JLN-720

SATELLITE LOG

Instruction Manual

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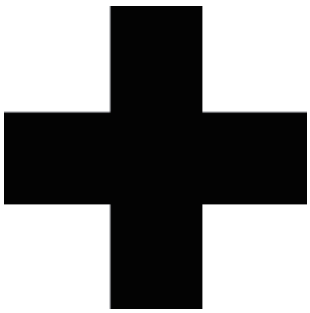
JRC Japan Radio Co., Ltd.

● Safety Cautions ●



Cautions for High Voltage

High voltage of hundreds volts is used inside this equipment. Touching a component inside the unit is very dangerous. (Any person other than authorized service engineers should not maintain, inspect, or adjust the unit.)

High voltages on the order of tens of thousand volts are most likely to cause instant deaths from electrical shocks. At times, even voltages on the order of several hundred volts could lead to electrocution. To defend against electrical shock hazards, do not put your hand into the inside of apparatus.

When you put in a hand unavoidably in case of urgent, it is strongly suggested to turn off the power switch and allow the capacitors, etc. to discharge with a wire having its one end positively grounded to remove residual charges. Before you put your hand into the inside of apparatus, make sure that internal parts are no longer charged. Extra protection is ensured by wearing dry cotton gloves at this time. Another important precaution to observe is to keep one hand in your pocket at a time, instead of using both hands at the same time. It is also important to select a secure footing to work on, as the secondary effects of electrical shock hazards can be more serious. In the event of electrical shocks, disinfect the burnt site completely and obtain medical care immediately.

Precautions for Rescue of Victim of Electric Shock

When a victim of electric shock is found, turn off the power source and ground the circuit immediately. If this is impossible, move the victim away from the unit as quick as possible without touching him or her with bare hands. He or she can safely be moved if an insulating material such as dry wood plate or cloth is used.

It is necessary to perform first aid immediately.

Breathing may stop if current flows through the respiration center of brain due to electric shock. If the electric shock is not large, breathing can be restored by artificial respiration. A victim of electric shock looks pale and his or her pulse may become very weak or stop, resulting in unconsciousness and rigidity at worst.

● Emergency Measures ●

Method of First-Aid Treatment

☆Precautions for First-Aid Treatments

Apply artificial respiration to the person who collapsed, minimizing moving as much as possible avoiding risks. Once started, artificial respiration should be continued rhythmically.

(1) Refrain from touching the patient carelessly as a result of the accident; the first-aider could suffer from electrical shocks by himself or herself.

(2) Turn off the power calmly and certainly, and move the patient apart from the cable gently.

(3) Call or send for a physician or ambulance immediately, or ask someone to call doctor.

(4) Lay the patient on the back, loosening the necktie, clothes, belts and so on.

(5) (a) Feel the patient's pulse.
(b) Check the heartbeat by bringing your ear close to the patient's heart.
(c) Check for respiration by bringing your face or the back of your hand to the patient's face.
(d) Check the size of patient's pupils.

(6) Opening the patient's mouth, remove artificial teeth, cigarettes, chewing gum, etc. if any. With the patient's mouth open, stretch the tongue and insert a towel or the like into the mouth to prevent the tongue from being withdrawn into the throat. (If the patient clenches the teeth so tight that the mouth won't open, use a screwdriver or the like to force the mouth open and then insert a towel or the like into the mouth.)

(7) Wipe off the mouth to prevent foaming mucus and saliva from accumulating.

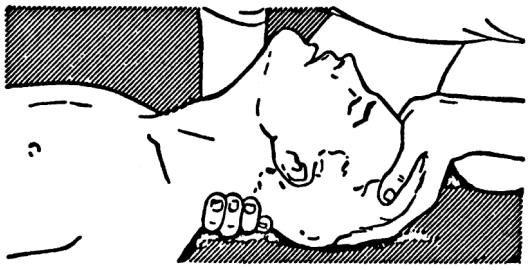
☆Treatment to Give When the Patient Has a Pulse Beating but Has Ceased to Breathe

∗ Performing mouth-to-mouth artificial respiration

(1) Bend the patient's face backward until it is directed to look back. (A pillow may be placed under the neck.)
(2) Pull up the lower jaw to open up the airway. (To spread the airway)
(3) Pinching the patient's nose, breathe deeply and blow your breath into the patient's mouth strongly, with care to close it completely. Then, move your mouth away and take a deep breath, and blow into his or her mouth. Repeat blowing at 10 to 15 times a minute (always with the patient's nostrils closed).
(4) Continue artificial respiration until natural respiration is restored.
(5) If the patient's mouth won't open easily, insert a pipe, such as one made of rubber or vinyl, into either nostril. Then, take a deep breath and blow into the nostril through the pipe, with the other nostril and the mouth completely closed.
(6) The patient may stand up abruptly upon recovering consciousness. Keep the patient lying calmly, giving him or her coffee, tea or any other hot drink (but not alcoholic drink) to keep him or her warm.

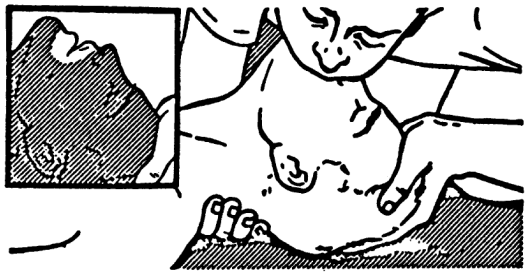
Mouth-to-mouth artificial respiration with the patient's head lifted

[1]



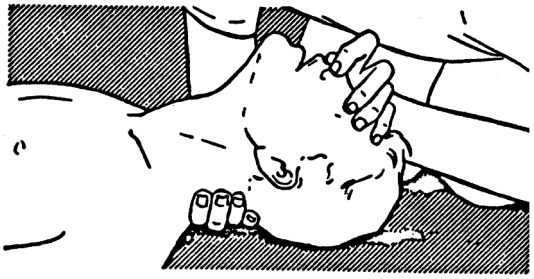
(1) Lift the back part of the patient's head. Support the forehead with one of your hand and the neck with the other hand.→ [1].
Many patients will have their airways opened by lifting their head in this way to ease mouth-to-mouth artificial respiration.

[2]



(2) Closing the patient's mouth with your mouth, press your cheek against the patient's nose→ [2].
Alternatively, hold the patient's nose with your finger to prevent air leak → [3].

[3]



(3) Blowing air into the patient's lungs.
Blow air into the patient's lungs until chest is seen to rise. The first 10 breaths must be blown as fast as possible.

Fig. 1 Mouth-to-mouth artificial respiration

Flow of Cardiopulmonary Resuscitation (CPR)

A person is collapsing.
- Secure the safety of the surrounding area.
- Prevent secondary disasters.

Check for response.
- Call while tapping the shoulder.

Responding → Listen to the appeal of the injured or ill person and give the necessary first-aid

Not responding

Ask for help.
- Make an emergency call.
- Ask to bring an AED.

Open the airway.
- Check for breathing.

Breathing → Recovery position
- Lay the injured or ill person on his/her side and wait for the arrival of the emergency services.

Not breathing

Give 2 rescue breaths; omittable Note([1])

Give CPR.
- 30 chest compressions
- Give 2 rescue breaths; omittable Note([1])

Note([1]) Omission of rescue breathing:
If there is a fear of infection because the injured or ill person has an intraoral injury, you are hesitant about giving mouth-to-mouth resuscitation, or preparing the mouthpiece for rescue breathing takes too long, omit rescue breathing and proceed to the next step.

Arrival of an AED
- Turn on the power.
- Use the AED by following its voice prompts. Fitting of the electrode pads, etc.

Automatic electrocardiogram analysis
- Do not touch the injured or ill person.

Electric shock is not needed.

Electric shock is needed.

Delivery of electric shock

The AED automatically analyzes the heart rhythm every 2 min.

Resume CPR from chest compressions by following the voice prompts of the AED.

When to stop CPR → When the injured or ill person has been handed over to the emergency services or has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.

Specific Procedures for Cardiopulmonary Resuscitation (CPR)

1. Check the scene for safety to prevent secondary disasters

a) Do not touch the injured or ill person in panic when an accident has occurred. (Doing so may cause electric shock to the first-aiders.)

b) Do not panic and be sure to turn off the power. Then, gently move the injured or ill person to a safe place away from the electrical circuit.

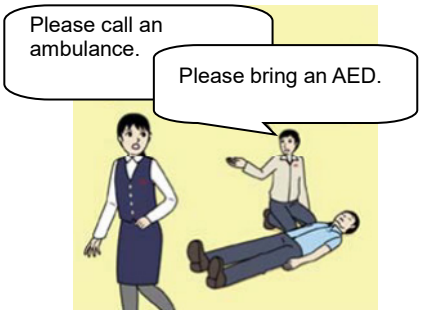
2. Check for responsiveness

a) Tap the shoulder of the injured or ill and shout in the ear saying, "Are you OK?"

b) If the person opens his/her eyes or there is some response or gesture, determine it as "responding." But, if there is no response or gesture, determine it as "not responding."

3. If responding

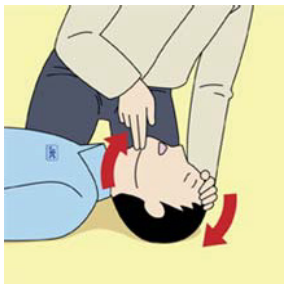
a) Give first-aid treatment.



4. If not responding

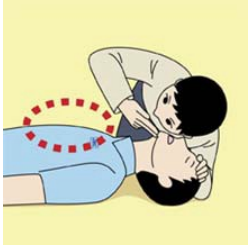
a) Ask for help loudly. Ask somebody to make an emergency call and bring an AED.

- **Somebody has collapsed. Please help.**
- **Please call an ambulance.**
- **Please bring an AED.**
- If there is nobody to help, call an ambulance yourself.



5. Open the airway

a) Touch the forehead with one hand. Lift the chin with the two fingers of the middle finger and forefinger of the other hand and push down on the forehead as you lift the jaw to bring the chin forward to open the airway. If neck injury is suspected, open the airway by lifting the lower jaw.



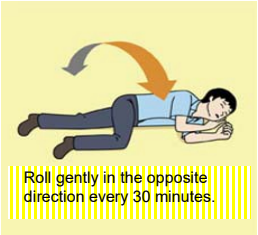
6. Check for breathing

a) After opening the airway, check quickly for breathing for no more than 10 seconds. Put your cheek down by the mouth and nose area of the injured or ill person, look at his/her chest and abdomen, and check the following three points.

- Look to see if the chest and abdomen are rising and falling.
- Listen for breathing.
- Feel for breath against your cheek.

b) If the injured or ill person is breathing, place him/her in the recovery position and wait for the arrival of the emergency services.

• Position the injured or ill person on his/her side, maintain a clear and open airway by pushing the head backward while positioning their mouth downward. To maintain proper blood circulation, roll him/her gently to position them in the recovery position in the opposite direction every 30 minutes.



7. Give 2 rescue breaths (omittable)

a) If opening the airway does not cause the injured or ill person to begin to breathe normally, give rescue breaths.

b) If there is a fear of infection because the injured or ill person has an intraoral injury, you are hesitant about giving mouth-to-mouth resuscitation, or getting and preparing the mouthpiece for rescue breathing takes too long, omit rescue breathing and perform chest compressions.

c) When performing rescue breathing, it is recommended to use a mouthpiece for rescue breathing and other protective devices to prevent infections.

d) While maintaining an open airway, pinch the person's nose shut with your thumb and forefinger of the hand used to push down the forehead.

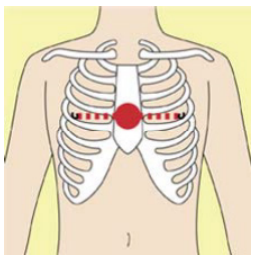
e) Open your mouth widely to completely cover the mouth of the injured or ill person so that no air will escape. Give rescue breathing **twice in about 1 second** and check if the chest rises.

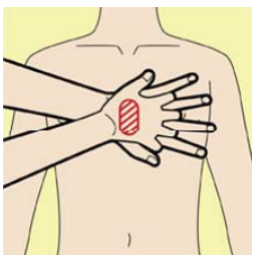
8. Cardiopulmonary resuscitation (CPR) (combination of chest compressions and rescue breaths)

a) Chest compressions

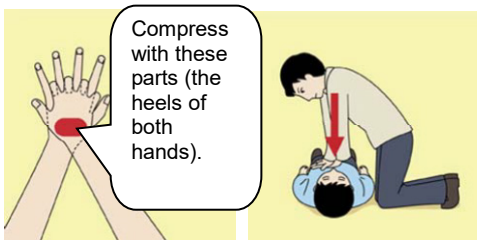
1) Position of chest compressions

• Position the heel of one hand in the center of the chest, approximately between the nipples, and place your other hand on top of the one that is in position.



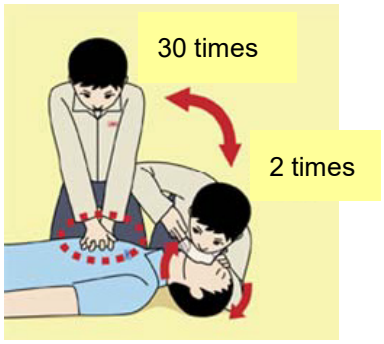


2) Perform chest compressions



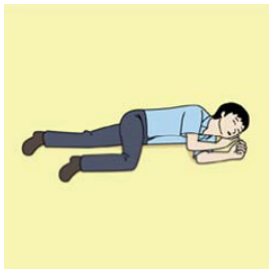
- Perform uninterrupted chest compressions of **30** at the rate of about **100 times** per minute.
  While locking your elbows positioning yourself vertically above your hands.
- With each compression, depress the chest wall to a depth of approximately **4 to 5 cm**.

b) Combination of **30** chest compressions and **2** rescue breaths



1) After performing **30** chest compressions, give **2** rescue breaths. If rescue breathing is omitted, perform only chest compressions.
2) Continuously perform the combination of **30** chest compressions and **2** rescue breaths without interruption.
3) If there are two or more first-aiders, alternate with each other approximately every **two minutes** (five cycles of compressions and ventilations at a ratio of 30:2) without interruption.

9. When to stop cardiopulmonary resuscitation (CPR)



a) When the injured or ill person has been handed over to the emergency services
b) When the injured or ill person has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.

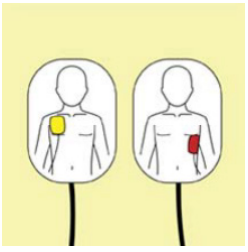
10. Arrival and preparation of an AED

a) Place the AED at an easy-to-use position. If there are multiple first-aiders, continue CPR until the AED becomes ready.
b) Turn on the power to the AED unit.
Depending on the model of the AED, you may have to push the power on button, or the AED automatically turns on when you open the cover.

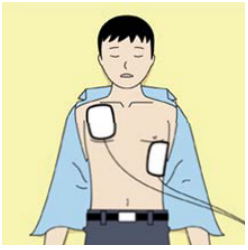
Turn on the power.

c) Follow the voice prompts of the AED.

11. Attach the electrode pads to the injured or ill person's bare chest



a) Remove all clothing from the chest, abdomen, and arms.
b) Open the package of electrode pads, peel the pads off and securely place them on the chest of the injured or ill person, with the adhesive side facing the chest. If the pads are not securely attached to the chest, the AED may not function. Paste the pads exactly at the positions indicated on the pads, If the chest is wet with water, wipe dry with a dry towel and the like, and



then paste the pads. If there is a pacemaker or implantable cardioverter defibrillator (ICD), paste the pads at least 3cm away from them. If a medical patch or plaster is present, peel it off and then paste the pads. If the injured or ill person's chest hair is thick, paste the pads on the chest hair once, peel them off to remove the chest hair, and then paste new pads.

c) Some AED models require to connect a connector by following voice prompts.

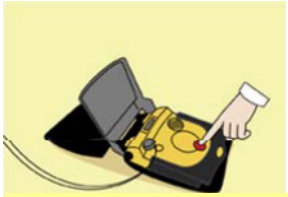
d) The electrode pads for small children should not be used for children over the age of 8 and for adults.

12. Electrocardiogram analysis

a) The AED automatically analyzes electrocardiograms. Follow the voice prompts of the AED and ensure that nobody is touching the injured or ill person while you are operating the AED.

b) On some AED models, you may need to push a button to analyze the heart rhythm.

13. Electric shock (defibrillation)



Press the shock button.

a) If the AED determines that electric shock is needed, the voice prompt saying, "Shock is needed" is issued and charging starts automatically.

b) When charging is completed, the voice prompt saying, "Press the shock button" is issued and the shock button flashes.

c) The first-aider must get away from the injured or ill person, make sure that no one is touching him/her, and then press the shock button.

d) When electric shock is delivered, the body of the injured or ill person may jerk.

14. Resume cardiopulmonary resuscitation (CPR).

Resume CPR consisting of **30** chest compressions and **2** rescue breaths by following the voice prompts of the AED.

15. Automatic electrocardiogram analysis

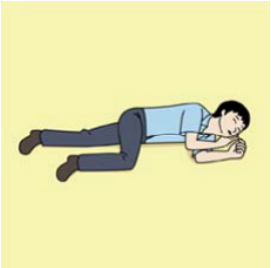
a) When **2 minutes** have elapsed since you resumed cardiopulmonary resuscitation (CPR), the AED automatically analyzes the electrocardiogram.

b) If you suspended CPR by following voice prompts and AED voice prompt informs you that shock is needed, give electric shock again by following the voice prompts.
If AED voice prompt informs you that no shock is needed, immediately resume CPR.

16. When to stop CPR (Keep the electrode pads on.)

a) When the injured or ill person has been handed over to the emergency services

b) When the injured or ill person has started moaning or breathing normally, lay him/her on his/her side in a recovery position and wait for the arrival of emergency services.



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Preface

Thank you for purchasing this JLN-720 Satellite Log from Japan Radio Co., Ltd.. This equipment is an SDME (Speed and Distance Measuring Equipment), complying with the regulations of IMO (International Marine Organization), measures and displays wide-range vessel speed over ground.

- Please read all safety precautions, pictorial indication and manual carefully before using your equipment to ensure safe and proper use.
- Please keep this instruction manual handy for future reference. Doing so will allow you to understand and to be prepared for any contingency.

● Pictorial Indication ●

Meanings of Pictorial Indication

Various pictorial indications are included in this manual and are shown on this equipment so that you can operate them safely and correctly and prevent any danger to you and / or to other persons and any damage to your property during operation. Such indications and their meanings are as follows.
Please understand them before you read this manual:

DANGER	This indication is shown where incorrect equipment operation due to negligence may cause death or serious injuries.
WARNING	This indication is shown where user is supposed to be in danger of being killed or seriously injured if this indication is neglected and this equipment is not operated correctly.
CAUTION	This indication is shown where user is supposed to be injured or any property damage is supposed to occur if this indication is neglected and this equipment is not operated correctly.

Examples of Pictorial Indication

Electric Shock

The △ mark represents CAUTION (including DANGER and WARNING).
Detailed contents of CAUTION ("Electric Shock" in the example on the left) is shown in the mark.

Disassembling Prohibited

The ⃠ mark represents prohibition.
Detailed contents of the prohibited action ("Disassembling Prohibited" in the example on the left) is shown in the mark.

Disconnect the power plug

The ● mark represents instruction.
Detailed contents of the instruction ("Disconnect the power plug" in the example on the left) is shown in the mark.

Warning Label

There is a warning label on the top cover of the equipment.
Do not try to remove, break or modify the label.

● Usage Precautions ●

⚠ DANGER	
	Never remove the cover of this equipment. Touching the high-voltage section inside may cause an electric shock.
	Before conducting inspection, maintenance or parts replacement, make sure to turn off the power and breaker. Failure to comply may cause an electric shock, fire or an equipment fault. Make sure to turn the breaker off since voltage is still outputted from the distribution processor even after the displays are turned off. Failure may result in equipment failure, or death or serious injury due to electric shock.
	Do not touch the equipment with hands or gloves wet with water. Otherwise, an electric shock or a malfunction may occur.

⚠WARNING

	Customers shall never attempt to check or repair the inner of the equipment. Checking or repair by an unqualified person may cause a fire or an electric shock.
	Do not attempt to disassemble or tamper with this equipment. A fire, an electric shock, or a malfunction may occur.
	For maintenance, inspection of the internal section of the equipment, request the service to the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.
	In case you find smoke, unusual odor or extreme high heat coming from the equipment, turn off the power and breaker immediately, unplug the power supply cable from an electric outlet, and contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Keeping the equipment in operation under such condition may cause fire or an electric shock.
	The satellite log must be used strictly as navigation aid equipment only. The final decision on navigation must be made by the pilot. If the final decision is made based on the information displayed by the satellite log only, an accident such as collision or grounding may occur.
	This equipment must not be used by anyone except ship's crews and maintenance staff. Failure to comply may result in misuse.
	Do not use this equipment under any power supply voltage other than the voltage that is indicated. Failure to comply may result in fire, an electric shock, or an equipment fault.
	Do not place a glass or cup containing water, etc., or a small metal object on this equipment. If water or such object gets inside, a fire, an electric shock, or a malfunction may occur.

⚠WARNING

	In case water or a metal object gets inside the equipment, turn off the power and the breaker immediately, unplug the power supply cable from an electric outlet, and contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Keeping the equipment in operation under such condition may cause a fire, an electric shock or a malfunction.
	Always turn off the power and breaker before inserting/removing this equipment or the connector of the connection cable with the external equipment. Failure to comply may result in fire or an equipment fault.
	Do not touch the power supply cable, circuit cable, or GPS compass sensor during severe thunder. Failure to comply may result in an electric shock.
	When the power cable is damaged (exposed cable conductor, broken cable, or torn capsule), request replacement to the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Using the cable as it is may result in fire or an electric shock.
	Do not apply strong shock to the power supply cable or the LAN cable by striking it or hammering it. Otherwise, an open circuit failure may result.
	Make sure using the specified fuses. Otherwise, fire or an equipment fault may occur.
	Before exchanging fuses of this equipment, the equipment must be switch off and the AC/DC input must be cut off
	Make sure using the specified lithium batteries. Other wise, fire or an equipment fault may occur.
	Do not throw the lithium batteries into fire. Fire or an injury may occur due to explosion.

⚠WARNING	
	Disposal of the battery must obey the local laws or rules.
	Before disposal of used lithium batteries, make sure the + and – terminals are insulated by tape. Otherwise, heat, rupture or fire may occur due to a battery short.
	When installing the cable that is attached to the GPS compass sensor, do not bend the cable to a sharp angle, twist it, or install it in such a manner that some force is applied to the cable. Failure to comply may cause cracks or damage inside of the film, resulting in fire or an electric shock.
	Do not install the GPS compass sensor in a place that is exposed to severe vibration. Failure to comply may cause reception defects, resulting in an accident.

⚠CAUTION

	Electrical work for this equipment must be requested to the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Conducting electrical work by anyone other than the specialized maintenance staff may result in an accident or an equipment fault.
	Use the screws that are specified in the installation manual when installing this equipment. Use of any other screws may result in an injury or an equipment failure caused by the equipment dropping down.
	Use the specified power supply cables, signal cables, and earth cables. Failure to comply may cause faults in some other equipment or cause this equipment to become susceptible to faults from some other equipment.
	When mounting the equipment on the wall, mount it firmly to avoid the equipment from dropping under its own weight. Failure to comply may result in an injury caused by the dropping equipment.
	When installing this equipment, make sure that the equipment is connected to the earth terminal and the earth plate properly. Failure to comply may results in an electric shock at an equipment fault or an electric leakage.
	Do not place this equipment inside of a cupboard or cover it with a cardboard. Failure to comply may cause heat accumulation, resulting in fire or an equipment fault.
	Do not block the ventilation opening of the equipment. Otherwise, heat may accumulate inside to cause a fire or a malfunction.
	Do not place this equipment in water or wet this equipment. Failure to comply may result in an electric shock or an equipment malfunction. If water drops are attached to this equipment, wipe them off with a dry cloth.
	Do not place any object on the operation panel. In particular, if a hot object is placed on the operation panel, it can cause deformation of the surface of the operation panel.
	Do not use the equipment in environments other than those provided in the specifications. Doing so may result in equipment failure, malfunction, or injury.

⚠CAUTION

	Do not use or leave the equipment under direct sunlight for a long time or in the temperatures above 55°C. (except wing display) Otherwise, fire or a malfunction may occur.
	Do not install the equipment in a place under the influence of water, humidity, vapor, dust or soot. (except wing display) Failure to comply may result in fire, an electric shock, or an equipment malfunction.
	Do not place this equipment in a location under the influence of frequent vibrations or impact. Failure to comply may cause the equipment to drop or fall over, resulting an injury or an equipment fault.
	This equipment may not satisfy the desired performance and functionality when it is installed other than ships. Because this product is designed to be installed for ship.
	Adjustments must be made by specialized service technicians. Incorrect settings may result in unstable operation, and this may lead to accidents or equipment failure.
	Do not rotate the semi-fixed resistor and trimmer condenser that are installed in its equipment since they have been adjusted to the exact positions. Failure to comply may result in an equipment fault or malfunctioning.
	Do not apply any undue shock on the operation panel. Otherwise, a malfunction may result.
	When cleaning the display screen, do not wipe it too strongly with a dry cloth. Also, do not use gasoline or thinner to clean the screen. Failure will result in damage to the screen surface.
	Adjust the brightness of main display according to the surrounding lighting; particularly using the brightness pattern [NIGHT] may interfere with the recognition of display information.

⚠CAUTION

Do not carry out operation of touch panel by a sharp object.

Otherwise, the screen may be damaged.

If power outage occurs inside of the ship during the operation of the satellite log, the image may be disturbed or may not be displayed.

In this case, reconnect the power supply.

Exterior of the Equipment

NWZ-510SDG Main Display

NNN-21 GPS Compass Sensor

NQA-7010 Distribution Processor

Abbreviations

AC	:	Alternating Current
ACK	:	Acknowledge
ADV	:	Advanced (Settings)
AED	:	Automated External Defibrillator
AFT	:	Aft
ALM	:	Alarm
approx.	:	approximate(ly)
AUTO	:	Automatic
BOW	:	Bow
bps	:	Bit per Second
BT	:	Bottom Tracking
BUZZ	:	Buzzer
CAL	:	Calibrate
CALC	:	Calculation
CH	:	Channel
COMM	:	Communication
CPR	:	Cardiopulmonary Resuscitation
DC	:	Direct Current
DDC	:	Display Dimming Control
DGPS	:	Differential GPS
DIM	:	Dimmer
DISP	:	Display
DR	:	Dead Reckoning, Dead Reckoned Position
DWG	:	Drawing
E	:	East
EL	:	Electroluminescence
EMC	:	Electromagnetic Compatibility
FG	:	Frame Ground
FORE	:	Fore
G	:	Standard Acceleration of Gravity
GND	:	Ground
GNSS	:	Global Navigation Satellite System
GPS	:	Global Positioning System
HF	:	High Frequency
HIST	:	History
HW	:	Hardware
ICD	:	Implantable Cardioverter Defibrillator
ID	:	Identification
IEC	:	International Electrotechnical Commission
IMO	:	International Maritime Organization
INFO	:	Information
INIT	:	Initial (Settings)
INMARSAT	:	International Maritime Satellite System

IP	:	Internet Protocol (Address)
IP	:	International Protection
kn (current abbr.)	:	knot
kt (former abbr.)	:	knot
L	:	Live Wire
LAN	:	Local Area Network (Cable)
LCD	:	Liquid Crystal Display
LOG	:	Log
MANUAL	:	Manual
MENU	:	Menu
MF	:	Medium Frequency
MID	:	Multi-information Display
min	:	minute(s)
N	:	Neutral Wire
N	:	North
NM	:	Nautical Mile
NMEA	:	National Marine Electronics Association
No.	:	Number
PC	:	Personal Computer
PORT	:	Port/Portside
ROT	:	Rate of Turn
PRN	:	Pseudo Random Noise
RECV	:	Receive
RMS	:	Remote Maintenance System
RMS	:	Root Mean Square
Rx RX	:	Receive/Receiver
S	:	South
S/N	:	Signal to Noise (ratio)
SAT	:	Satellite
SBAS	:	Satellite-based Augmentation System
SDME	:	Speed and Distance Measuring Equipment
SOG	:	Speed over the Ground
SP	:	Signal Process
SSLC	:	Single Serial LAN Converter
STBD	:	Starboard/Starboard Side
STD	:	Standard
STERN	:	Stern
STW	:	Speed through Water
SW	:	Switch
Tx TX	:	Transmit/Transmitter
VBW	:	Dual Ground/Water Speed (NMEA-Standard Sentence)
VDR	:	Voyage Data Recorder
VHF	:	Very High Frequency
VLW	:	Distance Traveled through Water (NMEA-Standard Sentence)

VTG	:	Vector Track an Speed over the Ground (NMEA-Standard Sentence)
W	:	West
WT	:	Water Tracking

Glossary

IEC60945	:	Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results
IEC61023	:	Maritime navigation and radiocommunication equipment and systems – Marine speed and distance measuring equipment (SDME) – Performance requirements, methods of testing and required test results
IEC61162	:	Maritime navigation and radiocommunication equipment and systems – Digital interfaces –
IEC61162-1	:	Part 1: Single talker and multiple listeners
IEC61162-2	:	Part 2: Single talker and multiple listeners, high-speed transmission
IEC62288	:	Maritime navigation and radiocommunication equipment and systems - Presentation of navigation-related information on shipborne navigational displays - General requirements, methods of testing and required test results
IMO MSC.334(90)	:	Adoption of Amendments to the performance standard for devices to measure and indicate speed and distance
SVGA	:	Super Video Graphics Array with resolution of 800x600 pixels
WVGA	:	Wide Video Graphics Array with resolution of 800x480 pixels
VGA	:	Video Graphics Array with resolution of 640x480 pixels

Chapter 1 General

1.1 Functions

JLN-720 satellite log is equipment that receiving signals from GPS satellites by GPS compass sensor mounted on board, and then measures speeds over the ground (SOG) based on the signal.
This equipment can measure and display the triaxial vessel speed, which are ahead/stern vessel speed, bow starboard/port speed, and stern starboard/port speed. The ahead/stern vessel speed is measured combining with Gyro, the bow starboard/port speed and the stern starboard/port speed is measured combing with rate of turn Gyro (ROT).
This equipment also measures and records the vessel distance.
The JLN-720 satellite log conforms to the International Maritime Organization (IMO) performance standards, provides accurate displays of ship's speed over a wide range from dead slow to maximum.

1.2 Features

This equipment has the following features.

Color main display with touch panel

This equipment contains a 5-inch color main display with touch panel to indicate maritime information, such as vessel speed, sailing distances. It has a user interface for making various settings.

Triaxial vessel speed calculation

Combining with GPS compass sensor, Gyro and ROT, this equipment can measure and display the triaxial vessel speed, which are ahead/stern vessel speed, bow starboard/port speed, and stern starboard/port speed.

Output to wing display

This equipment can connect to existing wing displays.

Display in analog mode

This equipment can display vessel speed in analog mode through existing analog displays and remote displays.

Switch serial output sentences version

VBW (vessel speed information), VLW (sailing distance information) and VTG (course and speed information) can be outputted in sentence format based on IEC61162-1. Besides, it can be switched between NMEA Ver.1.5, Ver.2.1, Ver.2.3 and Ver.4.0.

Remote Maintenance System (RMS)

Firmware of this equipment can be updated by RMS.

Initial setting through PC

This equipment can be initialized by specialized computer software through LAN connection.

Alert sequence

This equipment can support alert sequence function through contacts or serial communication.

Vessel speed alert

This equipment can set threshold value of vessel speed alert for both forward direction and backward direction individually.

AC power failure detection

When AC voltage is low, the equipment output an alert and input the corresponding acknowledgment (ACK) through a dedicated contact. This process is possible only when this equipment is supplied by 24VDC.

External dimmer

The display dimmer function can be supported by an external dimmer.

Supported standards

This equipment complies with the following standards.

IMO MSC.334(90)

IEC61023 ed.3

IEC60945 ed.4

IEC61162-1 ed.5

IEC61924-2 ed.1 INS-1

IEC62288 ed.2

1.3 Components

The standard components and optional components (separately sold) are shown in the tables below.

Standard components

Item name	Model	Code	Quantity	Remarks
GPS Compass Sensor	NNN-21	NNN21CH	1	-
Distribution Processor	NQA-7010	NQA-7010	1	-
Main Display	NWZ-510SDG	NWZ510SDG	1	5-inch display
Data Cable	H-CFQ-7248	CFQ-7248	1	Cable for communication between NNN-21 and NQA-7010 (10m/14-core)
Main Display Communication Cable	CFS-5680	CFS5680	1	Cable for communication/power supply between the main display and NQA-7010 (about 1.2m)
LAN Plug Connector	TM21P-88P(07)	5JWBS00548	3	-
Spare part	H-7ZXNA3004	7ZXNA3004	1	-
Instruction manual	H-7ZPNA3206	7ZPNA3206	1	-

Note

Connection with Gyro and ROT is necessary to operate the standard components.

Options (Separately sold)

Item name	Model	Code		Quantity		Remarks
Remote Display	NWZ-650SDR NWZ-840SDR	NWZ650SDR NWZ840SDR		5	up to 5 units	6.5-inch 8.4-inch
Multi-Information Display(MID)	NWZ-4610	NWZ4610		1		CFQ-5766A 2m attached
Wing Display	NWW-61T	NWW-61T-BS		3		-
Digital Display *1	NWW-62TA/TB *1	NWW-62TB *1		3 *1		TA: wall mount type *1 TB: flush mount type *1
Distance Counter	NWW-7	Color	Code	1		-
		N2.5	NWW-7-N2			
		N4	NWW-7-N4			
		2.5G7/2	NWW-7			
		7.5BG7/2	NWW-7-7			
Analog Display	NWW-24 NWW-25 NWW-26	Please refer to "Section 1.4.1 (11) Analog Display Size Table"		Max 2		-
Dimmer Unit	NCM-227	Color	Code	1		Connection compatible devices, p l ease refer to "Section 1.4.2 About linking / non-linking according to dimmer unit NCM-227 / NCM-329"
		N2.5	NCM-227-N2			
		N3	NCM-227-N			
		2.5G7/2	NCM-227-2			
		7.5BG7/2	NCM-227-7			
	NCM-329	N2.5	NCM329H-N2	1		
		N3	NCM-329-HN			
		2.5G7/2	NCM-329-H2			
		7.5BG7/2	NCM-329-H7			

Item name	Model	Code	Quantity	Remarks
Remote Display Communication Cable	CFS-6680	CFS6680	1	Cable for communication / power supply between the remote display and Distribution Processor (1.2m)
GPS Compass Sensor Connection Cable	H-CFQ7248-30	CFQ7248-30	1	30m / 14-core
	CFQ-7249	CFQ-7249	1	20m / 14-core / extension
	H-CFQ-7249-10	CFQ7249-10	1	10m / 14-core / extension
Multi-information Display Communication / Power Supply Cable	CFQ-5766D	CFQ5766D	1	10m / 14-core / extension
	CFQ-5766F	CFQ5766F	1	20m / 14-core / extension
Junction Box for GPS Compass Sensor	NQE-7720	NQE-7720	1	14-pin / extension
Junction Box Mounting Bracket	MPBP31612	MPBP31612	1	For NQE-7720
Mounting Rack	MPBX44117	MPBX44117	1	For NNN-21
Bird-hazard Preventive Kit	MPXP34012A	MPXP34012A	1	For NNN-21
Ground Wire	UL1015TEW 1X10AWG(104/0.26) LF5 GREEN PBF equivalent	2265191731	1	NQA-7010 ground for hull

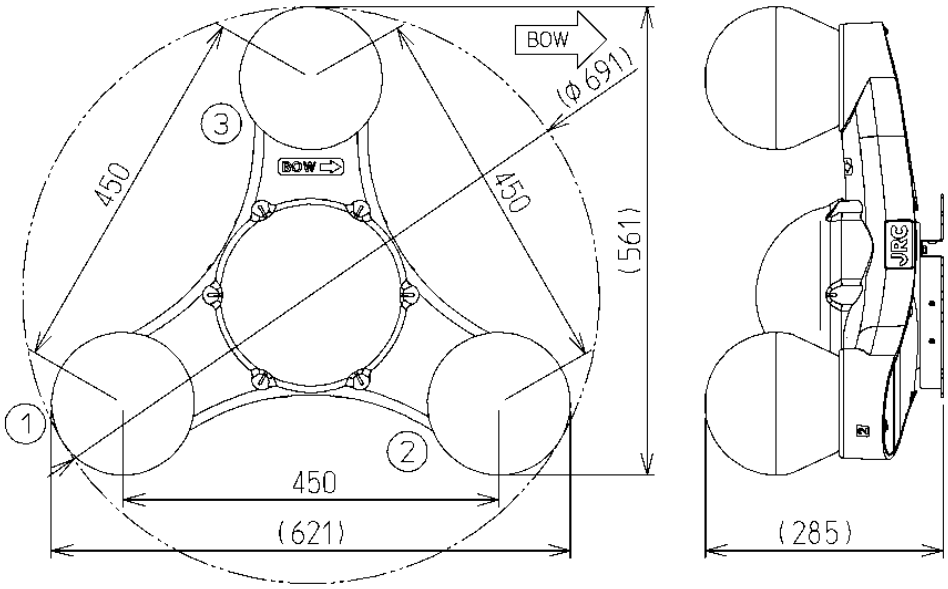
*1 Digital Display NWW-62TA / TB discontinued from July 2019.

After July 2019, only maintenance support is available.

1.4 Construction

This section provides the outline drawings of the system components.

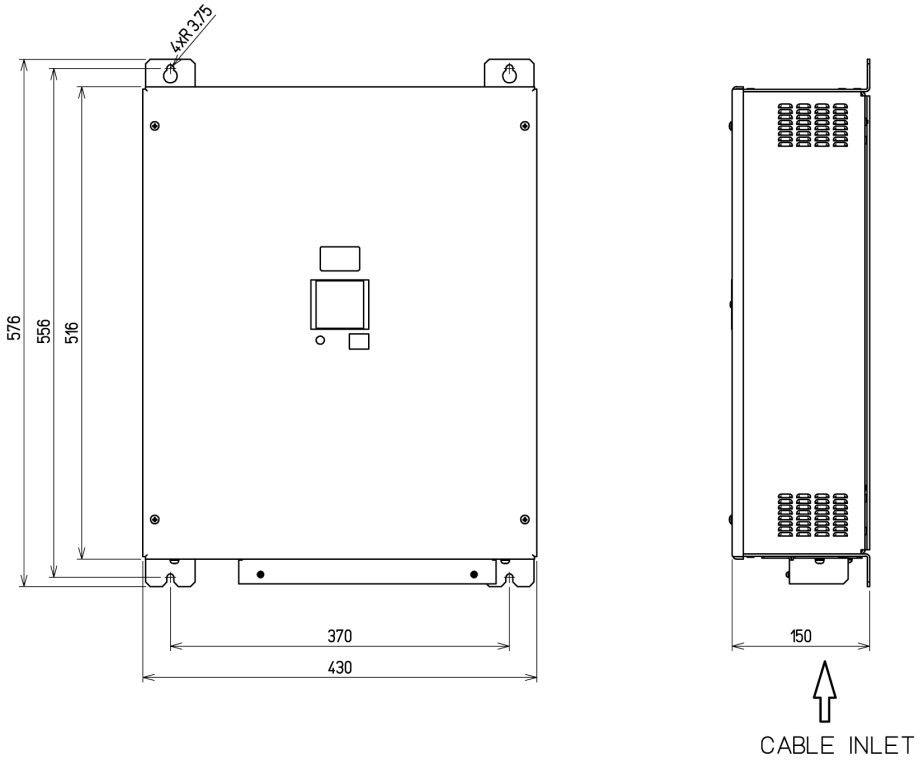
GPS Compass Sensor



Weight: 5.9kg

NNN-21 (Unit: mm)

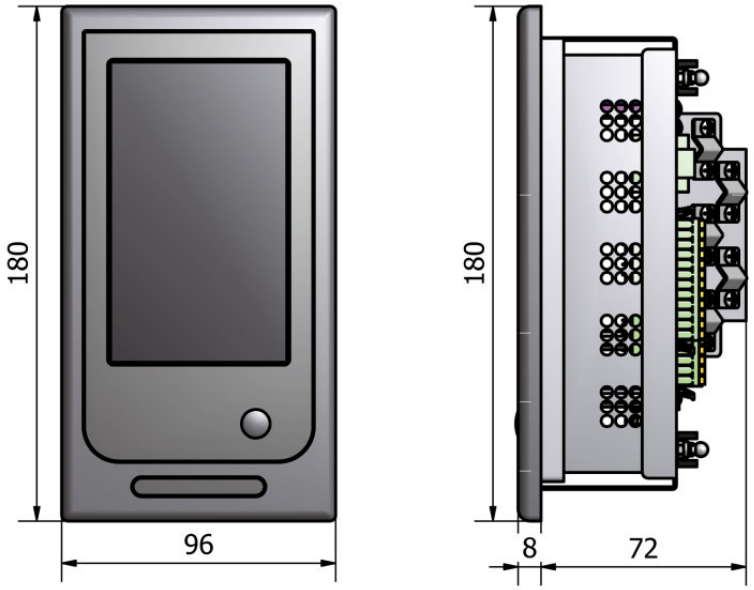
Distribution Processor



Weight: 11kg

NQA-7010 (Unit: mm)

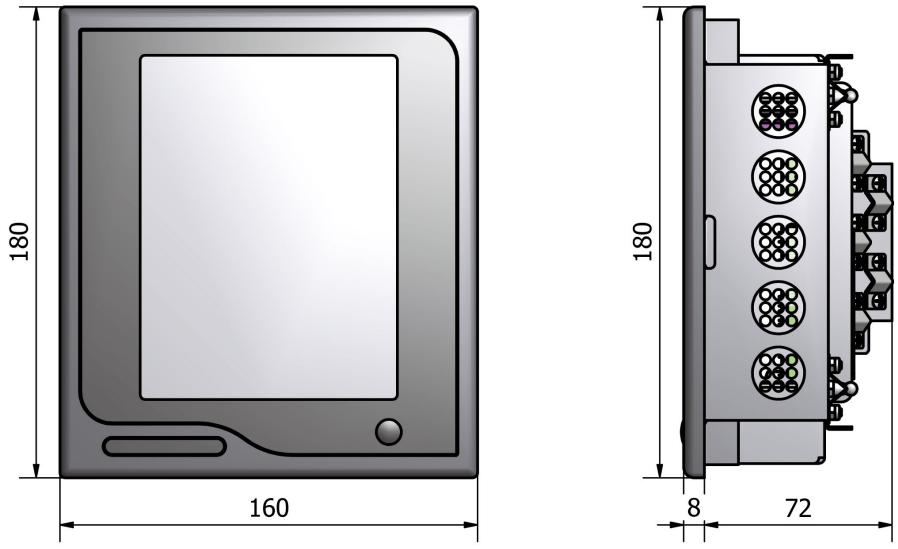
Main Display



Weight: 1.2kg

NWZ-510SDG (Unit: mm)

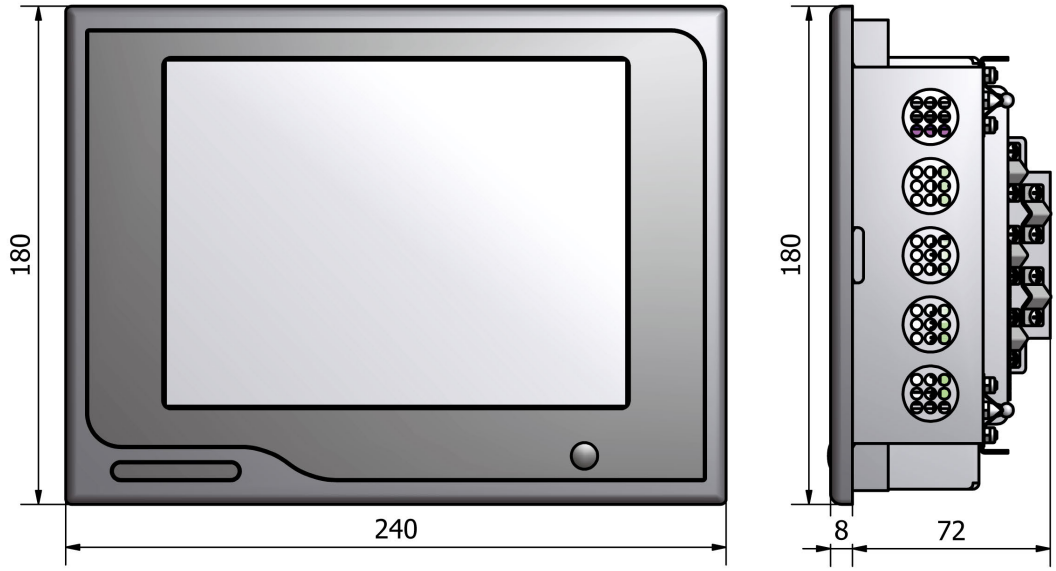
Remote Display (Optional)



Weight: 1.7kg

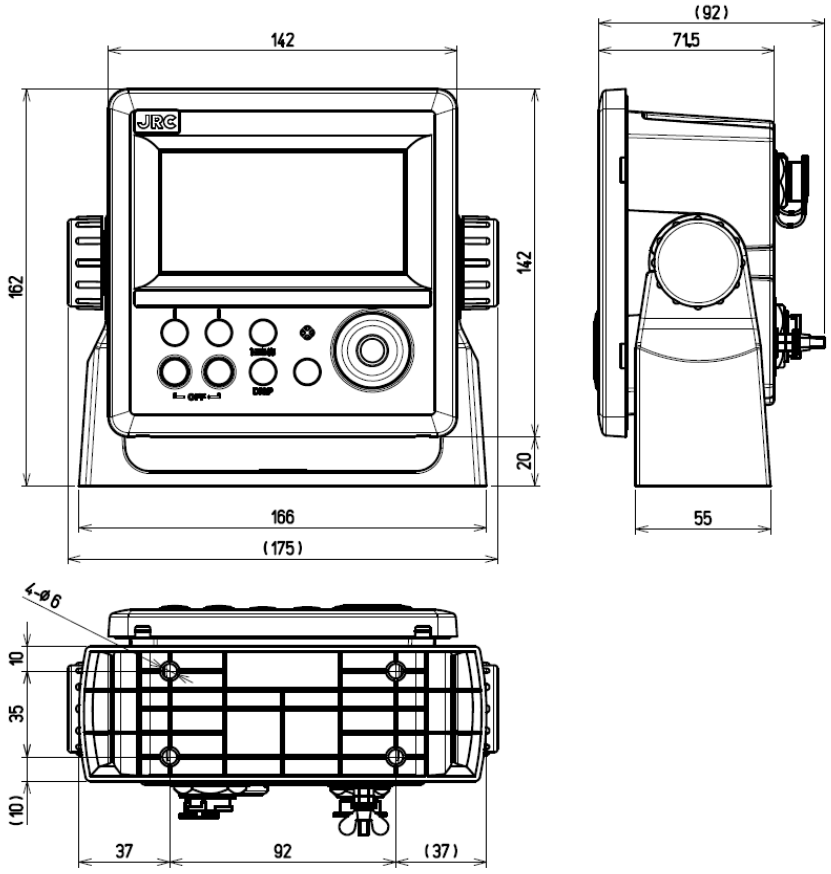
NWZ-650SDR (Unit: mm)

Remote Display (Optional)



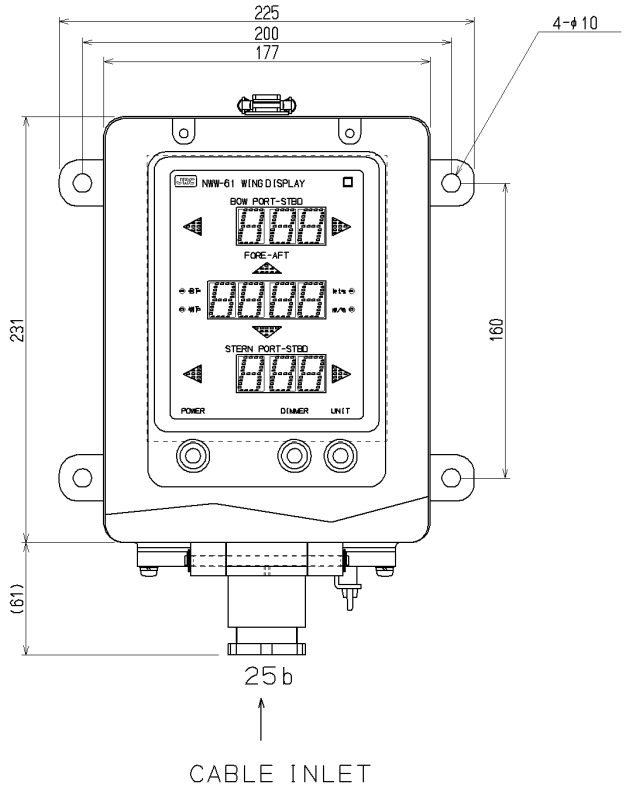
Weight: 2.4kg
NWZ-840SDR (Unit: mm)

Multi-information Display (Optional)



Weight: 0.8kg
NWZ-4610 (Unit: mm)

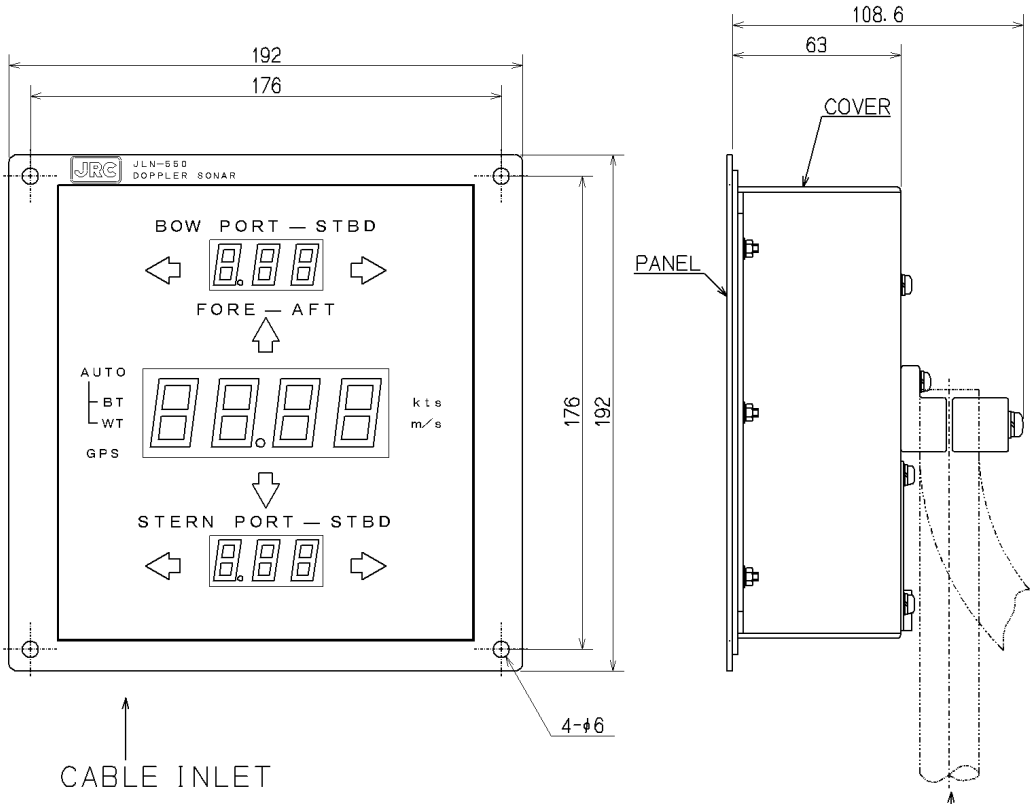
Wing Display (Optional)



Weight: 5kg

NWW-61T (Unit: mm)

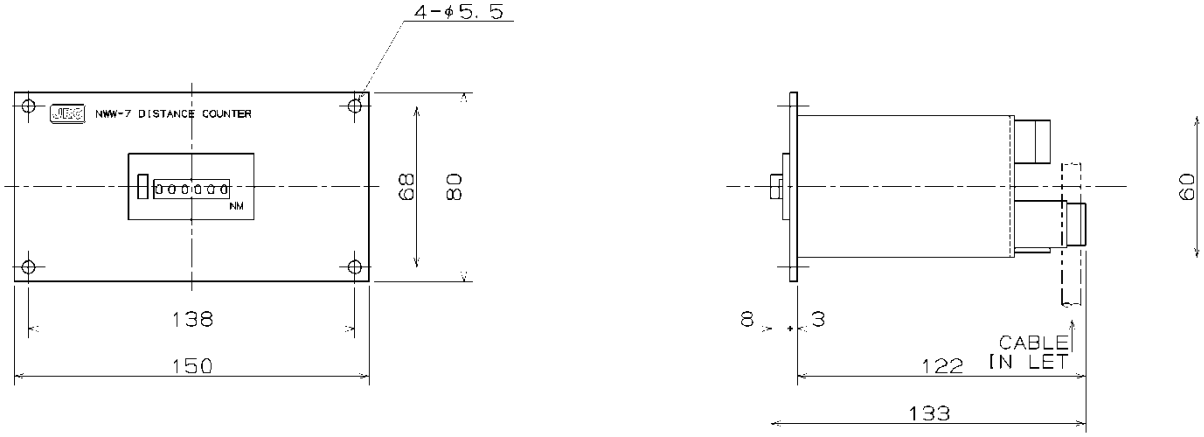
Digital Display (Optional)



Weight: 1.3kg

NWW-62TB (Unit: mm)

Distance Counter (Optional)



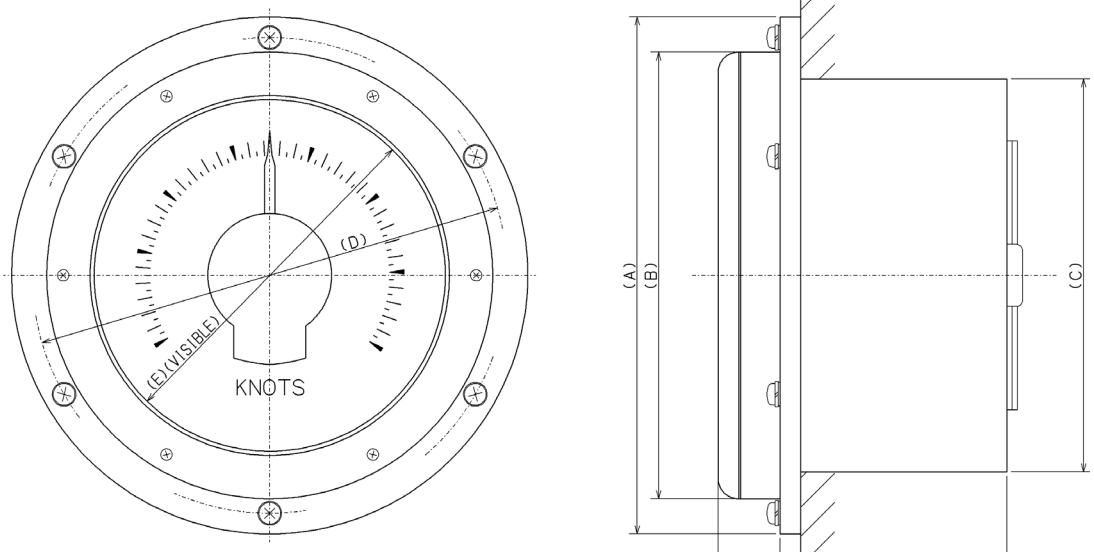
Weight: 0.8kg

NWW-7 (Unit: mm)

Note

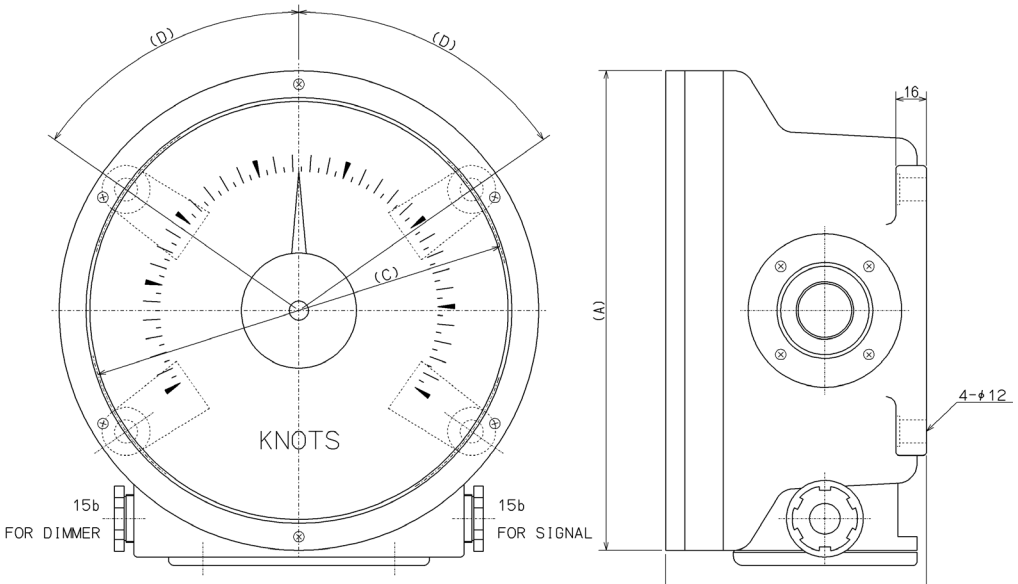
The sailing distance meter NWW-7 operates up to a speed of 45 kn.

Analog Display (Optional)



TYPE	A	B	C	D	E	MASS.	SCALE	E.L.PLATE
NWW-24L	φ250	φ216	φ190	φ230	φ170	6.5kg	-4~20 -5~25	GREEN
NWW-24S	φ200	φ173	φ150	φ186	φ125	3kg	-6~30 -7~35 -8~40	ORANGE

NWW-24 (Unit: mm)



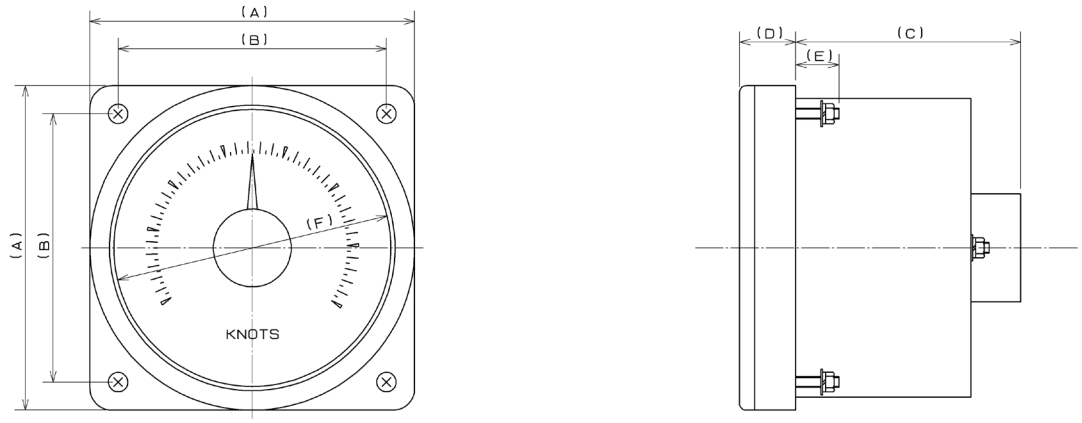
TYPE	A	B	C	D	MASS.	SCALE	E.L.PLATE
NWW-25L	φ250	136	φ220	55°	7kg	-4~20 -5~25 -6~30	GREEN
NWW-25S	φ200	140	φ180	60°	5kg	-7~35 -8~40 -10~20	ORANGE

TYPE SCALE E.L.PLATE PAINTING COLOR

NWW-25 □ □□ □ □

(L) (S) | (20) (25) (30) (35) (40) | (G) (O)

NWW-25 (Unit: mm)



TYPE	A	B	C	D	E	F	MASS.	SCALE	E.L.PLATE
NWW-26L	150	124	105	26	20	φ128	2.5kg	-4~20 -5~25	GREEN
NWW-26M	120	100	90	23	15	φ100	1.5kg	-6~30	
NWW-26S	110	90	90	11	15	φ100	1 kg	-7~35 -8~40	ORANGE

TYPE SCALE E.L.PLATE PAINTING COLOR

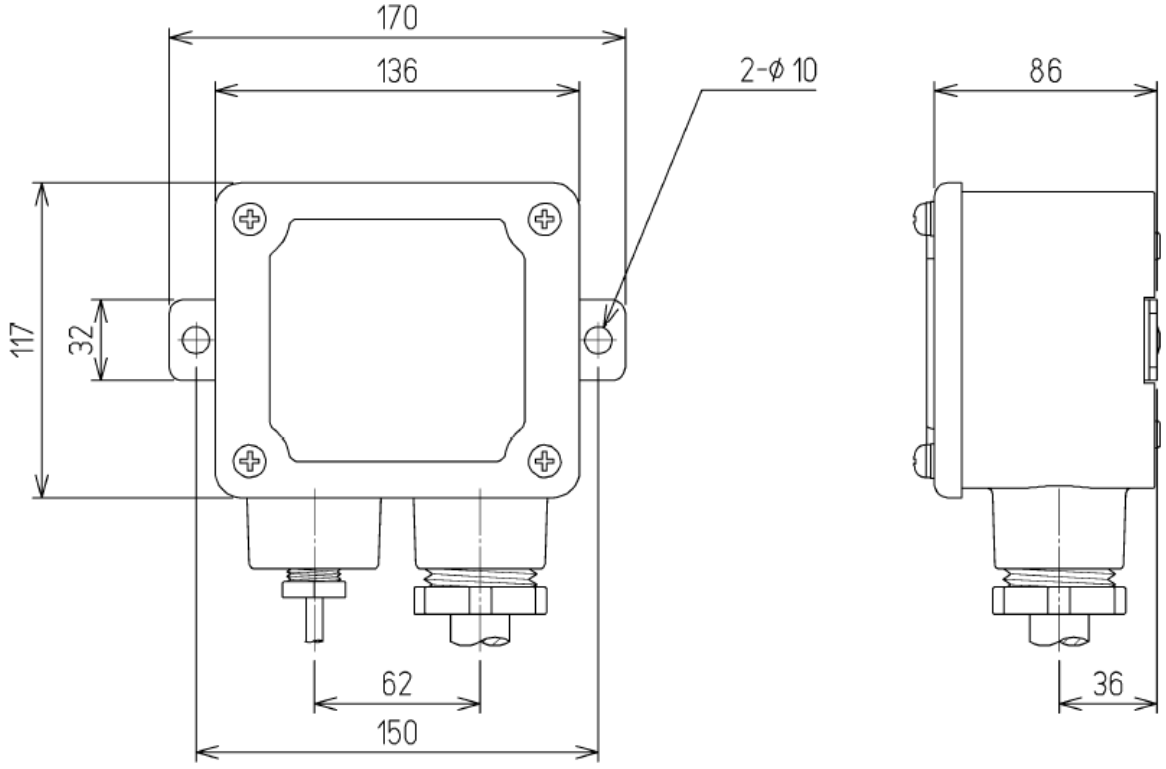
NWW-26 □ □□ □ □

(L) (M) (S) | (20) (25) (30) (35) (40) | (G) (O)

NWW-26 (Unit: mm)

		NWW-24 (Built-in)		NWW-25 (Wall-mount)		NWW-26 (Panel built-in)	
Range	Size	Green	Orange	Green	Orange	Green	Orange
-4~20kn	L	NWW-24L20G	NWW-24L20O	NWW-25L20G	NWW-25L20O	NWW-26L20G	NWW-26L20O
	M	-	-	-	-	NWW-26M20G	NWW-26M20O
	S	NWW-24S20G	NWW-24S20O	NWW-25S20G	NWW-25S20O	NWW-26S20G	NWW-26S20O
-5~25kn	L	NWW-24L25G	NWW-24L25O	NWW-25L25G	NWW-25L25O	NWW-26L25G	NWW-26L25O
	M	-	-	-	-	NWW-26M25G	NWW-26M25O
	S	NWW-24S25G	NWW-24S25O	NWW-25S25G	NWW-25S25O	NWW-26S25G	NWW-26S25O
-6~30kn	L	NWW-24L30G	NWW-24L30O	NWW-25L30G	NWW-25L30O	NWW-26L30G	NWW-26L30O
	M	-	-	-	-	NWW-26M30G	NWW-26M30O
	S	NWW-24S30G	NWW-24S30O	NWW-25S30G	NWW-25S30O	NWW-26S30G	NWW-26S30O

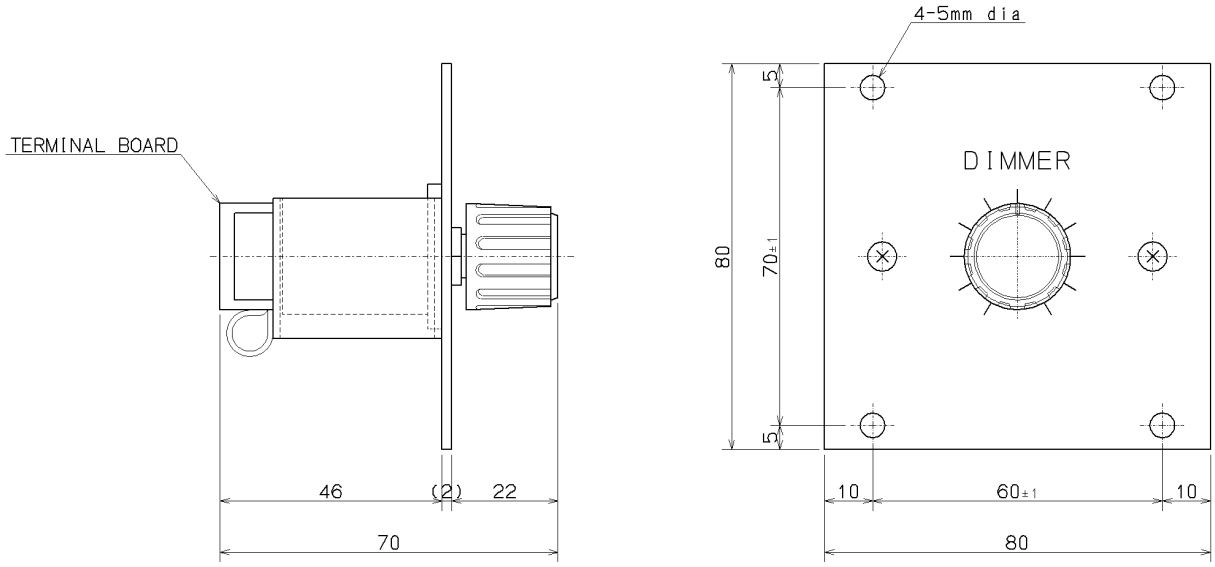
Junction Box for GPS Compass Sensor (Optional)



Weight: 1.2kg

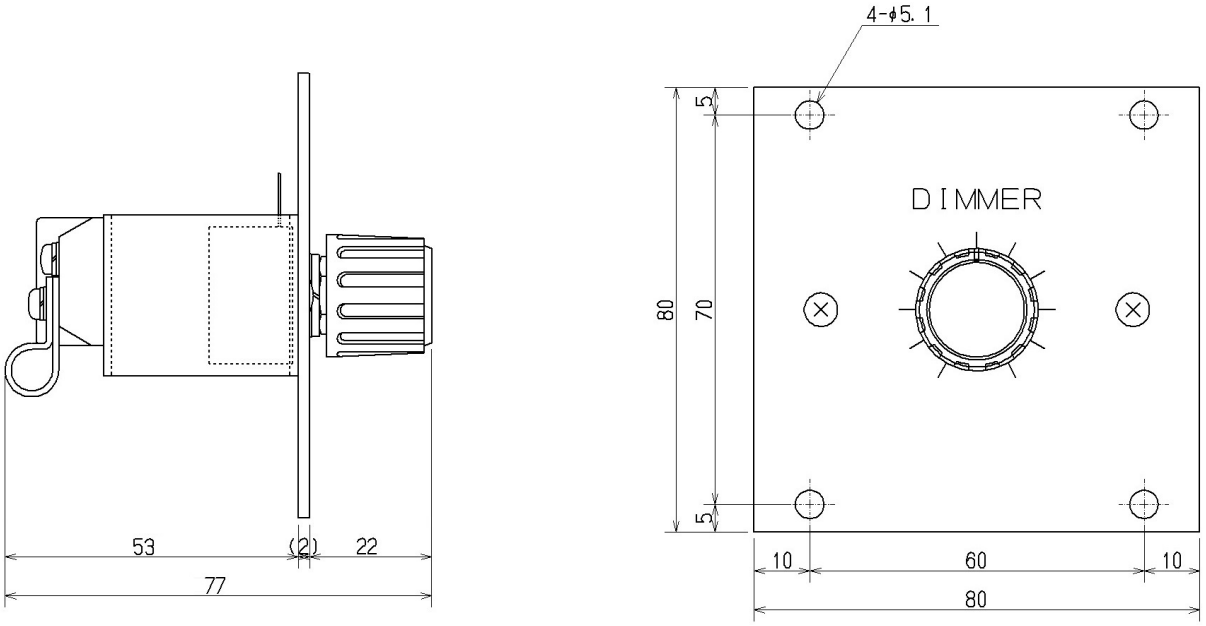
NQE-7720 (Unit: mm)

Dimmer Unit (Optional)



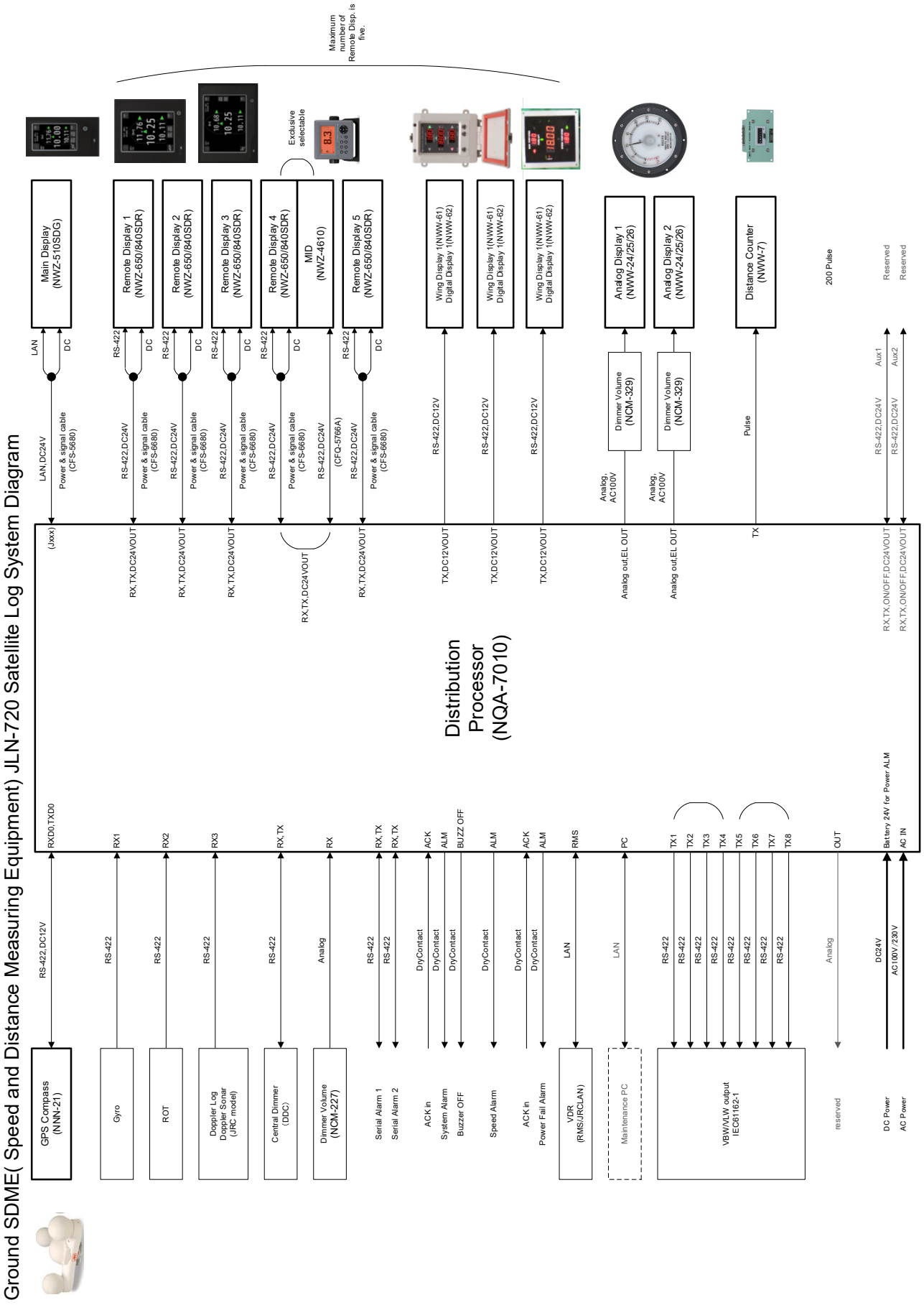
Weight: 0.5kg
NCM-227 (Unit: mm)

Distance counter (Optional)



Weight: 0.5kg
NCM-329 (Unit: mm)

1.5 System Configuration



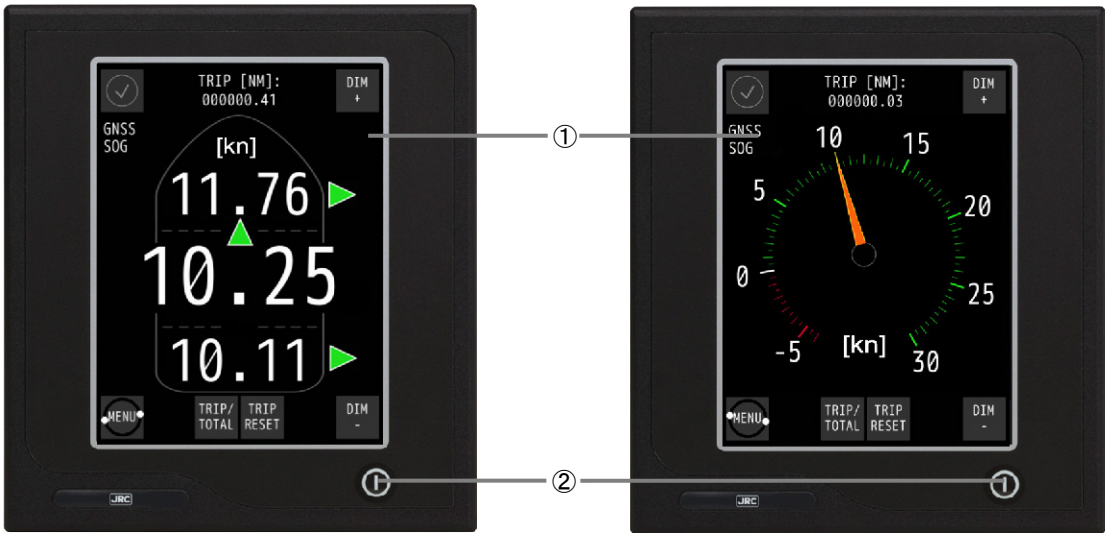
Chapter 2 Function of Each Components

2.1 Main Display NWZ-510SDG

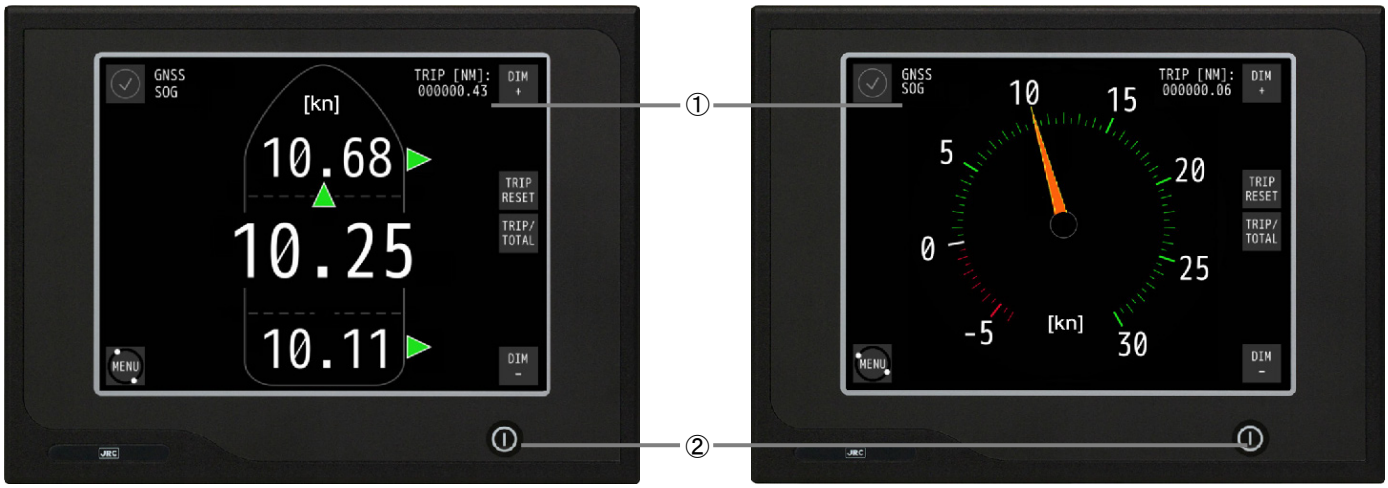
No.	Name	Function
①	Display	• Displays the following information as a display. – Operation status of the equipment (normal/abnormal) – Ahead/astern speed, bow starboard/port speed, stern starboard/port speed – Section sailing distance/total sailing distance – Rate of turn (ROT) • Enables the following operations by a touch panel. – Brightness adjustment – Switching between section sailing distance display and total sailing distance display – Resetting a section sailing distance – Calling a menu
②	Power supply button	Turns power supply ON/OFF whenever the button is pressed.

For more detailed information, please refer to Chapter 3.

2.2 Remote Display (Optional) NWZ-650SDR/840SDR



NWZ-650SDR (Digital) NWZ-650SDR (Analog)

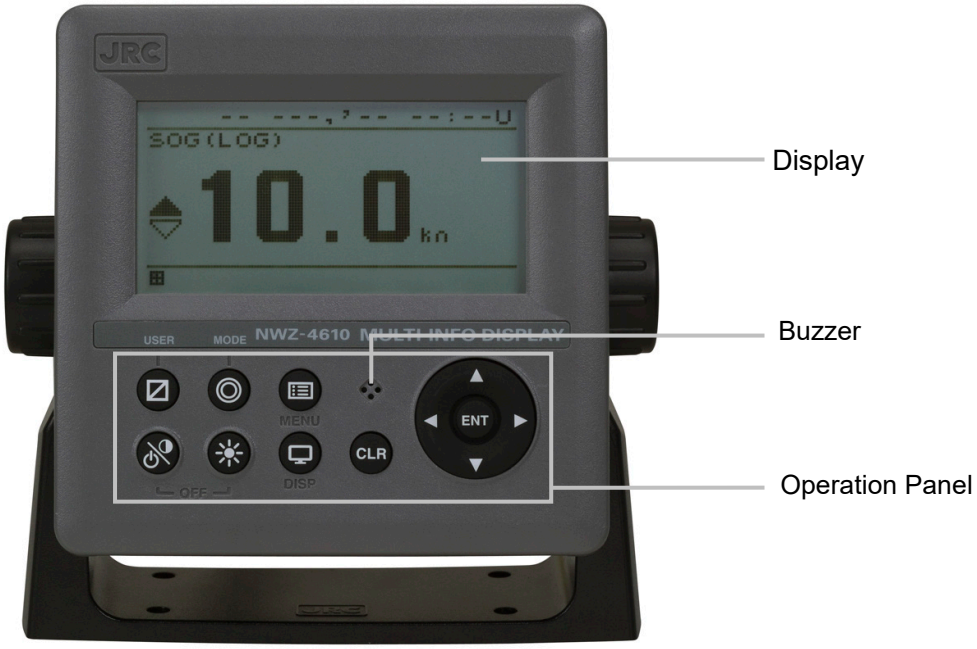


NWZ-840SDR (Digital) NWZ-840SDR (Analog)

No.	Name	Function
①	Display	• Displays the following information as a display. – Operation status of the equipment (normal/abnormal) – Ahead/astern speed (in digital or analog), bow starboard/port speed, stern starboard/port speed – Section sailing distance/total sailing distance • Enables the following operations by a touch panel. – Brightness adjustment – Switching between section sailing distance display and total sailing distance display – Resetting a section sailing distance – Calling a menu
②	Power supply button	Turns power supply ON/OFF whenever the button is pressed.

For more detailed information, please refer to Chapter 3.

2.3 MID (Optional) NWZ-4610



No.	Key	Key Name	Function
①		Power/Contrast	Use this key to turn on the power. Adjust the contrast. To turn off the power, press this key together with the key.
②		Dimmer	Use this key to adjust the brightness of the back light.
③		Menu	Use this key to display the main menu.
④		Display	Use this key to switch the display screen.
⑤	CLR	Clear	Use this key to cancel the operation. Use this key also to stop the alert.
⑥	ENT	Enter	Uses this key to determine the operation.
⑦		Trip reset	Press this key for 1 second to reset TRIP.
⑧		Unit	Use this key to change the unit.
⑨		Cursor	Use this key to move the cursor.

2.4 Wing Display (Optional) NWW-61T

No.	Name	Function
①	POWER button	Turns the power supply ON/OFF whenever the button is pressed.
②	DIMMER button	Adjusts the brightness
③	UNIT button	Switches the speed unit between kn and m/s whenever the button is pressed.

2.5 Distance Counter (Optional) NWW-7

No.	Name	Function
①	Trip reset	Press this key to reset TRIP.

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Chapter 3 Operation Method

⚠WARNING	
	The satellite log must be used strictly as navigation aid equipment only. The final decision on navigation must be made by the pilot. If the final decision is made based on the information displayed by the satellite log only, an accident such as collision or grounding may occur.
	This equipment must not be used by anyone except ship's crews and maintenance staff. Failure to comply may result in misuse.

⚠CAUTION	
	Do not carry out operation of touch panel by a sharp object. Otherwise, the screen may be damaged.
	If power outage occurs inside of the ship during the operation of the satellite log, the image may be disturbed or may not be displayed. In this case, reconnect the power supply.

3.1 Basic Operation

3.1.1 Power Supply ON/OFF

1 **Long press the power supply button for about 1sec.**
The power supply is turned on and the start screen is displayed.

The screen is switched to the normal screen after 30 seconds. Please do not shut down the main display before the vessel speed is displayed.

If the power supply button is long pressed again, the shutdown screen, which is the same as the start screen, is displayed, the power supply is turned off after 30 seconds, and the screen is cleared.
Notice: Do not shut down the system until the normal screen displaying.

3.1.2 Adjusting Brightness

Adjust the brightness to the suitable level for display.
Adjust the brightness by touching the [DIM+] button/[DIM-] button on the touch panel.
The brightness is set to maximum initially.

[DIM+] button

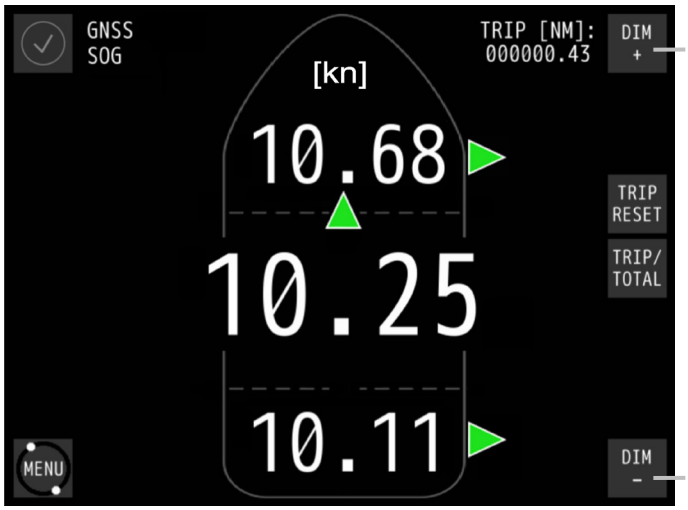
[DIM-] button

Main Display NWZ-510SDG

[DIM+] button

[DIM-] button

Remote Display NWZ-650SDR(Optional)



[DIM+] button

[DIM-] button

Remote Display NWZ-840SDR(Optional)

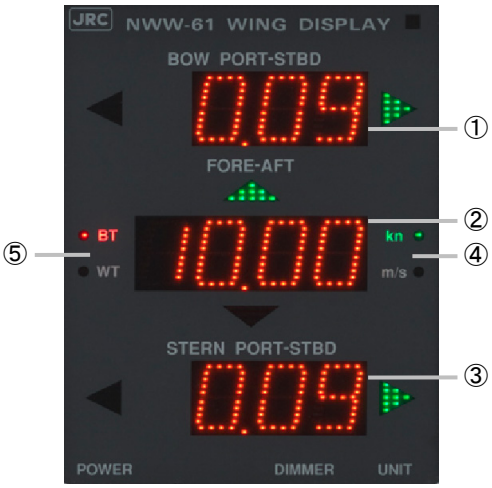
When the [DIM+] button is touched, the display brightness increases and the display can be dimmed by touching the [DIM-] button.
16 brightness levels are available.

3.2 Displaying Ship Speed/Rate of Turn/Accumulated Sailing Distance

On the normal screen, the ship speeds of the ahead/astern and starboard/port directions, rate of turn, and accumulated sailing distance are displayed.

3.2.1 Displaying Ship Speeds

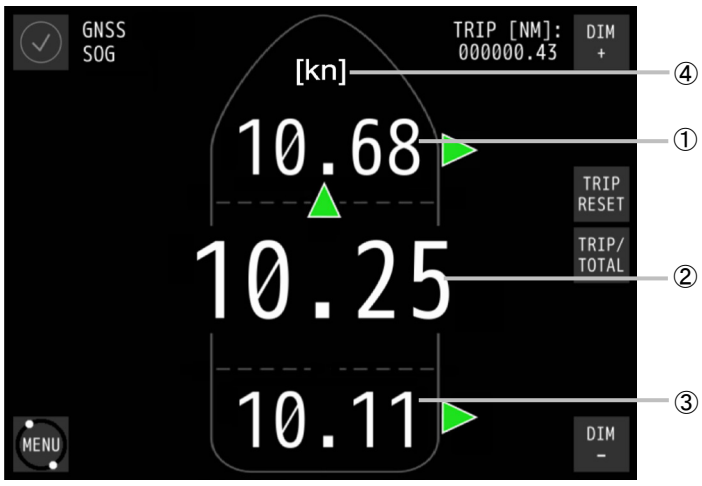
Main Display NWZ-510SDG



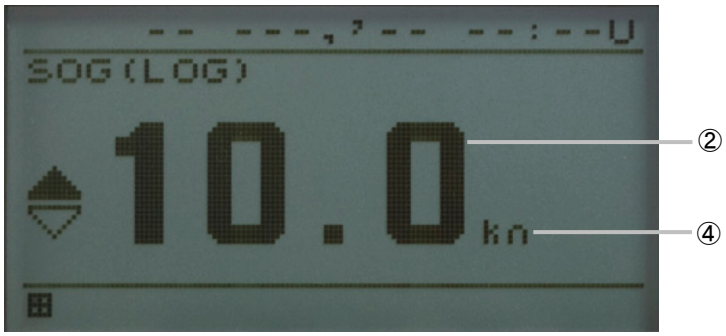
Wing Display NWW-61T (optional)

Remote Display NWZ-650SDR (Optional)

Digital Display NWW-62TA/TB (Optional)



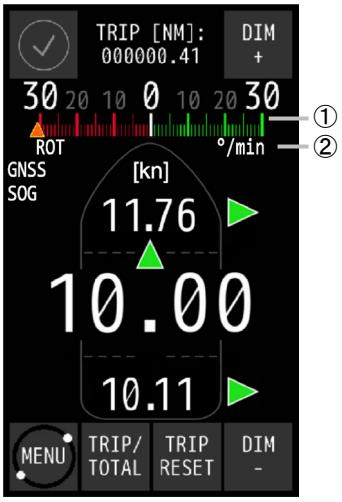
Remote Display NWZ-840SDR (Optional)



Multi-information Display NWZ-4610（Optional）

No.	Display	Remarks
①	Ship speed in the starboard/port direction (bow)	When the bow is moving in the starboard direction, ► is displayed and when the bow is moving in the port direction, ◄ is displayed.
②	Ship speed in the ahead/astern direction	When the ship is moving in the ahead direction, ▲ is displayed and when the ship is moving in the astern direction, ▼ is displayed.
③	Ship speed in the starboard/port direction (stern)	When the stern is moving in the starboard direction, ► is displayed and when the stern is moving in the port direction, ◄ is displayed.
④	Ship speed unit	The unit of ship speed can be set to kn(kts) or m/s by the operating the menu. For setting the ship speed unit of the main display, refer to “4.3.6 Ship Speed Unit Settings”.
⑤	Display mode	At connection with this equipment, the display mode is fixed to SOG (speed over the ground).

3.2.2 Displaying Rate of Turn



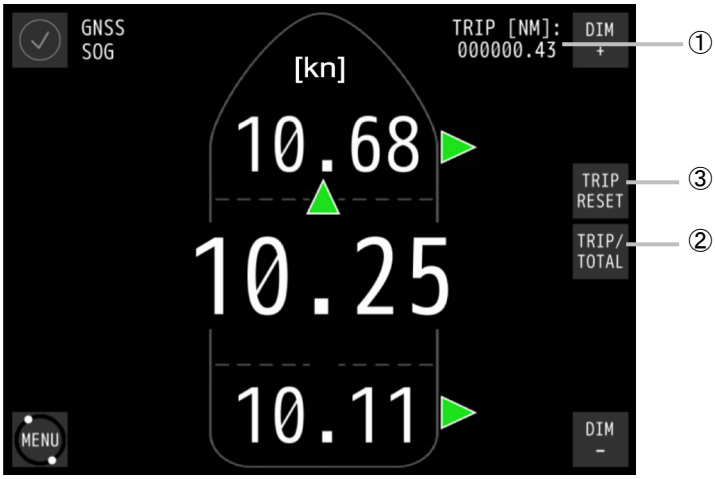
Main Display NWZ-510SDG

No.	Display	Remarks
①	Rate of Turn (ROT)	The ROT scale that is displayed on the screen can be set in the menu. For the setting of ROT scale, refer to “4.3.2 ROT Scale Settings”.
②	Rate of Turn unit	The unit of Rate of Turn is fixed to °/min.

3.2.3 Displaying the Accumulated Sailing Distance

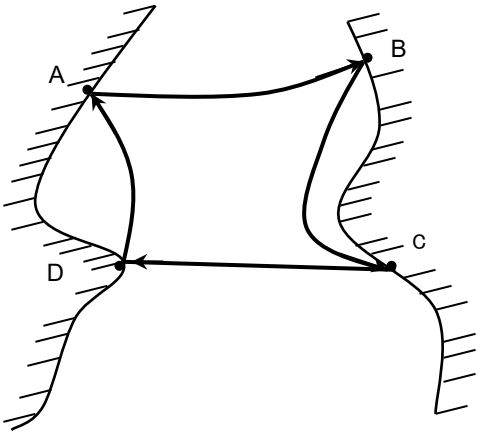
Main Display NWZ-510SDG

Remote Display NWZ-650SDR (Optional)



Remote Display NWZ-840SDR (Optional)

Distance Counter NWW-7(Optional)

No.	Display/button	Remarks
①	Accumulated sailing distance (total sailing distance or section sailing distance)	Whenever the [TRIP/TOTAL] button is pressed, the display is switched between the total sailing distance and the section sailing distance. As shown below, when a vessel leaves point A, stopover at points B, C, and D, then goes back to point A, the [TRIP] (section sailing distance) is used to calculate the distance of each of the individual segments between the point. The [TOTAL] (total sailing distance) is used to calculate the total run distance of the whole journey. 
②	[TRIP/TOTAL] button	Whenever the button is touched, the display is switched between the total sailing distance and the section sailing distance.
③	[TRIP RESET] button	This button can be used to reset the section sailing distance to 0. Remote display NWZ-650SDR/840SDR trip display would "--------" at first time. Do trip reset.

Notice: Resetting of the total sailing distance is unable to general users.

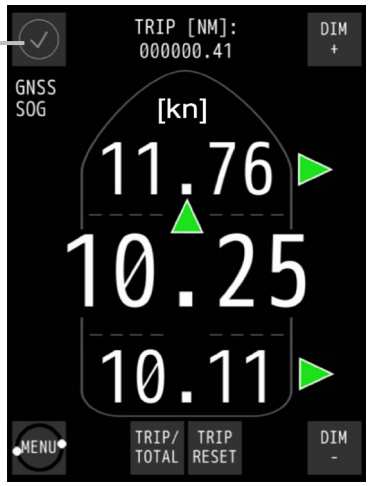
For resetting the total sailing distance, please request to the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.

3.3 Displaying Alert

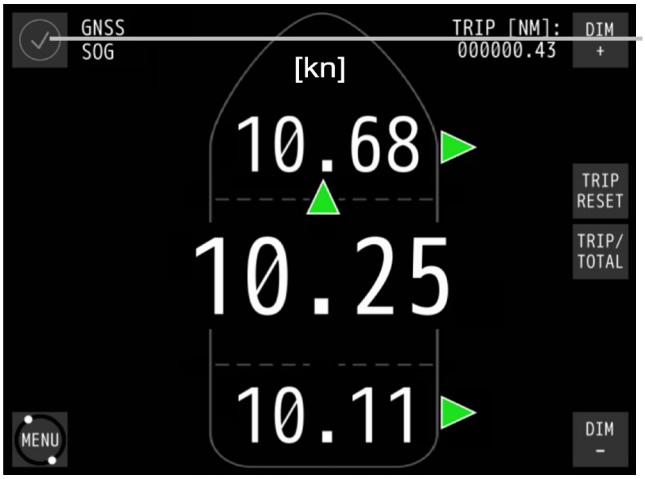
The Normal icon is displayed while this equipment is functioning normally.

Normal icon

Main Display NWZ-510SDG



Remote Display NWZ-650SDR (Optional)



Normal icon

Remote Display NWZ-840SDR (Optional)

When an alert occurs, the event is notified with alert icon and buzzer sound.
Every pressing the alert icon, alert content will appear and disappear.

Alert icon

Alert content

Press the alert content, the buzzer sound stops
Display of the alert icon remains unless the alert is cancelled.

Alert List displays the un acknowledged occurring alerts. When the alerts are acknowledged or cancelled, the alerts would be disappeared from the Alert List. The maximum Alert list display is 10.

For alert list and possible causes, please refer to “4.3.10 Alert History”. The maximum Alert history display is 40.

The Alert Icons are as follows.


Active –unacknowledged warning


Active –acknowledged warning


Rectified –unacknowledged warning


Caution

When multiple identical alerts occurred simultaneously, check the contents of the alerts with ALERT LIST and ALERT HIST (alert history).

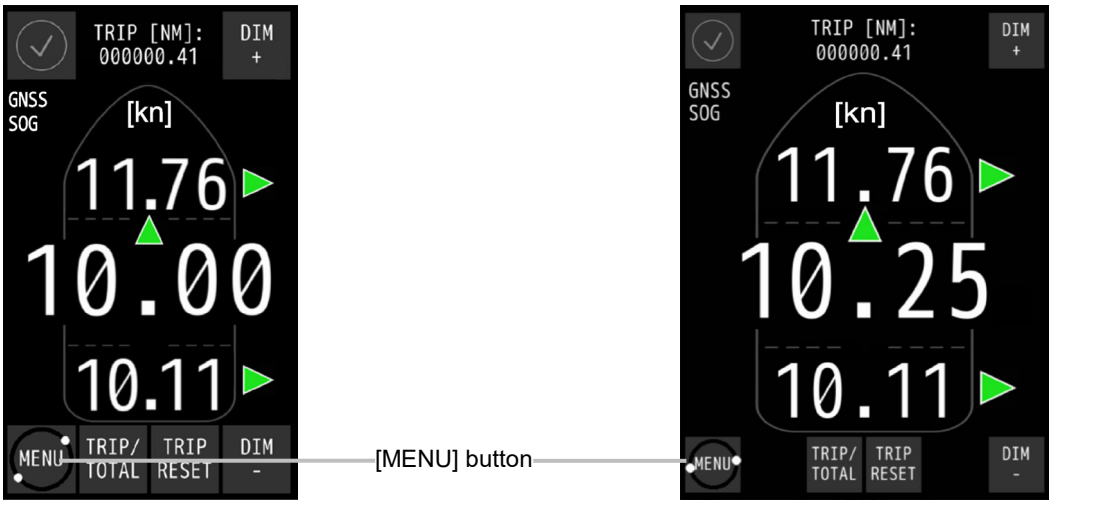
Chapter 4 Menu Settings and Configurations

On this equipment, various configurations can be set and adjusted by operating the menus on the touch panel.

⚠CAUTION	
	Adjustments must be made by specialized service technicians. Incorrect settings may result in unstable operation, and this may lead to accidents or equipment failure.
	Adjust the brightness of main display according to the surrounding lighting; particularly using the brightness pattern [NIGHT] may interfere with the recognition of display information.

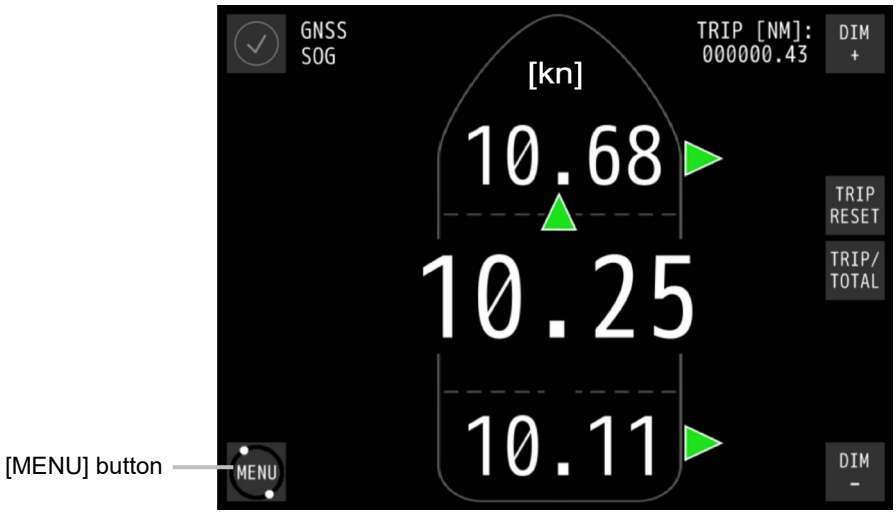
4.1 Main Menu

Touch the [MENU] button on the touch panel.



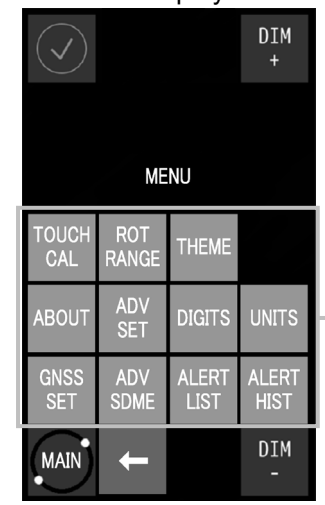
Main Display NWZ-510SDG

Remote Display NWZ-650SDR (Optional)



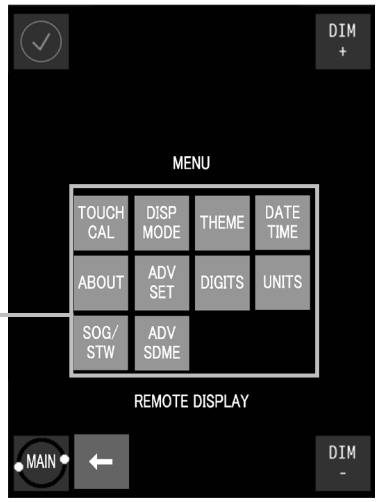
Remote Display NWZ-840SDR (Optional)

The main menu is displayed.

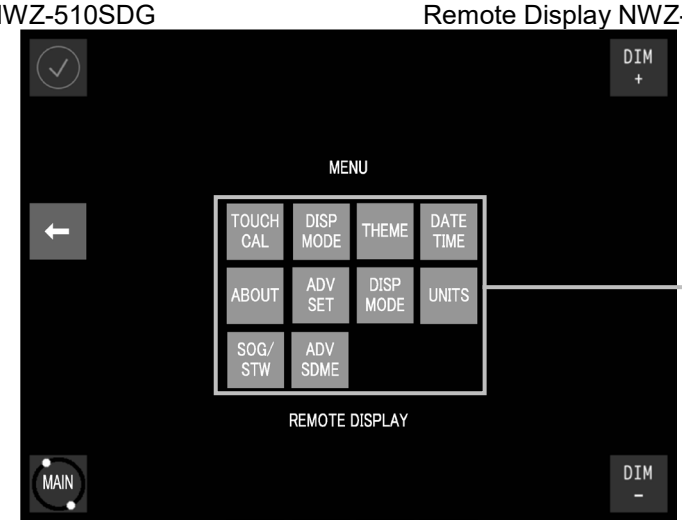


Main Display NWZ-510SDG

Main menu



Remote Display NWZ-650SDR (Optional)



Main menu

Remote Display NWZ-840SDR (Optional)

The function of each menu is listed below.

Menu	Function
[TOUCH CAL] (Touch position calibration)	Calibrates so that the position touched corresponds to the intended button.
[ROT RANGE] (Rate of turn scale display range setting)	Selecting the rate of turn scale range that is displayed on the touch panel.
[THEME] (Brightness adjustment)	Changes the brightness of the touch panel according to the ambient brightness.
[ABOUT](Information on this equipment)	Displays the information relating to this equipment such as the software version.
[ADV SET] (Advanced setting)	Menu for relevant engineers only. This function is not used by general users.
[DIGITS] (Number of speed indication digits)	Selecting the number of digits for ship speed indication.
[UNITS] (Unit setting)	Selecting the unit for ship speed.
[GNSS SET] (GNSS system setting)	Displays the information and settings of the Global Navigation Satellite System.
[ADV SDME] (Advanced setting of this equipment)	Menu for relevant engineers only This function is not used by general users.
[ALERT LIST] (Alert list)	Displays the list of current alerts.
[ALERT HIST] (Alert history)	Displays the history of all alerts that occurred.

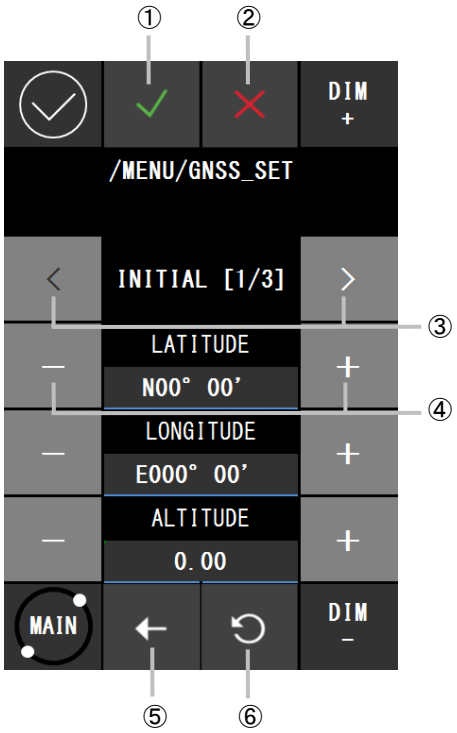
The following menus are only used for remote display.

Menu	Function
[DATE TIME] (Date setting)	Setting the year, month, day and time of remote display.
[DISP MODE] (Display mode selecting)	Selecting the display mode of remote display.
[SOG/STW] (SOG and STW selecting)	Selecting the display speed between SOG and STW.

* When JLN-720 is equipped Remote Display, Doppler Log or Doppler Sonar of JRC product is required to display water speed.

4.2 Common Operation of Each Menu

The following buttons perform the common functions.
(The buttons are available depended on the menu, for example, in [GNSS SET] menu below.)



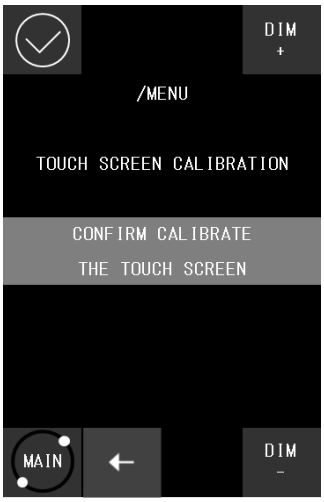
No.	Name	Function
①	(Enter) button	Saves the current settings or modifications. Saved setting is kept even after the power supply of this equipment is turned off.
②	(Reset and close) button	Resets all the settings/modifications and returns to the previous screen.
③	[<]/[>] (Change page) button	Turns the pages when the menu comprises multiple screens (pages).
④	[-]/[+]（Minus and plus）button	Increase and decrease the numbers or switching between several selections
⑤	(Return) button	Resets the current setting and returns to the previous screen.
⑥	(Undo) button	Resets the last setting/modification.

4.3 Operation of Each Menu

4.3.1 Touch Position Calibration

When the screen is touched and the position of the intended button does not match, the calibration can be corrected in this menu.

1. **Touch the [TOUCH CAL] button in the main menu.**
   A touch position calibration confirmation screen is displayed.



2. **Touch [CONFIRM CALIBRATE THE TOUCH SCREEN].**
   The start screen is displayed.
   5 seconds later, a touch position calibration screen is displayed.

3. Touch the center of the target marks at the four corners of the screen.

Touch the center of the target marks at the four corners in the order from 1 to 4.

The following screen is displayed.

4. Draw a graphic or a character for validation by touching the screen.

5. Confirm the graph or the character:

Calibration is completed. Close the [TOUCH CAL] menu by touching the [ACCEPT] button.

The touched position does not match the position of the graphic or character:

Restart calibration. Touch the [AGAIN] button and start again from step 2.

Note: If the calibration would take over one minutes, after return to the normal screen the “DISPLAY COMM FAIL” alert would occur. This is not the system malfunction.

4.3.2 ROT Scale Settings

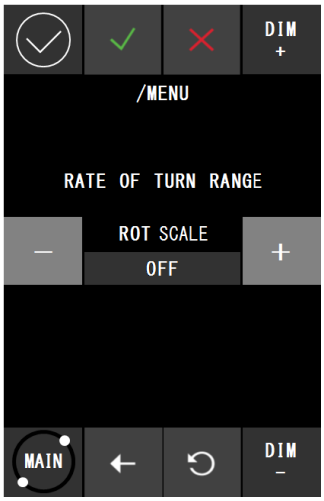
The scale of the rate of turn on the display can be set.

Note

For the display of rate of turn, refer to “3.2.2 Displaying Rate of Turn”.

1. **Touch the [ROT RANGE] button in the main menu.**

   The screen for setting a scale of rate of turn is displayed.



2. **Change the display scale by touching the [-]/[+] buttons.**

   OFF: (initial value)

   15: -15° to +15°

   30: -30° to +30°

   60: -60° to +60°

   90: -90° to +90°

   120: -120° to +120°

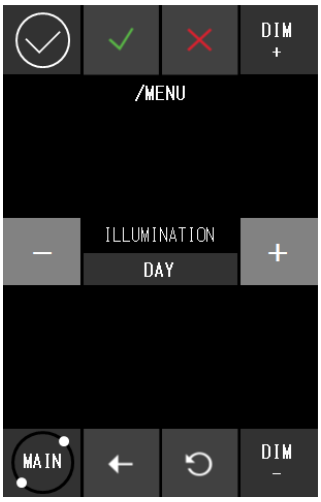
   150: -150° to +150°

3. **Close the [ROT RANGE] menu by touching the**  **button.**

4.3.3 Brightness Adjustment

The brightness of the screen can be adjusted by the time period of a day.

1. **Touch the [THEME] button in the main menu.**
   A brightness adjustment screen is displayed.

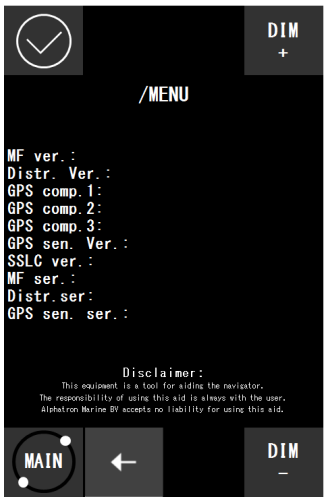


2. **Change the brightness by touching the [-]/[+] buttons.**
   DAY: High brightness (for daytime) (initial value)
   DUSK: Medium brightness (for evening time)
   NIGHT: Low brightness (for night time)
3. **Close the [THEME] menu by touching the**  **button.**

4.3.4 Detailed Information

The [ABOUT] menu displays the information relating to this equipment.
Before making an enquiry on this equipment, check the information of this equipment in the [ABOUT] menu.

1. Touch the [ABOUT] button in the main menu.
Information on the equipment is displayed.



2. Close the [ABOUT] menu by touching the ← button.

Information that is displayed in the [ABOUT] menu.
The following information is displayed in the [ABOUT] menu.

Information	Description
Software version (main display)	Software version of main display.
Software version (distributed processor)	Software version of distributed processor. Indicated in the format of “Rxx.xx”.
Software version (GPS compass sensor core 1)	Software version of GPS compass sensor core 1. Indicated in the format of “RLx.x”.
Software version (GPS compass sensor core 2)	Software version of GPS compass sensor core 2. Indicated in the format of “RLx.x”.
Software version (GPS compass sensor core 3)	Software version of GPS compass sensor core 3. Indicated in the format of “RLx.x”.
Software version (GPS compass sensor)	Software version of GPS compass sensor. Indicated in the format of “Rxx.xx”.
Software version (single serial-LAN converter)	Software version of single serial-LAN converter. Indicated in the format of “Rxx.xx”.
Serial number (main display)	Main display serial number. (Note: now displaying only “0000000000”)
Serial number (distribution processor)	Serial number of the distribution processor.
Serial number (GPS compass sensor)	Serial number of the GPS compass sensor Indicated in the format of “KXxxxxx”

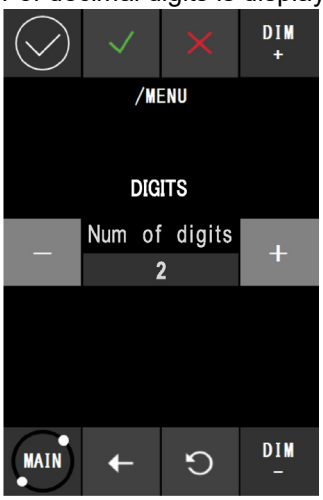
4.3.5 Advanced Settings

This menu is for the engineers who are engaged in the installation of this equipment.
This menu is not used by general users.

4.3.6 Setting the number of decimal digits of a ship speed

The number of decimal digits can be set for the ship speed that is displayed on the normal screen.

1. **Touch the [DIGITS] button on the main menu.**
   A screen for setting the number of decimal digits is displayed.



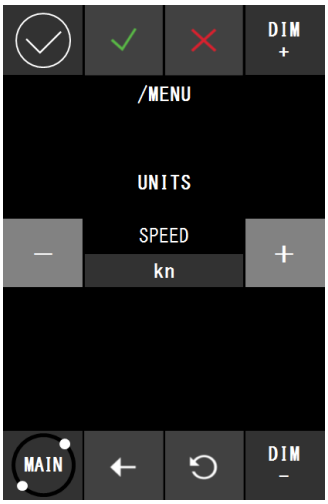
2. **Set the number of decimal digits by touching the [-]/[+] buttons.**
   2: Displays two decimal digits (default value).
   1: Displays one decimal digit.

3. **Close the menu by touching the**  **button.**

4.3.7 Ship Speed Unit Settings

The unit of the ship speed that is displayed on the touch panel can be set.

1. **Touch the [UNITS] button in the main menu.**
   A screen for setting a unit is displayed.



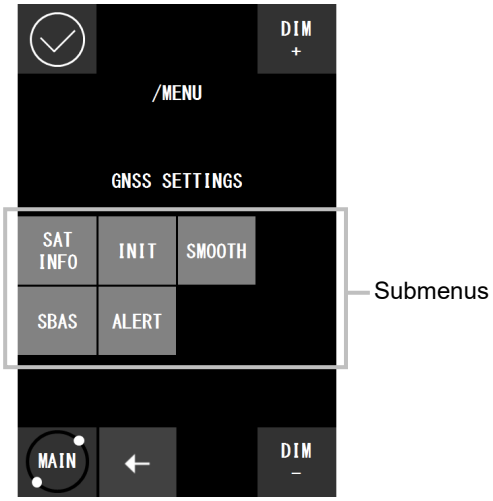
2. **Change the unit by touching the [-]/[+] buttons.**
   kn: knots (initial value)
   m/s: meters/second
3. **Close the [UNITS] menu by touching the**  **button.**

4.3.8 GPS Information and Settings

On this menu, display the information relating to the accuracy of GPS and set accuracy and alert.
Five submenus are available under the [GNSS SET] menu.

1. Touch the [GNSS SET] button in the main menu.

The following submenus are displayed.



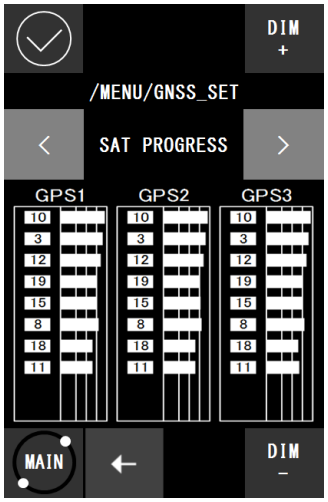
The function of each submenu is as follows.

Submenu	Function
[SAT INFO]	Displays satellite information.
[INIT]	Increases the GPS accuracy by setting of the latitude/longitude, height of the GPS compass sensor, date, and time.
[SMOOTH]	Prevents an extreme change of position data obtained from the satellites.
[SBAS]	Used for the setting of SBAS that corrects GPS errors by using a stationary satellite.
[ALERT]	Set the time before issuing an alert when positioning by GPS is disabled.

4.3.8.1 Satellite Information

This submenu displays the information of the satellite that is currently used by the GPS compass sensor.

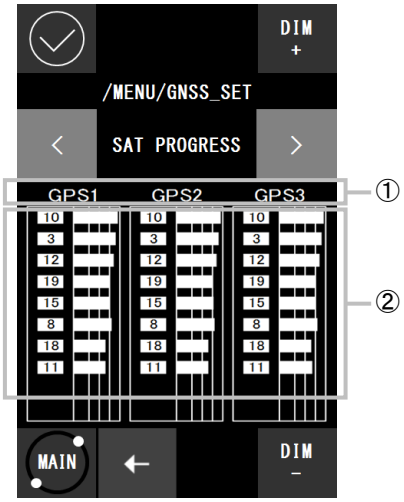
1. **Touch the [SAT INFO] button in the submenu.**
   The 1st page of the satellite information screen is displayed.



2. **Change the page by touching the [<]/[>] button as required and check the information.**
   There are four pages for a satellite information screen.
3. **Close the [SAT INFO] submenu by touching the ← button.**
4. **Close the [GNSS SET] menu by touching the ← button.**

Satellite information screen

The following information is displayed in page 1 of the satellite information screen.



No.	Display	Meaning
①	GPS compass sensor core number	Three sensor cores of GPS compass sensor NNN-21
②	PRN code of satellite and signal intensity	PRN code of the GPS satellite that is currently used. Displays the satellite S/N ratios (signal to noise ratio) starting from the highest ratio at the top to lowest. For the display of the PRN code, refer to “PRN code display format”.

PRN code display format

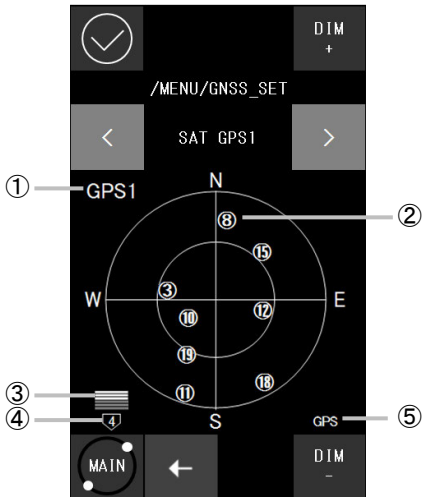
The display of the PRN code is in one of the following three formats according to the satellite utilization status.

10 10 : Used for measuring the position and the azimuth (high satellite signal intensity)

10 10 : Used for measuring the position (slightly lower satellite signal intensity)

10 10 : Not used (Satellite signal intensity too low for positioning usage)

The following information is displayed in pages 2 to 4 of the satellite information screen.



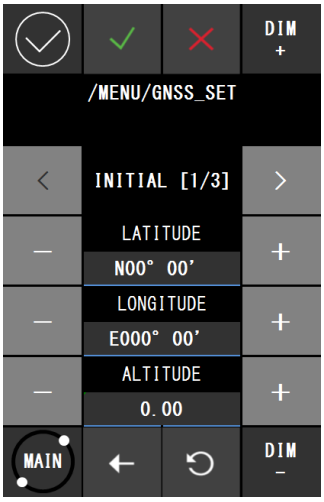
No.	Display	Meaning
①	GPS compass sensor core number	Number of the 3 cores from GPS compass sensor They are GPS1, GPS2, and GPS3 and the GPS1 Screen displays the information of the GPS satellite that is currently received by core 1.
②	PRN code	PRN code of the GPS satellite that is currently used. For the display of PRN code, refer to “PRN code display format”.
③	Calculation progress	The display changes in the sequence of  as the GPS positioning calculation progresses. When calculation is completed, this mark is cleared.
④	Number of GPS satellites	Displays the number of GPS satellites that are currently used. The number is displayed when the number of satellites is 4 or less and hidden when the number of satellites is 5 or more.
⑤	GPS positioning mode	GPS positioning mode that is currently executed. GPS: Normal GPS positioning mode SBAS: SBAS (error correction by using a stationery satellite) positioning mode SIM: Simulation mode under which no actual positioning is performed (demonstration mode)

4.3.8.2 Initial Settings

Information on the latitude/longitude, date and time can be set in this menu according to the actual information.

1. Touch the [INIT] button in the submenu.

The 1st page of the information setting screen is displayed.



2. Touch the [-]/[+] button, the [LATITUDE] can be switched between the north latitude and the south latitude; the [LONGITUDE] can be switched between the east longitude and the west longitude; the [ALTITUDE] (height of the GPS compass sensor from the surface of sea) can be decreased or increased every 10m.

3. Touch the [LATITUDE], [LONGITUDE] and [ALTITUDE] button, the numeric entry screen is displayed.

Touch the  botton to delete the existing numbers.

Touch the panel to enter the numbers.

Touch  botton to confirm the entry, and close the numeric entry screen.

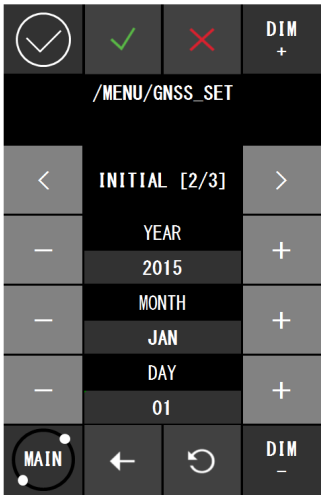
The setting ranges are as follows.

[LATITUDE]: N/S 00°00' to 90°00' (initial value: N00°00')

[LONGITUDE]: E/W 000°00' to 180°00' (initial value: E000°00')

[ALTITUDE]: 0.00 to 99.9m (initial value: 0.00)

4. Turning to the 2nd page by touching the [>] button.



5. Set [YEAR], [MONTH], and [DAY] to the actual values by touching the [-]/[+] buttons and touch the button.

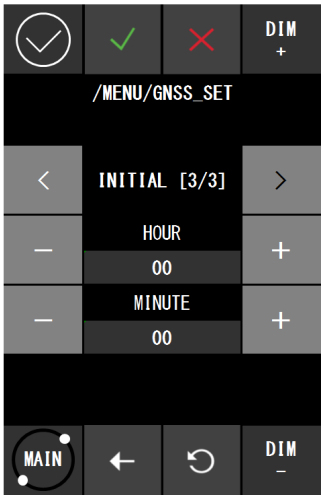
The setting ranges are as follows.

[YEAR]: 2000 to 2099 (initial value: 2015)

[MONTH]: JAN～DEC (initial value: JAN)

[DAY]: 01 to 31 (initial value: 01)

6. Turning to page 3 by touching the [>] button.



7. Set [HOUR] and [MINUTE] to the actual values by touching the [-]/[+] buttons and touch the button.

The setting ranges are as follows.

[HOUR]: 00 to 23 (initial value: 00)

[MINUTE]: 00 to 59 (initial value: 00)

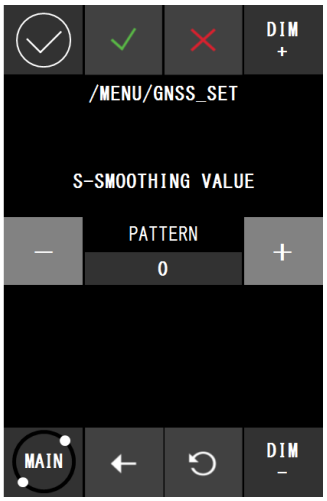
8. Close the [GNSS SET] menu by touching the button.

4.3.8.3 Smoothing Settings

The submenu is used to prevent extreme changes of the calculated ship speed. This stabilizes the speed displayed on the main display.

1. Touch the [SMOOTH] in the submenu.

A smooth setting screen is displayed.



2. Select a smooth setting value by touching the [-]/[+] buttons.

0: Somewhat weak smooth setting (recommended initial value).

1: Weak smooth setting

2: Strong smooth setting

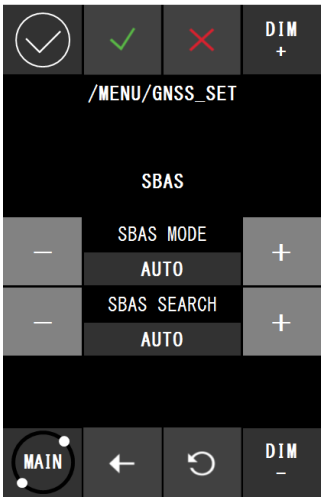
3. Close the [SMOOTH] submenu by touching the button.

4. Close the [GNSS SET] menu by touching the button.

4.3.8.4 SBAS Mode Settings

Satellite-Based Augmentation System (SBAS) that using a stationary satellite to correct GPS errors can be set.

1. **Touch the [SBAS] button in the submenu.**
   The SBAS setting screen is displayed.



2. **Select a SBAS mode by touching the [-]/[+] button of [SBAS MODE].**
   AUTO: SBAS, or GPS Only will be selected automatically for measurement according to the status of signal reception. (In order: SBAS → GPS only)
   GPS ONLY: Position is fixed by GPS only. SBAS measurement will not be performed.
   SBAS+GPS: SBAS takes the priority of measurement. Switched automatically to “GPS Only” when SBAS information is not obtained.
   DGPS+GPS: Not used for JLN-720.

3. **Specify the stationary satellite to be used with the number by touching the [-]/[+] buttons of [SBAS SEARCH].**
   AUTO: Automatically search.
   Specifiable numbers are from 120 to 138.

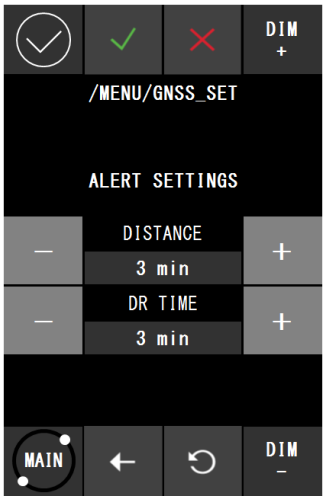
4. **Close the [SBAS] submenu by touching the ✓ button.**

5. **Close the [GNSS SET] menu by touching the ← button.**

4.3.8.5 Alert Settings

When positioning by GPS is disabled, the interval time before issuing an alert can be set.

1. **Touch the [ALERT] button in the submenu.**
   An alert issuing setting screen is displayed.



2. **Set the elapsed time for issuing an alert by touching the [-]/[+] buttons of [SBAS MODE].**
   One of [OFF] (alert hidden), [1 min], [2 min], and [3 min] can be set.
   For instance, when [1 min] is set, an alert is issued one minute after the positioning by GPS is stopped.
   This alert indicates the “stopping of the communication with GPS”.

3. **Set the time from switching to DR (Dead Reckoning) to the issuing of alert by touching the [-]/[+] buttons.**

   One of [1 min], [2 min], and [3 min] can be set.
   For instance, when [2 min] is set, at the stopping of positioning by GPS, the operation is switched to DR and, after 2 minutes, an alert is issued.
   This alert indicates “deterioration of the accuracy of the predicted position”.

4. **Close the [ALERT] submenu by touching the button.**

5. **Close the [GNSS SET] menu by touching the button.**

4.3.9 SDME Advanced Settings

This menu is used by engineers who are assigned to install this equipment.
This menu is not used by general users.

4.3.10 Alert List

A list of current alerts. The alerts that have been acknowledged or resolved are not displayed in this list. (displays upto 10)

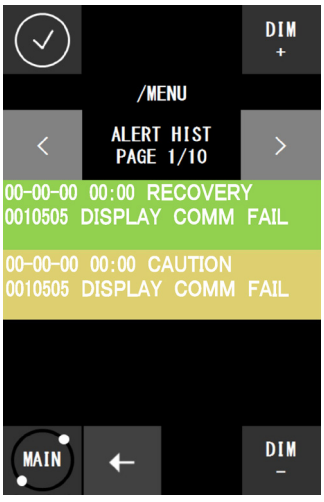
1. **Touch the [ALERT LIST] button in this main menu.**
   An alert list is displayed.

2. **When the list contain multiple pages, the page can be switched by touching the [<]/[>] buttons.**
3. **Close the [ALERT LIST] menu by touching the ← button.**

4.3.11 Alert History

The history of the alerts that were issued (including occurring and acknowledging longitude and latitude) can be displayed. (displays upto 40)

1. **Touch the [ALERT HIST] button in the main menu.**
   An alert list is displayed.



2. **When the history covers multiple pages, the page can be switched by touching the [-]/[+] buttons.**
3. **Close the [ALTER HIST] menu by touching the ← button.**

JLN-720 Alert list

Pop up message	Warning	Caution	Possible Causes
GPS SENSOR FAIL	○		Communication between GPS compass sensor is disconnected
NO GPS FIX		○	Unable to receive GPS signal
NO GPS HEADING		○	Unable to receive GPS signal
GYRO DATA RECV FAIL		○	Communication between Gyro sensor is disconnected
ROT DATA RECV FAIL		○	Communication between ROT sensor is disconnected
DISPLAY COMM FAIL		○	Communication between main display is disconnected
HW CHECK FAIL	○		A failure of hardware is detected
NO GPS ROT		○	Unable to receive GPS signal
DISTANCE CALC FAIL		○	Unable to receive GPS signal
SSLC HW CHECK FAIL	○		A failure of hardware is detected
PARSING OF NMEA (*Talker* + *ID*) FAILED		○	Communication between distribution processor and main/remote display is disconnected
INVALID CHECKSUM OF NMEA (*Talker* + *ID*) SENTENCE		○	Communication between distribution processor and main/remote display is disconnected
(*ID*) TIMED OUT		○	Communication between distribution processor and main/remote display is disconnected
DISTRIBUTOR COM. FAIL		○	Communication between distribution processor and main display is disconnected
MODBUS TIMEDOUT		○	Communication between distribution processor is disconnected
MODBUS CANNOT CONNECT TO (*IP*):(*PORT*)		○	Communication between distribution processor and main display is disconnected
MAINTENANCE MODE		○	Under maintenance mode
UPDATE MODE		○	Under software update mode

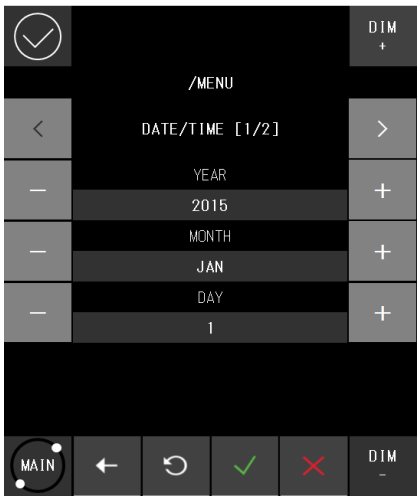
- Warning: Occurred when the equipment can operate, but unable to measure the speed or the voyage distance of the vessel.
- Caution: Occurred when the performance of this equipment is OK, but in an unintended state.

4.3.12 Date Setting (for remote display)

Information on the date and time of the remote display can be set in this menu according to the actual information.

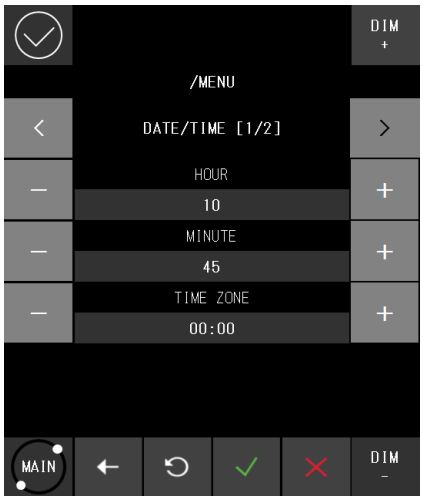
1. **Touch the [DATE TIME] button in the main menu of remote display.**
   The 1st page of the information setting screen is displayed.

2. **Set [YEAR], [MONTH], and [DAY] to the actual values by touching the [-]/[+] buttons.**



   The setting ranges are as follows.
   [YEAR]: 2000 to 2099 (initial value: 2015)
   [MONTH]: JAN～DEC (initial value: JAN)
   [DAY]: 1 to 31 (initial value: 1)

3. **Turning to page 2 by touching the [>] button.**



4. **Set [HOUR], [MINUTE] and [TIME ZONE] to the actual values by touching the [-]/[+] buttons.**
   The setting ranges are as follows.
   [HOUR]: 0 to 23 (initial value: 0)
   [MINUTE]: 0 to 59 (initial value: 0)
   [TIME ZONE]: -12:00 to +12:00 (initial value: 00:00)

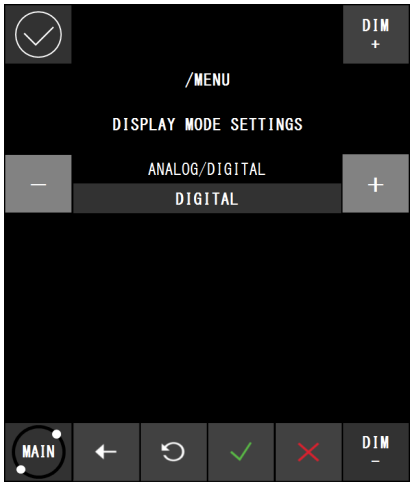
5. **Confirm the setting and close the [DATE TIME] menu by touching the ✓ button.**

4.3.13 Display Mode Selection (for remote display)

Display mode of the remote display can be selected in this menu.

1. **Touch the [DISP MODE] button in the main menu of remote display.**
   Display mode setting screen is then displayed.

2. **Set the display mode by touching the [-]/[+] buttons.**



DIGITAL: Display in digital mode (initial value)
ANALOG: Display in analog mode

Display in digital mode

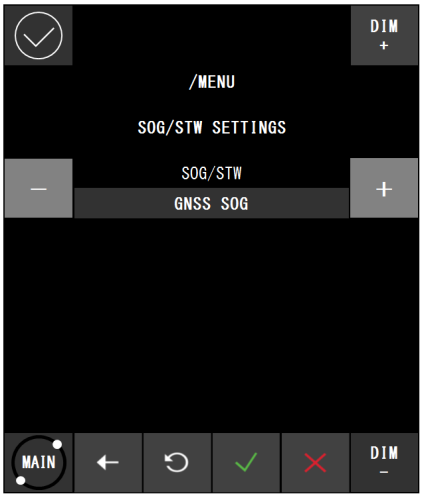
Display in analog mode

3. **Confirm the setting and close the [DISP MODE] menu by touching the ✓ button.**

4.3.14 SOG and STW selection (for remote display)

The SOG and STW of the remote display can be selected in this menu. (Connection to Doppler Log is necessary to some selections.)

1. **Touch the [SOG/STW] button in the main menu of remote display.**
2. **SOG/STW setting screen is then displayed. Touch the [-]/[+] buttons to switch the SOG and STW of the remote display**



GNSS SOG: Display the vessel speed over ground from the GPS compass sensor.
DOPPLER SOG: Display the vessel speed over ground from the Doppler.
DOPPLER STW: Display the vessel speed through water from the Doppler.

3. **Confirm the setting and close the [SOG/STW] menu by touching the button.**

Chpater 5 Installation Method

⚠CAUTION	
	Electrical work for this equipment must be requested to the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Conducting electrical work by anyone other than the specialized maintenance staff may result in an accident or an equipment fault.
	Use the screws that are specified in the installation manual when installing this equipment. Use of any other screws may result in an injury or an equipment failure caused by the equipment dropping down.
	Use the specified power supply cables, signal cables, and earth cables. Failure to comply may cause faults in some other equipment or cause this equipment to become susceptible to faults from some other equipment.
	When mounting the equipment on the wall, mount it firmly to avoid the equipment from dropping under its own weight. Failure to comply may result in an injury caused by the dropping equipment.
	When installing this equipment, make sure that the equipment is connected to the earth terminal and the earth plate properly. Failure to comply may results in an electric shock at an equipment fault or an electric leakage.
	Do not place this equipment inside of a cupboard or cover it with a cardboard. Failure to comply may cause heat accumulation, resulting in fire or an equipment fault.
	Do not use or leave the equipment under direct sunlight for a long time or in the temperatures above 55°C. (except wing display) Otherwise, fire or a malfunction may occur.
	Do not install the equipment in a place under the influence of water, humidity, vapor, dust or soot. (except wing display) Failure to comply may result in fire, an electric shock, or an equipment malfunction.
	Do not place this equipment in a location under the influence of frequent vibrations or impact. Failure to comply may cause the equipment to drop or fall over, resulting an injury or an equipment fault.

5.1 Installation of the Main Display and Distribution Processor

Installation location

Install these equipment units in a place that is not susceptible to interferences since signal cables are susceptible to noise and generate noise easily.

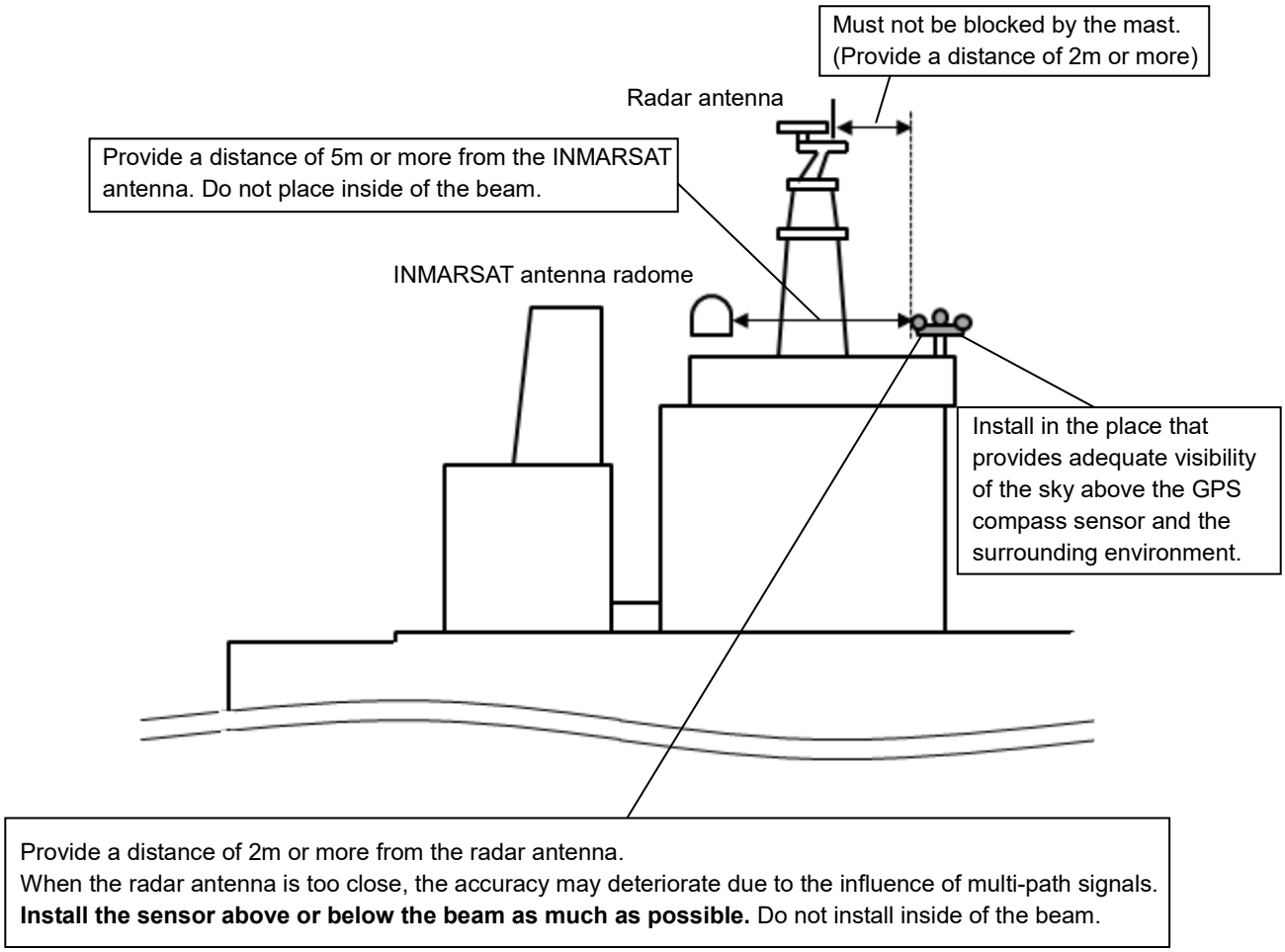
Do not install the equipment units in the coaxial cable besides of the DSB radio or amateur radio device.

Do not install the equipment units in a place that is exposed to direct sunlight (except wing displays), wave splashes, or hot air.

5.2 Installation of the GPS Compass Sensor

⚠WARNING	
	When installing the cable that is attached to the GPS compass sensor, do not bend the cable to a sharp angle, twist it, or install it in such a manner that some force is applied to the cable. Failure to comply may cause cracks or damage inside of the film, resulting in fire or an electric shock.
	Do not install the GPS compass sensor in a place that is exposed to severe vibration. Failure to comply may cause reception defects, resulting in an accident.

This equipment determines the ship's heading azimuth by using carrier waves of the GPS satellite. Install the GPS compass sensor in a place free from any barriers so that the sensor can directly receive radio waves from the satellite without any blockage or re-reflection of waves in the surrounding environment. An unsuitable sensor installation environment may cause frequent interruptions of the ship's heading azimuth calculation.
If an ideal location cannot be selected easily and some compromise is necessary, initially install the GPS compass sensor and fix the sensor after carrying out tests as to whether specified performance can be obtained. Installation of the GPS compass sensor in an unsuitable place causes deterioration of accuracy, resulting in possible accidents. Under low visibility or frequent radio reflections, deterioration of azimuth accuracy or interruption of azimuth measurements may occur.
Install the GPS compass sensor in the place that complies with the following criteria.



Strictly observe the following instructions when installing the GPS compass sensor on a tiltable mast.

- Make sure that no abnormal vibration or impact is generated.
- When the mast is tilted, suspend the use of the GPS compass sensor since the sensor cannot function normally.
- Make sure that no positional difference occurs as a result of tilting the mast.

Install the GPS compass sensor in a place free from any barrier so that the sensor can directly receive radio waves from the satellite without any interferences of radio waves from the ambient environment or re-reflection.

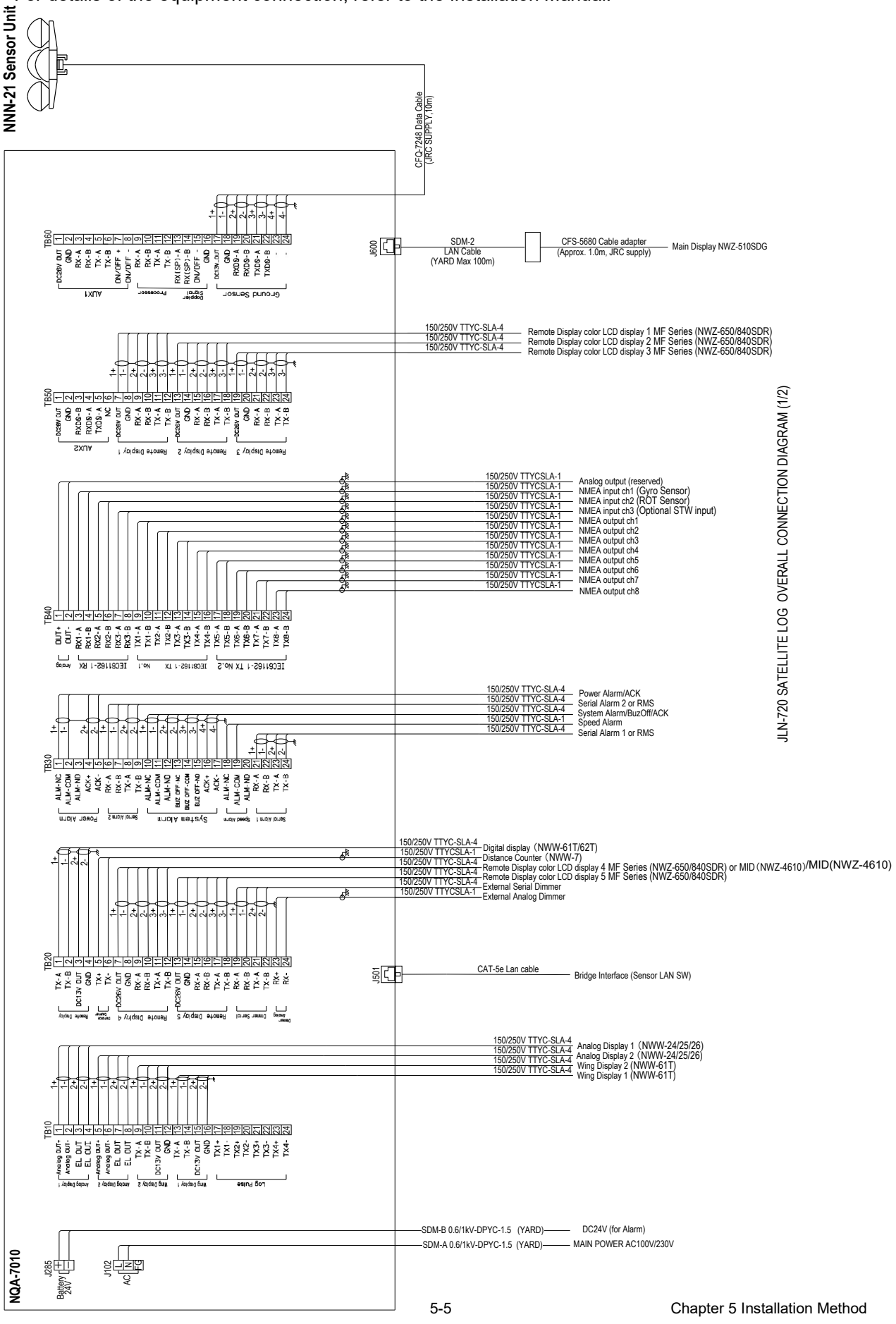
Install the GPS compass sensor in a place that complies with the following criteria as much as possible.

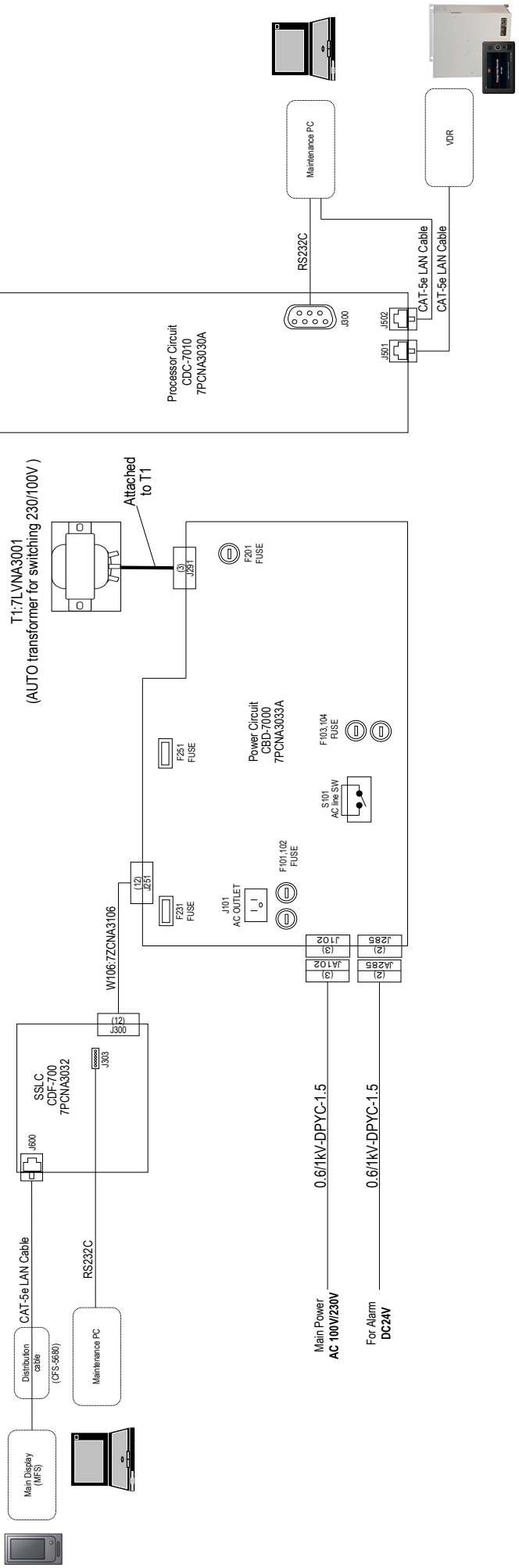
- Place of high visibility that can receive signals uniformly from the satellites in the sky
- Place at the sufficient distance from any high output transmission antennas
- Place outside of the radar beam
- Place at the distance of 5m or more from the INMARSAT antenna and outside of the beam
- Place at the distance of 3m or more from the VHF, MF/HF, and azimuth detector
- Place at the distance of 1m or more from the magnetic compass sensor
- Place at the distance of 3m or more from the amateur radio device antenna

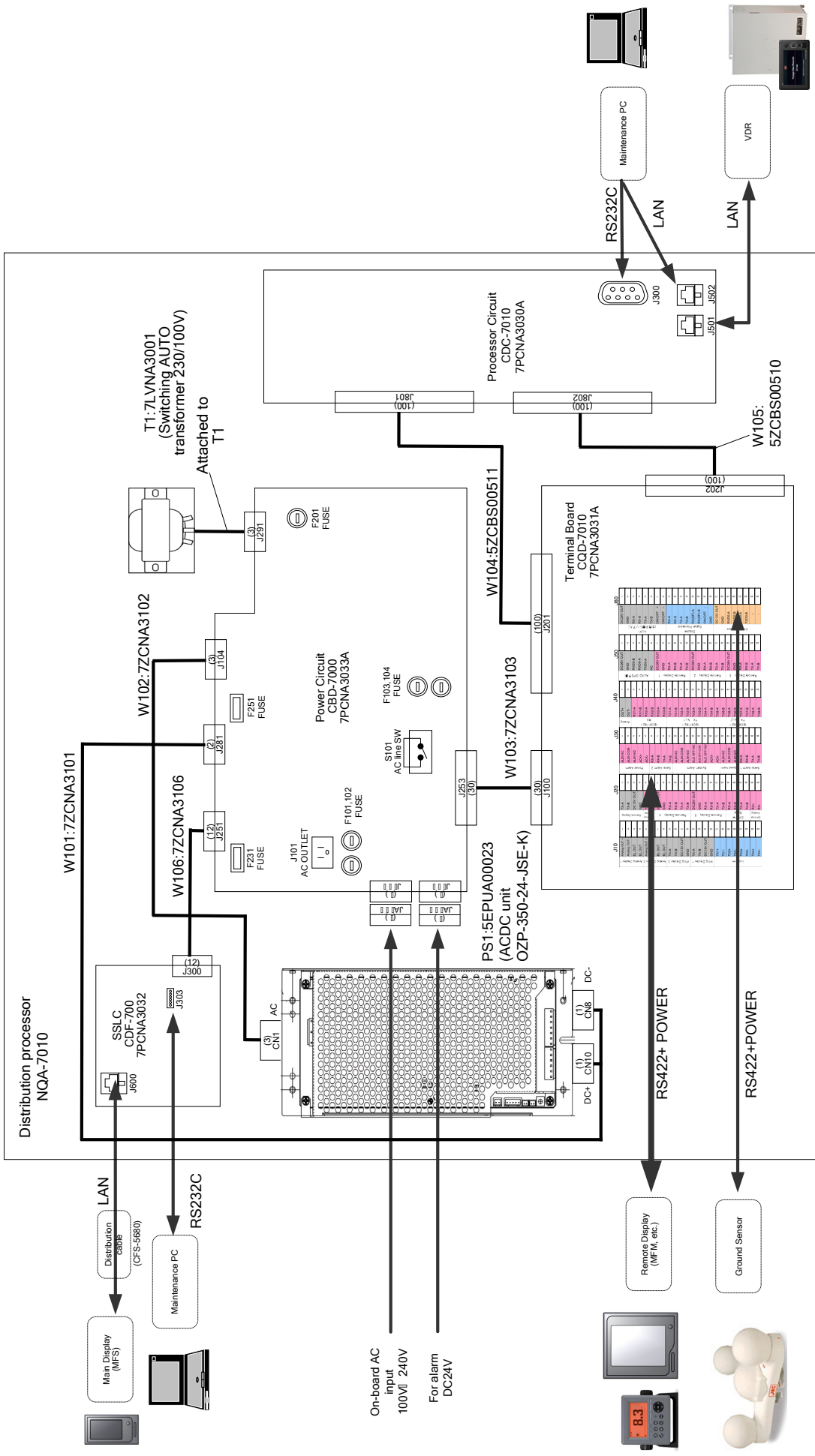
If an ideal location cannot be selected easily and some compromise is necessary, initially install the GPS compass sensor and fix the sensor after carrying out tests as to whether specified performance can be obtained. Installation of the GPS compass sensor in an unsuitable place causes deterioration of accuracy, resulting in possible accidents.

5.3 Connection Diagram

For details of the equipment connection, refer to the Installation Manual.




Maintenance PC
VDR
RS232C
CAT-5e LAN Cable
CAT-5e LAN Cable
J300
J502
J501
Processor Circuit
CDC-7010
7PCNA3030A
T1:7LVNA3001
(AUTO transformer for switching 230/100V)
Attached
to T1
(3)
J291
F201
FUSE
F251
FUSE
Power Circuit
CBD-7000
7PCNA3033A
F103,104
FUSE
S101
AC line SW
F101,102
FUSE
J101
AC OUTLET
(12)
J251
F231
FUSE
W106:7ZCNA3106
(12)
J300
J303
J600
SSLC
CDF-700
7PCNA3032
J102
(3)
J285
(2)
0.6/1kV-DPYC-1.5
0.6/1kV-DPYC-1.5
Main Power
AC 100V/230V
For Alarm
DC24V
CAT-5e LAN Cable
Distribution
cable
(CFS-5680)
RS232C
Maintenance PC
Main Display
(MFS)


Distribution processor
NQA-7010
SSLC
CDF-700
7PCNA3032
J600
J303
(12)
J300
(3)
CN1
AC
DC-
DC+
(1)
CN8
(1)
CN10
W101:7ZCNA3101
W102:7ZCNA3102
W106:7ZCNA3106
W103:7ZCNA3103
W104:5ZCBS00511
W105:
5ZCBS00510
T1:7LVNA3001
(Switching AUTO
transformer 230/100V)
Attached to
T1
(3)
J291
F201
FUSE
(3)
J104
F251
FUSE
(2)
J281
(12)
J251
F231
FUSE
J101
AC OUTLET
F101,102
FUSE
S101
AC line SW
F103,104
FUSE
Power Circuit
CBD-7000
7PCNA3033A
J253
(30)
(30)
J100
(100)
J201
Terminal Board
CQD-7010
7PCNA3031A
(100)
J801
(100)
J802
Processor Circuit
CDC-7010
7PCNA3030A
J202
(100)
J300
J502
J501
RS232C
LAN
LAN
Maintenance PC
VDR
PS1:5EPUA00023
(ACDC unit
OZP-350-24-JSE-K)
RS422+ POWER
RS422+POWER
LAN
RS232C
Distribution
cable
(CFS-5680)
Maintenance PC
Main Display
(MFS)
On-board AC
input
100V～240V
For alarm
DC24V
Remote Display
(MFM, etc.)
Ground Sensor

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Chapter 6 Maintenance and Inspection

⚠WARNING	
	Customers shall never attempt to check or repair the inner of the equipment. Checking or repair by an unqualified person may cause a fire or an electric shock.
	For maintenance, inspection of the internal section of the equipment, request the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.
	In case you find smoke, unusual odor or extreme high heat coming from the equipment, turn off the power immediately, unplug the power supply cable from an electric outlet, and contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office. Keeping the equipment in operation under such condition may cause fire or an electric shock.

6.1 Routine Maintenance

The life of equipment is determined by the degree of routine maintenance and inspection conditions. To constantly maintain the equipment in good condition, it is recommended to carry out regular inspection. This prevents equipment faults.

Regularly carry out the inspections that are listed in the table.

Notes

- Before inspecting the equipment, make sure that the power supply and the breaker is turned off.
- Do not use any organic solvent such as thinner or benzene to clean the surface of the equipment. Failure to comply damages the surface coating. Clean the surface by removing any rubbish and dust and wipe the surface with a clean cloth.

Maintenance and inspection method

Item	Maintenance inspection
Cleaning	Remove any stains from the panel surface, knobs, switches, top cover, and bottom cover by gently wiping with a dry cloth. Clean thoroughly the blades of the air vent to improve the air flow. To clean the display, use a solution of mild soap and water, if needed.
Loose parts	Check for any loose screws, nuts, knobs, switches, and connectors and correctly tighten any loose parts.
Cable connection	Check the connections of equipment cables and connectors to ensure that they are connected properly.
Fuse	When the power supply fuse is blown, replace the fuse after thoroughly checking the cause.

6.2 Countermeasures for Abnormalities and Faults

When detecting any of the following symptoms, contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.

- The screen is blank or the power is not supplied to the equipment even if the power supply button is pressed.
- Smoke, abnormal odor, or abnormal high temperature is detected.

In this case, turn off the power supply immediately and disconnect the power supply cable.

The contact method can be found in back spine cover of this manual.

Chapter 7 After-Sales Service

7.1 Requesting Repair

When suspecting “fault”, stop using the equipment and contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.

● Repair under the warranty period

When the equipment becomes faulty while it is used in the normal utilization condition according to the description/instruction in the instruction manual, the distributor or JRC will repair the equipment without charge. If the equipment becomes faulty due to mishandling, negligence, or for a reason beyond control such as natural disaster or fire, repair is charged.

● Repair beyond the warranty period

When the functions can be recovered by repair, JRC will repair the equipment with charge according to the customer’s request.

● Necessary information

- Product name, model name, manufacturing date, and manufacturing number
- Condition of abnormality (as detailed as possible)
- Office name or organization name, address, telephone number and FAX number

7.2 Recommendation of Inspection and Maintenance

The performance may deteriorate due to the aging of parts although the degree varies depending on the utilization condition. For the inspection and maintenance separate from the normal maintenance, contact the store, nearest JRC agent, JRC marine service department, sales department, regional office, branch or sales office.
This service is charged.

For any questions regarding the after-sales service, please contact your distributor/agent, JRC branch, sales office, or liaison office. The contact method can be found in back spine cover of this manual.

Chapter 8 Disposal

⚠WARNING	
	Do not throw the lithium batteries into fire. Fire or an injury may occur due to explosion.
	Disposal of the battery must obey the local laws or rules.
	Before disposal of used lithium batteries, make sure the + and – terminals are insulated by tape. Otherwise, heat, rupture or fire may occur due to a battery short.

Disposal of this equipment

Disposal treatment of this equipment must comply with the regulations or rules of the Government or the local government that controls the location of the disposal.

The GPS compass sensor NNN-21 of this equipment contains a backup battery (lithium battery).

[Note] Although the operation is still possible even when the battery is empty,

- Takes time to positioning
- Year, month, day vary from the actual ones

will possibly happen.

有毒有害物质或元素的名称及含量

(Names & Content of toxic and hazardous substances or elements)

形式名(Type): JLN-720　　名称(Name): Satellite Log

部件名称 (Part name)	有毒有害物质或元素 (Toxic and Hazardous Substances and Elements)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
GPS 指南针接收器(Sensor Unit)	×	○	×	×	×	×
显示装置 (Display Unit)	×	○	×	×	×	×
分配处理装置 (Distribution Processor)						
外部设备 (Peripherals)	×	○	×	×	×	×
选择(Options)						
电线类(Cables)						
手册 (Documents)						

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11306-2006 标准规定的限量要求以下。
(Indicates that this toxic, or hazardous substance contained in all of the homogeneous materials for this part is below the requirement in SJ/T11363-2006.)

×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。
(Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T 11363-2006.)

Chapter 9 Specification

9.1 General Specification

Ground measuring system	Satellite system
Bow starboard/port speed measurement scale	-99.99 to +99.99kn
Ahead/astern speed measurement scale	-99.99 to +99.99kn
Stern starboard/port speed measurement scale	-99.99 to +99.99kn
No. of digits displayed	Fixed 4 digits
Minimum digital display unit	0.01kn
Minimum analog display unit	Scale: 0.5kn units Value: 5.0kn units
Sailing display range	0-999999.99 NM
Ship speed accuracy	1% of the speed of the ship, or 0.1kn whichever is greater 0.2% of the speed of the ship, or 0.02kn whichever is greater (only for positioning by 5 or more satellites)
Sailing accuracy	Greater value between 1% per hour or 0.1NM
Power consumption	53W 60VA (for 100VAC) 58W 110VA (for 230VAC)
Power consumption of resource alert circuit	0.25W (normal condition) 0.5W (when power fail alert happening)

9.2 GPS Compass Sensor NNN-21

9.2.1 Electrical Specifications

Reception system	Multi-channel all-in-view (12CH+SBAS 1CH)
Reception frequency	1575.42MHz ±1MHz (C/A code)
Tracking acceleration	1G
Power consumption	About 4W

9.2.2 Environmental Requirements

Operating temperature range	-25°C to +55°C
Storage temperature range	-25°C to +70°C
Protection level	IP56
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Compass safety distance	0.3m (STD/STEER)

9.2.3 Mechanical Specifications

External size	ϕ691 × 285mm
Weight	5.9kg
Color	Munsell N9
Cable	10m

9.3 Distribution Processor NQA-7010

9.3.1 Electrical Specifications

Power supply voltage	100/230VAC (+15%, -15%)
Power consumption	Maximum 58W (include sensor and displays power)

9.3.2 Environmental Requirements

Operating temperature range	-15°C to +55°C
Storage temperature range	-25°C to +70°C
Protection level	Equivalent to IP22
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Compass safety distance	1.0m (STD), 0.6m (STEER)

9.3.3 Mechanical Specifications

External size	430mm (width) × 576mm (height) × 150mm (depth) excluding projected sections
Weight	About 11kg
Color	Munsell N2.5

9.3.4 External Interface

IEC61162-1	Input: 3ch
	Output: 8ch
Analog output	1 system 2ch
Dimmer input	1ch
Contact	Input: 2ch
	Output: 3ch
Distance counter pulse output	1ch
Serial dimmer input/output	1ch
Serial alert input/output	2ch

9.3.4.1 IEC61162-1

Specification	IEC61162-1
Transmission speed	4800 bps
Data bit	8 bits/parity: none/stop bit: 1 bit
Output interval	1s
Sentence	VBW/VLW/VTG

9.4 Main Display NWZ-510SDG

9.4.1 Panel

Display unit	5-inch color LCD, 480(H) × 800(V) pixels (WVGA)
Operation buttons	Touch panel and power supply button
Backlight (LED)	LCD and power supply button
Maximum luminance	over 300 cd/m^2
Viewing distance	1m for sailing distance
	3.7m for ahead/astern direction speed
	2m for starboard/port direction (bow) speed
	2m for starboard/port direction (stern) speed
Dimmer function adjustments	Selection from daytime, intermediate, nighttime and 16-level
Color	Munsell N2.5

9.4.2 Electrical Specifications

Power supply voltage	18VDC to 34VDC
Power consumption	About 8W

9.4.3 Environmental Requirements

Operating temperature range	-15°C to +55°C
Storage temperature range	-25°C to +70°C
Protection level	Equivalent to IP22 (front at installation of flash mount)
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Compass safety distance	0.1m (STD), 0.1m (STEER)

9.4.4 Mechanical Specifications

External size	96mm (width) × 180mm (height) × 80mm (depth) excluding any projected sections
Weight	1.2kg

9.5 Remote Display (Optional) NWZ-650SDR

9.5.1 Panel

Display unit	6.5-inch color LCD, 480(H) × 600(V) pixels (VGA)
Operation buttons	Touch panel and power supply button
Backlight (LED)	LCD and power supply button
Maximum luminance	over 300 cd/m^2
Viewing distance	1.2m for sailing distance
	5.7m for ahead/astern direction speed
	4.2m for starboard/port direction (bow) speed
	4.2m for starboard/port direction (stern) speed
Dimmer function adjustments	Selection from daytime, intermediate, nighttime and 16-level
Color	Munsell N2.5

9.5.2 Electrical Specifications

Power supply voltage	18VDC to 34VDC
Power consumption	About 10W

9.5.3 Environmental Requirements

Operating temperature range	-15°C to +55°C
Storage temperature range	-25°C to +70°C
Protection level	Equivalent to IP22 (front at installation of flash mount)
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Compass safety distance	0.1m (STD), 0.1m (STEER)

9.5.4 Mechanical Specifications

External size	160mm (width) × 180mm (height) × 80mm (depth) excluding any projected sections
Weight	1.4kg

9.6 Remote Display (Optional) NWZ-840SDR

9.6.1 Panel

Display unit	8.4-inch color LCD, 800(H) × 600(V) pixels (SVGA)
Operation buttons	Touch panel and power supply button
Backlight (LED)	LCD and power supply button
Maximum luminance	over 300 cd/m^2
Viewing distance	1.2m for sailing distance
	5.7m for ahead/astern direction speed
	4.2m for starboard/port direction (bow) speed
	4.2m for starboard/port direction (stern) speed
Dimmer function adjustments	Selection from daytime, intermediate, nighttime and 16-level
Color	Munsell N2.5

9.6.2 Electrical Specifications

Power supply voltage	18VDC to 34VDC
Power consumption	About 11W

9.6.3 Environmental Requirements

Operating temperature range	-15°C to +55°C
Storage temperature range	-25°C to +70°C
Protection level	Equivalent to IP22 (front at installation of flash mount)
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Compass safety distance	0.1m (STD), 0.1m (STEER)

9.6.4 Mechanical Specifications

External size	240mm (width) × 180mm (height) × 80mm (depth) excluding any projected sections
Weight	2.1kg

9.7 MID (Optional) NWZ-4610

9.7.1 Panel

Display unit	4.5-inch black-and-white LCD, 128 × 64 pixels
Backlight	White LED or Orange LED (switched by setting)
Dimmer function adjustments	4-level (bright, intermediate, dark, off)
Dimmer control	Button or dimmer unit
Contrast	13-level
Operation buttons	12 buttons
Memory backup	Flash memory

9.7.2 Electrical Specifications

Power supply voltage	12/24VDC (10.8V to 31.2V)
Power consumption	Below 2.5W

9.7.3 Environmental Requirements

Operating temperature range	-15°C to +55°C
Storage temperature range	-25°C to +70°C
Vibration	Complies with IEC60945 ed.4
EMC	Complies with IEC60945 ed.4
Protection level	IP55

9.7.4 Mechanical Specifications

External size	142mm (width) × 142mm (height) × 92mm (depth) without desk rack
	175mm (width) × 162mm (height) × 92mm (depth) with desk rack
Weight	0.8kg
Rack color	N4
Installation	Tabletop or flush mount

9.8 Data format

9.8.1 Output data

Protocol

IEC61162-1(NMEA0183)

Bit rate	: 4800
Data bit	: 8 bit
Parity	: none
Start bit	: 1
Stop bit	: 1
interval	: 1 sec
version	: NMEA0183 ver1.5, 2.1, 2.3, **4.0,** IEC61162-1 version is selected by installation setting menu. Default value iNMEA0183 ver4.0.

Data Sentences

Note: The length of each sentence is variable. Make sure that sentences of any length can be received.

IEC61162-1 No.1 four ports
IEC61162-1 No.2 four ports
- VBW : Dual ground/water speed (JLN-720 outputs ground speed only)
- VLW : Dual ground/water distance（JLN-720 outputs ground distance only）
- VTG : Course over ground and ground speed

Serial Alarm 1 one port
Serial Alarm 2 one port
- ALR : Set alarm state
- ALF : Alert sentence
- ALC : Cyclic alert list
- ARC : Alert command refused
- HBT : Monitoring communication enabled/disabled

Dimmer Serial one port
- DDC : Display dimming control

■ VBW – Dual ground/water speed

Version 1.5

Do not output VBW sentence

Version 2.1

$GPVBW, x.x,x.x,A,x.x,x.x,A *hh<CR><LF>

1 2 3 4 5 6 11

Version 2.3 4.0、IEC61162-1

$GPVBW, 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 11

1	: Longitudinal water speed, knots	“-“ = astern
2	: Transverse water speed, knots	“-“ = port
3	: Status: water speed,	A = data valid, V = data invalid
4	: Longitudinal ground speed, knots	“-“ = astern
5	: Transverse ground speed, knots	“-“ = port
6	: Status: ground speed,	A = data valid, V = data invalid
7	: Stern transverse water speed, knots	“-“ = port
8	: Status: stern water speed,	A = data valid, V = data invalid
9	: Stern transverse ground speed,	“-“ = port
10	: Status: stern ground speed,	A = data valid, V = data invalid
11	: Checksum	

■ VLW – Dual ground/water distance

Version 1.5

$GPVLW, xxxx.x,N,xxx.xx,N<CR><LF>

1 2

Version 2.1

$GPVLW, x.x,N,x.x,N *hh<CR><LF >

1 2 3

1	: Total cumulative distance, nautical miles
2	: Distance since reset, nautical miles
3	: Checksum

Version 2.3 4.0、IEC61162-1

$GPVLW, x.x,N,x.x,N,x.x,N,x.x,N*hh<CR><LF>

1 2 3 4 5

1	: Total cumulative water distance, nautical miles
2	: Water distance since reset, nautical miles
3	: Total cumulative ground distance, nautical miles
4	: Ground distance since reset, nautical miles
5	: Checksum

■ VTG – Course over ground and ground speed

Version 1.5

$GPVTG, xxx.x,T,,,xxx.x,N,,<CR><LF>

1 2 3 4

Version 2.1

$GPVTG, xxx.x,T,,,xxx.x,N,xxx.x,K*hh<CR><LF>

1 2 3 4 5 6 8

Version 2.3 4.0、IEC61162-1

$GPVTG, xxx.x,T,,,xxx.x,N,xxx.x,K,a*hh<CR><LF>

1 2 3 4 5 6 7 8

1, 2 : Course over ground, degrees true

3, 4 : Speed over ground, knots

5, 6 : Speed over ground, km/h

7 : Mode Indicator (version 2.3, 4.0, IEC61162-1)

A = Autonomous mode
D = Differential mode
N = Data not valid
S = Simulator mode
P = SBAS mode (IEC61162-1 only)

8 : Checksum

■ ALR – Set alarm state

$VDALR, hhmmss.ss, xxx, A, A, c--c *hh<CR><LF>

1 2 3 4 5 6

1 : Time of alarm condition change, UTC

2 : Unique alarm number (identifier) at alarm source

3 : Alarm condition (A = threshold exceeded, V = not exceeded)

4 : Alarm's acknowledge state, A = acknowledged, V = unacknowledged

5 : Alarm's description text

6 : Checksum

■ ALF – Alert sentence

$VDALF,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 1112 13 14

1 : Total number of ALF sentences for this message, 1 to 2

2 : Sentence number, 1 to 2

3 : Sequential message identifier, 0 to 9

4 : Time of last change

5 : Alert category, A, B or C

6 : Alert priority, E, A, W or C

7 : Alert state, A, S, N, O, U or V

8 : Manufacturer mnemonic code

9 : Alert identifier

10 : Alert instance, 1 to 999999

11 : Revision counter, 1 to 99

12 : Escalation counter, 0 to 9

13 : Alert text

14 : Checksum

■ ALC – Cyclic alert list

$VDALC,xx,xx,xx,x.x,aaa,x.x,x.x,x.x,……,aaa,x.x,x.x,x.x*hh <CR><LF>

1 2 3 4 5 6 7 8 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
9 : Checksum

■ ARC – Alert command refused

$ VDARC, hhmnss.ss, aaa, x.x, x.x, c*hh<CR><LF>

1 2 3 4 5 6

1 : Release time
2 : Alert specifically defined by the manufacturer
3 : Alert ID
4 : Alert instance
5 : Rejected alert command
6 : Checksum

■ HBT – Monitoring communication enabled/disabled

$ VDHBT, x.x, A, x*hh<CR><LF>

1 2 3 4

1 : Repetition cycle setting
2 : Equipment status
3 : Sequence number
4 : Checksum

■ DDC – Display dimming control

$VDDDC,a, xx,a,a*hh<CR><LF>

1 2 3 4 5

1 : Display dimming preset
2 : Brightness percentage 00 to 99
3 : Color palette
4 : Sentence Status Flag
5 : Checksum

9.8.2 Input data

Protocol

Bit rate	: 4800
Data bit	: 8 bit
Parity	: none
Start bit	: 1
Stop bit	: 1
interval	: Automatic
version	: IEC61162-1

Data sentence

IEC61162-1 RX1, RX2 port

HDT : Heading true

THS : True heading and status

ROT : Rate of turn

The priority of RX1, RX2 port sentence is as follows.

Heading	RX1 HDT > RX2 HDT > RX1 THS > RX2 THS
Rate of turn	RX2 ROT > RX1 ROT

IEC61162-1 RX3 port

VBW : Dual ground/water speed (Input water speed from JRC's water SDME)

VLW : Dual ground/water distance (Input water distance from JRC's water SDME)

Serial Alarm 1 port

Serial Alarm 2 port

ACK : Acknowledge alarm

ACN : Alert command

Dimmer Serial port

DDC : Display dimming control

Input data format

■ HDT – Heading true

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

1 2

1: Heading, degrees true
2: Checksum

This is a deprecated sentence which has been replaced by THS.

■ THS – True heading and status

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

1 2 3

1: Heading, degrees true
2: Mode indicator
A = Autonomous
E = Estimated (dead reckoning)
S = Simulator mode
V = Data not valid (including standby)
3: Checksum

This sentence replaces the deprecated sentence HDT

■ ROT – Rate of turn

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

1 2 3

1: Rate of turn, °/min, "-" = bow turns to port
2: Status
A = data valid
V = data invalid
3: Checksum

■ 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 11

1	: Longitudinal water speed, knots	"-" = astern
2	: Transverse water speed, knots	"-" = port
3	: Status: water speed,	A = data valid, V = data invalid
4	: Longitudinal ground speed, knots	"-" = astern
5	: Transverse ground speed, knots	"-" = port
6	: Status: ground speed,	A = data valid, V = data invalid
7	: Stern transverse water speed, knots	"-" = port
8	: Status: stern water speed,	A = data valid, V = data invalid
9	: Stern transverse ground speed,	"-" = port
10	: Status: stern ground speed,	A = data valid, V = data invalid
11	: Checksum	

■ 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

1	: Total cumulative water distance, nautical miles
2	: Water distance since reset, nautical miles
3	: Total cumulative ground distance, nautical miles
4	: Ground distance since reset, nautical miles
5	: Checksum

■ ACK – Acknowledge alarm

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

1 2

1	: Unique alarm number (identifier) at alarm source
2	: Checksum

■ ACN – Alarm command

$--ACN,hhmmss.ss,aaa,x.x,x.x,c,a*hh <CR><LF>

1 2 3 4 5 6 7

1	: Time
2	: Manufacturer mnemonic code
3	: Alert Identifier
4	: Alert Instance, 1 to 999999
5	: Alert command, A, Q, O or S
6	: Sentence status flag
7	: Checksum

■ DDC – Display dimming control

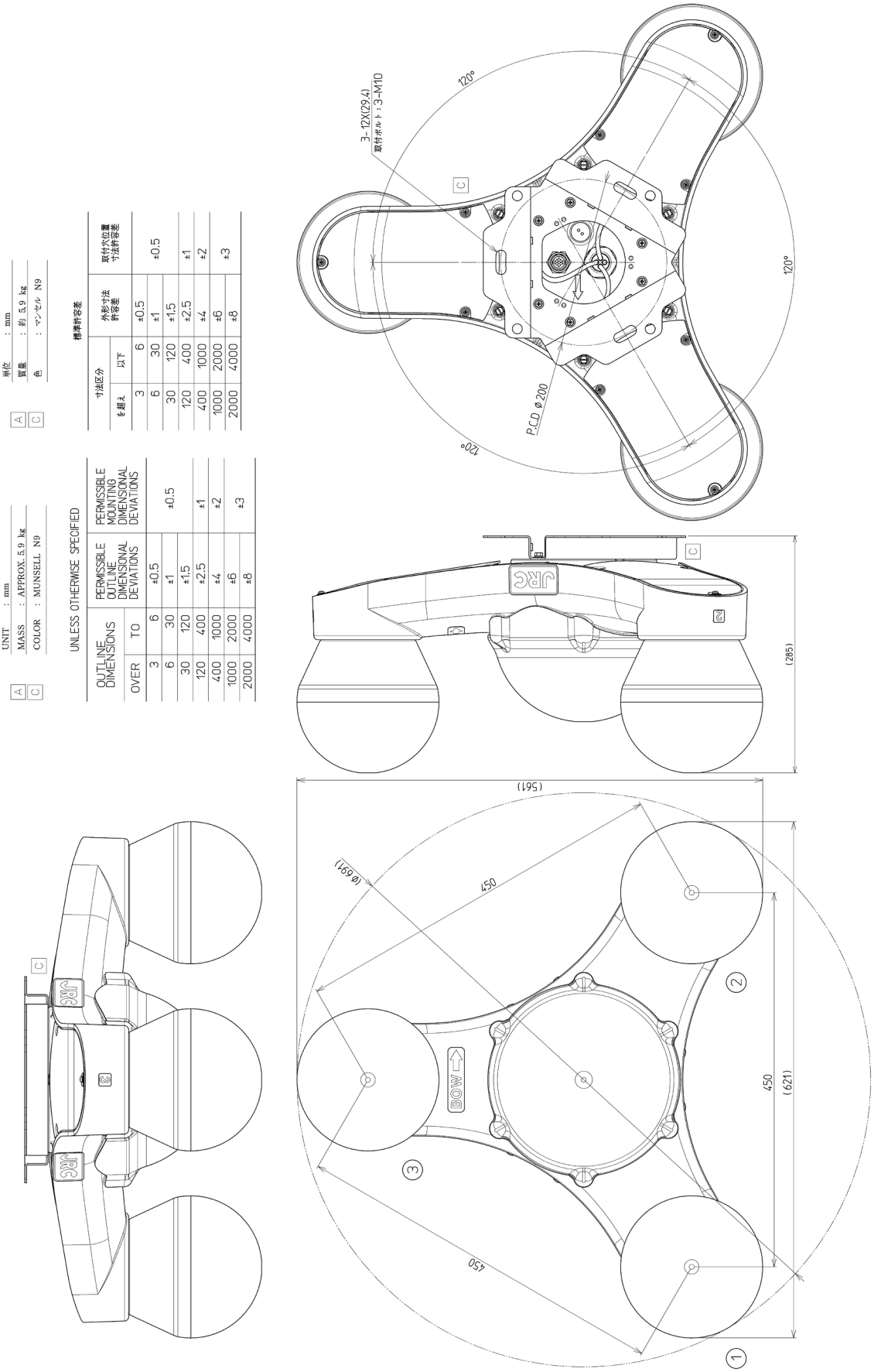
$--DDC,a, xx,a,a*hh<CR><LF>

1 2 3 4 5

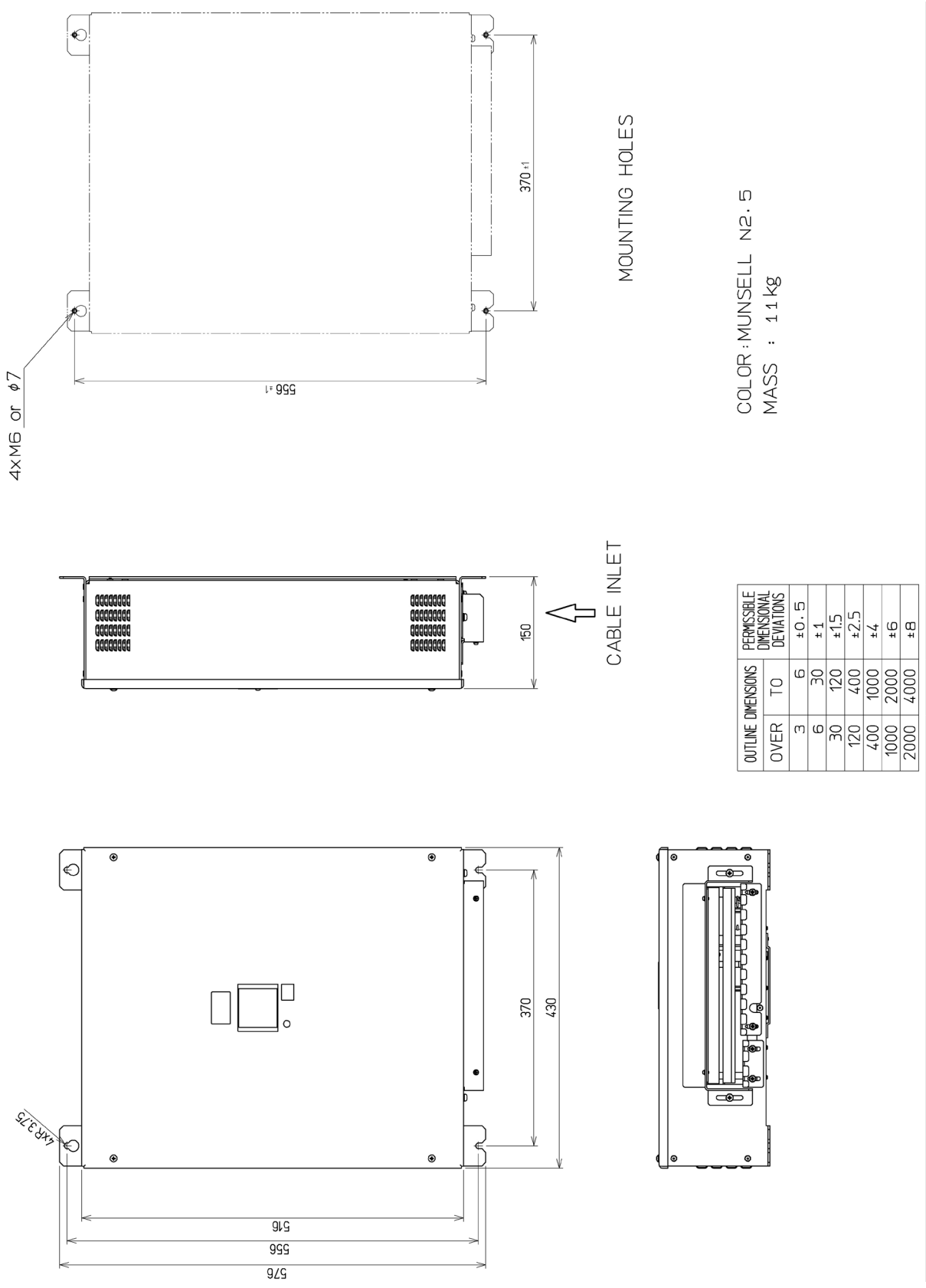
1	: Display dimming preset
2	: Brightness percentage 00 to 99
3	: Color palette
4	: Sentence Status Flag
5	: Checksum

Appendix A Installation Drawings

GPS Compass Sensor NNN-21



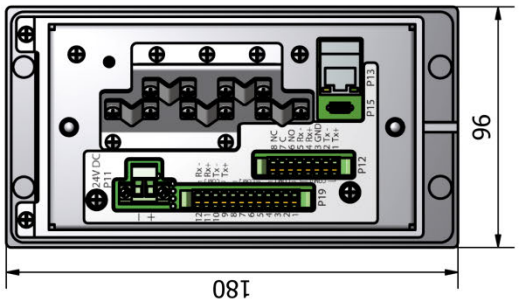
Distribution Processor NQA-7010

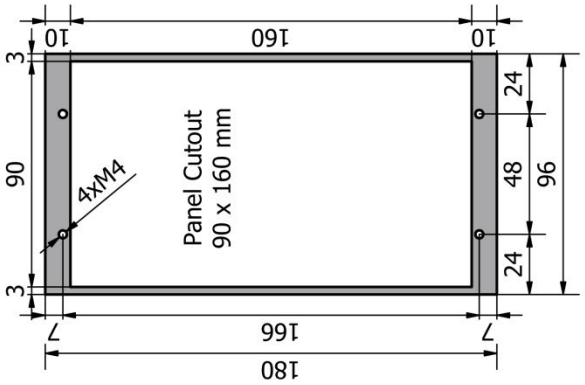


OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	±0.5
6	30	±1
30	120	±1.5
120	400	±2.5
400	1000	±4
1000	2000	±6
2000	4000	±8

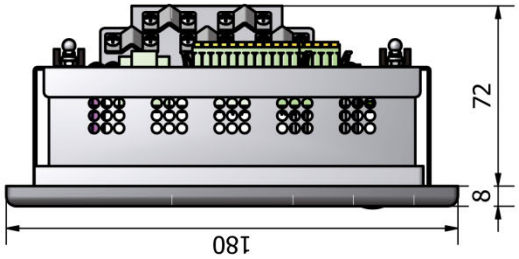
Main Display NWZ-510SDG (3-axe built-in)

Aftview

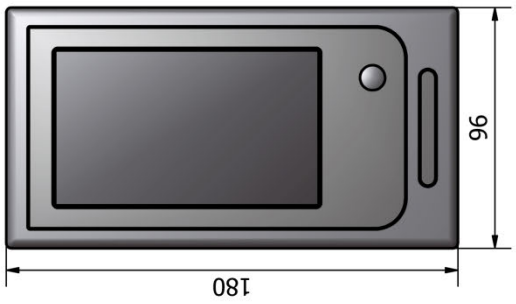




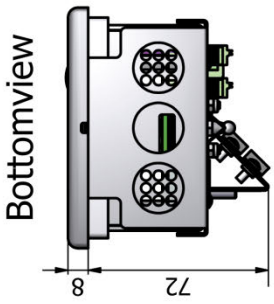
Sideview



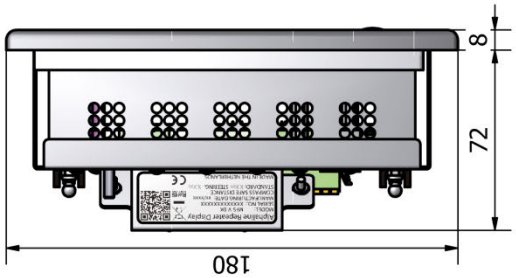
Frontview



Bottomview

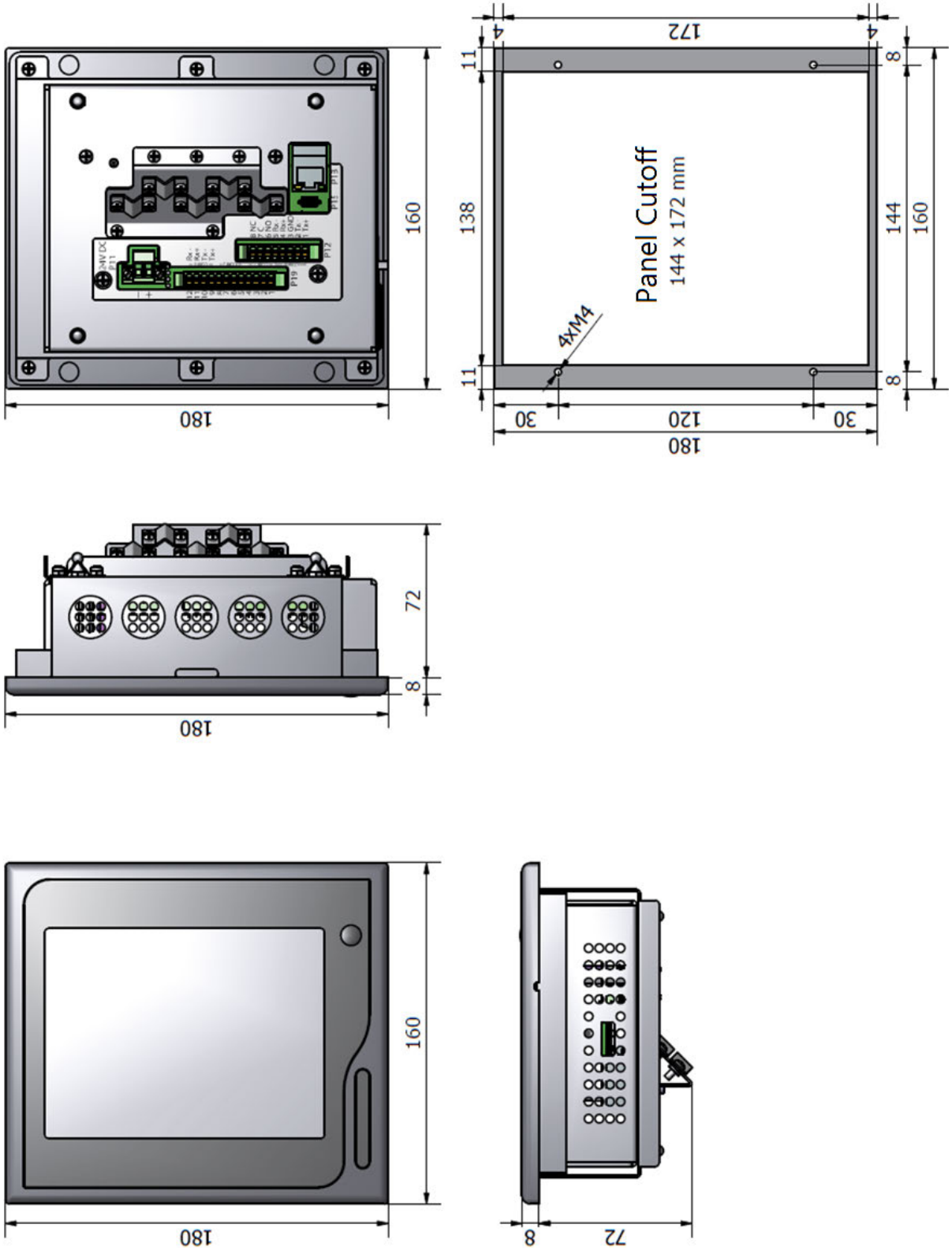


Sideview

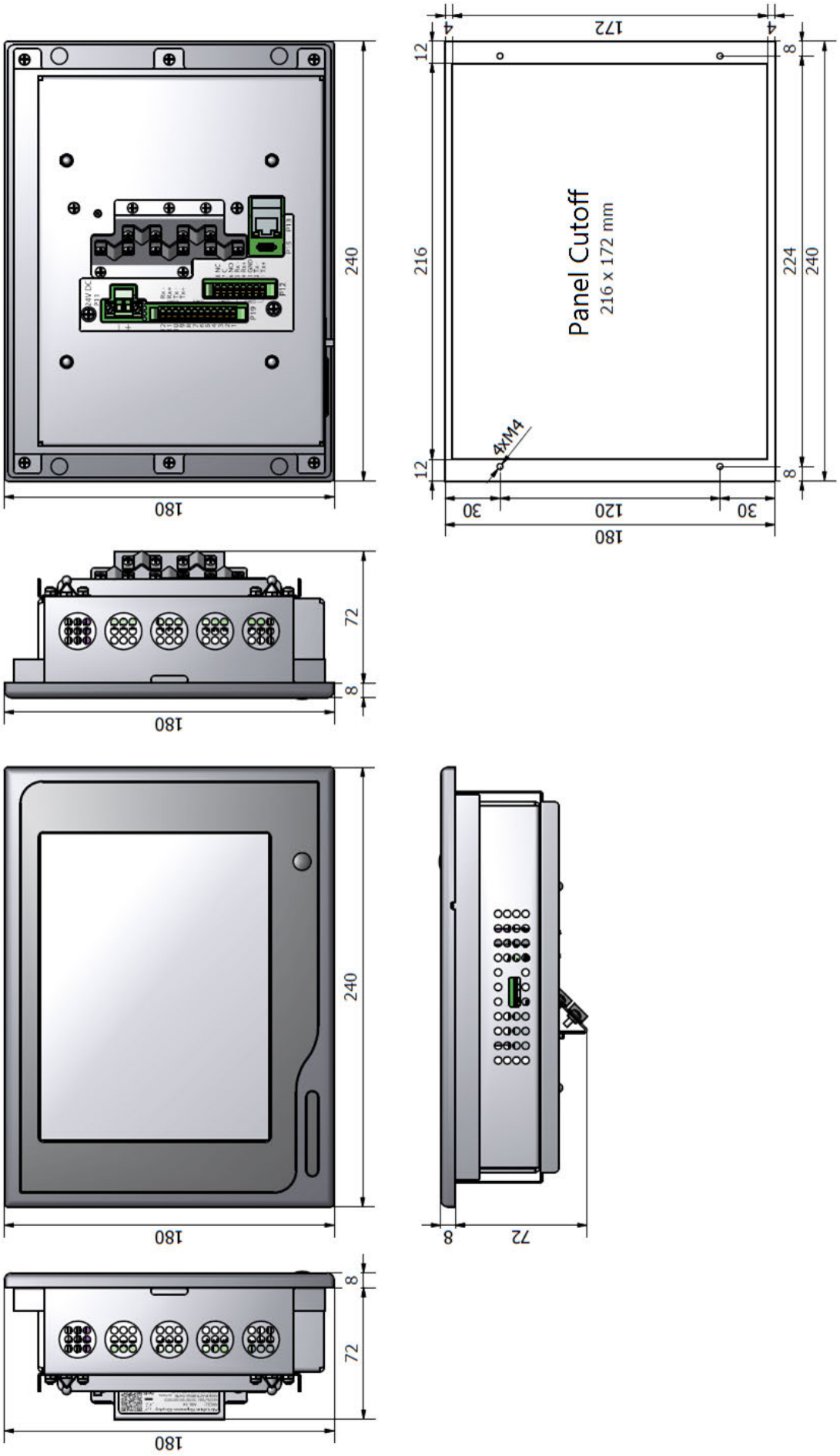


APP A

Remote Display NWZ-650SDR (Optional)

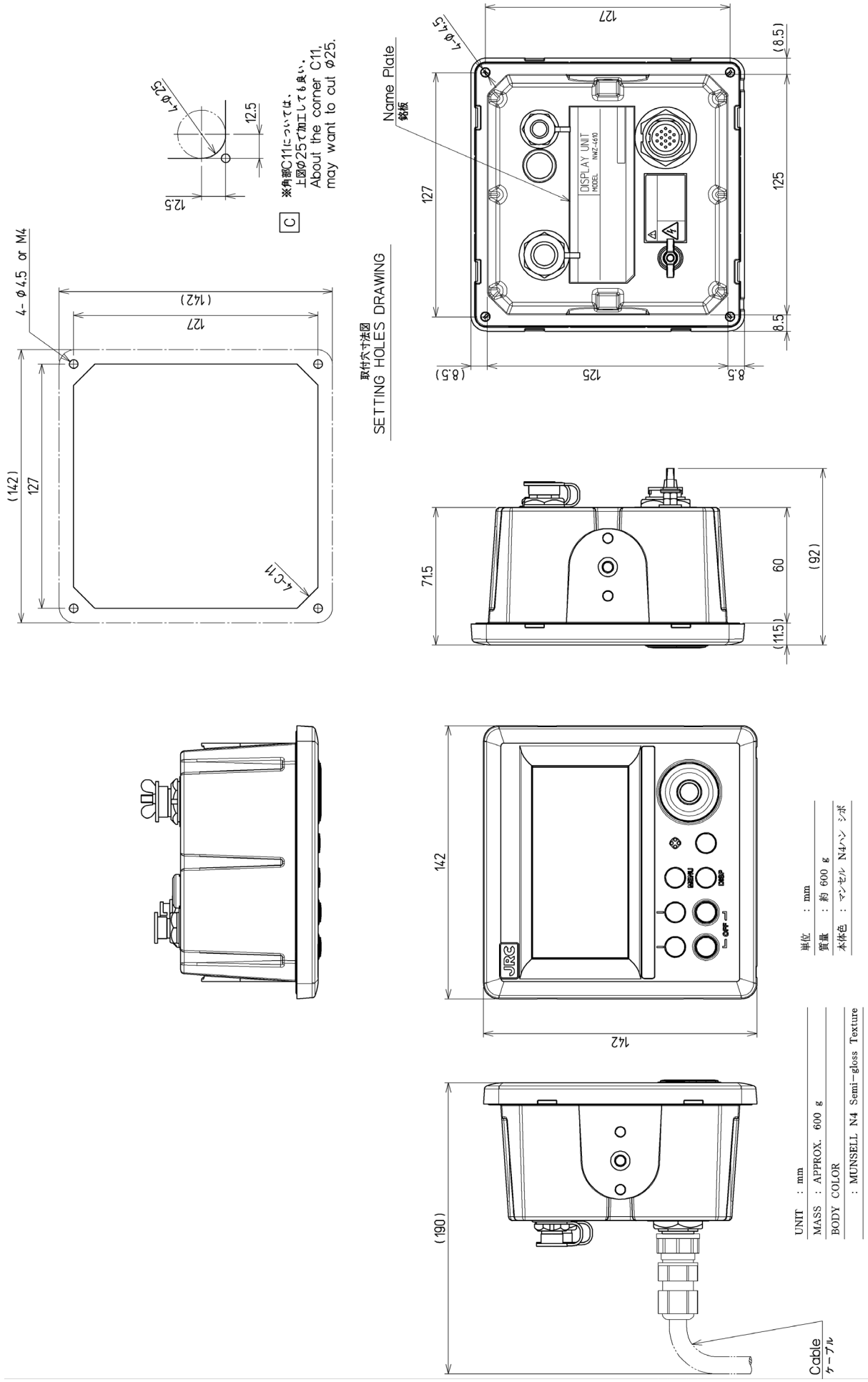


Remote Display NWZ-840SDR (Optional)

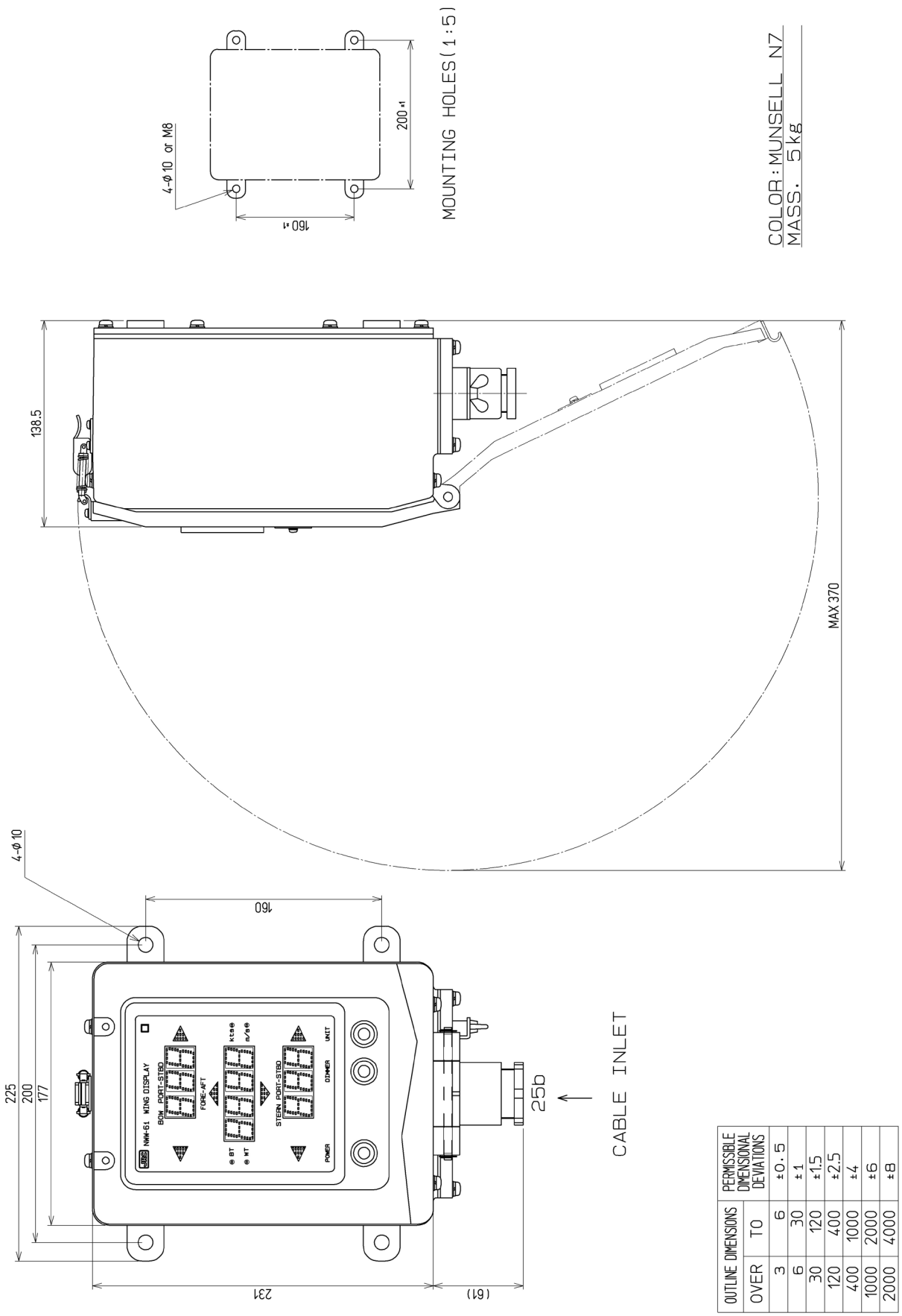


APP A

MID NWZ-4610 (Optional)



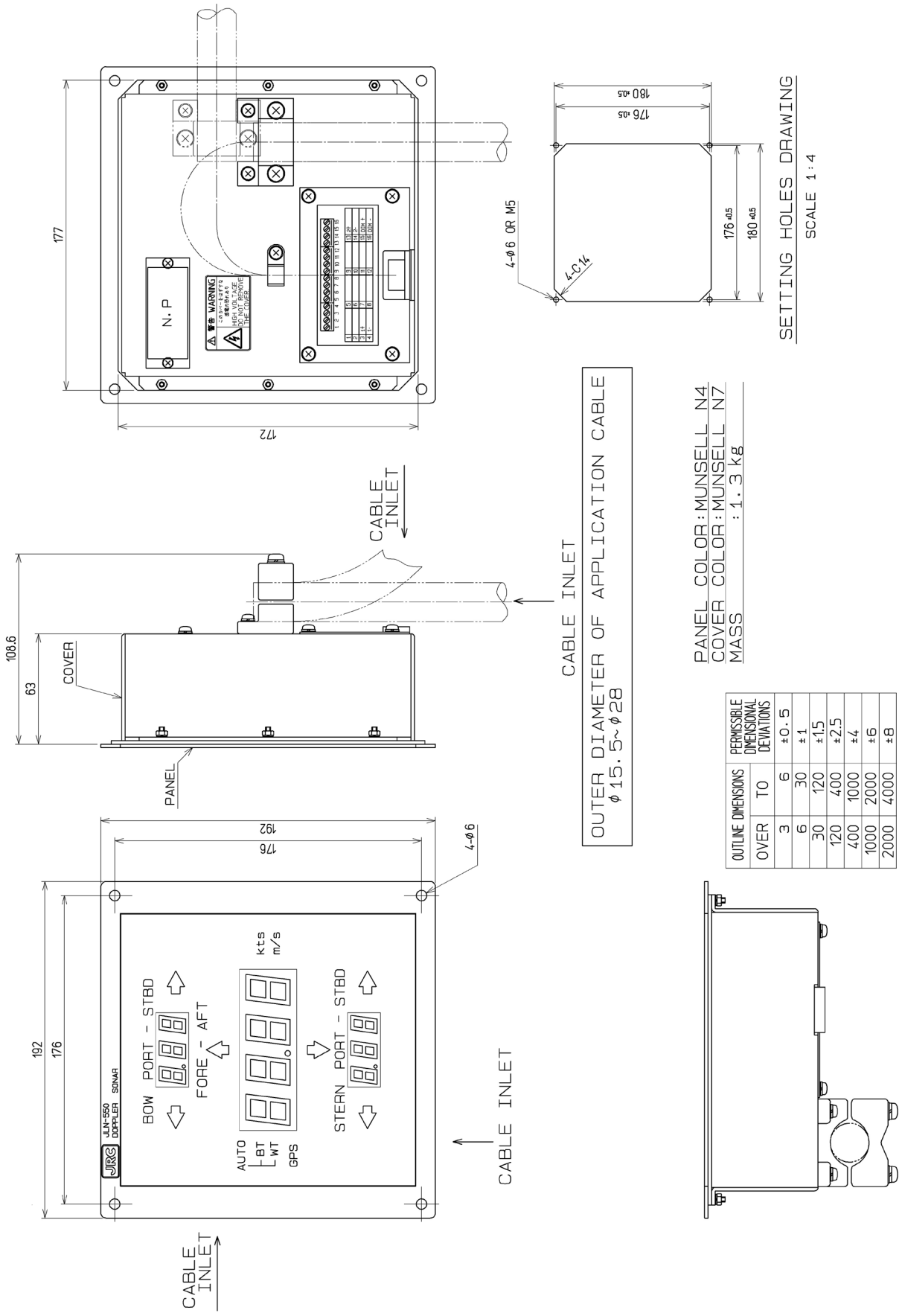
Wing Display NWW-61T (Optional)



OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	±0.5
6	30	±1
30	120	±1.5
120	400	±2.5
400	1000	±4
1000	2000	±6
2000	4000	±8

APP A

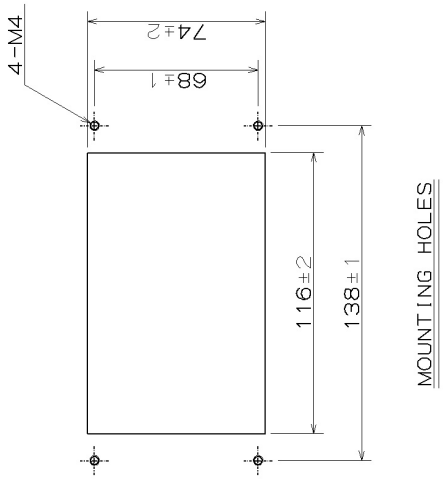
Digital Display NWW-62TB (Optional)



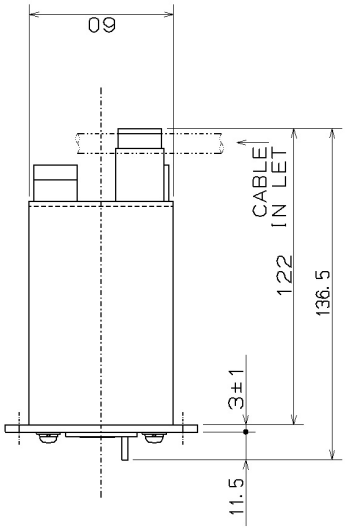
OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	±0.5
6	30	±1
30	120	±1.5
120	400	±2.5
400	1000	±4
1000	2000	±6
2000	4000	±8

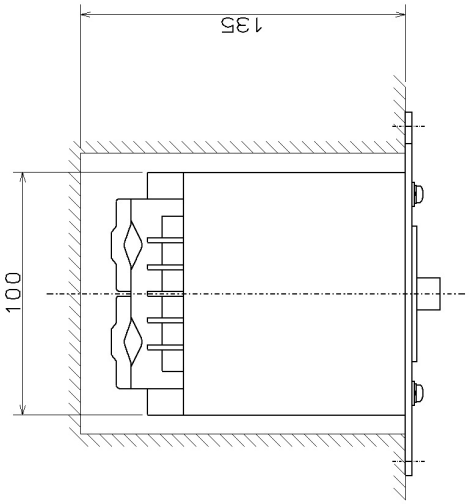
Distance Counter NWW-7 (Optional)

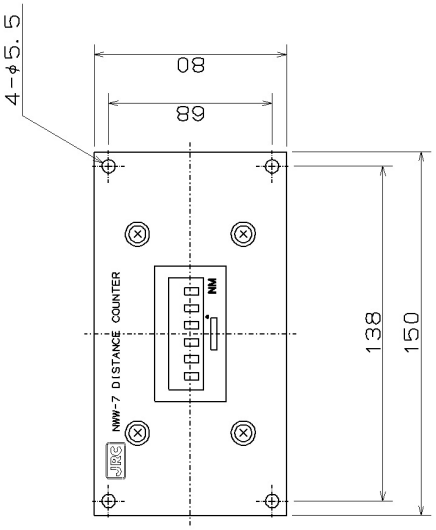
OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	± 0.5
6	30	± 1
30	120	± 1.5
120	400	± 2.5
400	1000	± 4
1000	2000	± 6
2000	4000	± 8



MOUNTING HOLES





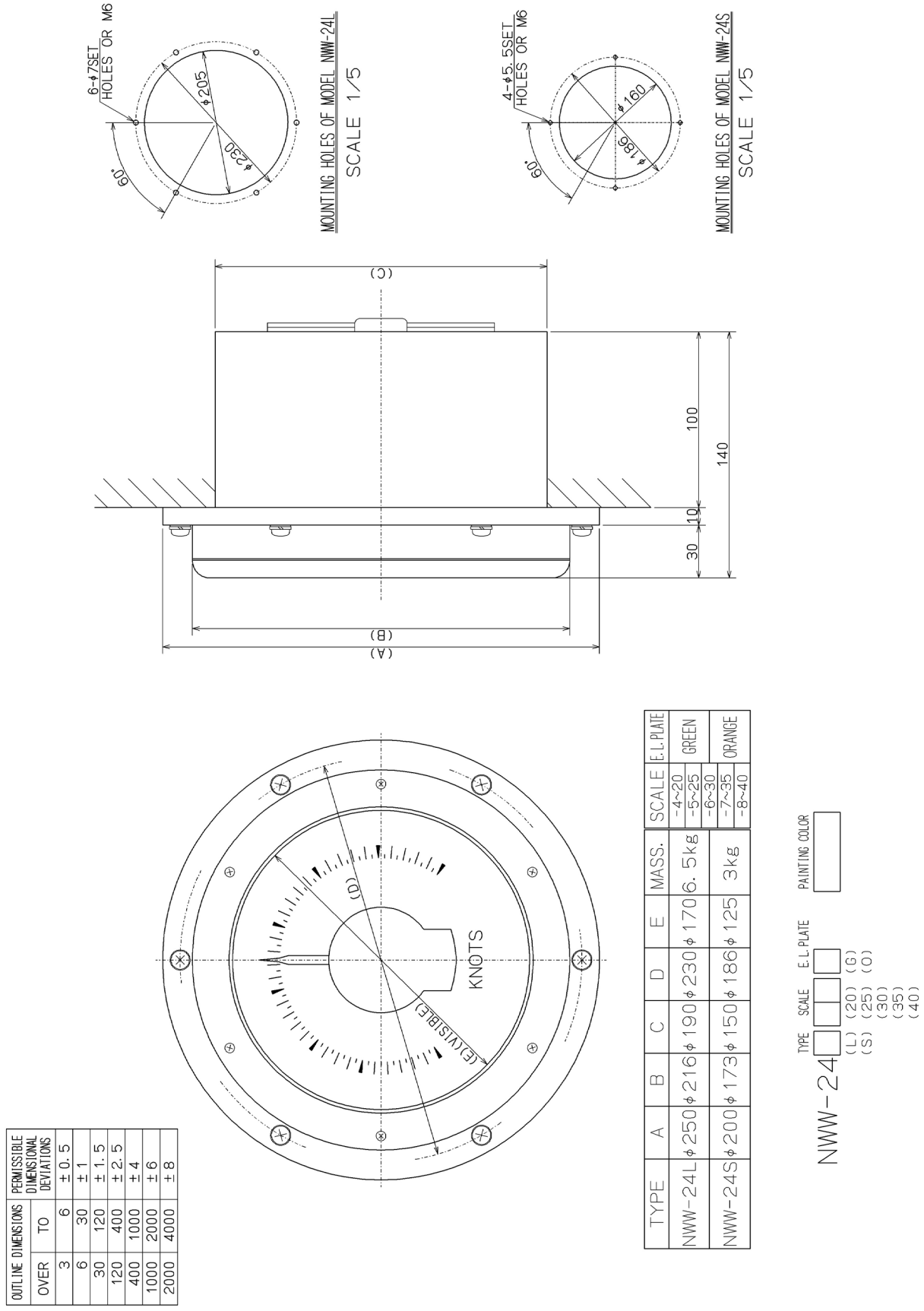


MASS 0.8kg

COLOR MUNSELL 2.5G7/2

APP A

Analog Display NWW-24 (Optional)



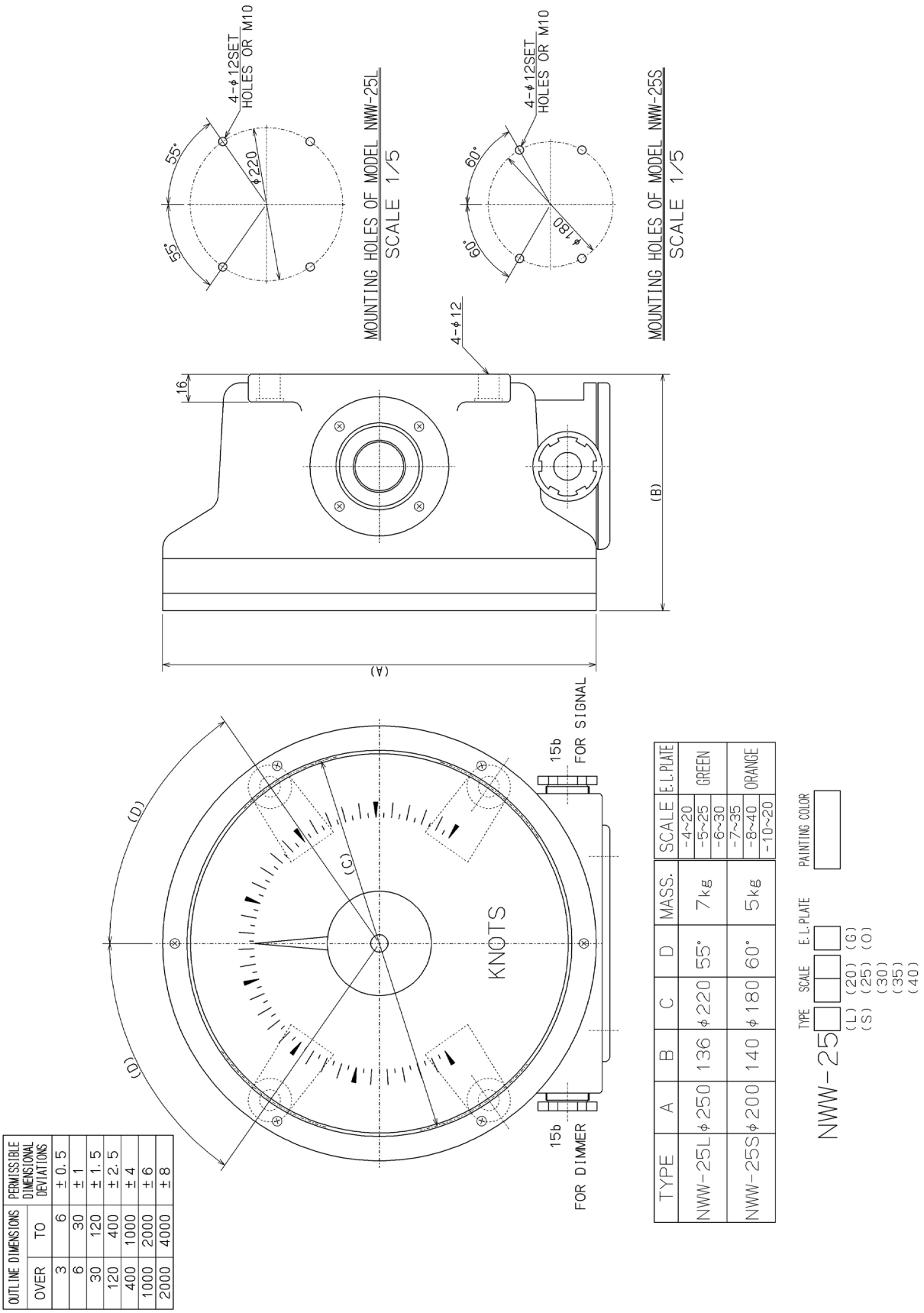
OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	±0.5
6	30	±1
30	120	±1.5
120	400	±2.5
400	1000	±4
1000	2000	±6
2000	4000	±8

TYPE	A	B	C	D	E	MASS.	SCALE	E.L.PLATE
NWW-24L	φ250	φ216	φ190	φ230	φ170	6.5kg	-4~20 -5~25	GREEN
NWW-24S	φ200	φ173	φ150	φ186	φ125	3kg	-6~30 -7~35 -8~40	ORANGE

NWW-24 TYPE □ SCALE □□ E.L.PLATE □ PAINTING COLOR □

(L) (20) (G)
(S) (25) (O)
(30)
(35)
(40)

Analog Display NWW-25 (Optional)



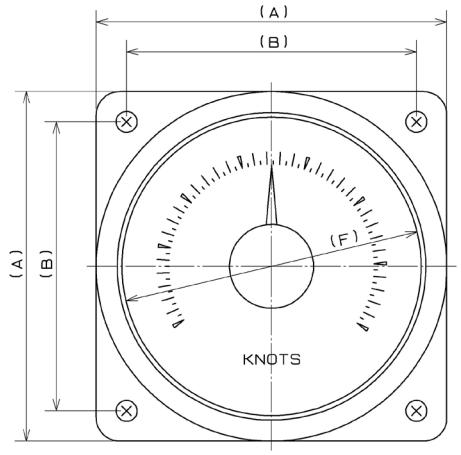
OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	± 0.5
6	30	± 1
30	120	± 1.5
120	400	± 2.5
400	1000	± 4
1000	2000	± 6
2000	4000	± 8

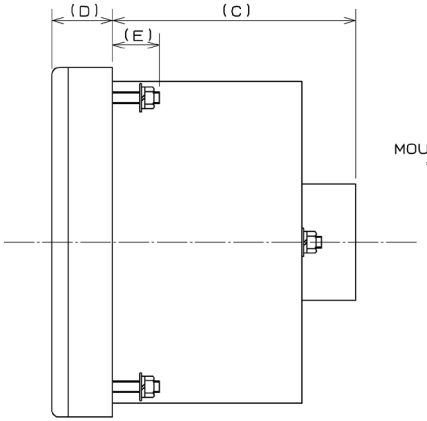
TYPE	A	B	C	D	MASS.
NWW-25L	φ250	136	φ220	55°	7kg
NWW-25S	φ200	140	φ180	60°	5kg

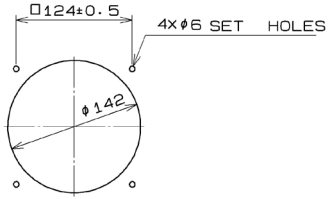
SCALE	E.L.PLATE
-4~20	GREEN
-5~25	
-6~30	
-7~35	ORANGE
-8~40	
-10~20	

NWW-25 □ □ □ □
TYPE SCALE E.L.PLATE PAINTING COLOR
(L) (20) (G)
(S) (25) (O)
(30)
(35)
(40)

OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	±0.5
6	30	±1
30	120	±1.5
120	400	±2.5
400	1000	±4
1000	2000	±6
2000	4000	±8

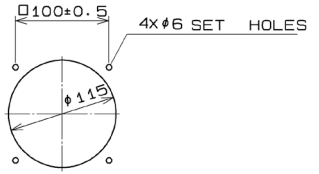






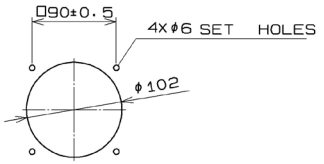
MOUNTING HOLES OF MODEL NWW-26L

SCALE 1/5



MOUNTING HOLES OF MODEL NWW-26M

SCALE 1/5



MOUNTING HOLES OF MODEL NWW-26S

SCALE 1/5

TYPE	A	B	C	D	E	F	MASS.	SCALE	E.L.PLATE
NWW-26L	150	124	105	26	20	φ128	2.5kg	-4~20	GREEN
								-5~25	
NWW-26M	120	100	90	23	15	φ100	1.5kg	-6~30	
NWW-26S	110	90	90	11	15	φ100	1 kg	-7~35	ORANGE
								-8~40	

TYPE SCALE E.L.PLATE

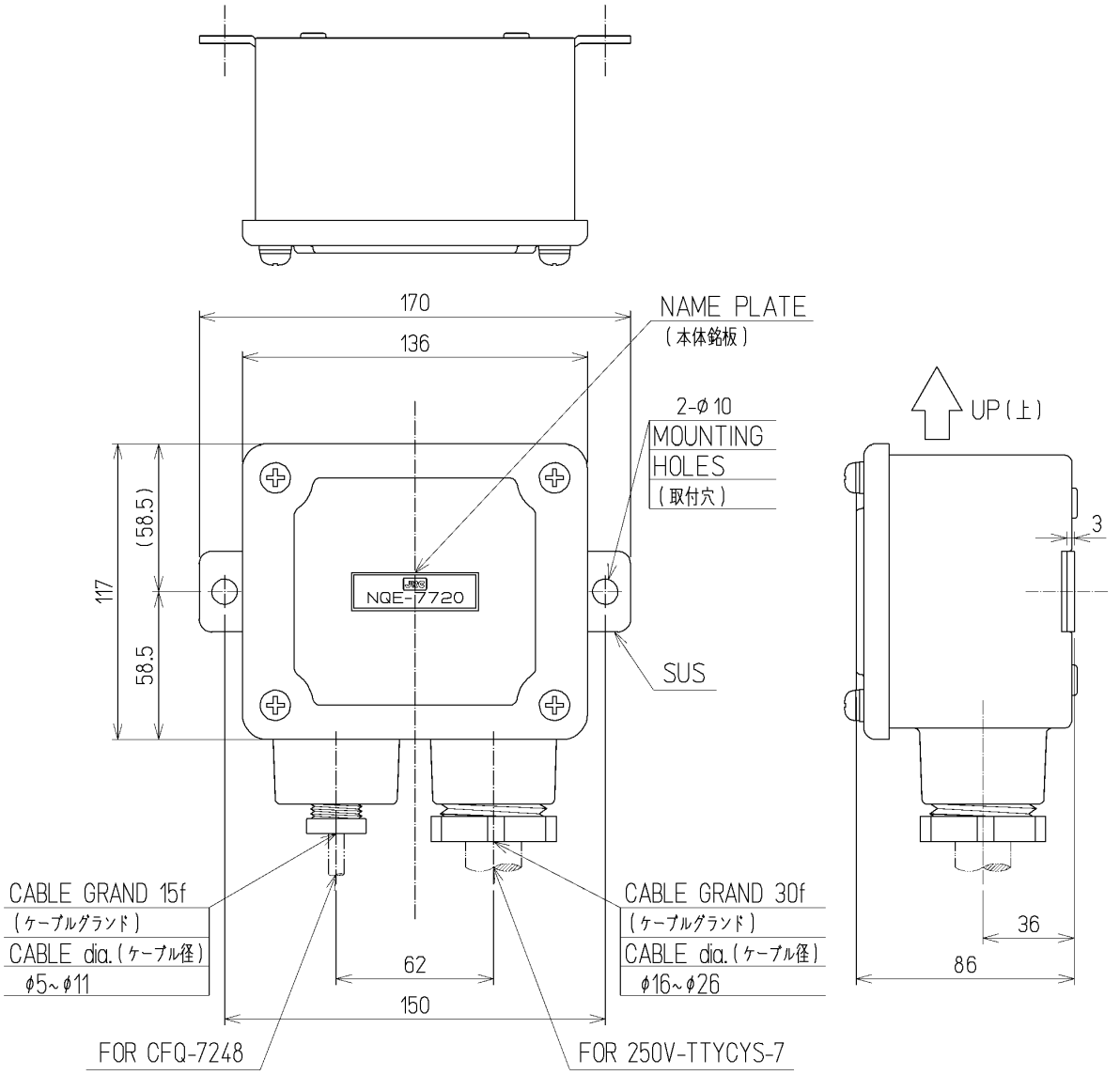
NWW-26 □ □□ □

(L) (20) (G)
(M) (25) (O)
(S) (30)
(35)
(40)

PAINTING COLOR

□

Junction Box for GPS Compass Sensor NQE-7720 (Optional)



UNIT	:	mm
MASS	:	APPROX. 1.2 kg
BODY COLOR	:	MUNSELL 7.5BG/2
IP GRADE	:	IP56

単位	:	mm
質量	:	約 1.2 kg
本体色	:	マンセル 7.5BG/2
防水	:	IP56

UNLESS OTHERWISE SPECIFIED

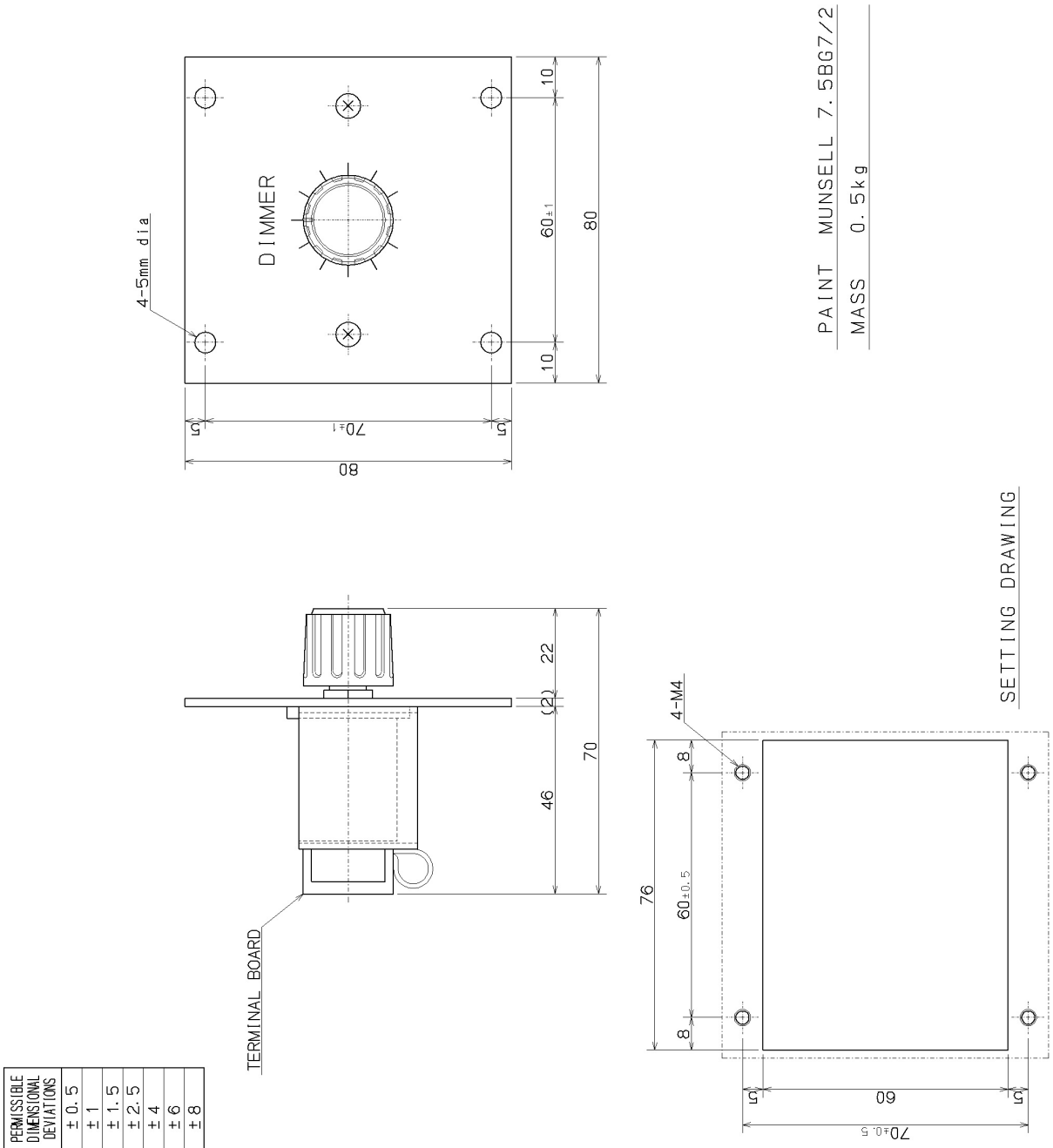
OUTLINE DIMENSIONS		PERMISSIBLE OUTLINE DIMENSIONAL DEVIATIONS	PERMISSIBLE MOUNTING DIMENSIONAL DEVIATIONS
OVER	TO		
3	6	±0.5	±0.5
6	30	±1	
30	120	±1.5	
120	400	±2.5	±1

標準許容差

寸法区分		外形寸法許容差	取付穴位置寸法許容差
を超え	以下		
3	6	±0.5	±0.5
6	30	±1	
30	120	±1.5	
120	400	±2.5	±1

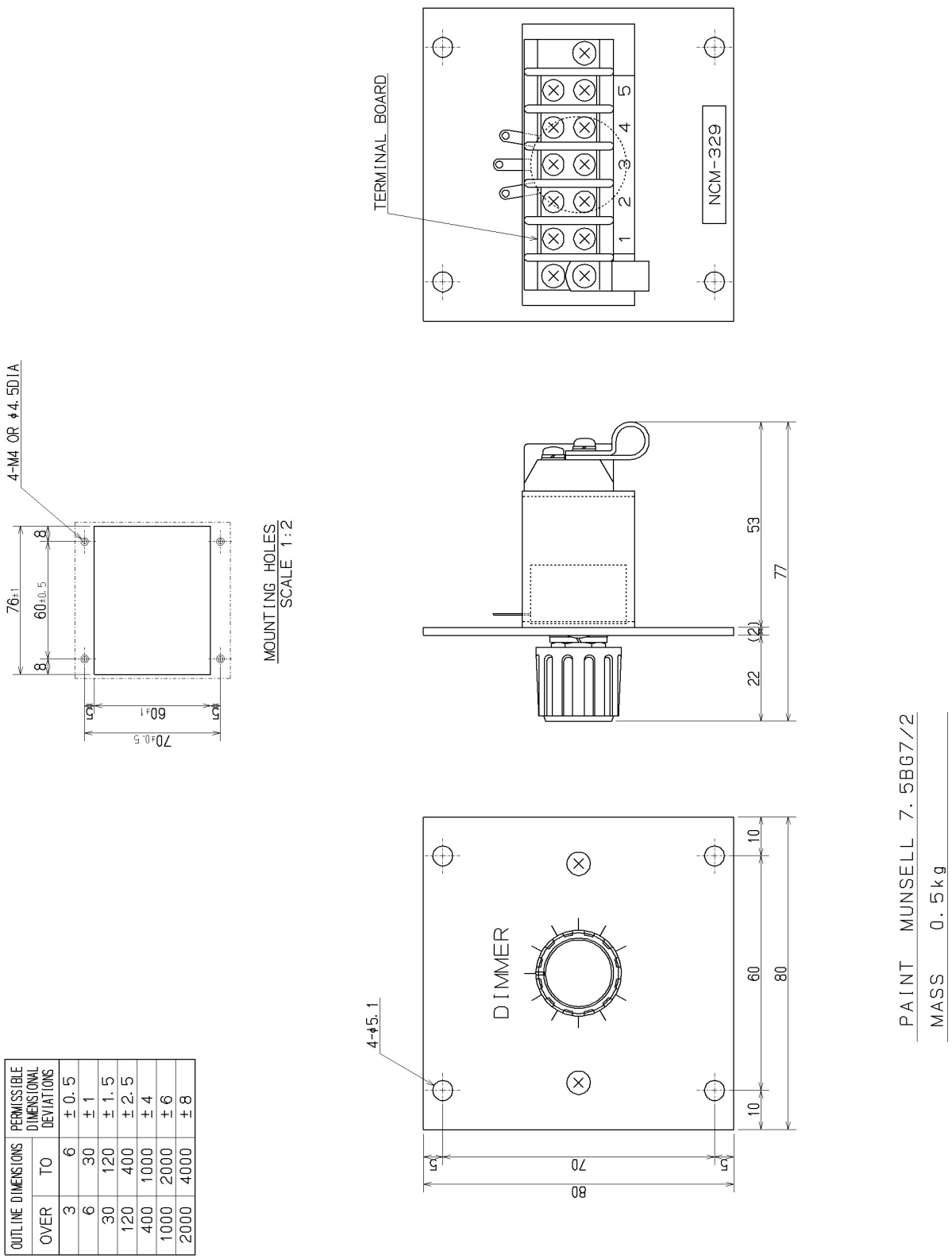
APP A

Dimmer Unit NCM-227 (Optional)



OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	± 0.5
6	30	± 1
30	120	± 1.5
120	400	± 2.5
400	1000	± 4
1000	2000	± 6
2000	4000	± 8

Dimmer Unit NCM-329 (Optional)



OUTLINE DIMENSIONS		PERMISSIBLE DIMENSIONAL DEVIATIONS
OVER	TO	
3	6	± 0.5
6	30	± 1
30	120	± 1.5
120	400	± 2.5
400	1000	± 4
1000	2000	± 6
2000	4000	± 8

APP A

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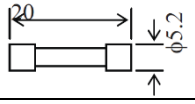
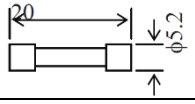
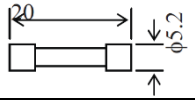
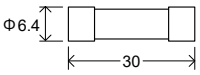
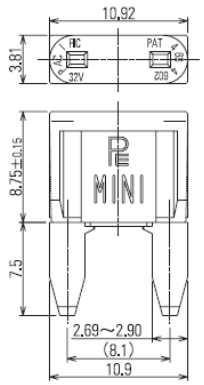
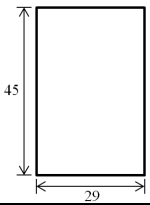
Appendix B Spare Parts List

SHIP No.		SPARE PARTS LIST FOR				U S E	SETS PER VESSEL
		MODEL JLN-720 Satellite Log					1
ITEM No.	NAME OF PART	OUTLINE (DIMENSION IN M/M)	QUANTITY			REMARKS	
			WORKING		SPARE	DESCRIPTION JRC CODE No.	SUB MARK OF BOX No.
			PER SET	PER VESS			
1	Fuse		2		4	MF51NR 250V 2 5ZFGD00200	
2	Fuse		2		4	MF51NR 250V 4 5ZFGD00117	
3	Fuse		1		2	MF51NR 250V 0.5 5ZFGD00019	
4	Fuse		2		6	MF60NR 250V 2 5ZFGD00010	
5	Fuse		2		4	1203 5ZFCK00016	
6	Heat Dissipation Sheet		1		1	- MTT316459	
MFR'S NAME		JAPAN RADIO CO.,LTD.				DWG. No.	7ZXNA3004

APP B

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For further information,contact:

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Since 1915

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ISO 9001, ISO 14001 Certified

CODE No.7ZPNA3206 OCT. 2019 Edition 2