FURUNO

OPERATOR'S MANUAL

REMOTE DISPLAY

Model **RD-20**

FURUNO ELECTRIC CO., LTD.

www.furuno.com

IMPORTANT NOTICES

General

- This manual has been authored with simplified grammar, to meet the needs of international users.
- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can void the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will void the warranty.
- The following concern acts as our importer in Europe, as defined in DECISION No 768/2008/EC.
  - Name: FURUNO EUROPE B.V.
  - Address: Siriusstraat 86, 5015 BT, Tilburg, The Netherlands
- The following concern acts as our importer in UK, as defined in SI 2016/1025 as amended SI 2019/470.
  - Name: FURUNO (UK) LTD.
  - Address: West Building Penner Road Havant Hampshire PO9 1QY, U.K.
- All brand, product names, trademarks, registered trademarks, and service marks belong to their respective holders.

How to discard this product

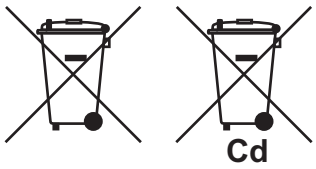
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (http://www.eiae.org/) for the correct method of disposal.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. If a battery is used, tape the + and - terminals of the battery before disposal to prevent fire, heat generation caused by short circuit.

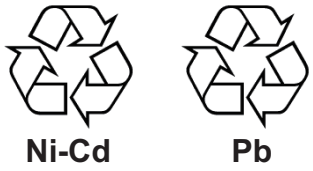
In the European Union

The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.



In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.

SAFETY INSTRUCTIONS

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

Safety Instructions for the Operator

WARNING

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can occur.

Turn off the power immediately if water leaks into the equipment or smoke or fire is coming from the equipment.

Failure to turn off the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

Keep heater away from the equipment.

Heat can change the equipment shape and melt the power cord, which can cause fire or electrical shock.

CAUTION

Do not use the equipment for other than its intended purpose.

Improper use of the equipment can affect performance and void the warranty.

Safety Instructions for the Installer

WARNING

Turn off the power at the switchboard before you install the equipment.

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

Be sure that the power supply is compatible with the voltage rating of the equipment.

Connection of an incorrect power supply can cause fire or equipment damage. The voltage rating of the equipment appears on the label above the power connector.

CAUTION

Ground the equipment to prevent mutual interference.

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

Model	Standard compass	Steering compass
RD-20	1.25 m	0.80 m
RD-501	1.30 m	0.85 m
RD-502	1.00 m	0.65 m

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FOREWORD

A Word to the Owner of the RD-20 Remote Display

Congratulations on your choice of the FURUNO RD-20 Remote Display. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

Since 1948, FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

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

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

Thank you for considering and purchasing FURUNO equipment.

Features

The main features of the RD-20 are as shown below.

- Compact remote display features easy-to-view display with red LED.
- The navigation data in digital format with connection of various sensors.
- The size conforms to DIN (Deutsche Industrie Normen) standards, so there is uniformity among the remote displays of other makers.
- Daisy chain connection is available for connecting a total of 10 RD-20s.
- When you connect multiple RD-20s, their display brilliances can be adjusted together.

Program Number

Program	Number	Initial Version
RD-20		
Starter	2651003-01.xx	Aug. 2009
Booter	2651004-01.xx	Aug. 2009
Main	2651005-01.xx	Aug. 2009
RD-501, RD-502		
2651009-01.xx		Aug. 2009

xx: minor change

CE/UKCA declaration

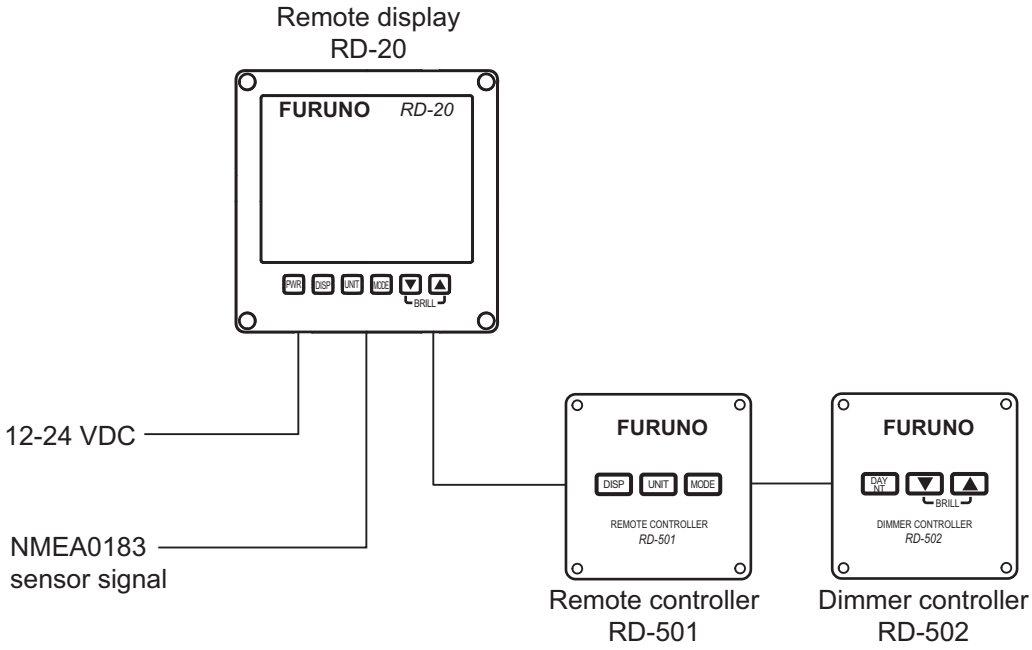
With regards to CE/UKCA declarations, please refer to our website (www.furuno.com), for further information on RoHS conformity declarations.

Disclosure of Information about China RoHS

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

SYSTEM CONFIGURATION

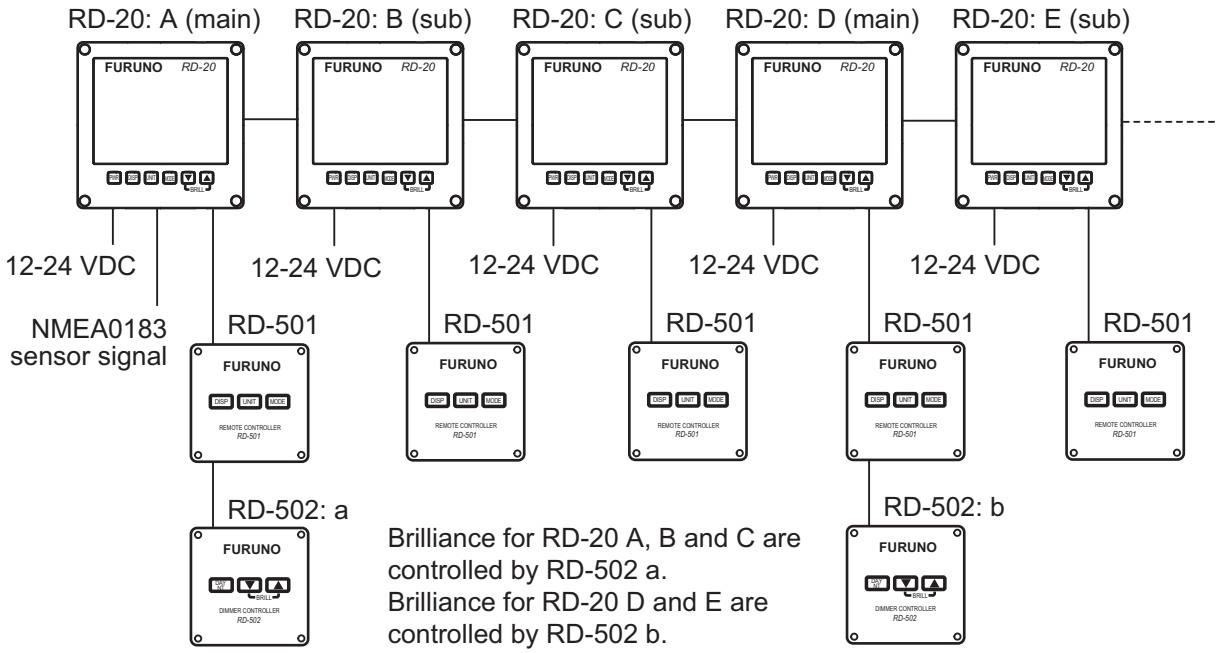
Single remote display



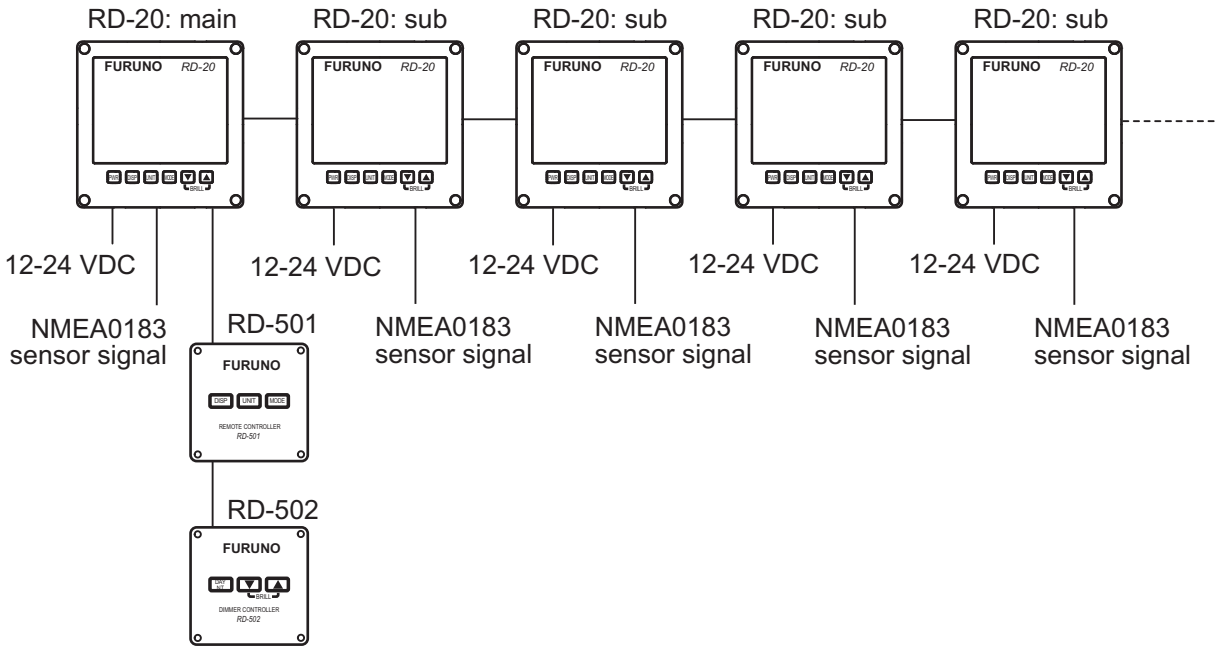
Environmental category:
Protected from weather: RD-20, RD-501, RD-502

Multiple remote displays (daisy chain connection)

Pattern 1: Sensor signal and dimmer controller are commonly used. A total of 10 RD-20s can be connected.



Pattern 2: Dimmer controller is commonly used. A total of 10 RD-20s can be connected.

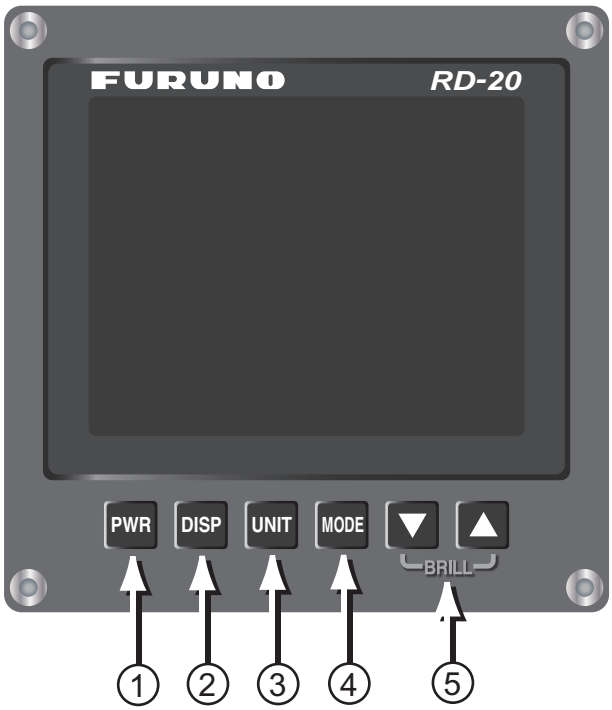


Note: When turning off the power for a RD-20 in the daisy chain connection, the RD-20s which are connected after that RD-20 can receive neither the sensor signal nor the brilliance signal.

1. OPERATION

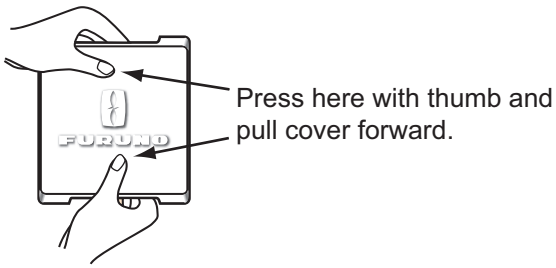
1.1 Controls

Remote display RD-20

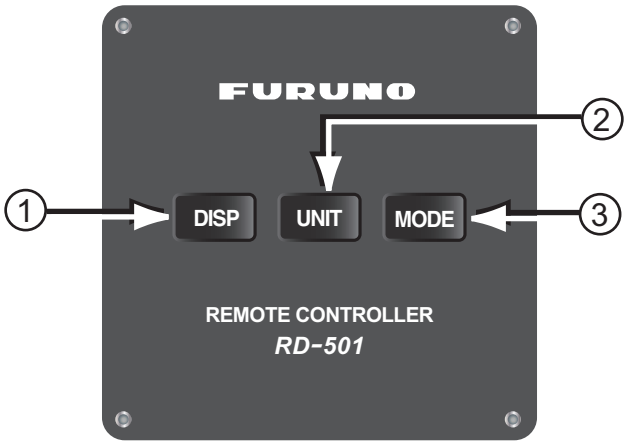


No.	Control	Description
1	PWR	Turn on/off the power.
2	DISP	Switch the screen.
3	UNIT	Select the units of measurement for the current screen.
4	MODE	Select the mode for the current screen.
5	▼, ▲	▼: Decrease the display brilliance. ▲: Increase the display brilliance. (See section 1.3 for details.)

How to remove the hard cover

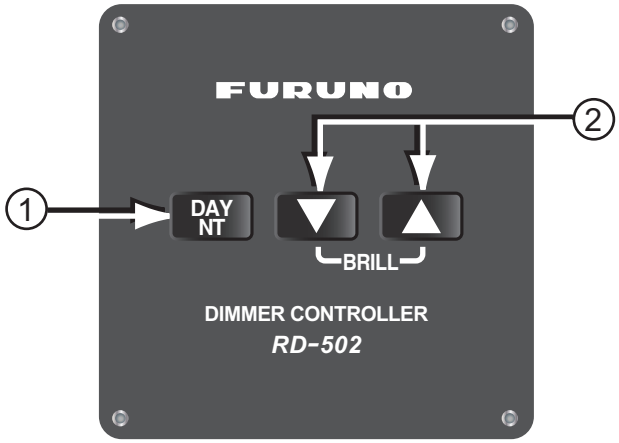


Remote controller RD-501



No.	Control	Description
1	DISP	Switch the screen.
2	UNIT	Select the units of measurement for the current screen.
3	MODE	Select the mode for the current screen.

Dimmer controller RD-502

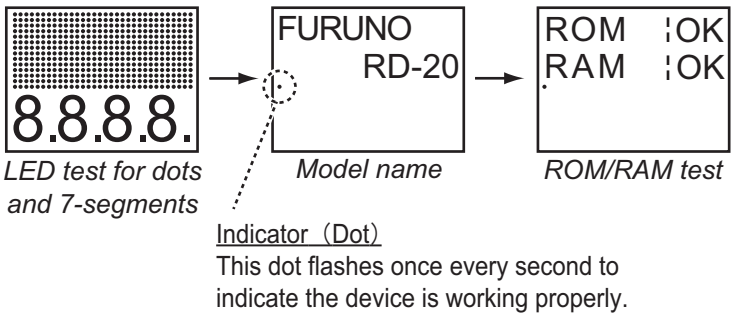


No.	Control	Description
1	DAY/NT	Switch the display brilliance between daytime use and nighttime use.
2	▼, ▲	▼: Decrease the display brilliance. ▲: Increase the display brilliance.

1.2 How to Turn the Power On and Off

Press the **PWR** key to turn on the power.

The start-up screen appears, showing all LED dots and 7-segments. Then, the model name, and then the results of the ROM and RAM check, OK or NG (No Good), are shown. After the self-tests are completed, the last-used display appears.



Note: If all dots and 7-segments do not light, or if NG appears as the ROM and RAM check result, contact your dealer.

To turn off the power, press the **PWR** key.

1.3 How to Adjust Display Brilliance

To adjust the display brilliance, press ▼, ▲, or **DAY/NT** key. The setting range is 0 to 9. "0" is off and "9" is the brightest. (Brightness default value = 9)

Operation with main RD-20

The main RD-20 simultaneously controls the display brilliance of the main RD-20 and the sub RD-20s.

- Controls with ▼ key: Decrease the display brilliance.
- Controls with ▲ key: Increase the display brilliance.

Operation with sub RD-20

When you want to individually adjust the display brilliance for each sub RD-20, do as follows:

- Controls with ▼ key: Decrease the display brilliance. (The variation is smaller than that of the main RD-20 and RD-502 connected to the main RD-20.)
- Controls with ▲ key: Increase the display brilliance. (The variation is smaller than that of the main RD-20 and RD-502 connected to the main RD-20.)

Operation with RD-502

The RD-502 simultaneously controls the display brilliance of the main RD-20 and the sub RD-20s.

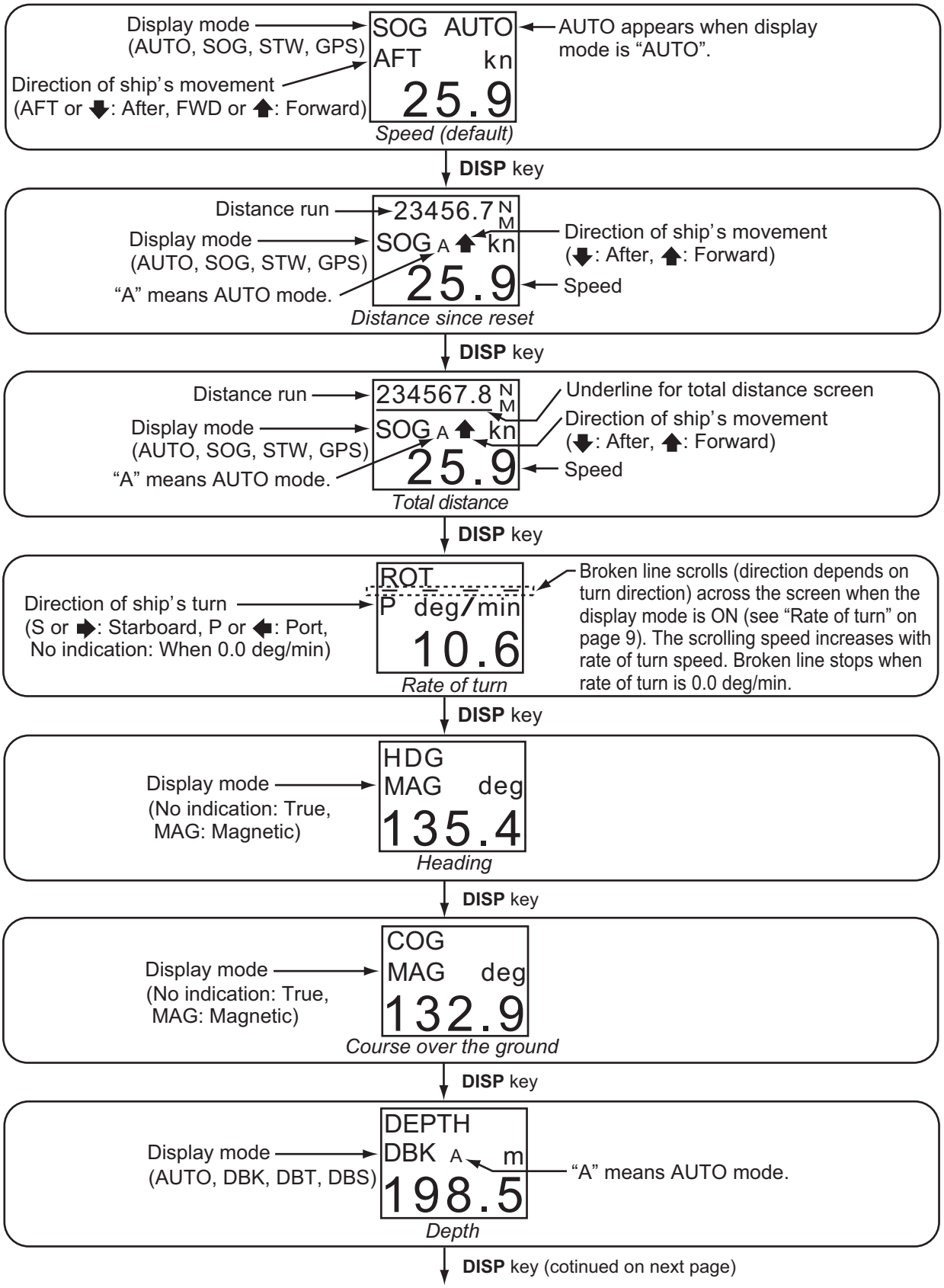
- Controls with ▼ key: Decrease the display brilliance.
- Controls with ▲ key: Increase the display brilliance.
- Controls with the **DAY/NT** key: The display brilliance changes as shown in the table below with every press of the key.

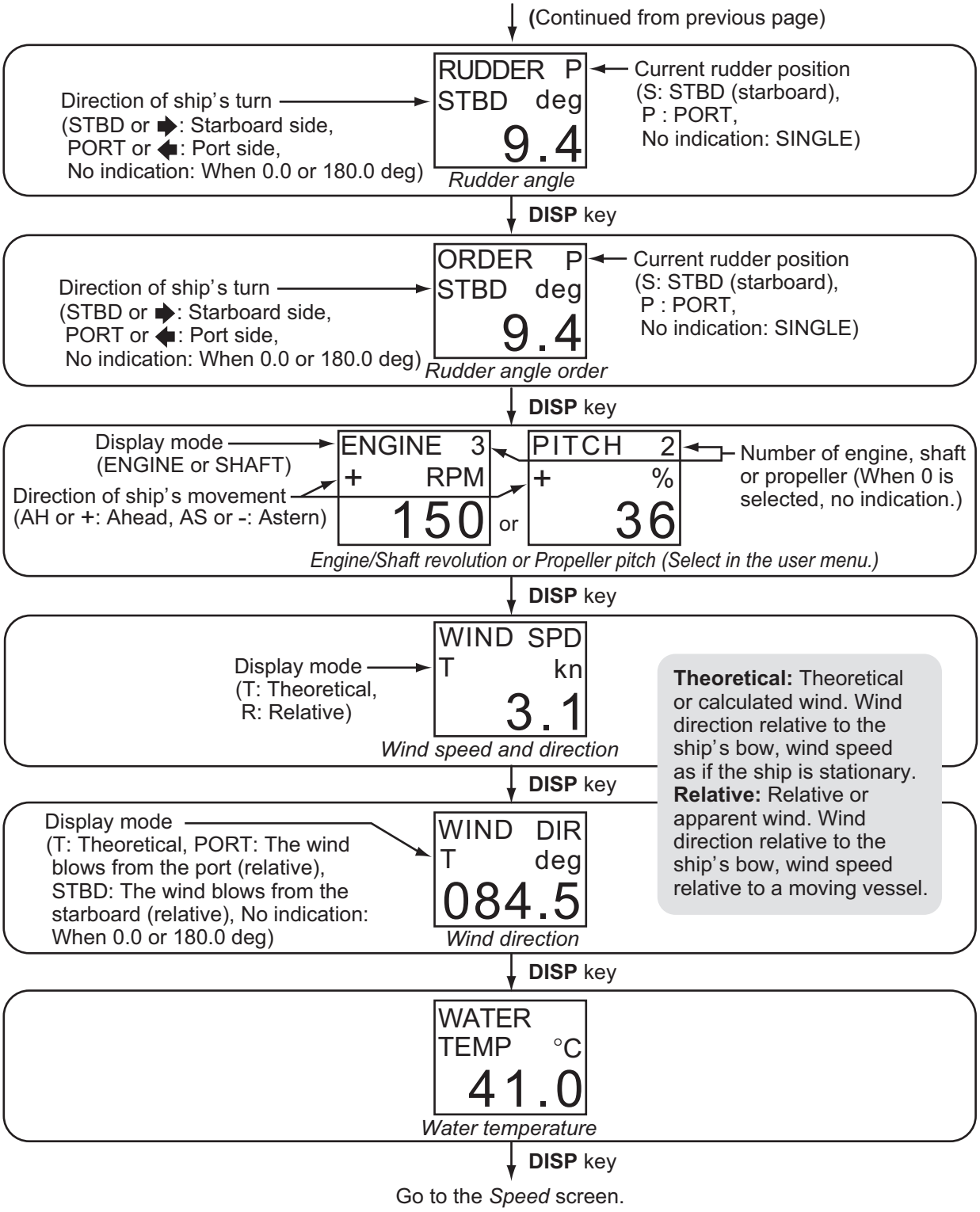
Current setting	Setting after key operation	Current setting	Setting after key operation	Current setting	Setting after key operation
0	0	4	8	8	4
1	5	5	9	9	5
2	6	6	2	—	
3	7	7	3		

1.4 How to Select a Screen

Screen

The screen for the RD-20 changes as follows with the **DISP** key. When you start the RD-20, the last-used screen appears. Availability of data depends on your system configuration.





Note: Settings are saved six seconds after you change settings. If you turn off the power right after you change settings, the last settings are not saved.

List of terms

The following table shows the terms used in the RD-20.

Term	Meaning
%	Percent
°C	Degree(s) Celsius
°F	Degree(s) Fahrenheit
1AXIS	1-axis
7-SEG	7-Segment
38.4k	38.4Kbps
4.8k	4.8Kbps
A, AUTO	Automatic
AFT	After
AH	Ahead
ALL	All
ARROWS	Arrows
AS	Astern
AVE	Average
BACK	Back
BAUD-RATE	Baud rate
BOOTER	Booter
BRILL	Brilliance
CAL	Calibration
CH1	Serial Input port, "Channel 1" (RD1A, RD1B)
CH2	Serial Input/Output port, "Channel 2" (RD2A, RD2B, TD2A, TD2B)
ChkSUM	Check Sum
CLEAR	Clear
COG	Course Over the Ground
DATA	Data
DAY	Daytime
DBK	Depth Below Keel
DBS	Depth Below Surface
DBT	Depth Below Transducer
deg/min	degree/minute
DEPTH	Depth
DIMMER	Dimmer
DIR	Direction
DISP	Display
DOT	Dot-Matrix
ENGINE	Engine
ft	feet
FWD	Forward
GPS	Global Positioning System
HDG	Heading
KEY	Key
km/h	Kilometer/hour
kn	knot
LED	Light Emitting Diode
LOOP	Loop
MAG	Magnetic: The bearing measured with magnetic north as the reference direction.

Term	Meaning
MAIN	Main
MENU	Menu
mph	Miles per hour
m/s	Meter/second
NG	No Good
NM	Nautical Mile
No.	Number
NO	No
NT	Night
OFF	Off
OFFSET	Offset
OK	OK
ON	On
ORDER	Rudder Angle Order
OUT	Output
PITCH	Propeller Pitch
P, PORT	Port/Port Side
PWR	Power
R	Relative: Relative or apparent wind. The wind direction relative to the ship's bow and the wind speed relative to the moving vessel.
RAM	Random Access Memory
RANK	Rank of Dot-Matrix LED
ROM	Read Only Memory
ROT	Rate of Turn
RPM	Revolutions Per Minute
RUDDER	Rudder/Rudder Angle
SAVE	Save
SELECT	Select
SET	Set
SHAFT	Shaft
SIM	Simulation
SINGLE	Single
S-OUT	Sensor Out
SPEED, SPD	Speed
SOG	Speed Over the Ground
STARTER	Starter
STW	Speed Through the Water
S, STBD	Starboard/Starboard Side
SUB	Sub
SYS	System
T	Theoretical: Theoretical or calculated wind. The wind direction relative to the ship's bow and the wind speed as if the ship is stationary.
TEMP	Temperature
TEST	Test
TEXT	Text
TIME	Time
UNIT	Unit
VECTOR	Vector
WATER	Water

Term	Meaning
WIND	Wind
YES	Yes

1.5 How to Select the Units of Measurement

You can select the units of measurement for speed, distance, depth, wind speed and water temperature.

1. Press the **DISP** key to display the screen which you want to change the units of measurement.
2. Press the **UNIT** key to select the unit desired.
   - Speed: kn (default), m/s, km/h
   - Depth: ft (default), m, fm
   - Wind speed: kn (default), m/s, km/h, mph
   - Water temperature: °C (default), °F
   - Distance: The combinations of the units for distance and speed are as follows:

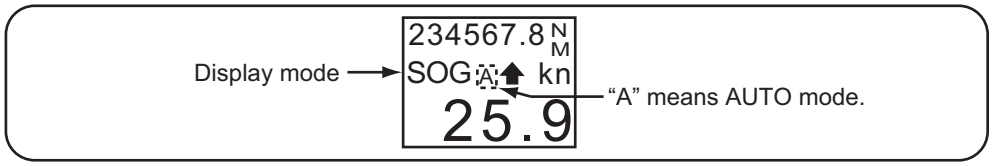
Distance	Speed	Remarks
NM	kn	Default
NM	m/s	
km	m/s	
km	kn	

1.6 How to Select the Display Mode

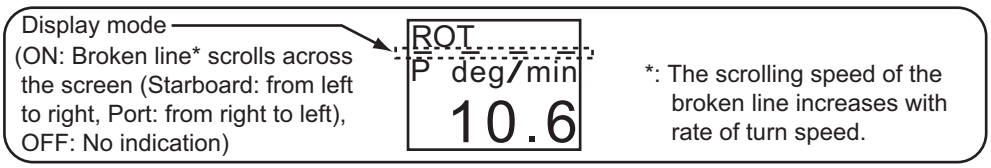
1. Press the **DISP** key to display the screen which you want to change the display mode.
2. Press the **MODE** key to select the display mode desired.
   - Speed: AUTO (default), SOG, STW, GPS
     In the [AUTO] mode, speed data is displayed in order of priority, SOG, STW and GPS. The SOG has the highest and GPS has the lowest priority. That is, when SOG, STW and GPS data are input, the SOG data is displayed. "AUTO" appears at the upper-right corner of the screen when the [AUTO] mode is active.



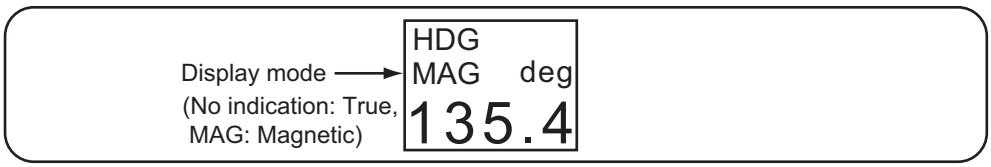
     SOG/STW: The speed data from the doppler sonar, doppler log, speed log, etc. GPS: The data from the navigation equipment not described above (mainly, SOG data from a GPS navigator).
   - Distance: AUTO (default), SOG, STW, GPS
     In the [AUTO] mode, the highest priority data is SOG and the lowest is GPS. "A" appears after the display mode when the [AUTO] mode is active.
     Note: This equipment can not receive VLW data which is based on SOG.



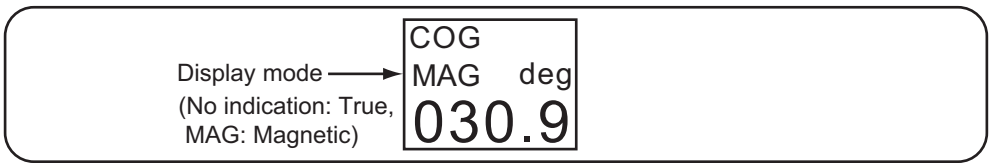
- Rate of turn: Turn on/off the broken line under the indication "ROT".



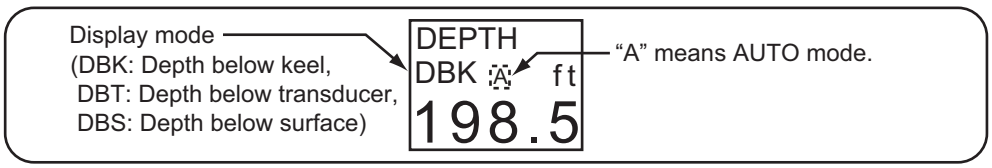
- Heading: True (default, display indication: none), Magnetic (display indication: "MAG")



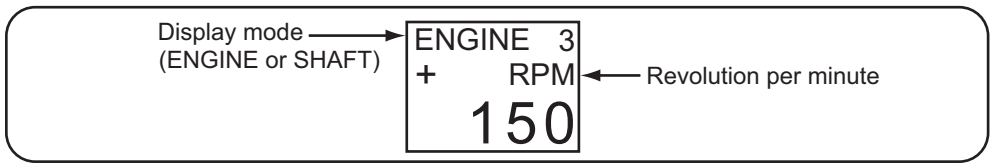
- Course over the ground: True (default, display indication: none), Magnetic (display indication: "MAG")



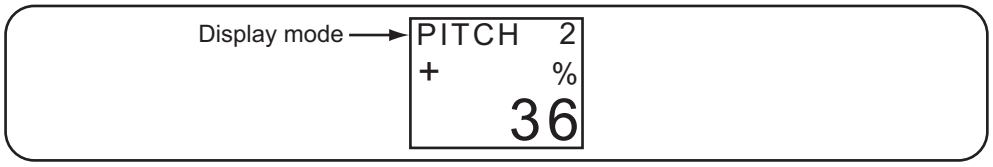
- Depth: AUTO (default), DBK, DBT, DBS
  In the [AUTO] mode, the highest priority data is DBK and the lowest is DBS. "A" appears after the display mode when the [AUTO] mode is active. The depth position setting of the echo sounder (FE-800) is used when the FE-800 is connected.
  Note: When the FE-800 is connected, you can not change the measurement unit setting.



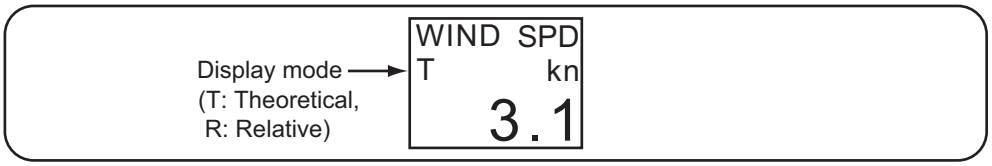
- Engine/shaft revolution: Select [ENGINE] or [SHAFT] from the user menu. The screen shows "ENGINE" or "SHAFT" depending on your selection.



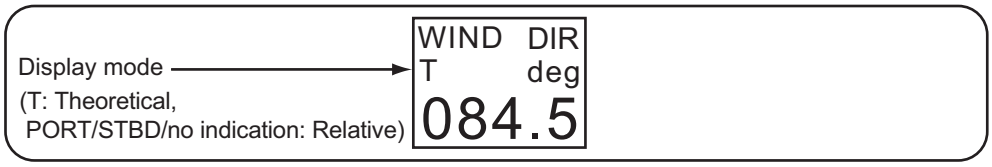
- Propeller pitch: Select [PITCH] from the user menu. "PITCH" appears on the screen.



- Wind speed: Theoretical (default, display indication: "T"), Relative (display indication: "R").



- Wind direction: Theoretical (default, display indication: "T"), Relative (When the wind blows from the port, "PORT" is displayed. When the wind blows from the starboard, "STBD" is displayed. When the wind direction is 0.0 or 180.0 degrees, there is no indication of "PORT" nor "STBD".)



1.7 How to Set the User Menu

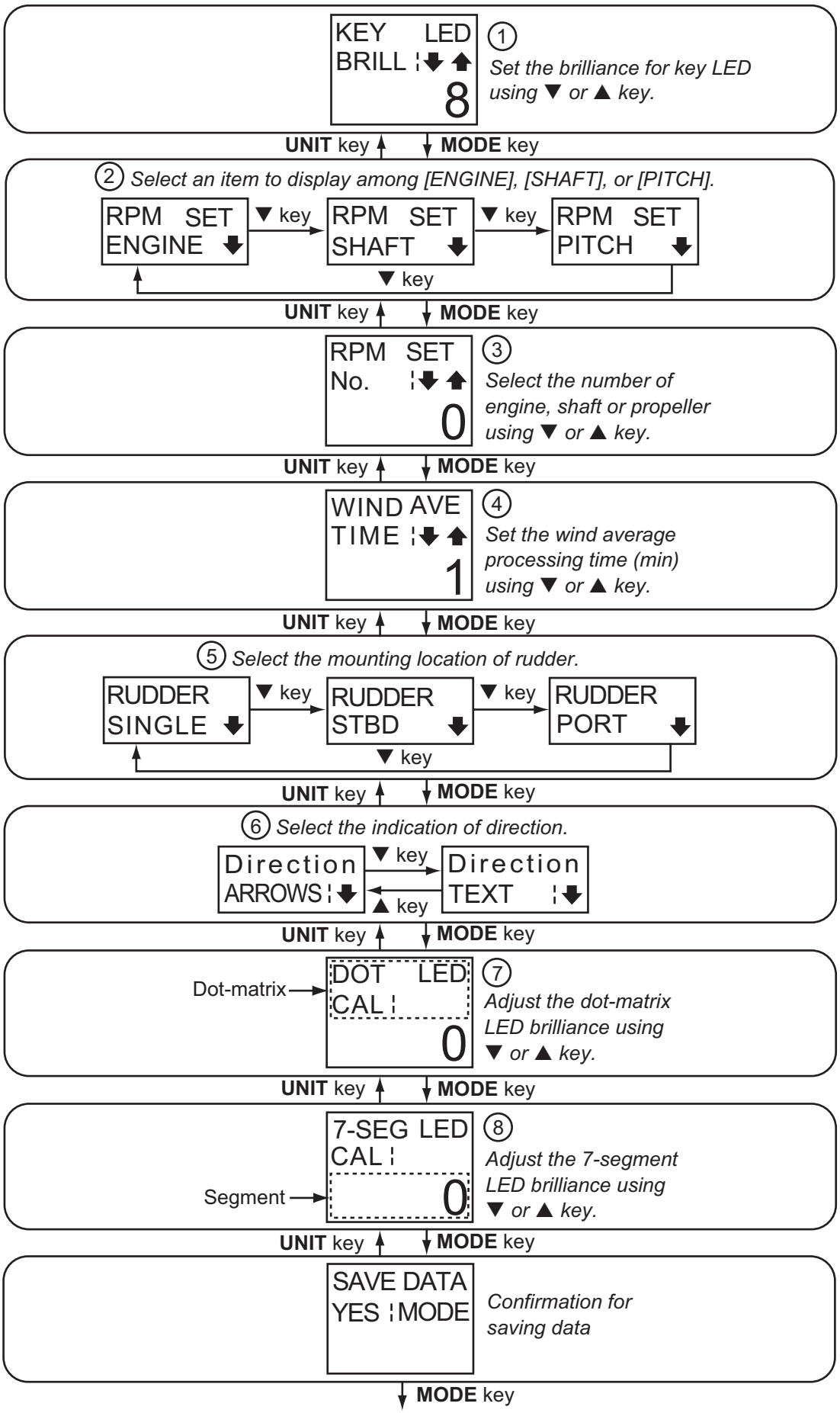
The user menu lets you adjust the RD-20 to meet your needs.

No.	Menu	Description	Setting	Default
1	KEY LED BRILL	Set the brilliance for key LED.	1 to 8	8
2	RPM SET ENGINE (or SHAFT, PITCH)	Select the engine-related data to show from [ENGINE], [SHAFT], or [PITCH].	ENGINE, SHAFT, PITCH	ENGINE
3	RPM SET No.	Select the number of engine, shaft, or propeller.	0 to 9	0
4	WIND AVE TIME	Set the wind averaging time to smooth wind data. The longer the setting, the more the data is smoothed. To find the momentary wind direction and speed, select the shorter time.	0, 1, 2, 3, 5, 10 min	1 min
5	RUDDER SINGLE (or STBD, PORT)	Select the mounting location of the rudder from [SINGLE], [STBD] (starboard), or [PORT].	SINGLE, STBD, PORT	SINGLE
6	Direction ARROWS (or TEXT)	Select the indication of direction from [ARROWS] or [TEXT] for speed, ROT (rate of turn), rudder and engine/shaft/pitch.	ARROWS, TEXT	ARROWS
7	DOT LED CAL	If there is a difference between the dot-matrix LED brilliance and the 7-segment LED brilliance, adjust the DOT LED CAL or 7-SEG LED CAL so that both brilliances are the same. -3 is the darkest and 3 is the brightest.	-3 to 3	0
8	7-SEG LED CAL		-3 to 3	0

Setting procedures

1. While you hold down the **DISP** key, press the **PWR** key to turn on the power.
2. Press the **MODE** key or the **UNIT** key to select the screen desired.
3. Press ▼ or ▲ key to set the value then press the **MODE** key to save the data and go to the next screen.
4. After you set all options, the screen for saving data appears. Press the **MODE** key to save the data. The equipment restarts.

Note: The user menu is inoperative on the RD-501 and RD-502.


KEY LED
BRILL
8
① Set the brilliance for key LED using ▼ or ▲ key.
UNIT key
MODE key
② Select an item to display among [ENGINE], [SHAFT], or [PITCH].
RPM SET
ENGINE
▼ key
RPM SET
SHAFT
▼ key
RPM SET
PITCH
▼ key
UNIT key
MODE key
RPM SET
No.
0
③ Select the number of engine, shaft or propeller using ▼ or ▲ key.
UNIT key
MODE key
WIND AVE
TIME
1
④ Set the wind average processing time (min) using ▼ or ▲ key.
UNIT key
MODE key
⑤ Select the mounting location of rudder.
RUDDER
SINGLE
▼ key
RUDDER
STBD
▼ key
RUDDER
PORT
▼ key
UNIT key
MODE key
⑥ Select the indication of direction.
Direction
ARROWS
▼ key
▲ key
Direction
TEXT
UNIT key
MODE key
Dot-matrix
DOT LED
CAL
0
⑦ Adjust the dot-matrix LED brilliance using ▼ or ▲ key.
UNIT key
MODE key
7-SEG LED
CAL
Segment
0
⑧ Adjust the 7-segment LED brilliance using ▼ or ▲ key.
UNIT key
MODE key
SAVE DATA
YES MODE
Confirmation for saving data
MODE key
The equipment restarts.

2. MAINTENANCE, TROUBLE-SHOOTING

NOTICE

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts of the equipment.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

2.1 Maintenance

Check the following points regularly to maintain performance:

- Check that connections on the rear panel are firmly tightened and free of dust.
- Check that the ground system is free of rust and the ground wire is tightly fastened.
- Remove dust or dirt from the cabinet with a soft, dry cloth. For stubborn dirt, you can use water-diluted mild detergent. Clean the cabinet with a dry cloth after you use detergent. Do not use solvents like thinner, acetone or benzene to clean the unit. They can remove paint and indications.

2.2 Life of the Parts

Fuse replacement

The fuse in the remote display protects the equipment from overcurrent and equipment fault. If the fuse blows, find the cause before you replace the fuse. Use the correct fuse. A wrong fuse can damage the equipment. See the outline drawings about the location of the fuse.

⚠ WARNING

Use the correct fuse.

A wrong fuse can damage the equipment and cause fire.

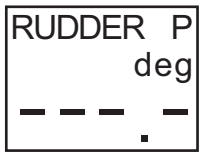
Type	Code No.	Remarks
FGMB 125V 2A PBF	000-157-479-10	12-24 VDC

LED life

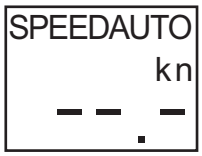
The life of the LED is approximately 46,000 hours. The actual number of hours depends on ambient temperature and humidity. The consumption current depends on the number of lighting LEDs and the LED brilliance.

2.3 Error Screens

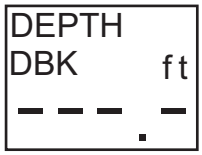
When the NMEA sentences are not input or are timed out, the RD-20 displays the following error screens.



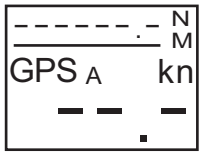
Example: Rudder angle



Example: Speed in [AUTO] mode



Example: Depth in not [AUTO] mode



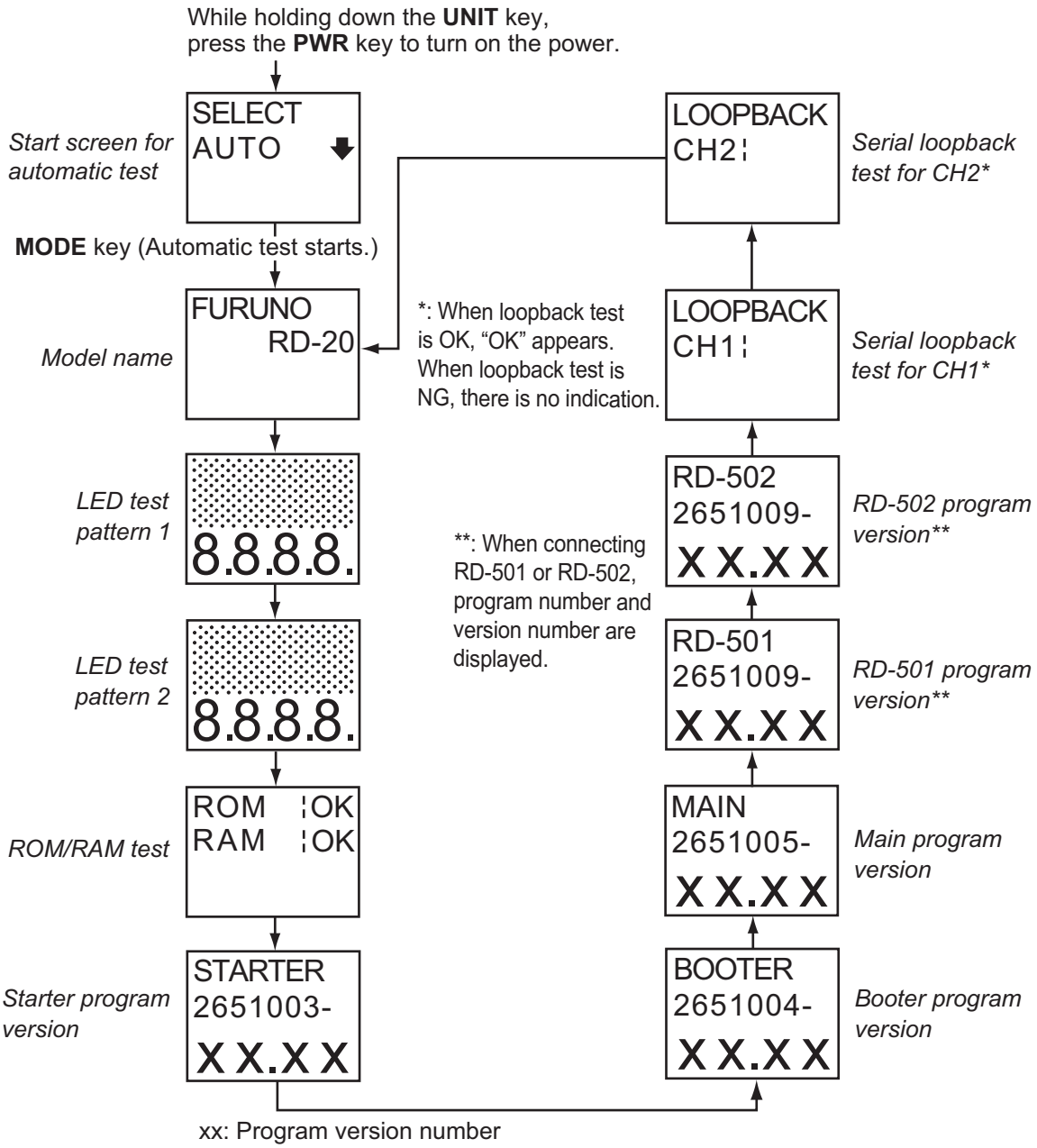
Example: Total distance in [AUTO] mode

2.4 Diagnostic Test

The diagnostic test checks the system for correct operation. There are two types of diagnostic tests; automatic test and key test.

Automatic test

1. While you hold down the **UNIT** key, press the **PWR** key to turn on the power.
2. Press the **MODE** key. The automatic test starts. To stop the test, press the **PWR** key.
   Note: You can extend the display time for a screen by three seconds. Momentarily press any key (except the **PWR** key) at the desired screen during the test. You can do this procedure up to 10 times, that is you can extend the display time to a maximum of 30 seconds.



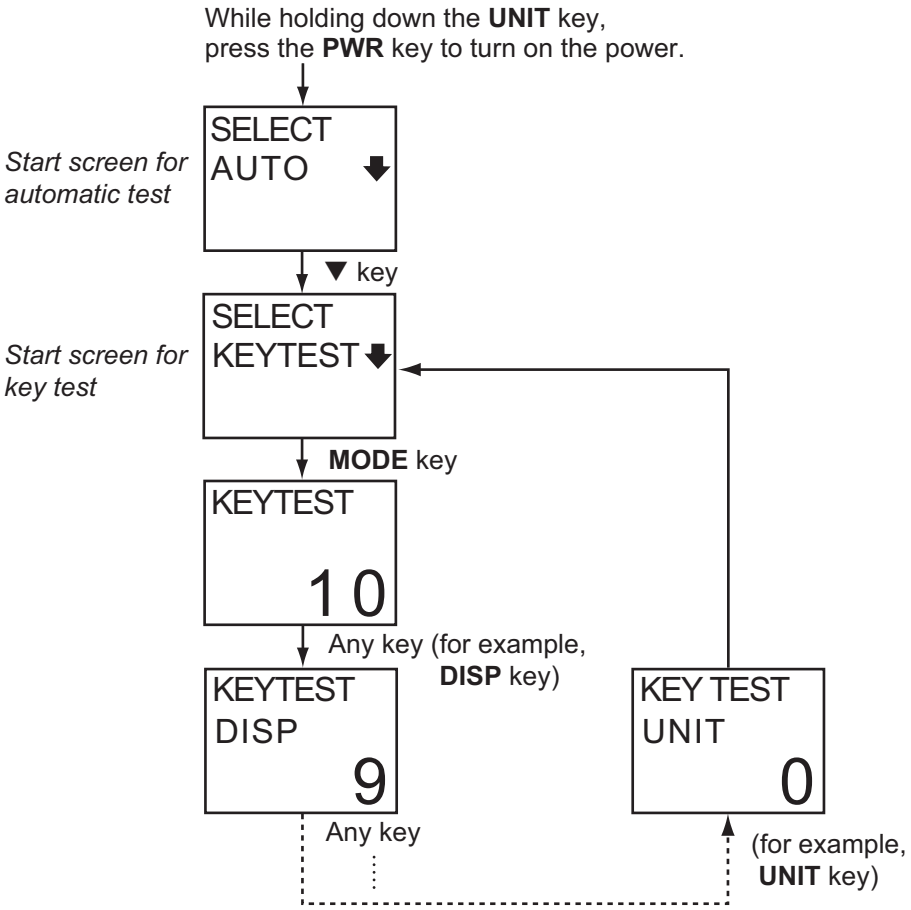
Test results

- Model name: The model name "RD-20" is displayed.
- LED test (pattern 1 and 2): Check that all LED segments light.
- ROM, RAM: The results of the ROM/RAM test are displayed as OK or NG (No Good). If any NG is displayed, contact your dealer for instruction.
- Program version (starter, booter, main, RD-501, RD-502): The program version numbers are displayed.
- Serial loopback test (CH1 and CH2), for field serviceman: A test jumper is required for this test. The result of the loopback test is displayed as OK or no indication (test not done).

Key test

1. While you hold down the **UNIT** key, press the **PWR** key to turn on the power.
2. Press ▼ key once to display the key test screen.
   Note: You can not use the ▼ key of the RD-502 at this screen.

3. Press the **MODE** key.
4. Press each key except the **PWR** key. You can test up to 10 keys. The key name for the key pressed and the number of keys remaining to test are displayed. When the count is 0, the start screen for the key test appears. When testing more than 10 keys, repeat steps 3 and 4.

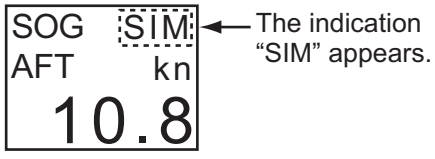


5. To stop the test, press the **PWR** key.

Note: For the remote controller and dimmer controller, "-R" is displayed after the key name except the **DAY/NT** key.

2.5 Simulation Mode

The simulation mode, which shows internally generated navigation data, is provided to acquaint you with the features of the RD-20. "SIM" appears and flashes at the upper-right corner of the screen when the simulation mode is turned on.

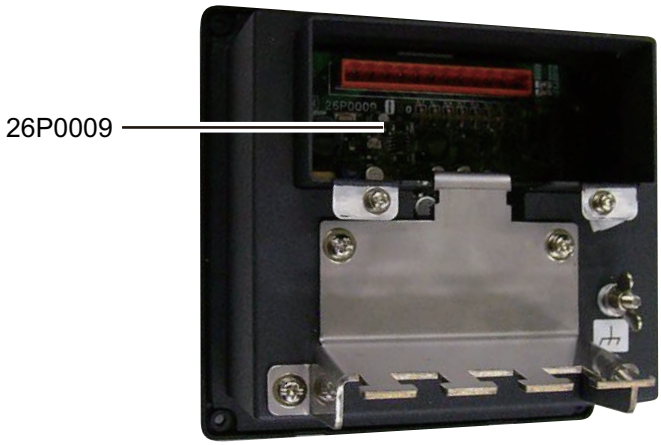


1. While you hold down the **UNIT** key, press the **PWR** key to turn on the power.
2. Press ▼ key twice. The screen for simulation appears.
   Note: You can not use the ▼ key of the RD-502 at this screen.
3. Press the **MODE** key to start the simulation mode.
4. To stop the simulation mode, press the **PWR** key to turn off the power.

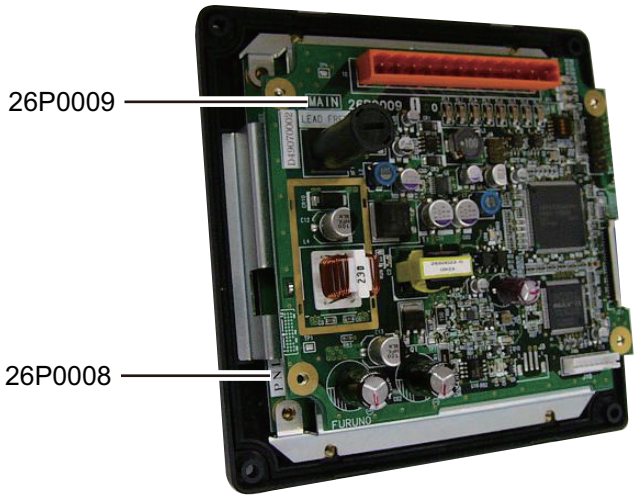
2.6 Parts Location and Parts List

Parts Location

RD-20

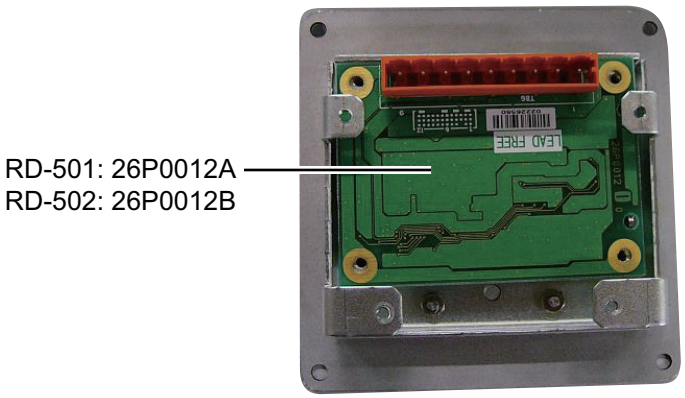


Rear side



Cover opened

RD-501/502



Cover opened

Parts List

ELECTRICAL PARTS	Model	RD-20
	Unit	Remote display RD-20

PRINTED CIRCUIT BOARD	Code No.
26P0008, PNL	-
26P0009, MAIN	-

ELECTRICAL PARTS	Model	RD-501
	Unit	Remote controller RD-501

PRINTED CIRCUIT BOARD	Code No.
26P0012A, RMT	-

ELECTRICAL PARTS	Model	RD-502
	Unit	Dimmer controller RD-502

PRINTED CIRCUIT BOARD	Code No.
26P0012B, RMT	-

3. INSTALLATION

3.1 Equipment List

Standard supply

Name	Type	Code No.	Qty	Remarks
Remote Display	RD-20	-	1	
Installation Materials	CP26-01001*	001-076-460-00	1	
Accessories	FP26-00301*	001-076-470-00	1	
Spare Parts	SP26-00101*	001-076-450-00	1	

Optional supply

Name	Type	Code No.	Remarks
Remote Controller	RD-501	-	Including CP26-01101*
Dimmer Controller	RD-502	-	Including CP26-01201*
Hanger	OP26-1*	000-016-195-00	
Spare Parts	SP26-00101 (BOX)	001-077-030-00	

*: See the Packing lists.

3.2 Installation of Remote Display

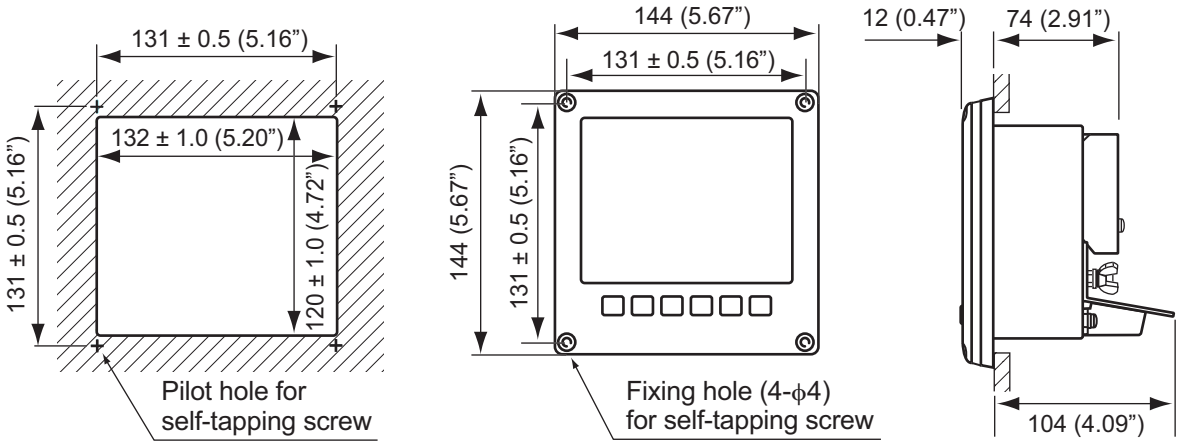
Mounting considerations

The remote display can be installed on a desktop, on the overhead, or flush mounted in a panel. When you select a mounting location, keep in mind the following points:

- The nominal viewing distance for the display unit is 2.0 m. Select a suitable mounting location considering that distance.
- Locate the unit away from exhaust pipes and vents.
- Locate the unit out of direct sunlight.
- Select an installation location that is well ventilated.
- Mount the unit where shock and vibration are minimal.
- Locate the unit away from equipment which generates the electromagnetic fields like a motor or generator.
- Allow enough maintenance space at the sides and rear of the unit. Leave enough slack in cables to facilitate maintenance and servicing.
- Observe the compass safe distances (see page ii) to prevent interference to a magnetic compass.

Flush mounting

1. Make a cutout in the mounting location (132 mm (width) x 120 mm (height)).
2. Make four pilot holes for self-tapping screws (diameter: 3 mm) in the location indicated in the illustration below.
3. Insert the sponge to the remote display from the rear side.
4. Set the remote display to the cutout and fasten the remote display with four self-tapping screws (M3x15).
5. Set a cosmetic cap to each fixing screw on the front panel. (See "How to set the cosmetic cap" on page 20.)

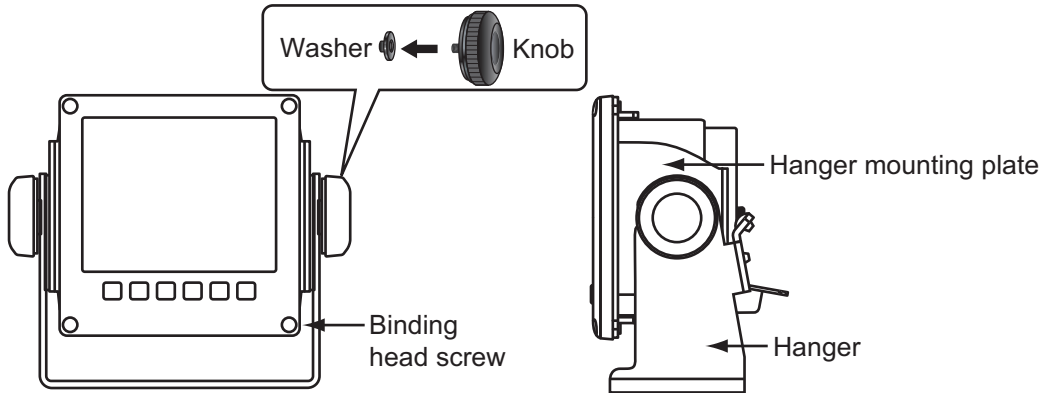


Note: If it is more convenient to connect cables before you install the remote display, first connect the cables referring to the section 3.4.

Desktop or overhead mounting

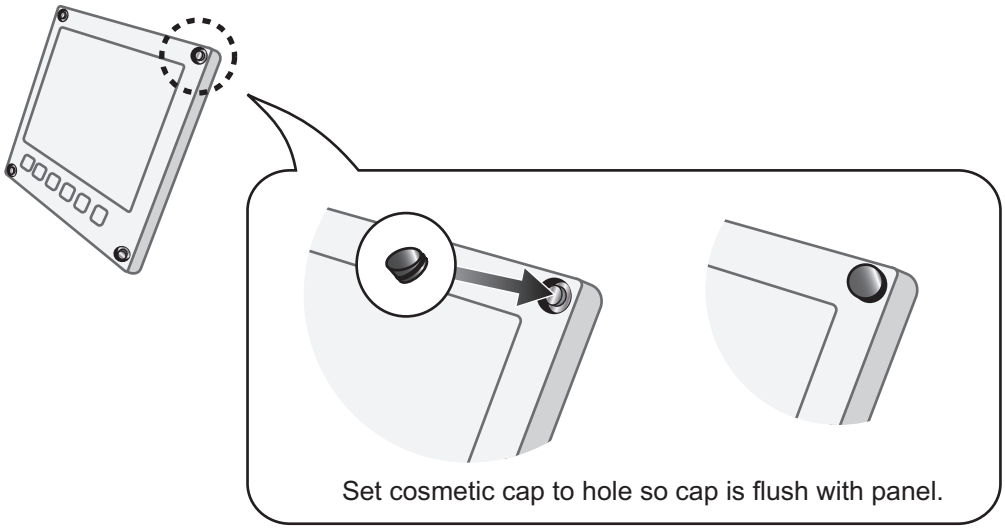
You can mount the remote display on a desktop or on the overhead using the optional hanger (Type: OP26-1, Code No.: 000-016-195-00).

1. Insert the hanger mounting plate to the remote display from the rear and fasten the hanger mounting plate from the front of the remote display with four binding head screws (M3x12).
2. Fix the bottom of the hanger to the mounting location with four self-tapping screws (4x16).
3. Insert a washer to each knob (right and left) and fix the knobs to the remote display loosely.
4. Slip the screw parts of the knobs to the slit of the hanger and set the remote display to the hanger.
5. Tighten the knobs to fasten the hanger to the remote display.
6. Set a cosmetic cap to each fixing screw on the front panel. (See "How to set the cosmetic cap" on page 20.)



How to set the cosmetic cap

Set a cosmetic cap to each fixing screw on the front panel as shown below.

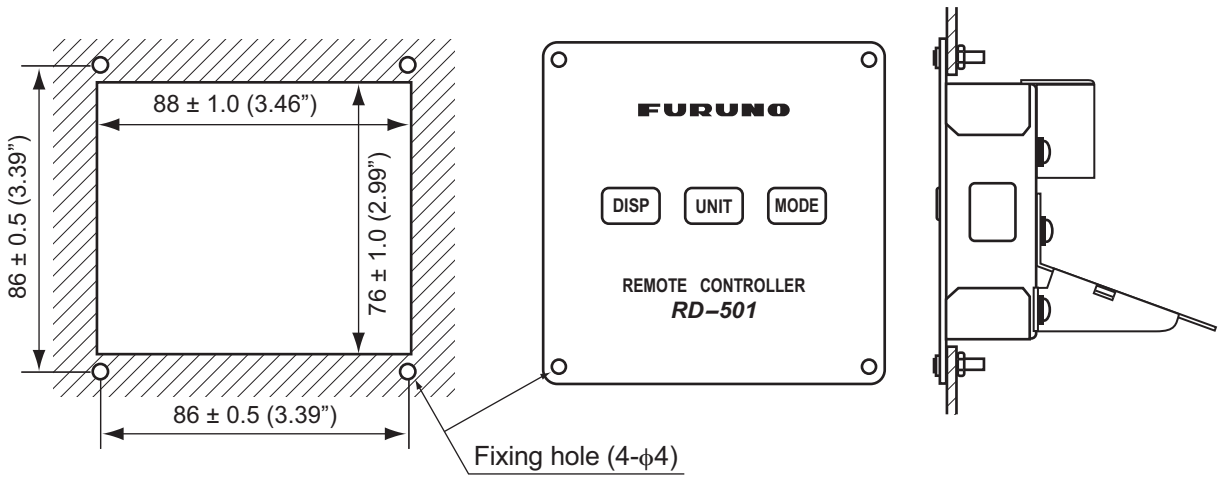


3.3 Installation of Remote Controller and Dimmer Controller

The optional remote controller RD-501 and dimmer controller RD-502 can be flush mounted in a panel. The size and the mounting procedure are shared by RD-501 and RD-502. For the mounting location, refer to the mounting considerations for the remote display in section 3.2.

Flush mounting

1. Make a cutout in the mounting location (88 mm (width) x 76 mm (height)).
2. Make four holes of ϕ4 in the location indicated in the illustration below.
3. Set the remote controller or dimmer controller to the cutout. Insert four binding head screws (M3x12) from the front side then fasten the unit with four sets of flat washers, spring washers and hexagonal nuts from the rear side.



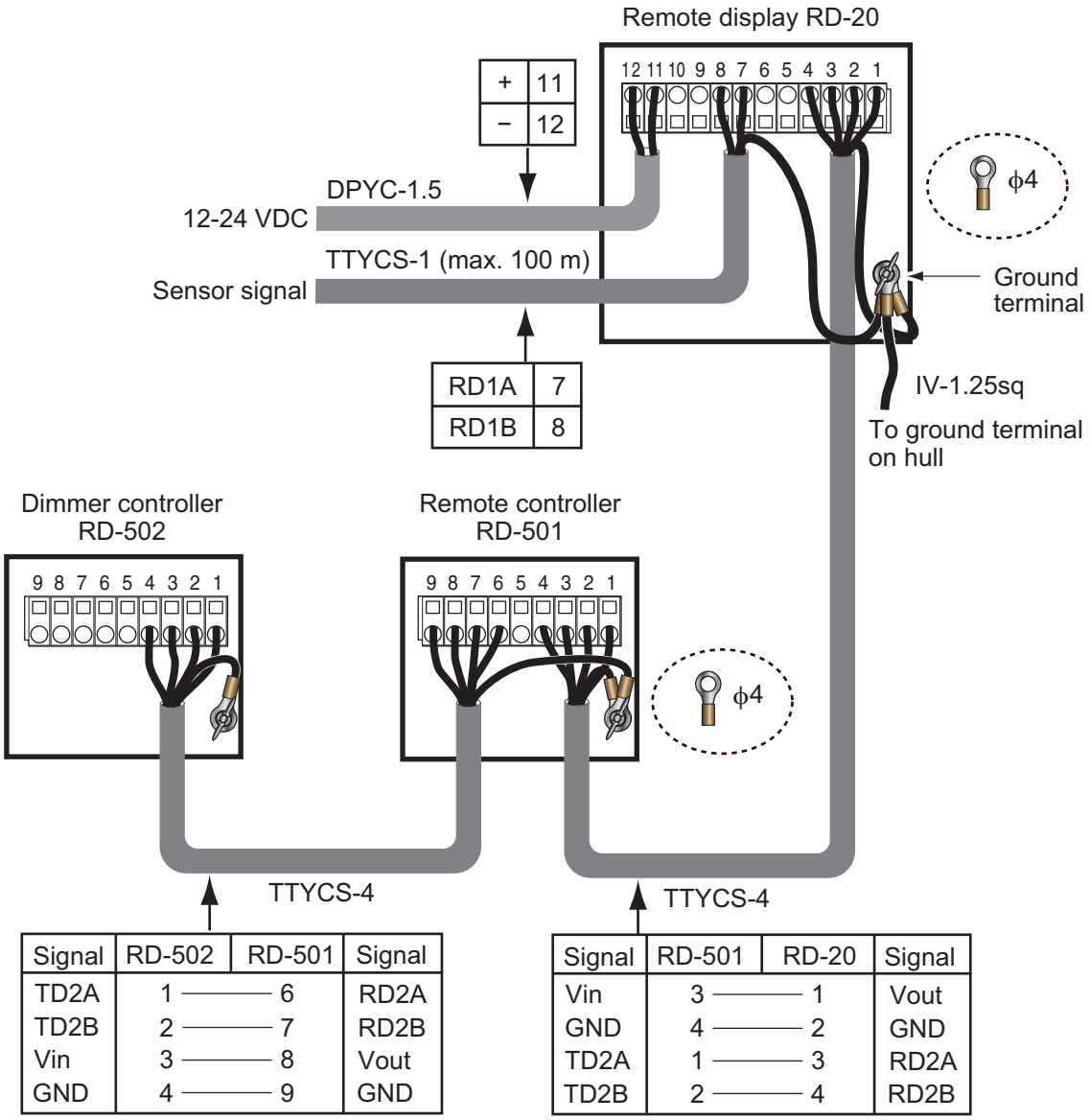
Note: If it is more convenient to connect cables before you install the remote controller or dimmer controller, first connect the cables referring to the section 3.4.

3.4 Wiring

Interconnection

Refer to the interconnection diagram (page S-1) to connect cables.

Single remote display

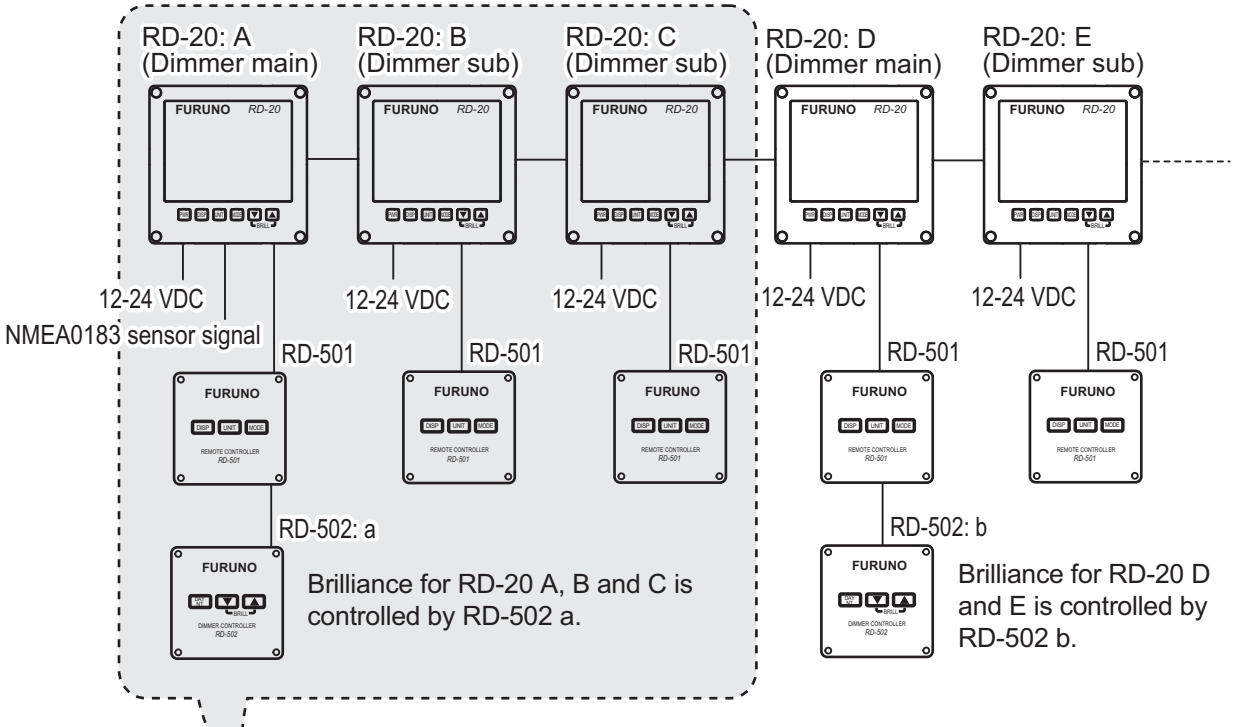


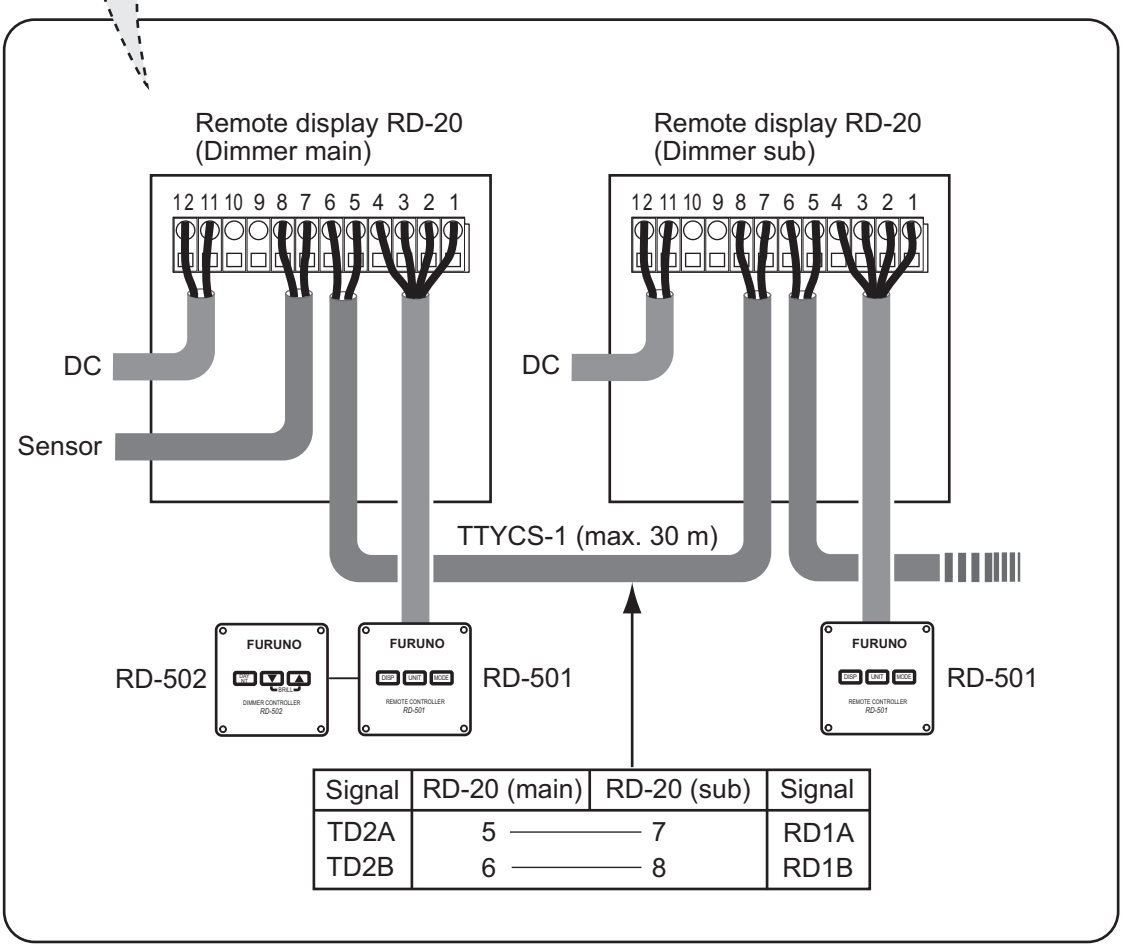
Signal	RD-502	RD-501	Signal
TD2A	1	6	RD2A
TD2B	2	7	RD2B
Vin	3	8	Vout
GND	4	9	GND

Signal	RD-501	RD-20	Signal
Vin	3	1	Vout
GND	4	2	GND
TD2A	1	3	RD2A
TD2B	2	4	RD2B

Multiple remote displays (daisy chain connection)

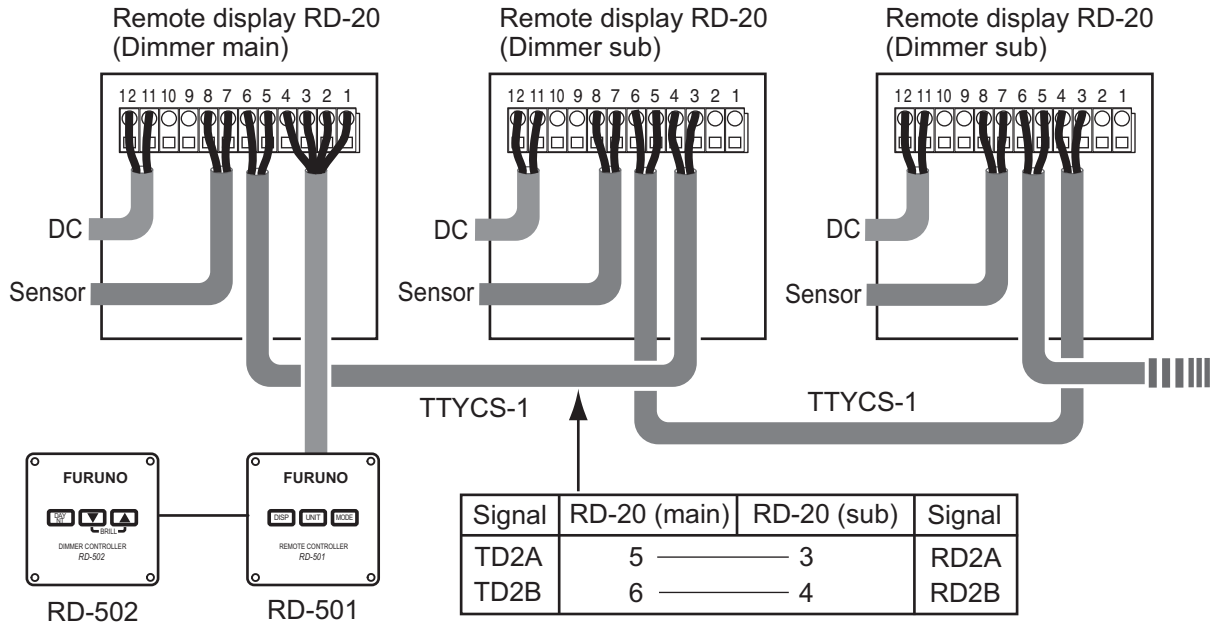
Pattern 1: Sensor signal and dimmer controller are commonly used. A total of 10 RD-20s can be connected in a daisy chain. A maximum of nine sub RD-20s can be connected.





Signal	RD-20 (main)	RD-20 (sub)	Signal
TD2A	5	7	RD1A
TD2B	6	8	RD1B

Pattern 2: Dimmer controller is commonly used. A total of 10 RD-20s can be connected in a daisy chain. A maximum of nine sub RD-20s can be connected.

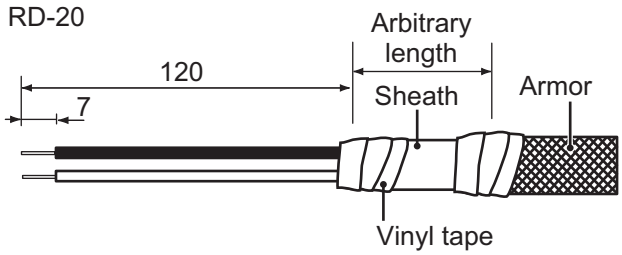


Note: When you turn off the power for a RD-20 in the daisy chain connection, the RD-20s which are connected after that RD-20 can receive neither the sensor signal nor the brilliance signal.

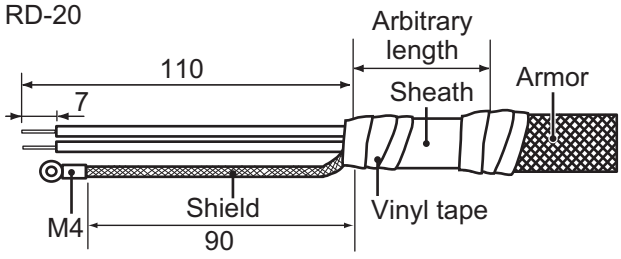
Connection of each unit

Process each cable referring to the illustrations below and on the next page. The cables shown are JIS (Japanese Industrial Standard) cables. For the equivalent cables, see section 3.6.

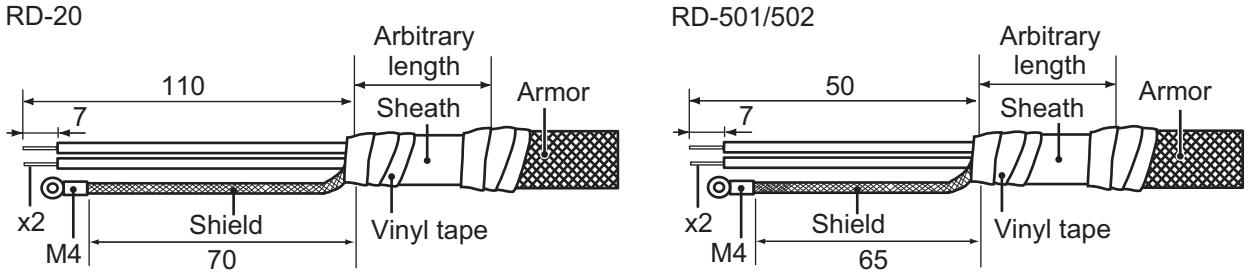
Fabrication of RD-20 power cable DPYC-1.5



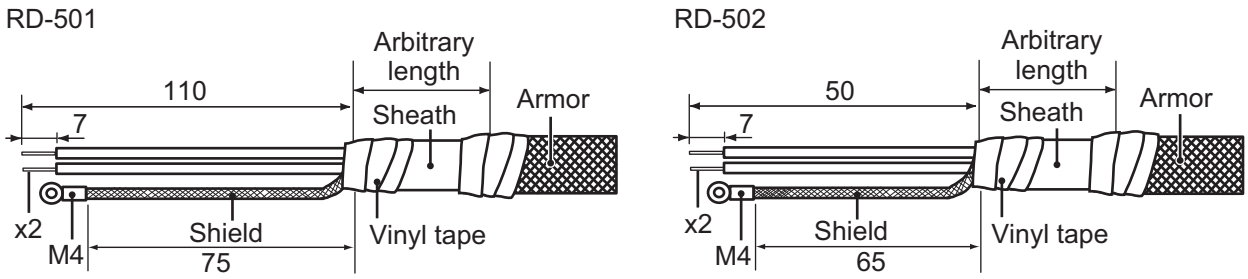
Fabrication of sensor signal cable TTYCS-1



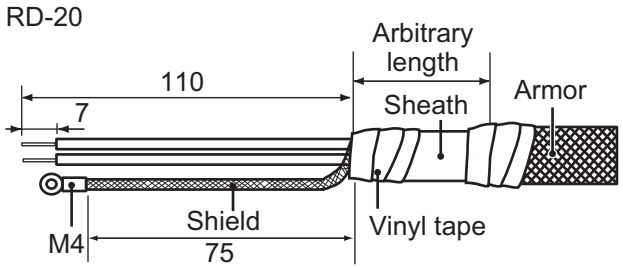
Fabrication of cable TTYCS-4 between RD-20 and RD-501/502



Fabrication of cable TTYCS-4 between RD-501 and RD-502

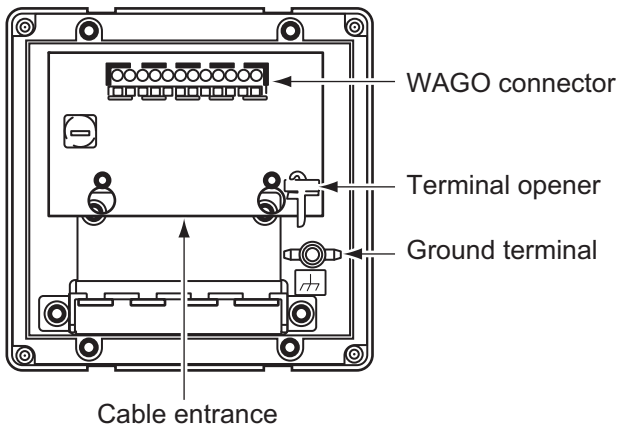


Fabrication of cable TTYCS-1 between RD-20s in daisy chain connection



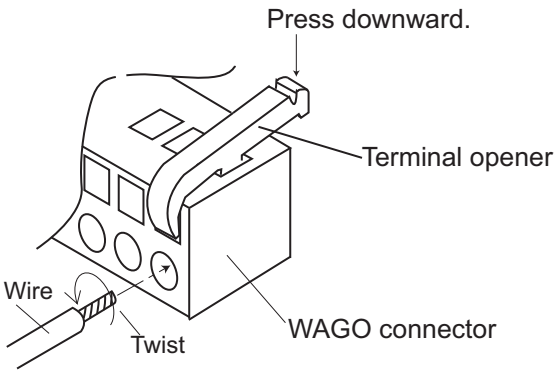
Connection

Remove the WAGO connector from each unit and connect each cable core to the WAGO connector. See the interconnection diagram (page S-1). The terminal opener is attached inside the remote display at the location shown in the figure below.



Remote display, rear panel

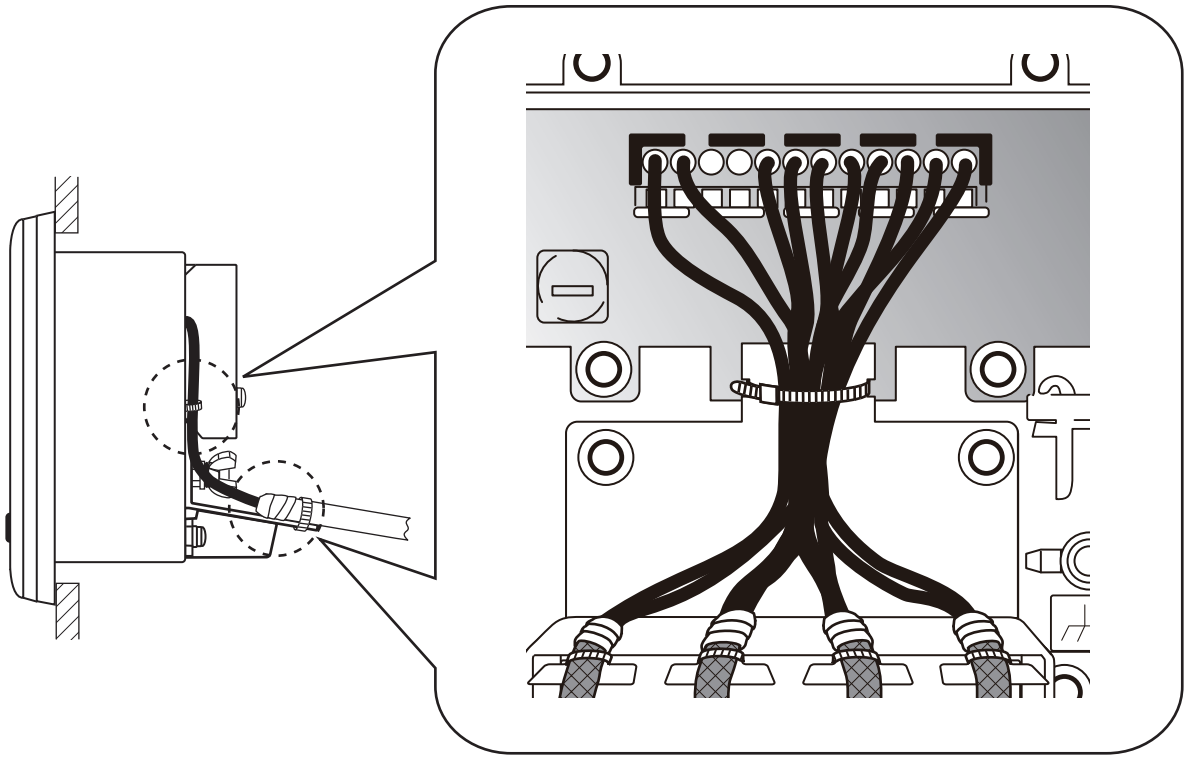
How to connect wires to WAGO connector



Procedure

1. Twist the cores.
2. Press the terminal opener downward.
3. Insert the wire to hole.
4. Remove the terminal opener.
5. Pull the wire to confirm that it is secure.

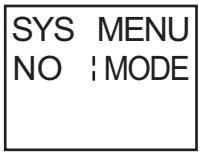
Attach the WAGO connectors (with cables). Bind the sheaths of cables to the fixture with the cable ties.



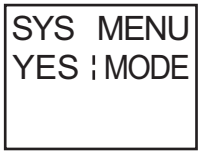
3.5 Adjustments

After wiring each unit, initialize each remote display as follows:

1. While you hold down the **MODE** key, press the **PWR** key to turn on the power.

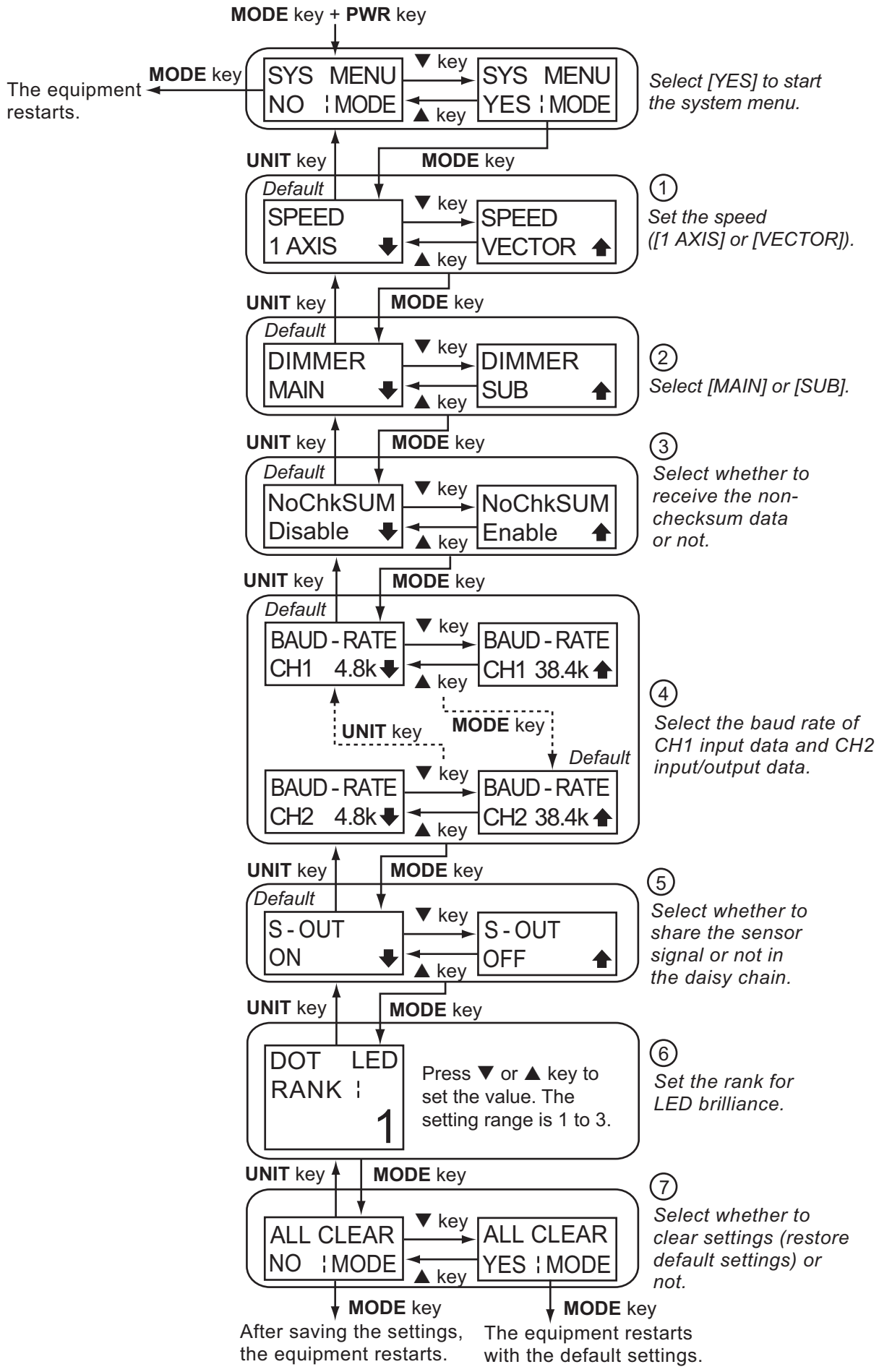


   Note: If you press the **MODE** key with this screen shown, the equipment restarts.
2. Press ▼ key to select the screen for [YES].



3. Press the **MODE** key. The screen for speed appears.
4. Press ▼ or ▲ key to change the setting.
5. Press the **MODE** key to go to the next screen. Use ▼ or ▲ key to change the setting.
6. Repeat step 5 to set all menus. You can use the **UNIT** key to return to the previous screen.
7. After you set all menus, press the **MODE** key with the screen for [ALL CLEAR]. The equipment restarts.

Note: The system menu is inoperative on the RD-501 and RD-502.


MODE key + PWR key
MODE key
The equipment restarts.
SYS MENU
NO ¦MODE
▼ key
▲ key
SYS MENU
YES ¦MODE
Select [YES] to start the system menu.
UNIT key
MODE key
Default
SPEED
1 AXIS
SPEED
VECTOR
1
Set the speed ([1 AXIS] or [VECTOR]).
DIMMER
MAIN
DIMMER
SUB
2
Select [MAIN] or [SUB].
NoChkSUM
Disable
NoChkSUM
Enable
3
Select whether to receive the non-checksum data or not.
BAUD - RATE
CH1 4.8k
BAUD - RATE
CH1 38.4k
BAUD - RATE
CH2 4.8k
BAUD - RATE
CH2 38.4k
4
Select the baud rate of CH1 input data and CH2 input/output data.
S - OUT
ON
S - OUT
OFF
5
Select whether to share the sensor signal or not in the daisy chain.
DOT LED
RANK ¦
1
Press ▼ or ▲ key to set the value. The setting range is 1 to 3.
6
Set the rank for LED brilliance.
ALL CLEAR
NO ¦MODE
ALL CLEAR
YES ¦MODE
7
Select whether to clear settings (restore default settings) or not.
MODE key
After saving the settings, the equipment restarts.
MODE key
The equipment restarts with the default settings.

No.	Menu	Description	Default
1	SPEED	• [1 AXIS]: Display FWD/AFT speed. Forward: FWD (↑), After: AFT (↓) • [VECTOR]: Do not display the direction of the ship's movement. **Note:** The [VECTOR] speed consists of forward/after speed of the ship and the influence of tidal current/wind. Requires multi-axis speed data.	[1 AXIS]
2	DIMMER	• [MAIN]: Set the unit which is connected to the dimmer controller in the daisy chain connection as the main unit. • [SUB]: Set the unit which is not connected to the dimmer controller in the daisy chain connection as a sub unit.	[MAIN]
3	NoChkSUM	• [Enable]: Receive NMEA0183 sentences with and without checksums. • [Disable]: Do not receive NMEA0183 sentences that do not have checksums.	[Disable]
4	BAUD-RATE	• [CH1/2 4.8k]: Select if the CH1 input data or CH2 input/output data is 4.8 Kbps. • [CH1/2 38.4k]: Select if the CH1 input data or CH2 input/output data is 38.4 Kbps.	[CH1 4.8k], [CH2 38.4k]
5	S-OUT	• [ON]: Share the sensor signal in the daisy chain (pattern 1 in the system configuration). • [OFF]: Do not share the sensor signal in the daisy chain (pattern 2 in the system configuration).	[ON]
6	DOT LED RANK	Set the rank for LED brilliance in order to even out the brilliance of the remote displays in the daisy chain connection. Press ▼ or ▲ key to set the value. The setting range is 1 to 3. [3] is the highest ranking.	-
7	ALL CLEAR	• [NO]: Do not clear the settings. Select [NO] and press the **MODE** key. After saving the above setting, the equipment restarts. • [YES]: Clear the settings. Select [YES] and press the **MODE** key. The equipment restarts with the default settings. When clearing the settings for RD-20, the following items are restored to default. • Settings for the data display (screen mode), display mode, unit of measurement, direction of the ship, display brilliance • Settings for the user menu • Settings for the system menu except the rank for LED brilliance	[NO]

3.6 JIS Cable Guide

Cables listed in the manual are usually shown as Japanese Industrial Standard (JIS). Use the following guide to locate an equivalent cable locally.

JIS cable names may have up to 6 alphabetical characters, followed by a dash and a numerical value (example: DPYC-2.5).
For core types D and T, the numerical designation indicates the *cross-sectional Area (mm^2)* of the core wire(s) in the cable.
For core types M and TT, the numerical designation indicates the *number of core wires* in the cable.

1. Core Type

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

2. Insulation Type

P: Ethylene Propylene Rubber

3. Sheath Type

Y: PVC (Vinyl)

4. Armor Type

C: Steel

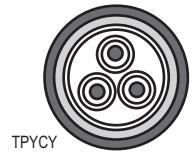
5. Sheath Type

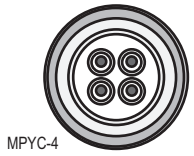
Y: Anticorrosive vinyl sheath

6. Shielding Type

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


DPYCY


TPYCY


MPYC-4


TTYCSLA-4

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

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

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

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

APPX. 1 DIGITAL INTERFACE

Input sentences

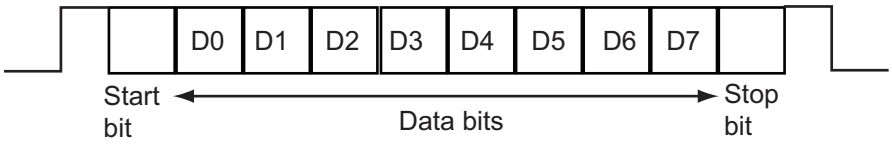
DBK, DBS, DBT, DPT, HDG, HDM, HDT, HTC, HTD, MTW, MWV, RMC, ROT, RPM, RSA, THS, VBW, VHW, VLW, VTG, VWR, VWT

Data reception

Data is received in serial asynchronous form in accordance with the standard referenced in IEC 61162-1.

The following parameters are used:

- Baud rate Input: 4800 bps, IEC 61162-1-2 Output: Same as above. Baud rate fixed at 38400 bps for RD-20.
- Data bits: 8 (D7 = 0), Parity: none, Stop bits: 1



Data sentences: Input

DBK - Depth below keel

$**DBK,x.x,f,x.x,M,x.x,F,*hh<CR><LF>
1 2 3 4 5 6

1. Water depth (0.00 to 99999.99)
2. feet
3. Water depth (0.00 to 99999.99)
4. Meters
5. Water depth (0.00 to 99999.99)
6. Fathom

DBS - Depth below surface

$**DBS,x.x,f,x.x,M,x.x,F,*hh<CR><LF>
1 2 3 4 5 6

1. Water depth (0.00 to 99999.99)
2. feet
3. Water depth (0.00 to 99999.99)
4. Meters
5. Water depth (0.00 to 99999.99)
6. Fathom

DBT - Depth below transducer

$**DBT,x.x,f,x.x,M,x.x,F,*hh<CR><LF>
1 2 3 4 5 6

1. Water depth (0.00 to 99999.99)
2. feet
3. Water depth (0.00 to 99999.99)
4. Meters
5. Water depth (0.00 to 99999.99)
6. Fathoms

DPT - Depth

$**DPT,x.x,x.x,x.x,*hh<CR><LF>
1 2 3

1. Water depth relative to the transducer, meters (0.00 to 99999.99)
2. Offset from transducer, meters (-99.99 to 99.99, null)
3. Maximum range scale in use (unused)

HDG - Heading, deviation and variation

$**HDG,x.x,x.x,a,x.x,a*hh<CR><LF>
1 2 3 4 5

1. Magnetic sensor heading, degrees (0.00 to 360.00)
2. Magnetic deviation, degrees (0.0 to 180.00)
3. E/W
4. Magnetic variation, degrees (0.0 to 180.00)
5. E/W

HDM - Heading magnetic

$**HDM,x.x,M*hh<CR><LF>
1 2

1. Heading, degrees (0.00 to 360.00)
2. Magnetic (M)

HDT - Heading true

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

1. Heading, degrees (0.00 to 360.00)
2. True (T)

HTC - Heading/Track control command

$**HTC,A,x.x,a,a,a,x.x,x.x,x.x,x.x,x.x,x.x,x.x,a,a*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. Override (A = in use, V = not in use)
2. Commanded rudder angle, degrees (-180.00 to 180.00)
3. Commanded rudder direction, (L/R=Port/starboard, null)
4. Selected steering mode
   (M = Manual steering S = Standalone (heading control) H = Heading control T = Track control R = Rudder control)
5. Turn mode (R=Radius controlled, T=Turn rate controlled, N=Turn is not controlled)
6. Commanded rudder limit, degrees (unsigned number) (unused)
7. Commanded off-heading limit, degrees (unsigned number) (unused)
8. Commanded radius of turn for heading changes, n.miles (unused)
9. Commanded rate of turn to heading changes, deg/min (unused)
10. Commanded heading-to-steer, degrees (unused)
11. Commanded off-track limit, n.miles (unsigned number) (unused)
12. Commanded track, degrees (unused)
13. Heading reference in use, T/M (unused)
14. Sentence status (unused)

HTD - Heading/Track Control Data

$**HTD,A,x.x,a,a,a,x.x,x.x,x.x,x.x,x.x,x.x,x.x,a,A,A,A,x.x*hh<CR><LF>
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

1. Override (A=In use, V=Not in use)
2. Commanded rudder angle, degrees (-180.00 to 180.00)
3. Commanded rudder direction (L/R=Port/starboard, null)
4. Selected steering mode
   (M = Manual steering, S = Standalone (heading control), H = Heading control, T = Track control, R = Rudder control)
5. Turn mode (R=Radius controlled, T=Turn rate controlled, N=Turn is not controlled)
6. Commanded rudder limit, degrees (unsigned number) (unused)
7. Commanded off-heading limit, degrees (unsigned number) (unused)
8. Commanded radius of turn for heading changes, n.miles (unused)
9. Commanded rate of turn to heading changes, deg/min (unused)
10. Commanded heading-to-steer, degrees (unused)
11. Commanded off-track limit, n.miles (unsigned number) (unused)
12. Commanded track, degrees (unused)
13. Heading reference in use, T/M (unused)
14. Rudder status (A=Within limits, V=Limit reached or exceeded) (unused)
15. Off-heading status (A=Within limits, V=Limit reached or exceeded) (unused)
16. Off-track status (A=Within limits, V=Limit reached or exceeded) (unused)
17. Vessel heading, degrees (unused)

MTW - Water temperature

$**MTW,x.x,C<CR><LF>
1

1. Water temperature, degrees C (-9.999 to 99.999)

MWV - Wind speed and angle

$**MWV,x.x,a,x.x,a,A*hh<CR><LF>
1 2 3 4 5

1. Wind angle, degrees (0.00 to 360.00)
2. Reference (R/T)
3. Wind speed (0.00 to 9999.99)
4. Wind speed units (K=km/h, M=m/s, N=nm, S=statute miles/h)
5. Status (A=Valid)

RMC - Recommended minimum specific GPS 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 (unused)
2. Status (A=data valid)
3. Latitude (0.00000 to 9000.00000)
4. N/S
5. Longitude (0.00000 to 18000.00000)
6. E/W
7. Speed over ground, knots (0.00 to 9999.99)
8. Course over ground, degrees true (0.00 to 360.00)
9. Date (unused)
10. Magnetic variation, degrees E/W (unused)
11. E/W (unused)
12. Mode indicator
    (A= Autonomous mode, D= Differential mode, F=Float RTK, P=Precise, R=Real time kinematic)
13. Navigational status indication (S=Safe)

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)

RPM - Revolutions

$**RPM, a, x, x.x, x.x, A*hh<CR><LF>
1 2 3 4 5

1. Source (S=shaft E=engine)
2. Engine or shaft number
   (numbered from centerline, 0 = single or on centerline, odd = starboard, even = port) (0 to 9)
3. Speed, revolutions/min (-1000.0 to 1000.0)
4. Propeller pitch (-100.0 to 100.0)
5. Status (A=data invalid)

RSA - Rudder sensor angle

$**RSA,x.x,A,x.x,A*hhCR><LF>
1 2 3 4

1. Starboard (or single) rudder sensor data (-180 - 180.0)
2. Starboard (or single) rudder sensor status (A=Vaild)
3. Port rudder sensor data (-180.00 to 180.00)
4. Port rudder sensor status (A=Vaild)

THS - Rudder sensor angle

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

1. Heading, degrees True (0.00 to 360.00)
2. Mode indicator (A=Autonomous)

VBW - Dual ground/water speed

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

1. Longitudinal water speed, knots (-9999.999 to 9999.999)
2. Transverse water speed, knots (-9999.999 to 9999.999)
3. Status: water speed (A=Data valid)
4. Longitudinal ground speed, knots (-9999.999 to 9999.999)
5. Transverse ground speed, knots (-9999.999 to 9999.999)
6. Status: ground speed (A=Data valid)
7. Stern transverse water speed, knots (-9999.999 to 9999.999)
8. Status: stern water speed (A=Data valid)
9. Stern transverse ground speed, knots (-9999.999 to 9999.999)
10. Status: stern ground speed (A=Data valid)

VHW - Water speed and heading

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

1. Heading, degree True (0.00 to 360.00)
2. T=True (fixed)
3. Heading, degree Magnetic (0.00 to 360.00)
4. M=Magnetic (fixed)
5. Speed, knots (0.00 to 9999.99)
6. N=Knots (fixed)
7. Speed, km/h (0.00 to 9999.99)
8. K=km/h (fixed)

VLW - Dual ground/water distance

$**VLW,x.x,N,x.x,N,x.x,N,x.x,N,*hh<CR><LF>
1 2 3 4 5 6 7 8

1. Total cumulative water distance (0.00 to 999999.99)
2. N=Nautical miles
3. Water distance since reset (0.00 to 999999.99)
4. N=Nautical miles
5. Total cumulative ground distance (unused)
6. N=Nautical miles (unused)
7. Ground distance since reset (unused)
8. N=Nautical miles (unused)

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 True (0.00 to 360.00)
2. T=True (fixed)
3. Course over ground, degrees Magnetic (0.00 to 360.00)
4. M=Magnetic (fixed)
5. Speed over ground, knots (0.00 to 9999.99)
6. N=Knots (fixed)
7. Speed over ground, km/h (0.00 to 9999.99)
8. K=km/h (fixed)
9. Mode indicator (A=Autonomous, D=Differential, P=Precise)

VWR - Relative (Apparent) wind speed and angle

$**VWR,x.x,a,x.x,N,x.x,M,x.x,K<CR><LF>
1 2 3 4 5 6 7 8

1. Measured wind angle relative to the vessel, degrees (0.00 to 180.00)
2. L=Left semicircle, R=Right semicircle
3. Velocity, knots (0.00 to 9999.99)
4. Unit (N, fixed)
5. Velocity, m/s (0.00 to 9999.99)
6. Unit (M, fixed)
7. Velocity, km/h (0.00 to 9999.99)
8. Unit (K, fixed)

VWT - True wind speed and angle

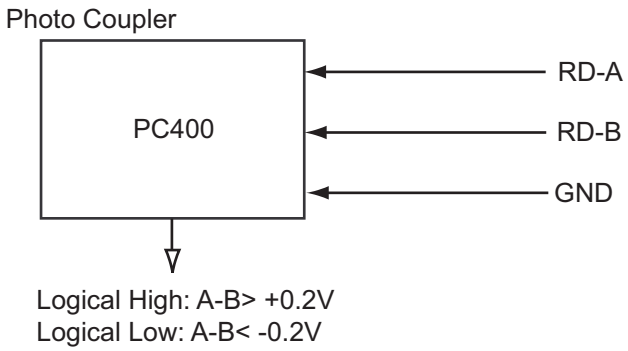
$**VWT,x.x,a,x.x,N,x.x,M,x.x,K<CR><LF>
1 2 3 4 5 6 7 8

1. Measured wind angle relative to the vessel, degrees (0.00 to 180.00)
2. L=Left semicircle, R=Right semicircle
3. Velocity, knots (0.00 to 9999.99)
4. Unit (N, fixed)
5. Velocity m/s (0.00 to 9999.99)
6. Unit (M, fixed)
7. Velocity, km/h (0.00 to 9999.99)
8. Unit (K, fixed)

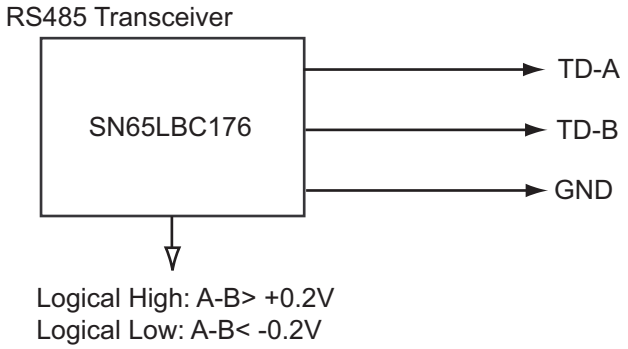
Serial Interface

Baud rate is selectable from 4800 bps and 38400 bps. Complies with IEC 61162-2.

Input port (RD-A, RD-B)



Output port (TD-A, TD-B)



SPECIFICATIONS OF REMOTE DISPLAY
RD-20

1 REMOTE DISPLAY

1.1	Display type	Segment LED and dot matrix (red)
1.2	Brilliance	10 steps (includes 'OFF')
1.3	Data indication	Ship's speed, Course, Heading, Distance, Depth, Rate of turn, Wind direction/speed, Rudder angle, Engine/ shaft RPM, Propeller pitch, Water temperature
1.4	Remote control	Remote controller (option) required
1.5	Remote dimmer	Dimmer controller (option) required
1.6	Interface	
	Remote control	Serial, 1 port, 38,400 bps, 5 VDC output (for remote/dimmer controller)
	Sensor	Input: 1 port, NMEA0183 Ver1.5/2.0/3.0/4.0/4.1
	Daisy chain (for RD-20)	Output: 1 port, 38,400 bps
1.7	Data sentences	DBK, DBS, DBT, DPT, HDG, HDT, HDM, HTC, HTD, MTW, MWV, RPM, RMC, ROT, RSA, THS, VBW, VHW, VLW, VTG, VWT, VWR

2 REMOTE CONTROLLER (OPTION)

2.1	Control button	DISP, UNIT, MODE
2.2	Interface	Serial, Input: 1 port, Output: 1 port, 38,400 bps 5 VDC input (supplied from remote display) 5 VDC output (for dimmer controller)

3 DIMMER CONTROLLER (OPTION)

3.1	Control button	DAY/NT, BRILL (▲/▼)
3.2	Interface	Serial, Output: 1 port, 38,400 bps 5 VDC input (supplied from remote display)

4 POWER SUPPLY

4.1	Remote display	12-24 VDC: 0.6-0.3 A (includes controller source)

5 ENVIRONMENTAL CONDITION

5.1	Ambient temperature	
	Remote display	-25°C to +55°C
	Remote/Dimmer controller	-15°C to +55°C
5.2	Relative humidity	95% at 40°C
5.3	Degree of protection	IP22
5.4	Vibration	IEC 60945

6 UNIT COLOR

N2.5

E4454S01G
161227

FURUNO

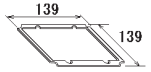
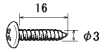
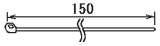
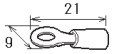
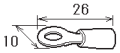
CODE NO.	001-076-460-00	26AB-X-9401 -3
TYPE	CP26-01001	1/1

工事材料表

INSTALLATION MATERIALS

REMOTE DISPLAY

RD-20

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	Fﾏｳﾝﾄｽﾎﾟﾝｼﾞ FLUSH MOUNTING SPONGE		26-004-1201-0 CODE NO. 100-350-750-10	1	
2	+ﾊﾞｲﾝﾄﾞﾀｯﾋﾟﾝﾋｭ TAPPING SCREW		3X16 SUS304 CODE NO. 000-171-996-10	4	
3	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150B CODE NO. 000-167-183-10	9	
4	圧着端子 CRIMP-ON LUG		FV2-4 BLU K CODE NO. 000-157-247-11	3	
5	圧着端子 CRIMP-ON LUG		FV5.5-4(LF) YEL K CODE NO. 000-166-744-11	1	

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

FURUNO

CODE NO.	001-677-210-00	26AB-X-9501 -4
TYPE	FP26-00301 ﾌﾞｼｭﾂﾖｳ	1/1

付属品表

ACCESSORIES

REMOTE DISPLAY

RD-20

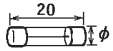
番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｷｬｯﾌﾟ CAP		26-004-1255-1 CODE NO. 100-353-651-10	4	

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

FURUNO

CODE NO.	001-076-450-00	26AB-X-9301-4 1/1
TYPE	SP26-00101	BOX NO. P

SHIP NO.	SPARE PARTS LIST FOR	U S E	SETS PER VESSEL
	REMOTE DISPLAY RD-20/RD-50, DS-600		

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-A 125V 2A PBF	1	1	2	000-157-479-10

MFR'S NAME	FURUNO ELECTRIC CO.,LTD.	DWG NO.	C4454-P01-E KR	1/1

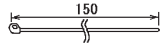
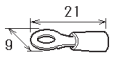
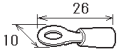
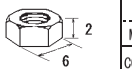
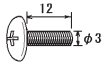
（略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.）

FURUNO

CODE NO.	001-076-990-00	26AC-X-9401 -3
TYPE	CP26-01101	1/1

工事材料表
INSTALLATION MATERIALS

REMOTE CONTROLLER
RD-501

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150B CODE NO. 000-167-183-10	4	
2	圧着端子 CRIMP-ON LUG		FV2-4 BLU K CODE NO. 000-157-247-11	1	
3	圧着端子 CRIMP-ON LUG		FV5.5-4(LF) YEL K CODE NO. 000-166-744-11	2	
4	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M3 SUS304 CODE NO. 000-167-477-10	4	
5	ﾐｶﾞｷ丸平座金 FLAT WASHER		M3 SUS304 CODE NO. 000-167-453-10	4	
6	ﾊﾞﾈ座金 SPRING WASHER		M3 SUS304 CODE NO. 000-167-404-10	4	
7	+ﾊﾞｲﾝﾄﾞｺﾈｼﾞ BINDING HEAD SCREW		M3X12 SUS304 CODE NO. 000-171-998-10	4	

FURUNO ELECTRIC CO ., LTD.

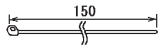
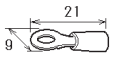
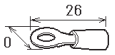
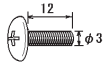
C4453-M01-D KR

FURUNO

CODE NO.	001-077-000-00	26AC-X-9402 -3
TYPE	CP26-01201	1/1

工事材料表
INSTALLATION MATERIALS

DIMMER CONTROLLER
RD-502

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	ｺﾝﾍﾞｯｸｽ CABLE TIE		CV-150B CODE NO. 000-167-183-10	2	
2	圧着端子 CRIMP-ON LUG		FV2-4 BLU K CODE NO. 000-157-247-11	1	
3	圧着端子 CRIMP-ON LUG		FV5.5-4(LF) YEL K CODE NO. 000-166-744-11	1	
4	六角ﾅｯﾄ 1ｼｭ HEXAGONAL NUT		M3 SUS304 CODE NO. 000-167-477-10	4	
5	ﾐｶﾞｷ丸平座金 FLAT WASHER		M3 SUS304 CODE NO. 000-167-453-10	4	
6	ﾊﾞﾈ座金 SPRING WASHER		M3 SUS304 CODE NO. 000-167-404-10	4	
7	+ﾊﾞｲﾝﾄﾞｺﾈｼﾞ BINDING HEAD SCREW		M3X12 SUS304 CODE NO. 000-171-998-10	4	

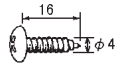
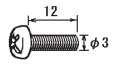
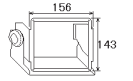
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

FURUNO

CODE NO.	000-016-195-00	26AB-X-9402 -0
TYPE	OP26-1	1/1

明細書
DESCRIPTION

REMOTE DISPLAY
RD-20

番号 NO.	名称 NAME	略図 OUTLINE	型名／規格 DESCRIPTIONS	数量 Q'TY	用途／備考 REMARKS
1	+ﾄﾗｽﾀｯﾋﾟﾝﾈｼﾞ 1ｼｭ SELF-TAPPING SCREW		4X16 SUS304 CODE NO. 000-162-605-10	4	
2	+ﾊﾞｲﾝﾄﾞｺﾈｼﾞ BINDING HEAD SCREW		M3X12 SUS304 CODE NO. 000-171-998-10	4	
3	ﾊﾝｶﾞｰ組品 HANGER ASSY.		OP26-1-1 CODE NO. 001-076-490-00	1	

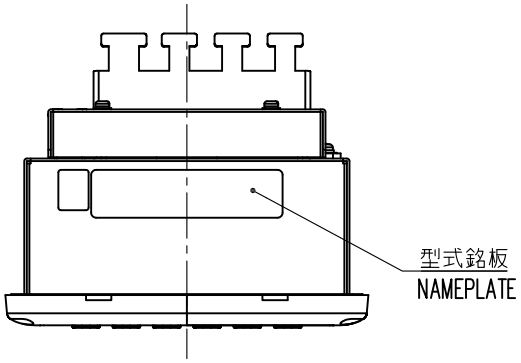
型式/ｺｰﾄﾞ番号が２段の場合、下段より上段に代わる過渡期品であり、どちらかが入っています。 なお、品質は変わりません。
TWO TYPES AND CODES MAY BE LISTED FOR AN ITEM. THE LOWER PRODUCT MAY BE SHIPPED IN PLACE OF THE UPPER PRODUCT. QUALITY IS THE SAME.
(略図の寸法は、参考値です。 DIMENSIONS IN DRAWING FOR REFERENCE ONLY.)

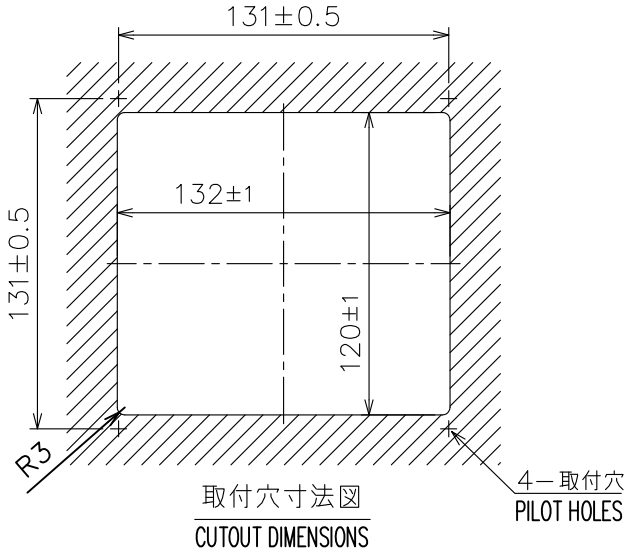
FURUNO ELECTRIC CO ., LTD.

FURUNO

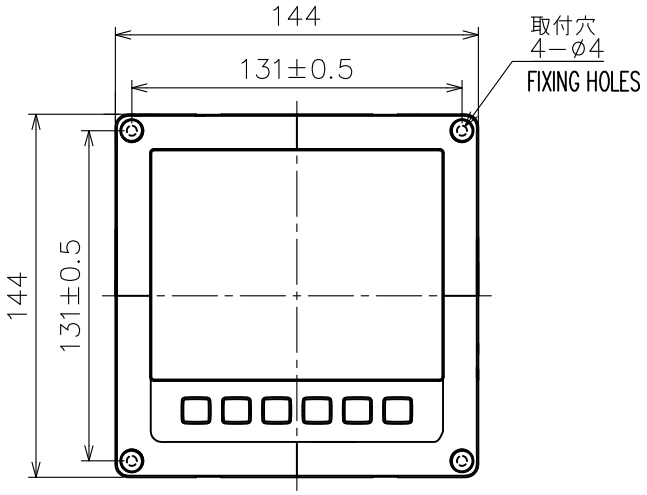
表1 TABLE 1

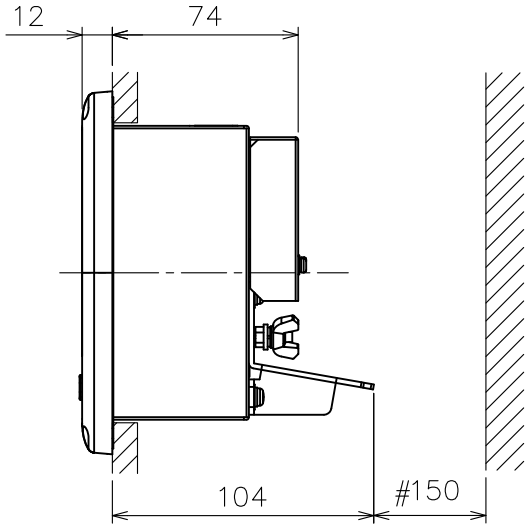
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

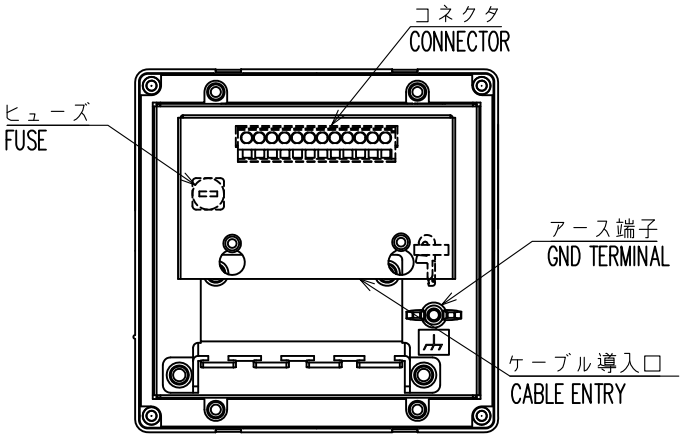




取付穴寸法図
CUTOUT DIMENSIONS







注 記 1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付用ネジはバインドタッピンネジ呼び径3×16を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE BINDING TAPPING SCREWS ø3x16 FOR FIXING THE UNIT.

DRAWN 21/May/09 T.YAMASAKI		TITLE	RD-20
CHECKED 22/May/09 T.TAKENO		名称	リモートディスプレイ（埋込装備）
APPROVED 9/Jun/09 R.Esumi			外寸図
SCALE	MASS 0.8 ±10% kg	NAME	REMOTE DISPLAY (FLUSH MOUNT)
DWG.No. C4454-G02- A	REF.No. 26-004-100G-2		OUTLINE DRAWING

D-1

FURUNO ELECTRIC CO., LTD.

FURUNO

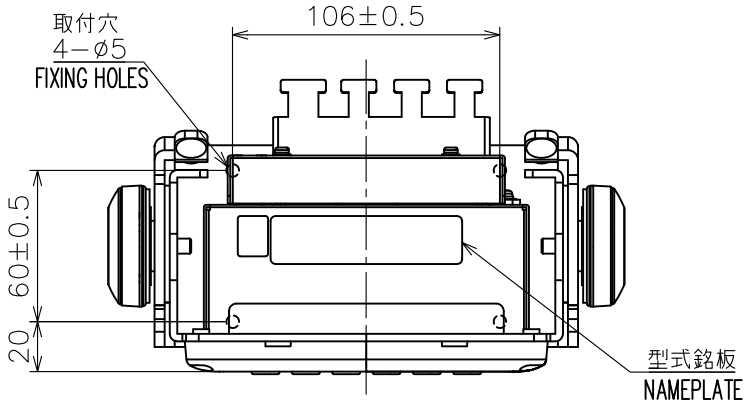
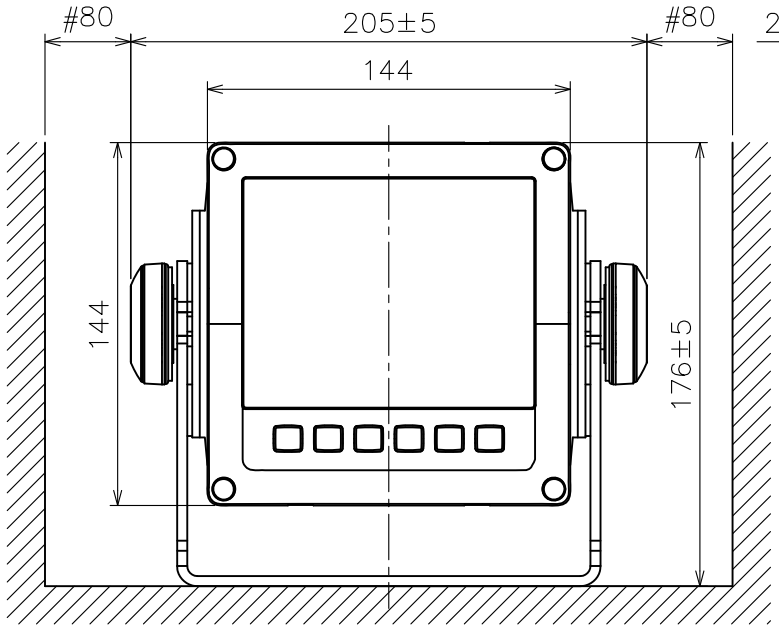
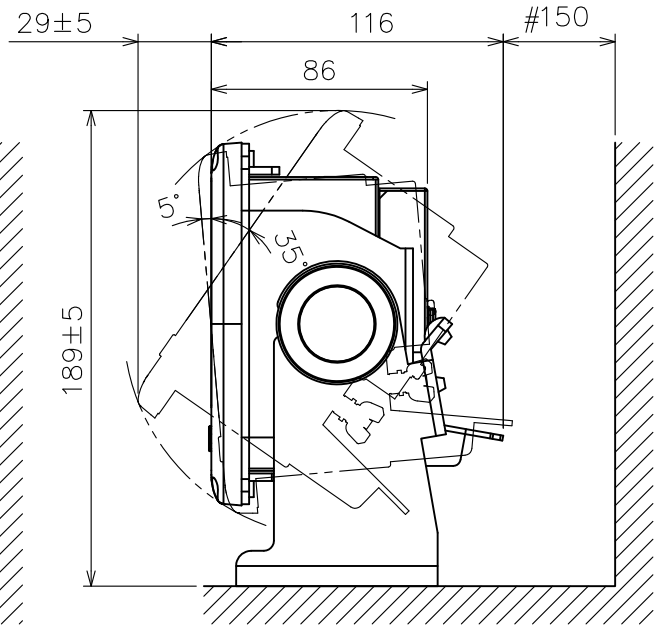
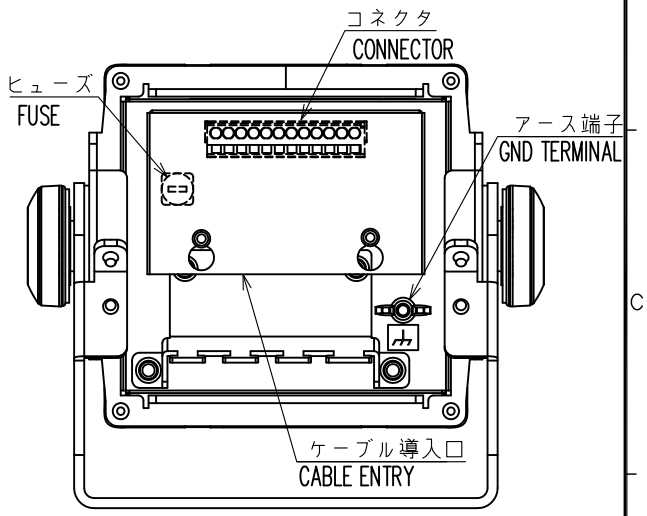


表1 TABLE 1

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） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付用ネジはトラスタッピンネジ呼び径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 TRUSS TAPPING SCREWS ø4x16 FOR FIXING THE UNIT.

DRAWN 21/May/09 T.YAMASAKI		TITLE	RD-20
CHECKED 22/May/09 T.TAKENO		名称	リモートディスプレイ（卓上装備）
APPROVED 9/Jun/09 R.Esumi			外寸図
SCALE	MASS 1.3 ±10% kg	NAME	REMOTE DISPLAY (TABLETOP MOUNT)
DWG.No. C4454-G01- A	REF.No. 26-004-110G-2		OUTLINE DRAWING

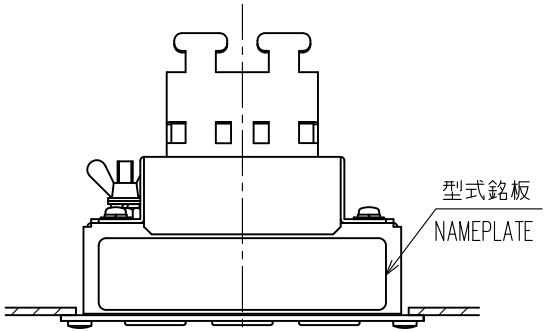
D-2

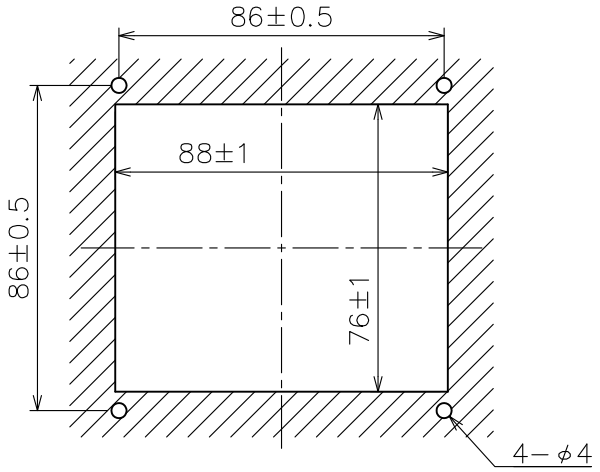
FURUNO ELECTRIC CO., LTD.

FURUNO

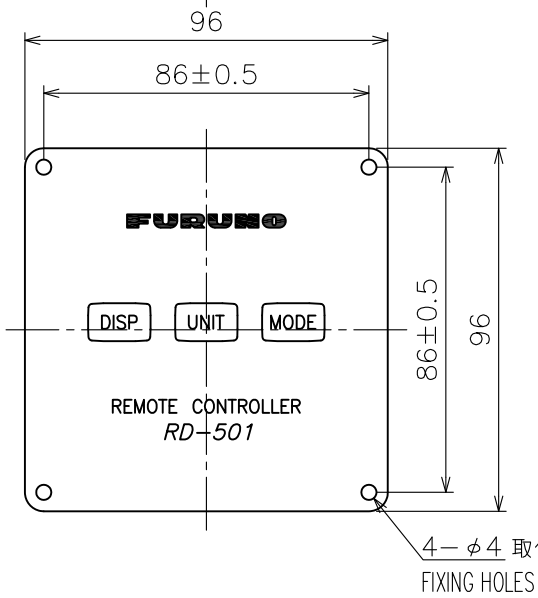
表1 TABLE 1

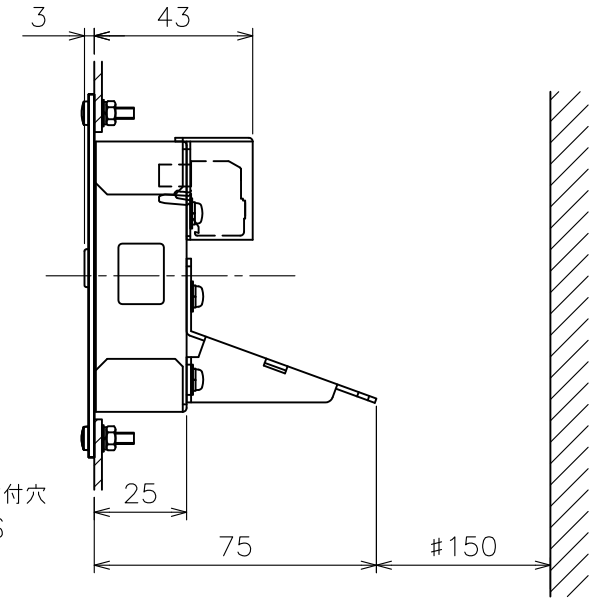
寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

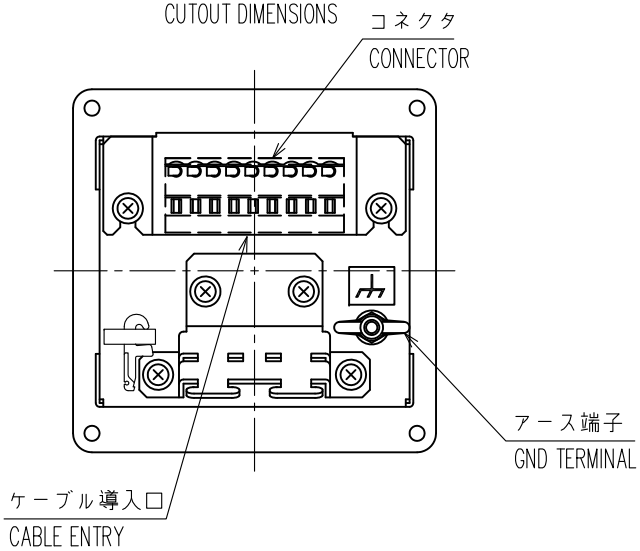




取付穴寸法図
CUTOUT DIMENSIONS







注 記 1） 指定外の寸法公差は表１による。
2） ＃印寸法は最小サービス空間寸法とする。
3） 取付にはＭ３Ｘ１２バインド小ネジ、Ｍ３平座金／バネ座金／ナットを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE BINDING SCREWS M3x12 AND M3 P.W./S.W./ NUTS FOR FIXING THE UNIT.

DRAWN 25/May/09 T.YAMASAKI		TITLE	RD-501
CHECKED 26/May/09 T.TAKENO		名称	リモート操作部（埋込装備）
APPROVED 9/Jun/09 R.Esumi	RD-50		外寸図
SCALE	MASS 0.38 ±10% kg	NAME	REMOTE CONTROLLER (FLUSH MOUNT)
DWG.No. C4453-G03-B	REF.No. 26-003-2006-3		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

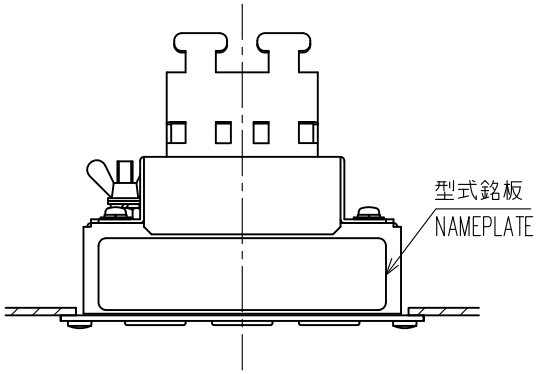
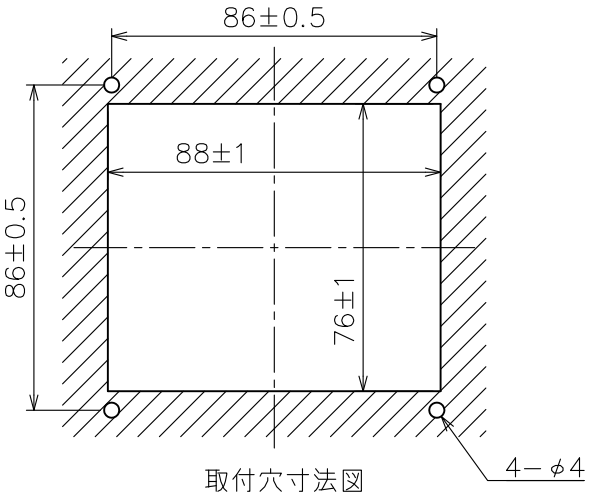
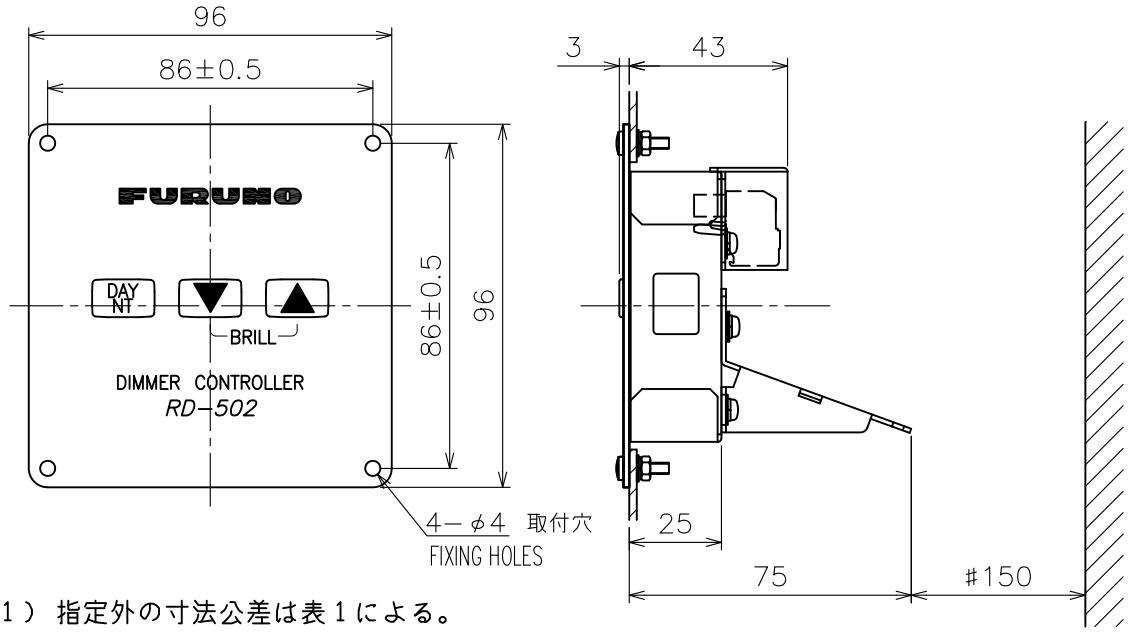


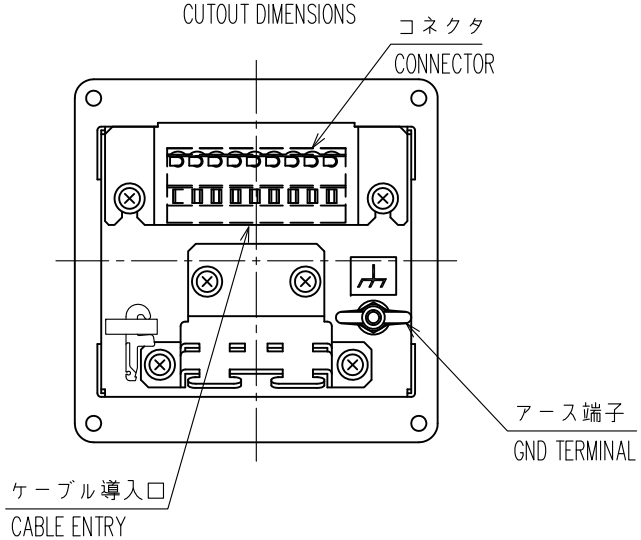
表1 TABLE 1

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



取付穴寸法図
CUTOUT DIMENSIONS





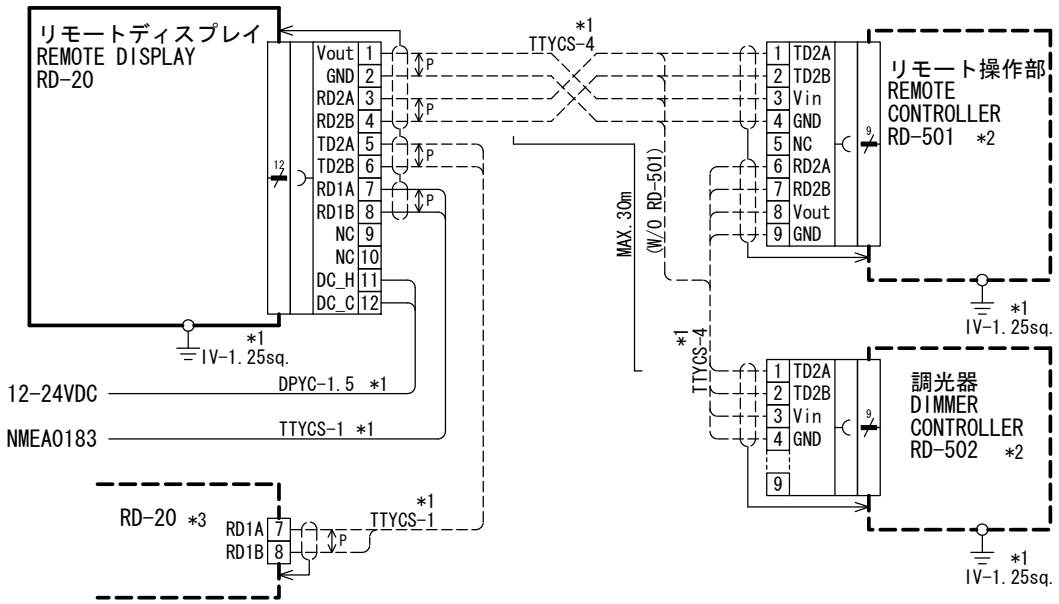
注 記 1）指定外の寸法公差は表1による。
2）＃印寸法は最小サービス空間寸法とする。
3）取付はＭ３Ｘ１２バインド小ネジ、Ｍ３平座金／バネ座金／ナットを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE BINDING SCREWS M3x12 AND M3 P.W./S.W./ NUTS FOR FIXING THE UNIT.

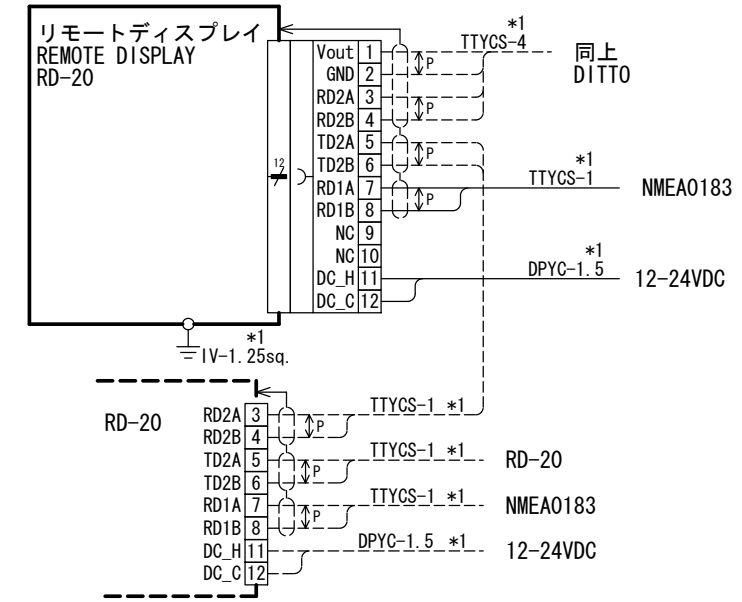
DRAWN 26/May/09 T.YAMASAKI		TITLE	RD-502
CHECKED 26/May/09 T.TAKENO		名称	調光器（埋込装備）
APPROVED 9/Jun/09 R.Esumi	RD-50		外寸図
SCALE	MASS 0.38 ±10% kg	NAME	DIMMER CONTROLLER (FLUSH MOUNT)
DWG.No. C4453-G04- C	REF.No. 26-003-250G-4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

1） NMEAデータを共有する場合　　TO USE NMEA DATA JOINTLY



2） 調光制御のみを共有する場合　　TO USE DIMMER CONTROL ONLY JOINTLY



注記
＊１）造船所手配。
＊２）オプション。
＊３）メニューより設定変更が必要。

NOTE
*1: SHIPYARD SUPPLY.
*2: OPTION.
*3: CHANGE SETTING FROM MENU.

DRAWN 31/Jul/09 T.YAMASAKI			TITLE RD-20
CHECKED 31/Jul/09 T.TAKENO			名称 リモートディスプレイ
APPROVED 4/Sep/09 R.Esumi			相互結線図
SCALE / MASS kg			NAME REMOTE DISPLAY
DWG.No. C4454-C01- B	REF.No. 26-004-0001-1		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.
9-52 Ashihara-cho, Nishinomiya, 662-8580, Japan
Tel: +81 (0)798 65-2111 Fax: +81 (0)798 63-1020
www.furuno.com

Publication No. DOCQA1521

Declaration of Conformity

We FURUNO ELECTRIC CO., LTD.

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

REMOTE DISPLAY RD-20

(Model name, type number)

to which this declaration relates conforms to the following standard(s) or other normative document(s)

EU
EMC Directive 2014/30/EU

IEC 60945 Ed.4.0: 2002

For assessment, see
• Test report
Furuno Labotech International Co., Ltd.
FLI 12-09-053, 25 Aug 2009

UK
SI 2016 No.1091 EMC Regulations 2016 as amended

EN 60945: 2002

For assessment, see
• Test report
Furuno Labotech International Co., Ltd.
FLI 12-09-053, 25 Aug 2009

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

On behalf of Furuno Electric Co., Ltd.

Nishinomiya City, Japan
26 July 2021

(Place and date of issue)

Akihiko Kanechika
Department General Manager
Quality Assurance Department

(name and signature or equivalent marking of authorized person)

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www.furuno.com

Publication No. SOCQA0015

PSTI Statement of Compliance

We FURUNO ELECTRIC CO., LTD.

(Name of manufacturer of the product)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address of manufacturer of the product)

declare under our sole responsibility that the product

REMOTE DISPLAY,
RD-20, RD-33, RD-50

(Product type, batch)

April / 30 / 2029

(Support period for the product)

https://www.furuno.co.jp/en/csr/sociality/customer/product_security.html

(Weblink for latest information and contact to report to the manufacturer security issues)

to which this declaration relates conforms to the following standard(s) or other normative document(s)

Product Security and Telecommunications Infrastructure Act 2022
Product Security and Telecommunications Infrastructure (Security Requirements for Relevant Connectable Products) Regulations 2023 Schedule 1

On behalf of Furuno Electric Co., Ltd.

Nishinomiya City, Japan
23 April 2024

(Place and date of issue)

Akihiko Kanechika
Department General Manager
Quality Assurance Department

(Signature, name and function of the signatory)

FURUNO ELECTRIC CO., LTD.

9-52 Ashihara-cho,
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・FURUNO Authorized Distributor/Dealer

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