2 3 4 5

1. MMSI of the addressed AIS unit
2. AIS channel of reception
3. Message ID
4. Message sequence number
5. Type of acknowledgement

ACA - See “ACA - AIS regional channel assignment message” on page AP-5.

ACS - Channel management information source

$**ACS,x,xxxxxxxxx,hhmmss.ss,xx,xx,xxxx,*hh<CR><LF>
1 2 3 4 5 6

1. Sequence number (0 to 9)
2. MMSI of originator (000000000 to 999999999, NULL)
3. UTC at receipt of channel management information (000000 to 235959, NULL)
4. UTC day (01 to 31, NULL)
5. UTC month (01 to 12, NULL)
6. UTC year (2010 to 2060, NULL)

ALC - Cyclic alert list

$**ALC,xx,xx,xx,x.x, aaa,x.x,x.x,x.x,·····,*hh<CR><LF>
1 2 3 4 5 6 7 8 9

1. Total number of sentences for this message (01 to 99)
2. Sentence number (01 to 99)
3. Sequential message identifier (00 to 99)
4. Number of alert entries
5. Manufacturer mnemonic code
6. Alert identifier
7. Alert instance
8. Revision counter

Alert entry 1
See Note

9. Additional Alert entries (see Note)

Note: Alert entry 0 - n: Each alert entry consists of
- Manufacturer Identifier (see ALF Manufactuer Identifier)
- Alert Identifier (see ALF Alert identifier)
- Alert instance (see ALF instance)
- Revision counter (see ALF revision counter)

ALF - Alert sentence

$**ALF,x,x,x,hhmmss.ss,a,a,a,aaa,x.x,x.x,x.x,x,c--c,*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13

1. Total number of ALF sentences for this message (1, 2)
2. Sentence number (1, 2)
3. Sequential message identifier (0 to 9)
4. Time of last change (hhmmss.ss, NULL)
5. Alert category (B=Category B, C=Category C, NULL)
6. Alert priority (W=Warning, C=Caution, NULL)
7. Alert state
   V=active - unacknowledged, S=active - silenced,
   A=active - acknowledged or active, O=active - responsibility transferred,
   U=rectified - unacknowledged, N=normal, NULL
8. Manufacturer mnemonic code (FEC, NULL)
9. Alert identifier (001 to 999999)
10. Alert instance (NULL)
11. Revision counter (1 to 99)
12. Escalation counter (0 to 9)
13. Alert text

ALR - Set state

$**ALR,hhmmss.ss,xxx,A,A,c—c,*hh<CR><LF>
1 2 3 4 5

1. Time of alarm condition change, UTC
2. Unique alarm number (identifier) at alarm source (000 to 999, NULL)
3. Alarm condition (A=threshold exceeded, V=not exceeded)
4. Alarm acknowledge state (A=acknowledged, V=not acknowledged)
5. Alarm description text (alphanumeric)

ARC - Alert command refused

$**ARC,hhmmss.ss,aaa,x.x,x.x,c*hh<CR><LF>
1 2 3 4 5

1. Time
2. Manufacturer mnemonic code
3. Alert identifier (001 to 99999)
4. Alert instance (NULL)
5. Refused alert command
   A=acknowledge
   Q=request/repeat information
   O=responsibility transfer
   S=silence

EPV - Command or report equipment property value”

$ **EPV,s,cc,c--c,x.x,c--c*hh<CR><LF>
1 2 3 4 5

1. Sentence status flag (Fixed: R=Response)
2. Equipment type (Fixed: AI)
3. Unique indentifier (MMSI: 00000000 to 999999999)
4. Property identifier for property to be set (106 to 113)
5. Value of property to be set

HBT - Heart beat supervision

$--HBT, x. x, A, x*hh<CR><LF>
1 2 3

1. Configured repeat interval (50)
2. Equipment status (A)
3. Sequential sentence identifier (0 to 9)

LRF - See “LRF - Long-range function” on page AP-8.

LR1 - Long-range reply with destination for function request “A”

$**LR1,x,xxxxxxxxx,xxxxxxxxx,c--c,c--c,xxxxxxxxx*hh<CR><LF>
1 2 3 4 5 6

1. Sequence number
2. MMSI of responder
3. MMSI of requester (reply destination)
4. Ship's name (1 to 20 characters)
5. Call sign (1 to 7 characters)
6. IMO number, (9-digit number)

LR2 - Long-range reply for function requests “B, C, E, and F”

$**LR2,x,xxxxxxxxx,xxxxxx,hhmmss.ss,llll.ll,a,yyyyy.yy,a,x.x,T,x.x,N*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Sequence number
2. MMSI of responder
3. Date (ddmmyy)
4. UTC of Position
5. Latitude - N/S
6. Longitude - E/W
7. Course over ground, degrees True
8. Speed over ground, Knots

LR3 - Long-range reply for function requests “I, O, P, U and W”

$**LR3,x,xxxxxxxxx,c--c,xxxxxx,hhmmss.ss,x.x,cc,x.x,x.x,cc,x.x*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11

1. Sequence number
2. MMSI of responder
3. Voyage destination (1 to 20 characters)
4. ETA date (ddmmyy)
5. ETA time
6. Draught
7. Ship/cargo
8. Ship length
9. Ship breadth
10. Ship type
11. Persons (0 to 8191)

LRI - See “LRI - Long-range interrogation” on page AP-9.

NAK - Negative acknowledgment

$**NAK,cc,ccc,c--c,x.x,c--c *hh<CR><LF>
1 2 3 4 5

1. Talker identifier
2. Affected sentence formatter
3. Unique identifier
4. Reason code for negative ackowledgment (0=Query functionality not supported, 1=Sentence formatter not supported, 2=Sentence formatter supported, but not enabled; 3=Senetence formatter supported and enabled, but temporarily unavailable; 4=Sentence formatter supported, but query for this sentence formatter is not supported; 5=Access denied, for sentence formatter requested; 6=Sentence not accepted due to bad checksum; 7=Sentence not accepted due to listener processing issue; 8,9=Reserved for future use; 10=Cannot perform the requested operation; 11=cannot fulfill request or command because of a problem with a data field in the sentence; 12 to 48=Reserved for future use; 49=Other reason as described in field 5.)
5. Negative acknowledgment’s descriptive text

SSD - See "SSD - AIS ship static data" on page AP-10.

TRL - AIS transmitter non functioning log

$**TRL,x.x,x.x,x,xxxxxxxx,hhmmss.ss,xxxxxxxx,hhmmss.ss,x,*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Total number of log entries (0 to 10)
2. Log entry number (1 to 10, NULL)
3. Sequential message indentifier (0 to 9, NULL)
4. Switch off date (ddmmyyyy, NULL)
5. Switch off UTC time (000000 to 235959, NULL)
6. Switch on date (ddmmyy, NULL)
7. Switch on UTC time (000000 to 235959, NULL)
8. Reason code (1 to 5, NULL) 1=power off, 2=silent mode, 3=transmission switched off by channel management command, 4=equipment malfunction, 5=invalid configuration.

TXT - Text transmission

$--TXT,xx,xx,xx,c--c*hh<CR><LF>
1 2 3 4

1. Total number of sentences (01 to 99)
2. Sentence number (01 to 99)
3. Text identifier
4. Text message

VDM - VHF data-link message

!AIVDM,x,x,x,a,s--s,x,*hh<CR><LF>
1 2 3 4 5 6

1. Total number of sentences needed to transfer the message (1 to 9)
2. Message sentence number (1 to 9)
3. Sequential message identifier (0 to 9, NULL)
4. AIS channel Number (A, B)
5. Encapsulated ITU-R M.1371 radio message (1 - 63 bytes)
6. Number of fill-bits (0 to 5)

VDO - AIS VHF data-link own-vessel report

!AIVDO,x,x,x,x,s--s,x,*hh<CR><LF>
1 2 3 4 5 6

1. Total number of sentences needed to transfer the message (1 to 9)
2. Message sentence number (1 to 9)
3. Sequential message identifier (0 to 9, NULL)
4. AIS channel Number (A, B, C, D, NULL)
5. Encapsulated ITU-R M.1371 radio message (1 to 63 bytes)
6. Number of fill-bits (0 to 5)

VER - Version

$AIVER,x,x,aa,c-c,c-c,c-c,c-c,c-c,c-c,x,*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10

1. Total number of sentences needed (1 to 9)
2. Sentence number (1 to 9)
3. Device type (AI)
4. Vendor ID
5. Unique Identifier
6. Manufacturer serial number
7. Model code (product code)
8. Software revision
9. Hardware revision
10. Sequential message identifier (0 to 9)

VSD - See "VSD - AIS voyage static data" on page AP-10.

Inland AIS specific sentences

Input sentences and output sentences

PIWWIVD - Inland waterway voyage data

$PIWWIVD x, x, x, xx.xx, xx.xx, x , xxx, xxxx, xxx, x.x, x.x, x.x, x.x, hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13

1. Reporting rate: 0 to 15, NULL (See table to the right)
2. No. of blue cones: 0 to 3, 4=B-Flag, 5=unknown (default), NULL
3. Loaded/unloaded: 1=loaded, 2=unloaded, 0=not available (default), NULL
4. Inland draught: 0.01 to 20.00(m), 0=unknown (default), NULL
5. Air draught: 0.01 to 40.00(m), 0=unknown (default), NULL
6. No. of tugboats: 0 to 6, 7=unknown (default), NULL
7. No. of crew members: 0 to 254, 255=unknown (default), NULL
8. No. of passengers: 0 to 8190, 8191=unknown (default), NULL
9. No. of shipboard personnel: 0 to 254, 255=unknown (default), NULL
10. Convoy extensiont o bow: 0.0 to 800.0, NULL
11. Convoy extension to stern: 0.0 to 800.0, NULL
12. Convoy extension to port-side: 0.0 to 100.0, NULL
13. Convoy extension to starboard-side: 0.0 to 100.0, NULL

0	Return to Autonomous mode
1	10 minutes
2	6 minutes
3	3 minutes
4	1 minute
5	30 seconds
6	15 seconds
7	10 seconds
8	5 seconds
9	Next longer
10	Next shorter
11	2 seconds
12 to 15	Reserved for future use

PIWWSSD - Inland waterway static ship data

$PIWWSSD CCCCCCCC, xxxx, xxxx, xxxx, x, x, x, x.x, x.x, x.x, x.x, hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11

1. ENI no. (00000000 to 99999999, NULL)
2. ERI ship type (0 to 9999, NULL)
3. Length of ship (0.0 to 800.0(m), NULL)
4. Beam of ship (0.0 to 100.0(m), NULL)
5. Quality of speed information (1: High, 0: Low, NULL)
6. Quality of course information (1: High, 0: Low, NULL)
7. Quality of heading information (1: High, 0: Low, NULL)
8. B value for internal position (0.0 to 800.0, NULL)
9. C value for internal position (0.0 to 100.0, NULL)
10. B value for external position (0.0 to 800.0, NULL)
11. C value for external position (0.0 to 100.0, NULL)

PIWWVSD - Inland waterway voyage data

$PIWWVSD x, x, x, x, xx.xx, xx.xx, x, xxx, xxxx, xxx, hh<CR><LF>
1 2 3 4 5 6 7 8
9 10

1. Reporting rate. 1: SOLAS reporting rate, 2: 2s, 0:not available (default)
2. Blue sign, 1: Not set, 2: Set, 0: Not available (default)
3. Hazardous cargo 0-3, 4=B-Flag, 5=unknown (default)
4. Loaded/unloaded, 1=loaded, 2=unloaded, 0=not available (default)
5. Static draught, 0.01 to 20.00(m), 0=unknown (default)
6. Air draught, 0.01 to 40.00(m), 0=unknown (default)
7. No. of tugboats, 0 to 6,7=unknown (default)
8. No. of crew members, 0 to 254, 255=unknown (default)
9. No. of passengers, 0 to 8190, 8191=unknown (default)
10. No. of shipboard personnel, 0 to 254, 255=unknown (default)

Input only sentence

PIWWSPW - Inland AIS security password

$PIWWSPW a, x, c - - - c, x, hh<CR><LF>
1 2 3 4

1. Mode (E: Password input, C: Password change)
2. Password level (1: Maintenance password, 2: User password
3. Password (At least 6 characters)
4. Valid time (0 and 1 to 60 (s))

Output only sentence

PIWWSPR - Inland AIS security password response

$PIWWSPR a, x, x, x, hh<CR><LF>
1 2 3 4

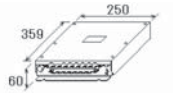
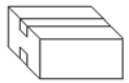
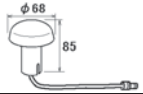
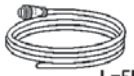
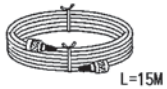
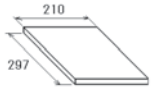
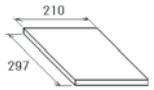
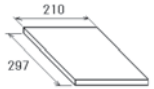
1. Mode (E: Password input, C: Password change)
2. Password level (1: Maintenance password, 2: User password, NULL)
3. Valid time (0 to 60 (s), NULL)
4. Status (0: Pass, 1: Fail)

PACKING LIST

05ES-X-9859 -1 1/1

A-1

FA-170-E-5-FCC ,FA-170-E-5-FCC-MIJ ,FA-170-E-5-FCC-USCG

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗﾝｽﾎﾟﾝﾀﾞ部 TRANSPONDER UNIT		FA-1701-E-FCC 000-029-277-00	1
表示部一式箱詰品 MONITOR UNIT COMPLETE SET		FA-1702 000-029-278-00	1
ｱﾝﾃﾅ ANTENNA UNIT		GPA-017S 000-146-294-19	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP05-06501 001-426-300-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY		Z-AWG25X4P-SB L050 001-426-390-00	1
ｹｰﾌﾞﾙ組品 CABLE ASSEMBLY		TNC-PS/PS-3D-L15M-R 001-173-110-10	1
工事材料 INSTALLATION MATERIALS		CP05-13601 001-426-480-00	1
図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-44900-* 000-191-089-1*	1
操作要領書(多言語) OPERATOR'S GUIDE (EN)		MLG-44900-* 000-191-091-1*	1
装備要領書(英) INSTALLATION MANUAL (EN)		IME-44900-* 000-191-093-1*	1

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

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

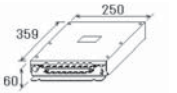
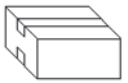
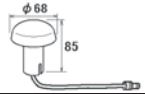
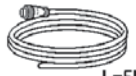
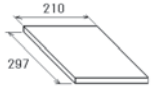
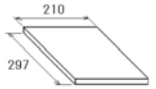
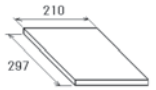
C4490-Z09-B

PACKING LIST

05ES-X-9857 -1 1/1

A-2

FA-170-E-5-GPA

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗﾝｽﾎﾟﾝﾀﾞ部 TRANSPONDER UNIT		FA-1701-E 000-029-275-00	1
表示部一式箱詰品 MONITOR UNIT COMPLETE SET		FA-1702 000-029-278-00	1
ｱﾝﾃﾅ ANTENNA UNIT		GPA-017S 000-146-294-19	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP05-06501 001-426-300-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY		Z-AWG25X4P-SB L050 001-426-390-00	1
工事材料 INSTALLATION MATERIALS		CP05-13601 001-426-480-00	1
図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-44900-* 000-191-089-1*	1
操作要領書(多言語) OPERATOR'S GUIDE (EN)		MLG-44900-* 000-191-091-1*	1
装備要領書(英) INSTALLATION MANUAL (EN)		IME-44900-* 000-191-093-1*	1

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

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

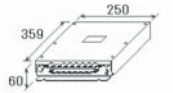
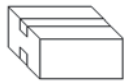
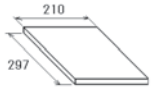
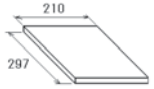
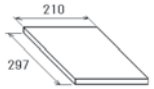
C4490-Z07-B

PACKING LIST

05ES-X-9856 -0 1/1

A-3

FA-170-E-V ,FA-170-E-HK-V

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗﾝｽﾎﾟﾝﾀﾞ部 TRANSPONDER UNIT		FA-1701-* 000-029-276-00 **	1
表示部一式箱詰品 MONITOR UNIT COMPLETE SET		FA-1702* 000-029-279-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP05-13601 001-426-480-00	1
図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-44900-* 000-191-089-1*	1
操作要領書(多言語) OPERATOR'S GUIDE (EN)		MLG-44900-* 000-191-091-1*	1
装備要領書(英) INSTALLATION MANUAL (EN)		IME-44900-* 000-191-093-1*	1

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

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

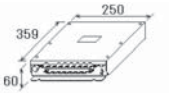
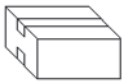
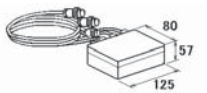
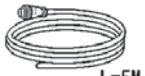
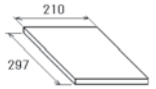
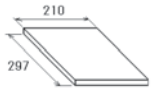
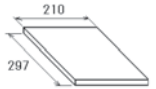
C4490-Z06-A

PACKING LIST

05ES-X-9854 -1 1/1

A-4

FA-170-E-5-DB1

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗﾝｽﾎﾟﾝﾀﾞ部 TRANSPONDER UNIT		FA-1701-E 000-029-275-00	1
表示部一式箱詰品 MONITOR UNIT COMPLETE SET		FA-1702 000-029-278-00	1
分配器 DISTRIBUTER UNIT		DB-1 000-053-854-00	1
予備品 SPARE PARTS			
予備品 SPARE PARTS		SP05-06501 001-426-300-00	1
工事材料 INSTALLATION MATERIALS			
ｹｰﾌﾞﾙ(組品) CABLE ASSEMBLY		Z-AWG25X4P-SB L050 001-426-390-00	1
工事材料 INSTALLATION MATERIALS		CP05-13601 001-426-480-00	1
工事材料 INSTALLATION MATERIALS		CP24-00101 005-950-730-00	1
図書 DOCUMENT			
取扱説明書(英) OPERATOR'S MANUAL (EN)		OME-44900-* 000-191-089-1*	1
操作要領書(多言語) OPERATOR'S GUIDE (EN)		MLG-44900-* 000-191-091-1*	1
装備要領書(英) INSTALLATION MANUAL (EN)		IME-44900-* 000-191-093-1*	1

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

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

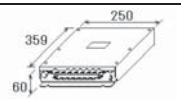
C4490-Z04-B

PACKING LIST

05ES-X-9851 -0 1/1

A-5

FA-170-J/E

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
ﾄﾗﾝｽﾎﾟﾝﾀﾞ部 TRANSPONDER UNIT		FA-1701-∗ 000-029-274-00 ∗∗	1

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

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

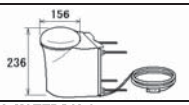
C4490-Z01-A

PACKING LIST

05ES-X-9864 -0 1/1

A-6

GVA-100-T-∗-170 , GVA-100-T-∗-170HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
複合空中線部 GPS/VHF COMBINED ANTENNA		GVA-100-T/HK 000-041-942-00 ∗∗	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP05-13901 001-426-820-00	1

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

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

C4490-Z14-A

PACKING LIST

FA-1702/-HK

NAME	OUTLINE	DESCRIPTION/CODE No.	Q'TY
ユニット UNIT			
表示部 MONITOR UNIT		FA-1702* 000-029-280-00 **	1
工事材料 INSTALLATION MATERIALS			
工事材料 INSTALLATION MATERIALS		CP05-13701 001-426-520-00	1

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

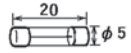
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

C4490-Z13-A

FURUNO

CODE NO.	001-426-300-00	05ES-X-9301 -0 1/1
TYPE	SP05-06501	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL

ITEM NO.	NAME OF PART	OUTLINE	DWG. NO. OR TYPE NO.	QUANTITY WORKING PER SET	QUANTITY WORKING PER VES	QUANTITY SPARE	REMARKS/CODE NO.
1	ﾋｭｰｽﾞ GLASS TUBE FUSE		FGMB 125V 8A PBF	1		2	000-191-004-10

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	C4490-P01-A	1/1

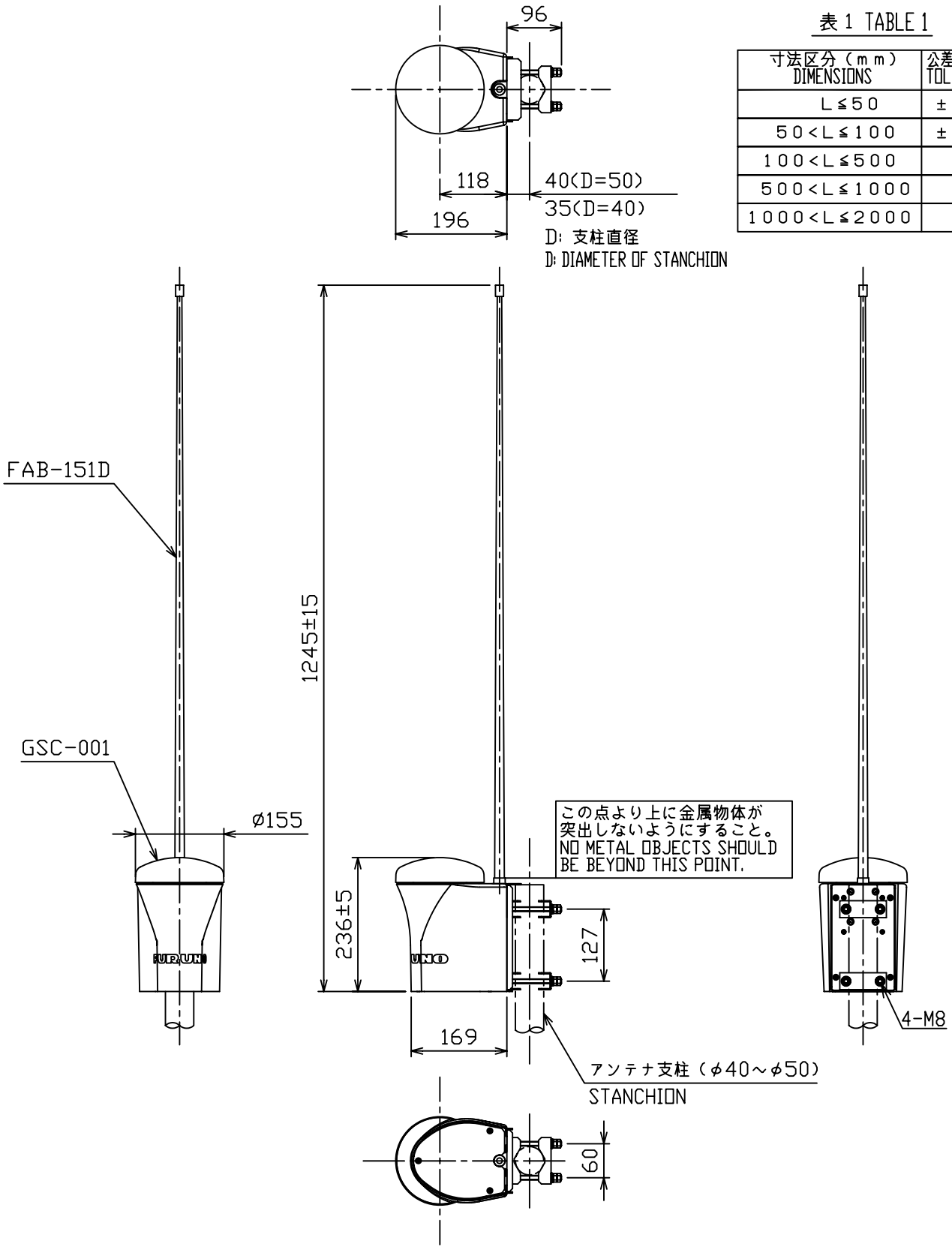
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

D-1

表 1 TABLE 1

寸法区分（ｍｍ） DIMENSIONS	公差（ｍｍ） TOLERANCE
L≦50	±1．5
50<L≦100	±2．5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±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 Feb. 9 '05 T.YAMASAKI		TITLE	GVA-100
CHECKED Feb. 9 '05 T.MATSUGUCHI		名称	GPS/VHF複合空中線部
APPROVED Feb.22'05 T.Matsuguchi	FA-100		外寸図
SCALE 1/10 MASS 3.3 ±10% kg		NAME	GPS/VHF COMBINED ANTENNA
DWG.No. C4417-G02- F	24-003-301G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

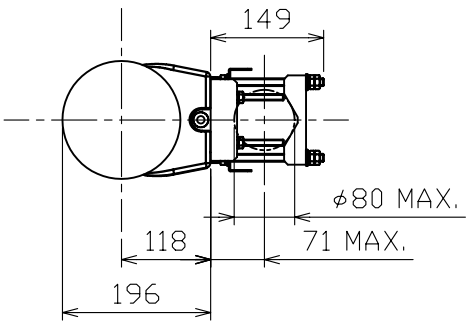
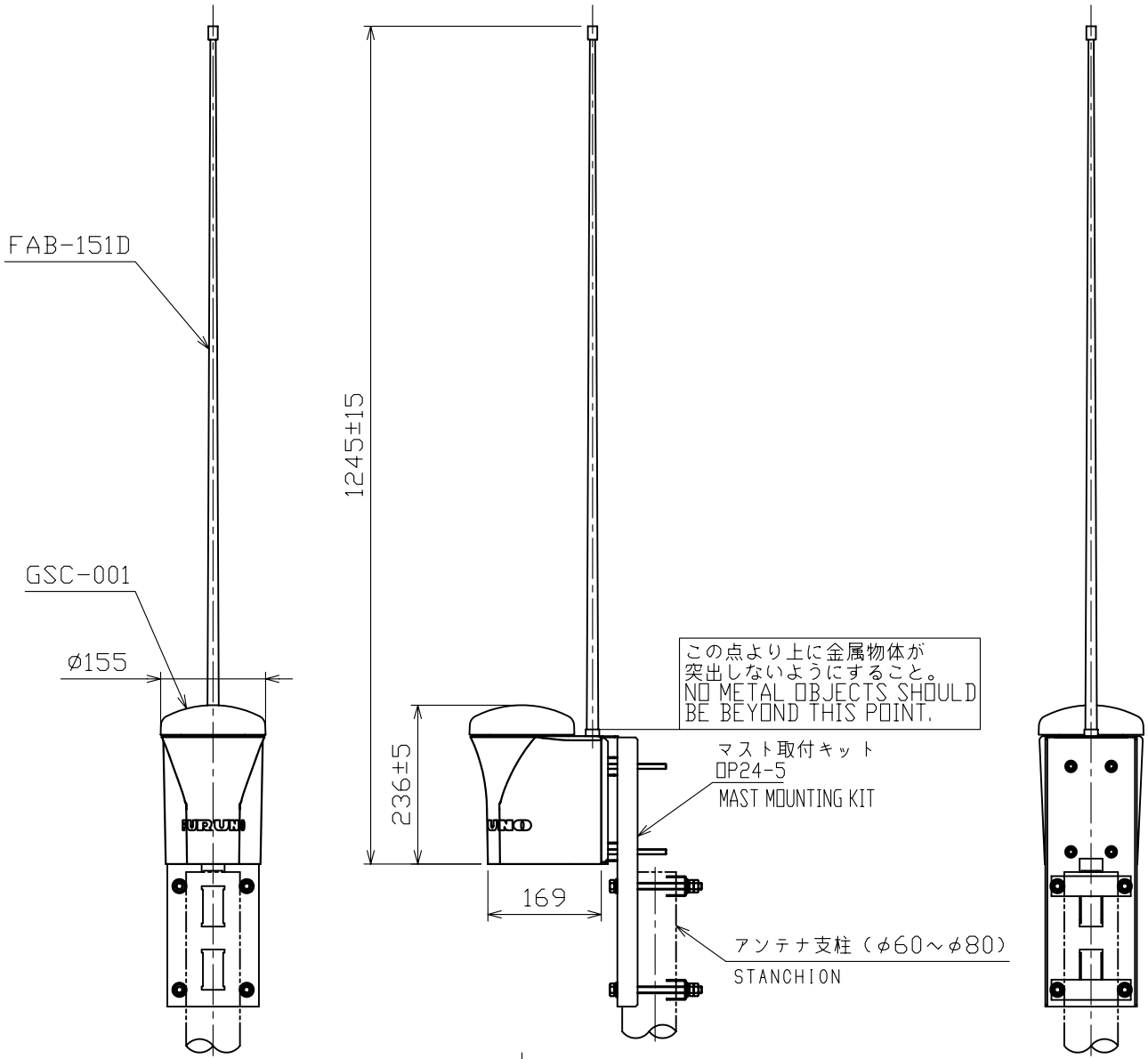


表 1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3
500<L≦1000	±4
1000<L≦2000	±5



注　記

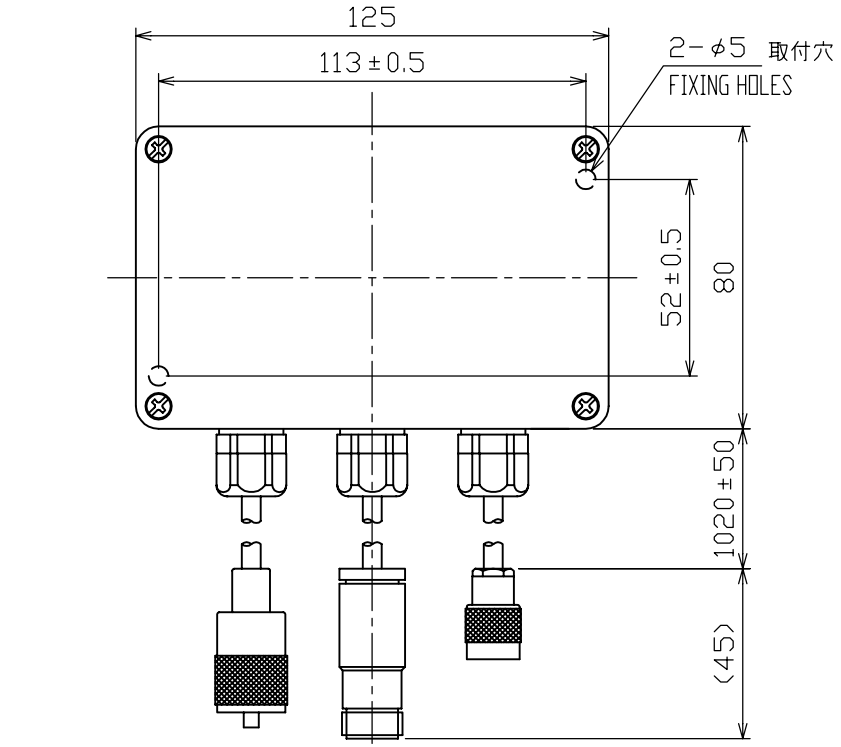
1）指定外の寸法公差は表 1 による。

NOTE

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

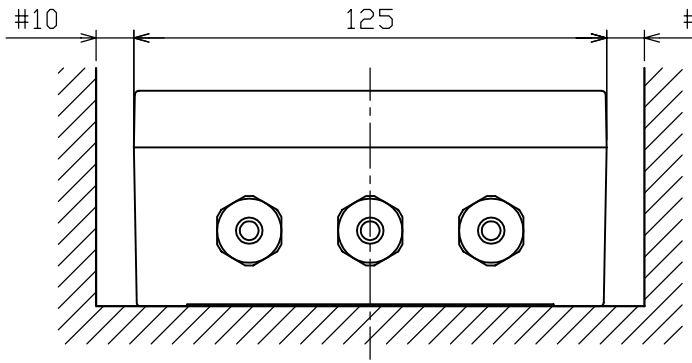
DRAWN Feb. 9 '05 T. YAMASAKI			TITLE GVA-100 (W/ OP24-5)
CHECKED Feb. 9 '05 T.MATSUGUCHI			名称 GPS/VHF 複合空中線部
APPROVED Feb.22'05 T.Matsuguchi		FA-100	外寸図
SCALE 1/10	MASS 5.1 ±10% kg		NAME GPS/VHF COMBINED ANTENNA
DWG.No. C4417-G10- B		24-003-303G-1	OUTLINE DRAWING

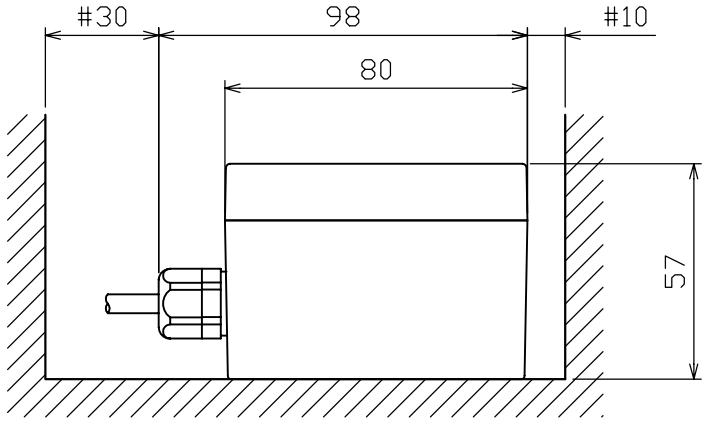
FURUNO



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

表1 TABLE 1





注　記　1）＃印寸法は最小サービス空間寸法とする。
　　2）指定外の寸法公差は表1による。
　　3）取付用ネジは＋ナベタッピンネジ４×３０を使用のこと。

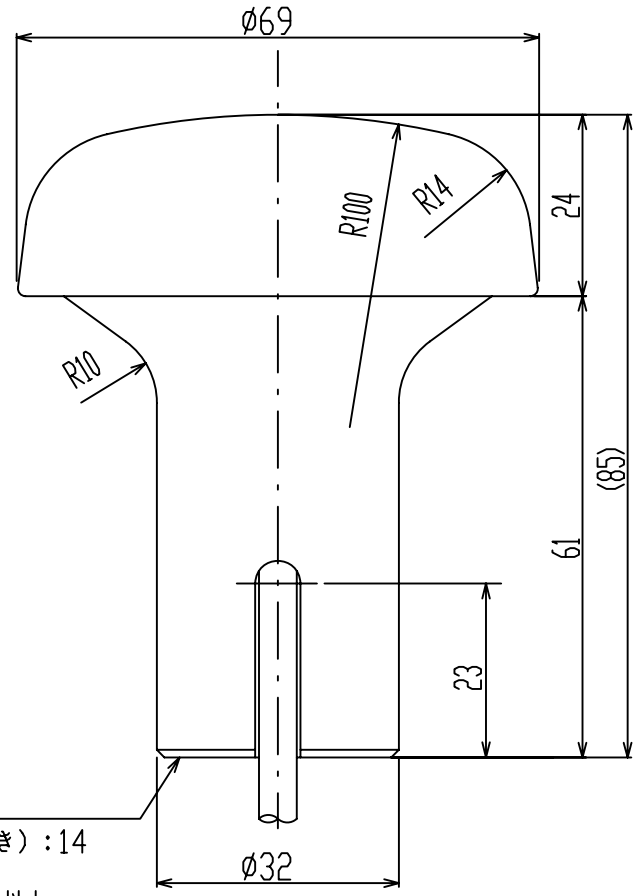
NOTE　1. #: RECOMMENDED SERVICE CLEARANCE.
　　2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS.
　　3. USE TAPPING SCREWS 4x30 FOR FIXING THE UNIT.

DRAWN Jan. 9 '03 T.YAMASAKI			TITLE DB-1
CHECKED Jan. 9 '03 Y.KIMURA			名称 分配器
APPROVED Jan. 9, '03 Y. Kimura	FA-100		外寸図
SCALE 1/2	MASS 0.85 ±10% kg		NAME DISTRIBUTOR
DWG No. C4417-G04-C	24-003-320G-4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

表1 TABLE 1

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



1-14UNS1B
ねじ山数(25.4mmにつき):14
ピッチ: 1.8143 mm
オネジ有効長さ:19 mm以上
オネジ有効径:24.17mm

THREAD PER 25.4mm (1 INCH): 14
PITCH: 1.8143 mm
THREAD LENGTH: 19 mm OR MORE
PITCH DIAMETER: 24.17mm

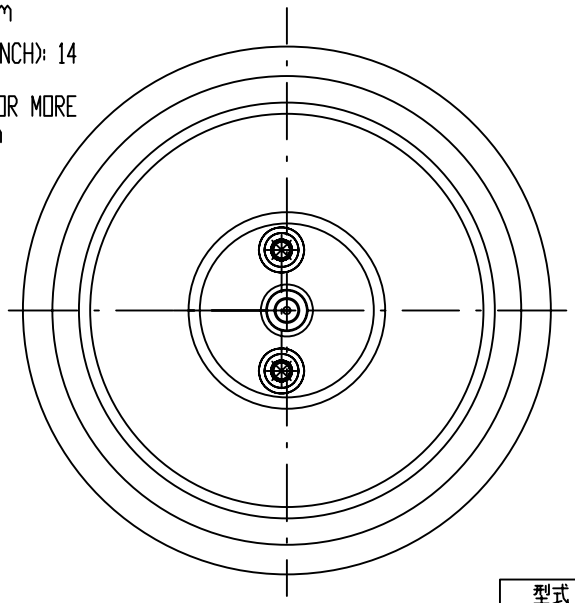


表2 TABLE 2

型式 TYPE	ケーブル長(m) CABLE LENGTH	プラグ PLAG	質量(kg±10%) MASS
GPA-017	10	TNC-P-3	0.6
GPA-017S	0.2	TNC-J-3	0.15

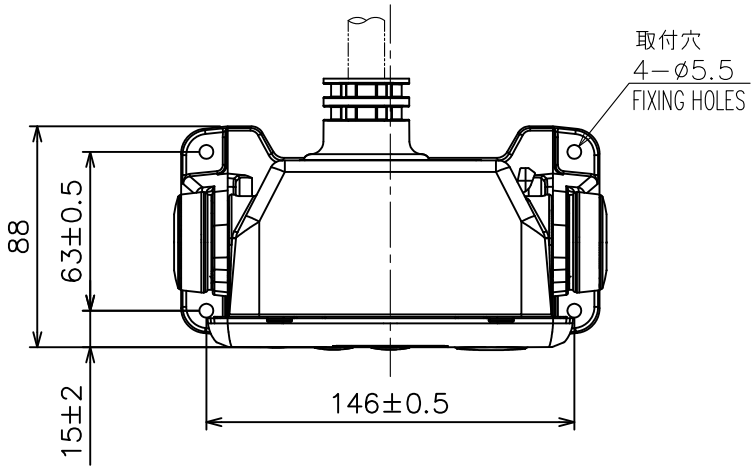
注記
指定外の寸法公差は表1による。

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

DRAWN Mar. 27 '07 T.YAMASAKI		TITLE GPA-017/017S
CHECKED Mar. 27 '07 T.TAKENO		名称 空中線部
APPROVED Mar.27'07 R.Esumi		外寸図
SCALE 1/1 MASS TABLE 2 表2参照		NAME ANTENNA UNIT
DWG.No. C4384-G04- L		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



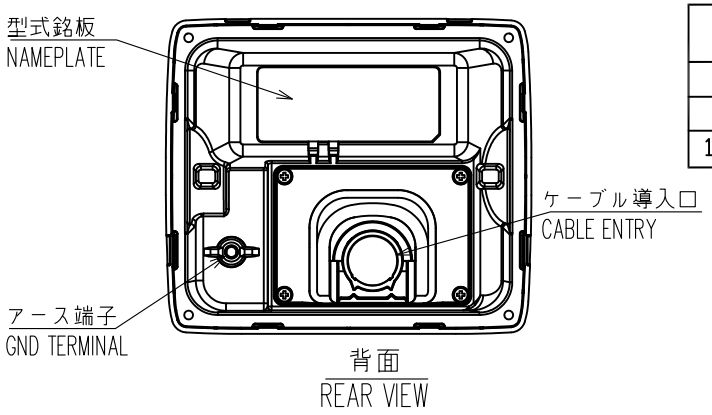
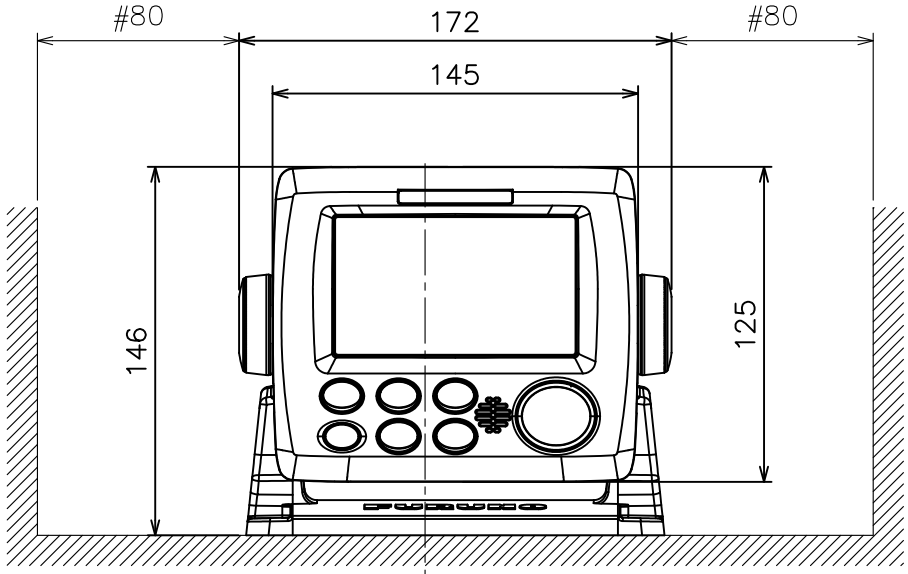
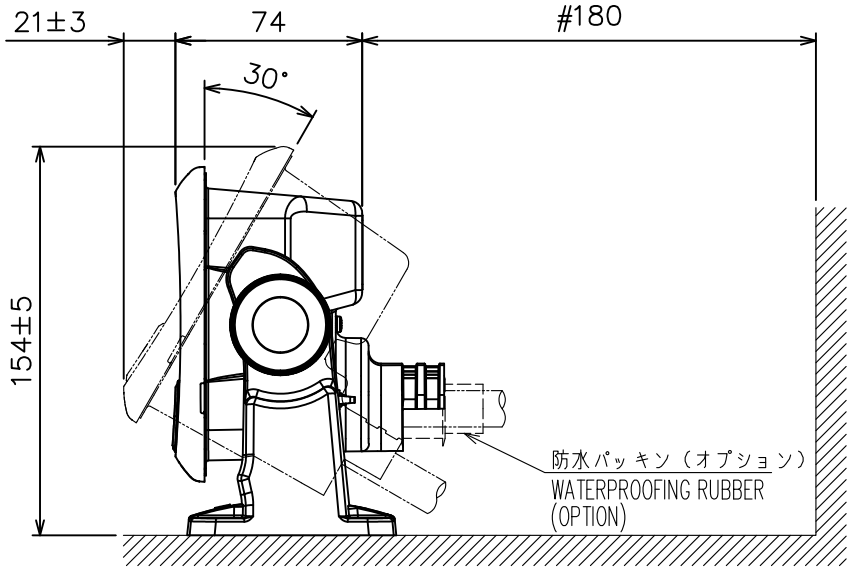


表1 TABLE 1

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





注　記

1）　指定外寸法公差は表1による。

2）　＃印寸法は、最小サービス空間寸法とする。

3）　取付用ネジはトラスタッピンネジ呼び径5×20を使用のこと。

NOTE

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

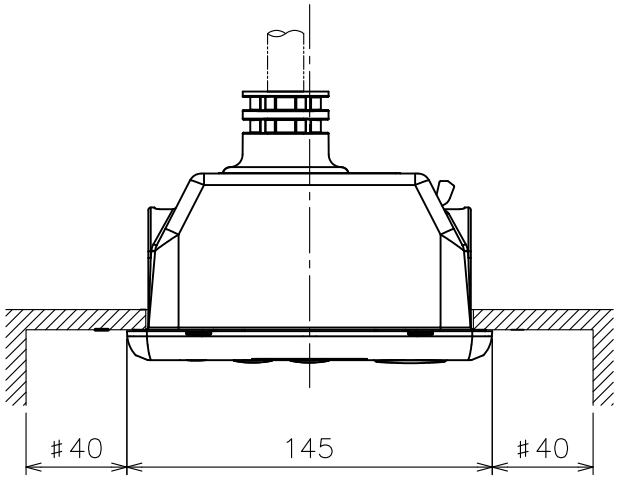
DRAWN 29/Jun/2015 T.YAMASAKI		TITLE	FA-1702
CHECKED 29/Jun/2015 H.MAKI		名称	表示部（卓上装備）
APPROVED 16/Apr/2015 H.MAKI	FA-170		外寸図
SCALE 1/3 MASS 0.7 ±10% kg	質量はオプションを含まず。 MASS DOES NOT INCLUDE OPTION.	NAME	DISPLAY UNIT (TABLETOP MOUNT)
DWG.No. C4490-G02- A	REF.No. 05-109-3506-1		OUTLINE DRAWING

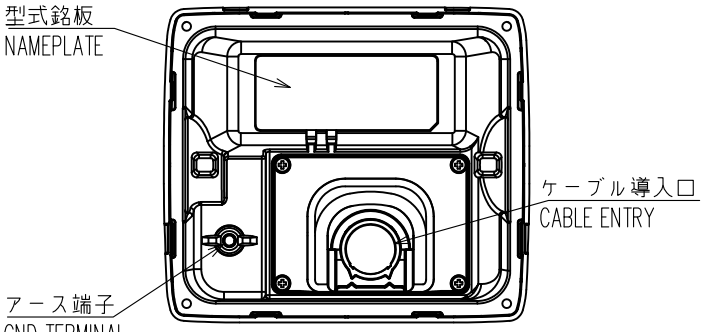
FURUNO ELECTRIC CO., LTD.

FURUNO

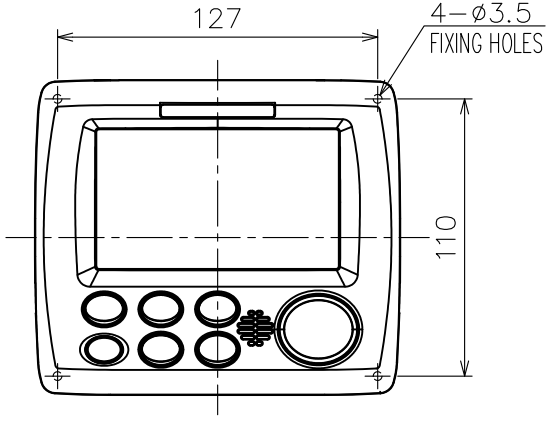
表１ TABLE 1

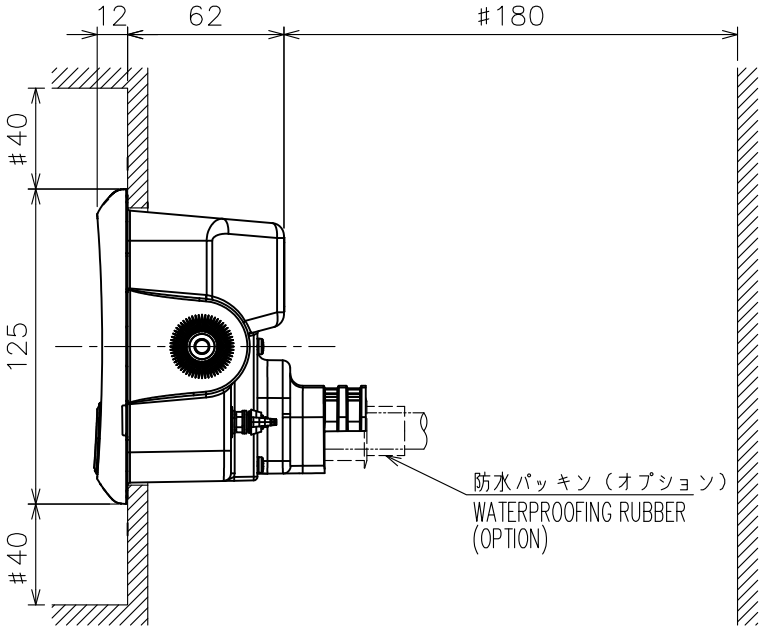
寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０<Ｌ≦１００	±２．５
１００<Ｌ≦５００	±３

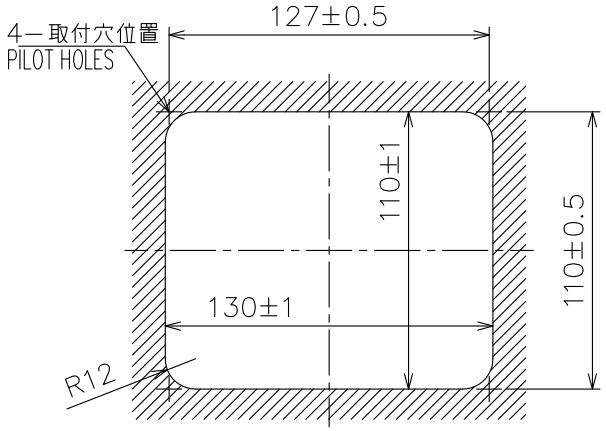




背面図
REAR VIEW







取付穴寸法
CUTOUT DIMENSIONS

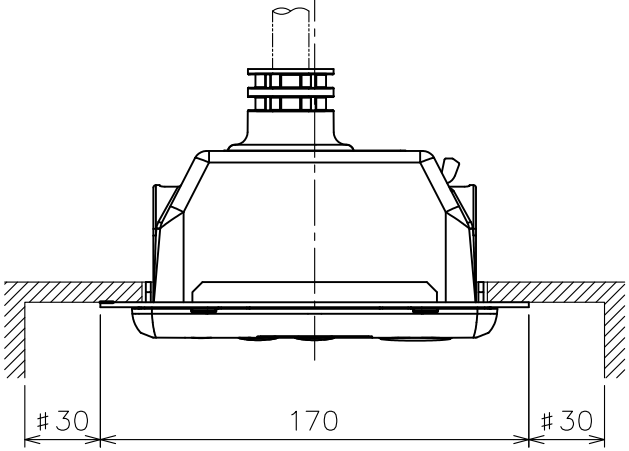
注　記
１）　指定外寸法公差は表１による。
２）　＃印寸法は、最小サービス空間寸法とする。
３）　取付用ネジはナベタッピンネジ呼び径３×２０を使用のこと。

NOTE
1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø3x20 FOR FIXING THE UNIT.

DRAWN 29/Jun/2015 T.YAMASAKI		TITLE	FA-1702
CHECKED 30/Jun/2015 H.MAKI		名称	表示部（埋込装備）
APPROVED 16/Apr/2015 H.MAKI	FA-170		外寸図
SCALE 1/3 MASS 0.6 ±10% kg	質量はオプションを含まず。 MASS DOES NOT INCLUDE OPTION.	NAME	DISPLAY UNIT (FLUSH MOUNT)
DWG.No. C4490-G03- A	REF.No. 05-109-3516-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO



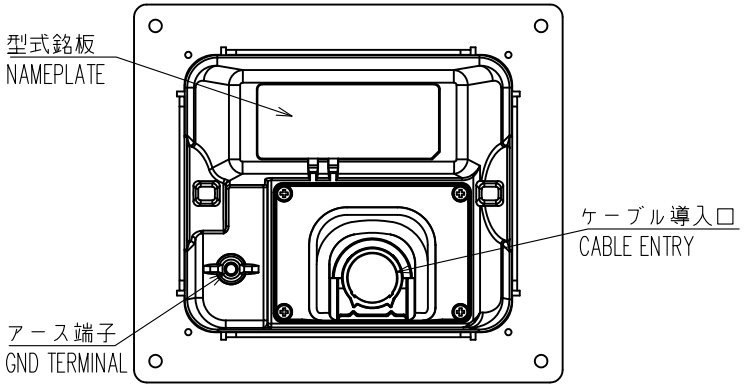
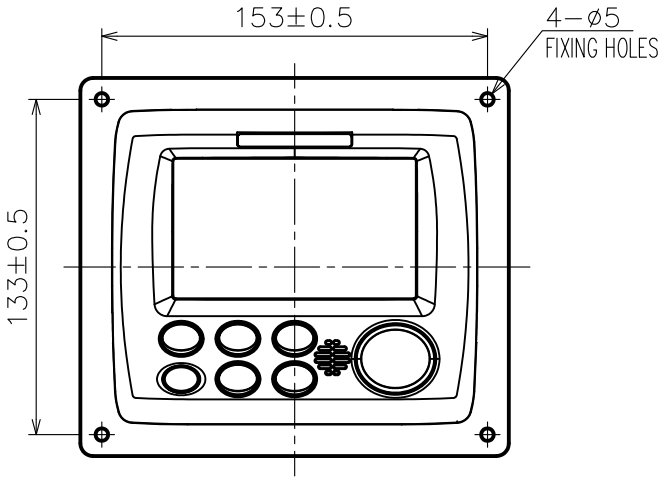
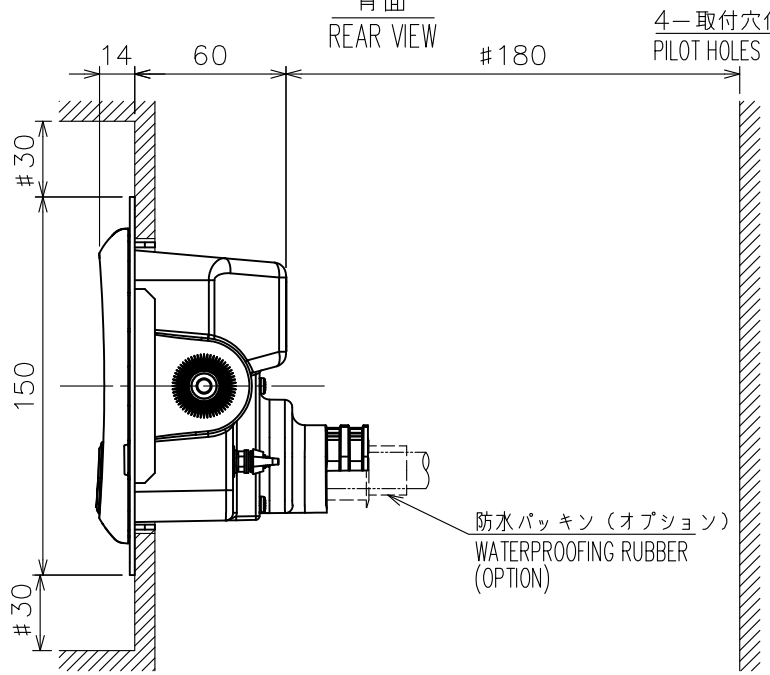


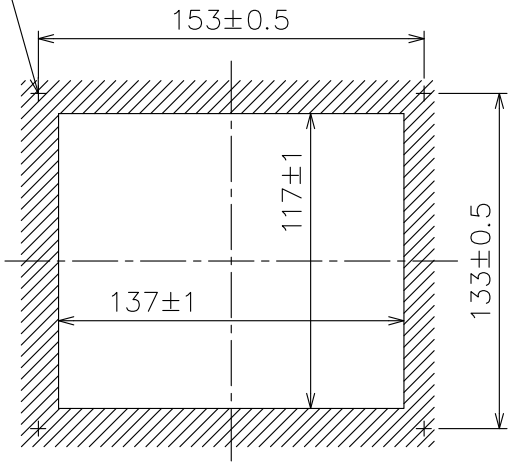
表１ TABLE 1

寸法区分（ｍｍ） DIMENSION	公差（ｍｍ） TOLERANCE
Ｌ≦５０	±１．５
５０<Ｌ≦１００	±２．５
１００<Ｌ≦５００	±３



背面
REAR VIEW





取付穴寸法
CUTOUT DIMENSIONS

注　記

１）　指定外寸法公差は表１による。

２）　＃印寸法は、最小サービス空間寸法とする。

３）　取付用ネジはトラスタッピンネジ呼び径４×１６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 ø4x16 FOR FIXING THE UNIT.

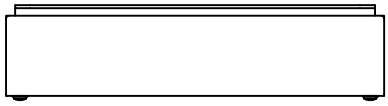
DRAWN 29/Jun/2015 T.YAMASAKI		TITLE	FA-1702
CHECKED 30/Jun/2015 H.MAKI		名称	表示部（パネル装備）
APPROVED 16/Apr/2015 H.MAKI	FA-170		外寸図
SCALE 1/3 MASS 0.65 ±10% kg	質量はオプションを含まず。 MASS DOES NOT INCLUDE OPTION.	NAME	DISPLAY UNIT (PANEL MOUNT)
DWG.No. C4490-G04- A	REF.No. 05-109-352G-1		OUTLINE DRAWING

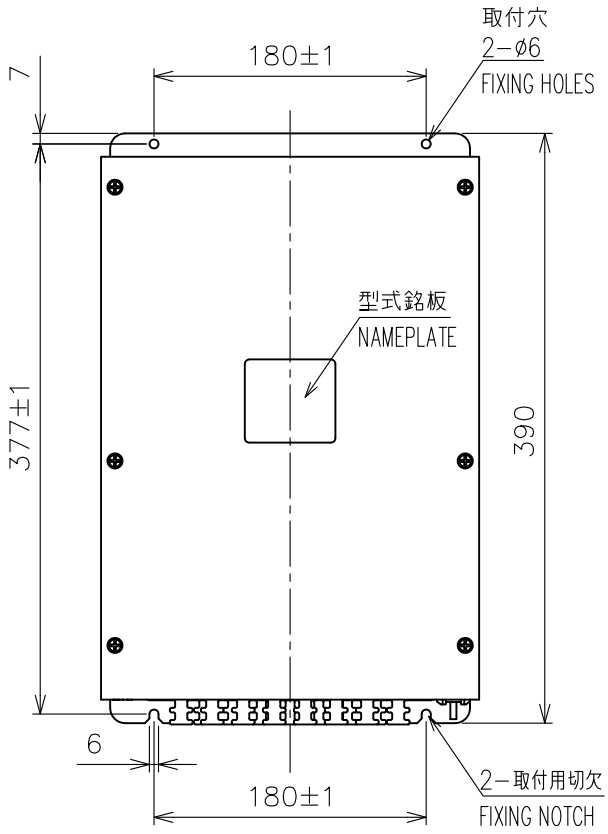
D-7

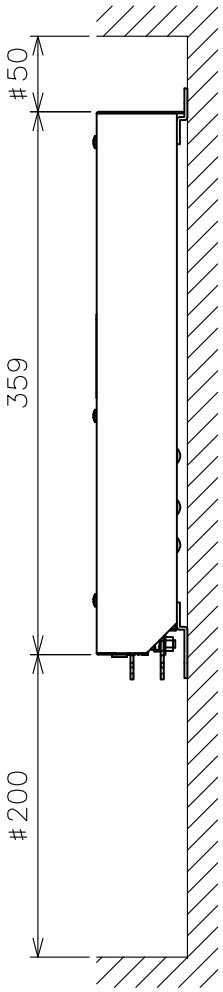
FURUNO ELECTRIC CO., LTD.

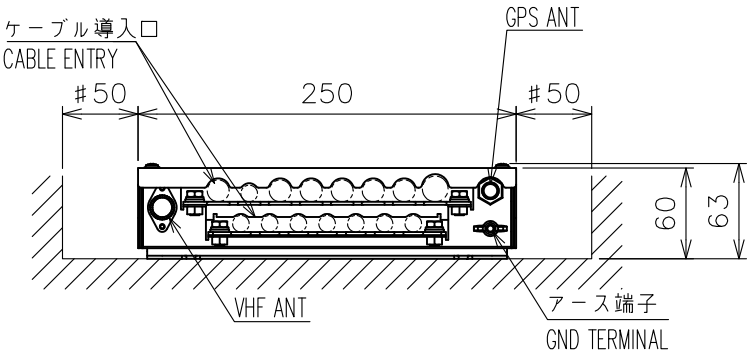
表1 TABLE 1

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









注記

1）指定外の寸法公差は表1による。

2）＃印寸法は最小サービス空間寸法とする。

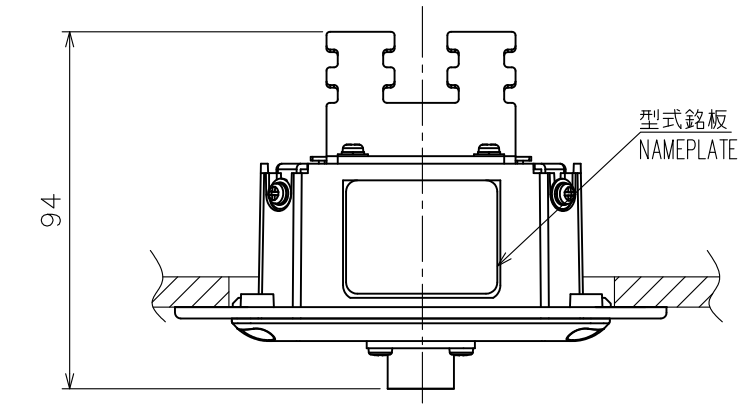
3）取付用ネジはタッピンネジ呼び径５×２０、またはＭ５ボルトを使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø5x20 OR M5 BOLTS FOR FIXING THE UNIT.

DRAWN 15/Oct/2015 T.YAMASAKI		TITLE	FA-1701
CHECKED 15/Oct/2015 H.MAKI		名称	トランスポンダ部
APPROVED 16/Apr/2015 H.MAKI	FA-170		外寸図
SCALE 1/5 MASS 3.0 ±10% kg		NAME	TRANSPONDER UNIT
DWG. No. C4490-G01- B	REF. No. 05-109-250G-2		OUTLINE DRAWING

FURUNO



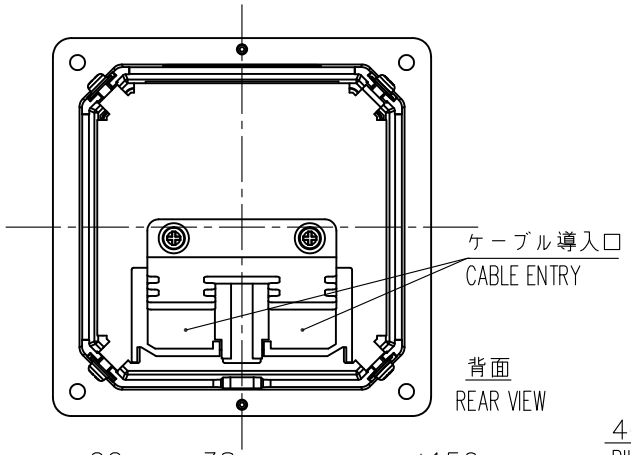
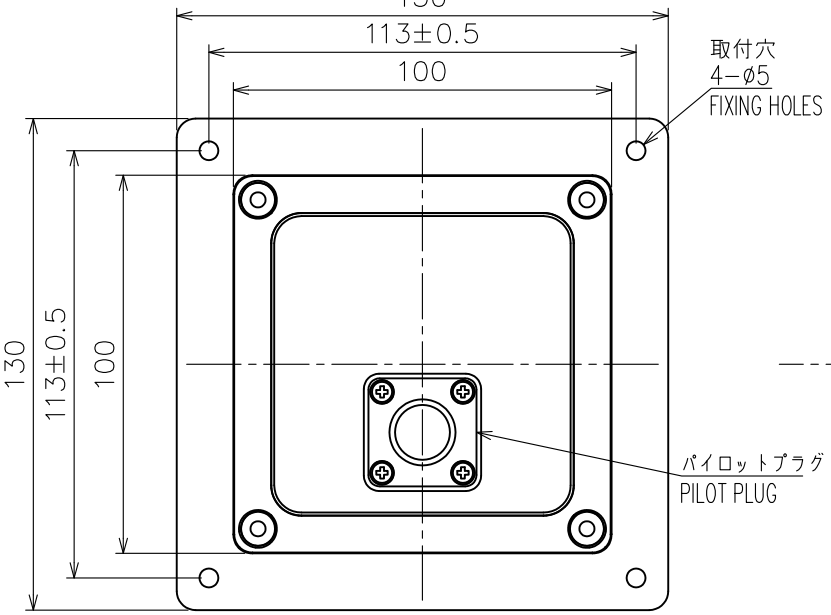
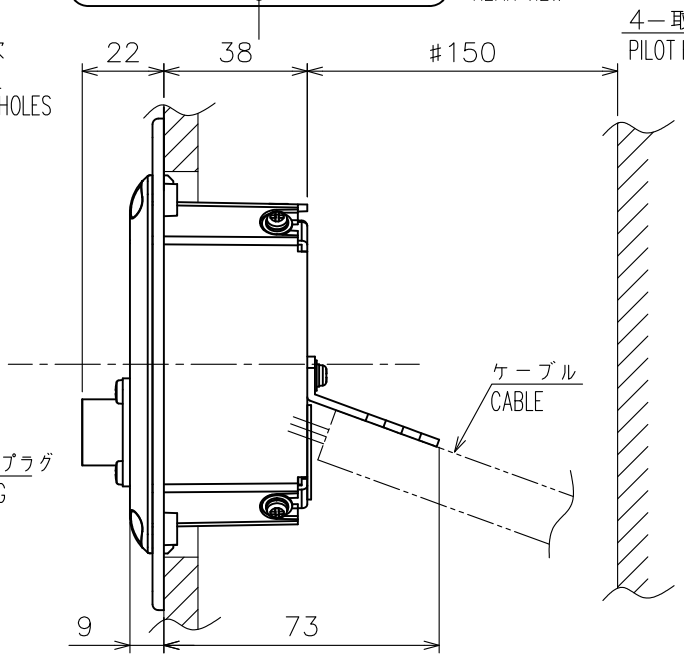
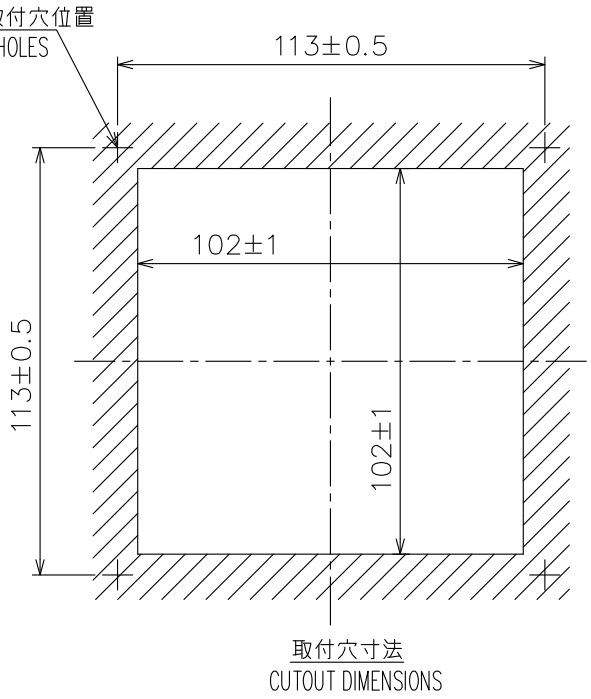


表1 TABLE 1

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







注　記

1）　指定外の寸法公差は表1による。

2）　#印寸法は最小サービス空間寸法とする。

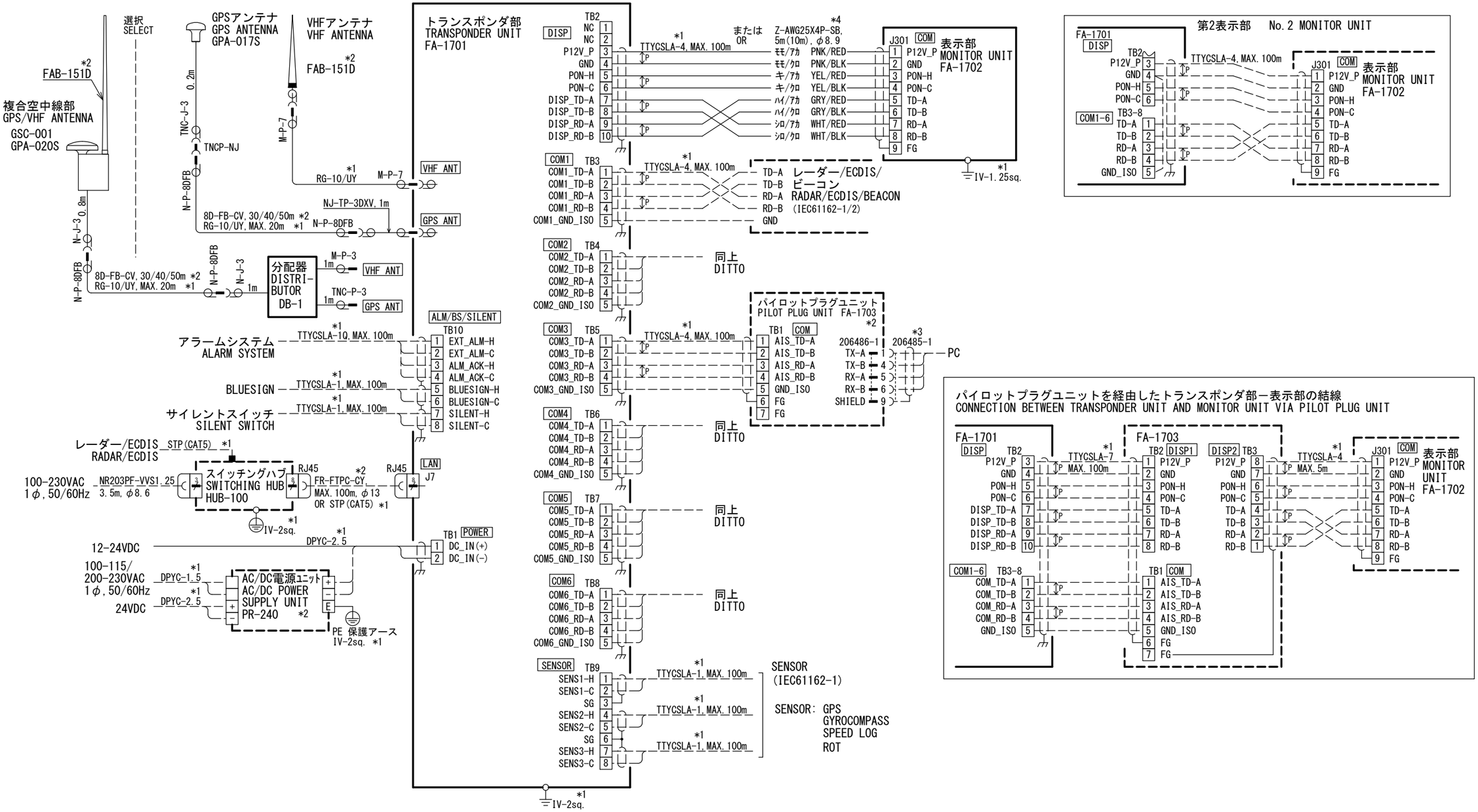
3）　取付にはトラスタッピンネジ呼び径4×16を使用のこと。

NOTE

1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

DRAWN 3/Aug/2015 T.YAMASAKI		TITLE	FA-1703
CHECKED 3/Aug/2015 H.MAKI		名称	パイロットプラグユニット
APPROVED 16/Apr/2015 H.MAKI	FA-170		外寸図
SCALE 1/2 MASS 0.28 ±10% kg	質量はケーブルを含まず。 MASS DOES NOT INCLUDE CABLE.	NAME	PILOT PLUG UNIT
DWG.No. C4490-G05- B	REF.No. 05-109-451G-1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配。
＊２）オプション。
＊３）TYCO ELECTRONICS社（旧AMP社）製。
＊４）国際向専用ケーブル。カラーコードは専用ケーブルのもの。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: PRODUCED BY TYCO ELECTRONICS (AMP) INC.
*4: 5m:STANDARD SUPPLY. 10m:OPTION. COLOR CODES SHOW CORES OF THE SUPPLIED CABLE.

DRAWN 9/Oct/2015 T. YAMASAKI		TITLE	FA-170
CHECKED 9/Oct/2015 H. MAKI		名称	国際船舶自動識別装置
APPROVED 13/Oct/2015 H.MAKI			相互結線図
SCALE / MASS kg		NAME	U-AIS TRANSPONDER
DWG No. C4490-C01- B	REF. No. 05-109-1001-0		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.