

JMA-3300 Series

**MARINE RADAR
EQUIPMENT**

**INSTRUCTION
MANUAL**



Japan Radio Co., Ltd.

PRECAUTIONS BEFORE OPERATION

■ Cautions for high voltage

High voltages from hundreds volts to tens of thousands volts are to be applied to the electronic equipment such radio and radar devices. You do not face any danger during normal operation, but sufficient cares are required for maintenance, inspection and adjustment of their internal components. (Maintenance, check-up and adjustment of the inside of the equipment are prohibited except by maintenance specialists.)

High voltages of tens of thousands volts are so dangerous as to bring a death from electric shock, but even voltages of hundred volts may sometimes lead to a death from electric shock. To prevent such an accident, make it a rule to turn off the power switch, discharge capacitors with a wire surely earthed on an end make sure that internal parts are no longer charged before you touch any parts inside these devices. At the time, wearing dry cotton gloves ensures you further to prevent such danger. It is also a necessary caution to put one of your hands in the pocket and not to use your both hands at the same time.

It is also important to select a stable foothold always to prevent additional injuries once you were shocked by electricity. If you were injured from electric shock, disinfect the burn sufficiently and get it taken care of promptly.

■ What to do in case of electric shock

When finding a victim of electric shock, turn off the power source and earth the circuit immediately. If it is impossible to turn off the circuit, move the victim away promptly using insulators such as dry wood plate and cloth without touching the victim directly.

In case of electric shock, breathing may stop suddenly if current flows to the respiration center in the brain. If the shock is not so strong, artificial respiration may recover breathing. When shocked by electricity, the victim will come to look very bad with weak pulse or without beating, resulting in unconsciousness and rigidity. In this case, it is necessary to perform an emergency measure immediately.

FIRST-AID TREATMENTS

■ First-aid treatments

As far as the victim of electric shock is not in dangerous condition, do not move him and practice artificial respiration on him immediately. Once started, it should be continued rhythmically.

- 1** Do not touch the victim confusedly as a result of the accident, but the rescuer may also get an electric shock.
- 2** Turn off the power source calmly and move the victim away quietly from the electric line.
- 3** Call a physician or ambulance immediately or ask someone to call a doctor.
- 4** Lay the victim on this back and loosen his necktie, clothes, belt, etc.
- 5**
 - a. Examine the victim's pulse.
 - b. Examine his heartbeat bringing your ear close to his heart.
 - c. Examine his breathing bringing the back of your hand or your face close to his face.
 - d. Check the size of the pupils of his eyes.
- 6** Open the victim's mouth and take out artificial teeth, cigarette or chewing gum if any. Keep his mouth open, stretch his tongue and insert a towel or the like in his mouth to prevent the tongue from suffocating. (If it is hard to open his mouth due to set teeth, open it with a screwdriver and insert a towel in this mouth.)
- 7** Then, wipe his mouth so that foaming mucus does not accumulate inside.

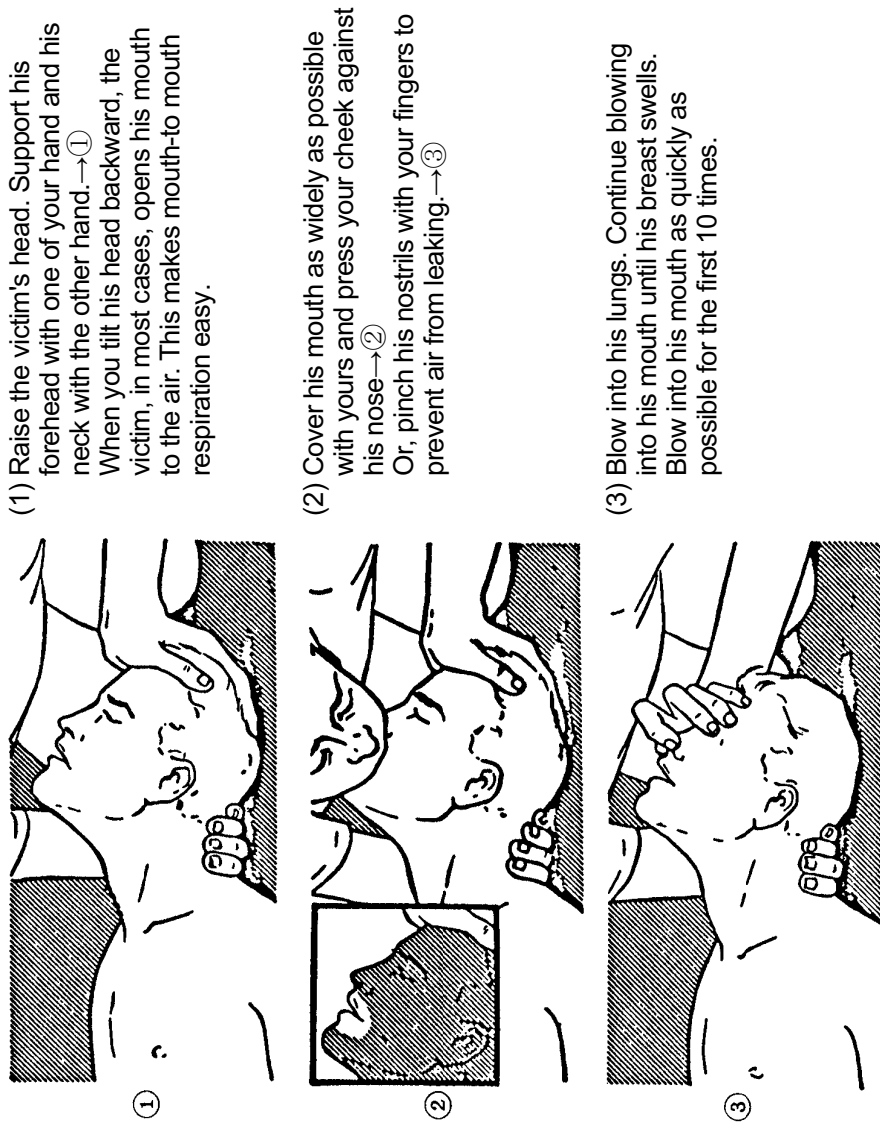
■ When pulse is beating but breathing has stopped

(Mouth-to-mouth respiration) Fig. 1

- 1 Tilt the victim's head back as far as this face looks back. (A pillow may be inserted his neck.)
- 2 Push his jaw upward to open his throat wide (to spread his airway).
- 3 Pinch the victim's nostrils and take a deep breath, block his mouth completely with yours and blow into his mouth strongly. Take a deep breath again and blow into his mouth.
- 4 Continue this 10 to 15 times a minutes (blocking his nostrils).
- 5 Carefully watch that he has recovered his natural breathing and atop practicing artificial respiration.
- 6 If it is difficult to open the victim's mouth, insert a rubber or vinyl tube into one of his nostrils and blow into it blocking the other nostril and his mouth completely.
- 6 When the victim recovers consciousness, he may try to stand up suddenly, but let him lie calmly and serve him with a cup of hot coffee or tea and keep him warm and quiet. (Never give him alcoholic drinks.)

● Method of mouth-to-mouth respiration by raising head

Fig. 1 Mouth-to mouth respiration



FIRST-AID TREATMENTS

■ When both pulse and breathing have stopped

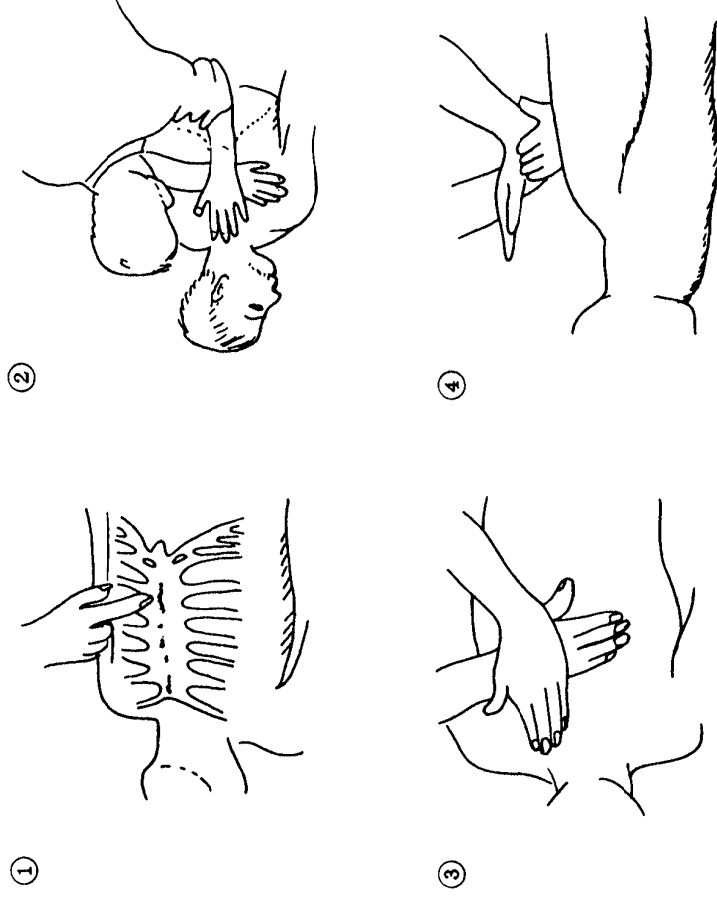
Perform the (Cardiac massage) Fig. 2 and (Mouth-to-mouth respiration) Fig. 1

When no pulse has come not to be felt, his pupils are open and no heartbeat is heard, cardiac arrest is supposed to have occurred and artificial respiration must be performed.

- 1 Place your both hands, one hand on the other, on the lower one third area of his breastbone and compress his breast with your elbows applying your weight on his breast so that it is dented about 2cm (Repeat compressing his breast 50 times or so a minutes). (Cardiac massage)
- 2 In case of one rescuer, Repeat cardiac massages about 15 times and blow into his mouth 2 times quickly, and repeat this combination.

- 3 In case of two rescuers, one person repeats cardiac massages 15 times while the other person blow into his mouth twice, and they shall repeat this combination. (Perform the cardiac massage and mouth-to-mouth respiration)
- 3 Examine his pupils and his pulse sometimes. When the both have returned to normal, stop the artificial respiration, serve him with a cup of hot coffee or tea and keep him warm and calm while watching him carefully. (Never give him alcoholic drinks.) Commit the victim to a medical specialist depending on his condition. To let him recover from the mental shock, it is necessary for persons concerned to understand his situations and the necessary treatment.

Fig. 2 Cardiac massage



PREFACE

Thank you very much for purchasing the JRC marine radar equipment, JMA-3300 series. This equipment is a marine radar equipment designed to obtain safe operation of marine ships. This equipment consists of a scanner unit and a display unit as its main units.




- Before operating the equipment, be sure to read this instruction manual carefully for correct operation.
- Maintain this instruction manual so that operators can refer to it at anytime. Refer to this manual when any inconvenience or defect occurs.

BEFORE OPERATION

BEFORE OPERATION

■ Pictorial Indication

Various pictorial indications are included in this manual and are shown on these 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.
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 any person is supposed to be in danger of being killed or seriously injured if this indication is neglected and these equipments are not operated correctly.
	CAUTION	This indication is shown where any person is supposed to be injured or any property damage is supposed to occur if this indication is neglected and these equipments are not operated correctly.

■ Examples of Pictorial Indication



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



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



The \bullet 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 equipment.
Do not try to remove, break or modify the label.

PRECAUTIONS

DANGER



Never carry out internal inspection or repair work of the equipment by users. Inspection or repair work by unauthorized personnel may result in fire hazard or electric shock. For inspection and repair work of equipment components, consult with our branch office, branch shop, sales office, or our distributor in your district.



When conducting maintenance, make sure to turn the main power off. Failure to comply may result in electrocution.



Turn off the main power before cleaning the equipment. Especially when a rectifier is used, make sure to turn it off since voltage is still output from the rectifier even after the radar is turned off. Failure to comply may result in equipment failure, electric shock or serious injury.



When conducting maintenance work on the antenna, make sure to turn its main power off. Failure to comply may result in electrocution or injuries.



Make sure to turn on the antenna operation switch. Failure to comply may result in injuries caused by physical contact with the rotating antenna.

WARNING



Never directly touch the internal components of the antenna, receiver/transceiver, or indicator. Direct contact with these high-voltage components may cause electrocution. For maintenance, inspection, or adjustment of equipment components, consult with our branch office, branch shop, sales office, or our distributor in your district.



Do not get close to the radiant section of the antenna. It is a rotating part, and it may cause injuries if it suddenly starts rotating and consequently hits the body. It is recommended that the radiant section be installed at a high place such as on the roof of the wheelhouse, on the flying bridge, on the trestle, or on the radar mast so that no one can get close to it. When any work must be done on the antenna, make sure to turn the antenna switch off.



Microwave radiation level:
Keep away from a scanner when it is transmitting. The high level of microwave is radiated from the front face of the scanner specified below. The microwave exposure at close range could result in injuries (especially of the eyes).

NKE-2103	50W/m ²	10W/m ²	2.5W/m ²
	n/a	26cm	123cm



Make sure to install the antenna at a place higher than human height. Direct exposure to electromagnetic waves at close range will have adverse effects on the human body.



Direct exposure to electromagnetic waves at close range will have adverse effects on the human body. When it is necessary to get close to the antenna for maintenance or inspection purposes, make sure to turn the indicator power switch to "OFF" or "STBY." Direct exposure to electromagnetic waves at close range will have adverse effects on the human body.



When conducting maintenance work, make sure to turn off the power and unplug the power connector J1 of the display unit so that the power supply to the equipment is completely cut off. Some equipment components can carry electrical current even after the power switch is turned off, and conducting maintenance work without unplugging the power connector may result in electrocution, equipment failure, or accidents.



Do not touch the radiator. Even if the power is turned off, the radiator may be rotated by the wind.

CAUTION



A malfunction may occur if the power in the ship is instantaneously interrupted during operation of the radar. In this case, the power should be turned on again.



Always use the automatic tuning mode. Use the manual tuning mode only when the automatic tuning mode does not provide the best tuning state due to deterioration of magnetron for example.



If sensitivity is set too high, unnecessary signals such as noises in the receiver and false echoes increase to lower target visibility. At the same time, if sensitivity is set too low, detection of targets such as ships and dangerous objects may be hindered. Therefore, sensitivity must always be set to an optimal level.



When using the sea clutter suppression function, never set the suppression level too high canceling out all image noises from the sea surface at close range. Detection of not only echoes from waves but also targets such as other ships or dangerous objects will become inhibited.

When using the sea clutter suppression function, make sure to choose the most appropriate image noise suppression level.



When using the sea clutter suppression function, never set the suppression level too high canceling out all image noises from the rain or snow at close range. Detection of not only echoes from the rain or snow but also targets such as other ships or dangerous objects will become inhibited.

When using the sea clutter suppression function, make sure to choose the most appropriate image noise suppression level.



Use the radar only as a navigation aid. The final navigation decision must always be made by the operator him/herself. Making the final navigation decision based only on the radar display may cause accidents such as collisions or running aground.



Use the target tracking function (TT) only as a navigation aid. The final navigation decision must always be made by the operator him/herself. Making the final navigation decision based only on the target tracking function (TT) information may cause accidents. The target tracking function (TT) information such as vector, target numerical data, and alarms may contain some errors. Also, targets that are not detected by the radar cannot be acquired or tracked. Making the final navigation decision based only on the radar display may cause accidents such as collisions or running aground.

⚠ CAUTION



Target Tracking Function Test is provided to test if the target tracking function is operating normally. Thus, do not use the function except when you test the target tracking function. Note especially that, if this function is used during actual navigation, simulated targets are displayed and may become confused with other actual targets. Therefore, never use this function during actual navigation.



When a large value is set as an association condition, a tracked target near an AIS target is identified as the AIS target and may thus disappear from the display. For example, when a pilot vessel equipped with the AIS function (a small target which is not a tracked target) goes near a cargo vessel which is a tracked target without the AIS function, the tracked target symbol for the cargo vessel may disappear.



Since these alarms may include some errors depending on the target tracking conditions, the navigation officer himself should make the final decision for ship operations such as collision avoidance. Making the final navigation decision based only on the alarm may cause accidents such as collisions.



When setting an automatic acquisition zone, make sure to properly adjust gain, sea-surface reflection suppression level, and rain/snow reflection suppression level so that the optimal target images are always on the radar screen. The automatic acquisition zone alarm will not be activated for targets undetected by the radar, and it may result in accidents such as collisions.



Any adjustments must be made by specialized service personnel. Incorrect settings may result in unstable operation.



Do not make any adjustments during navigation. Failure to comply may result in adverse effects on the radar function which may lead to accidents or equipment failure.



Any adjustments must be made by specialized service personnel. Failure to comply may result in accidents or equipment failure.



Make sure to shut off the main power before replacing parts. Failure to comply may result in electrocution or equipment failure.



When replacing magnetrons, make sure to shut off the main power and let the equipment stand for more than 5 minutes to discharge the high-voltage circuit. Failure to comply may result in electrocution.

CAUTION



Make sure to take off your watch when your hand must get close to the magnetron.
Failure to comply may result in damage to the watch since the magnetron is a strong magnet.



Make sure that two or more staff member work together when replacing the LCD.
If only one person attempts to replace the LCD, he/she may drop it and become injured.



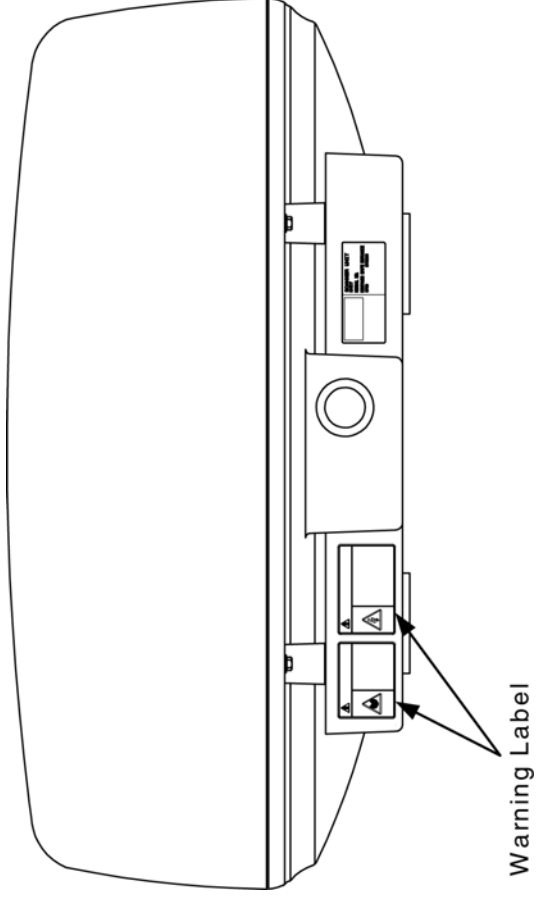
Do not directly touch the inverter circuit of the LCD display with a bare hand since high voltage temporarily remains in the circuit even after the main power is shut off.
Failure to comply may result in electrocution.



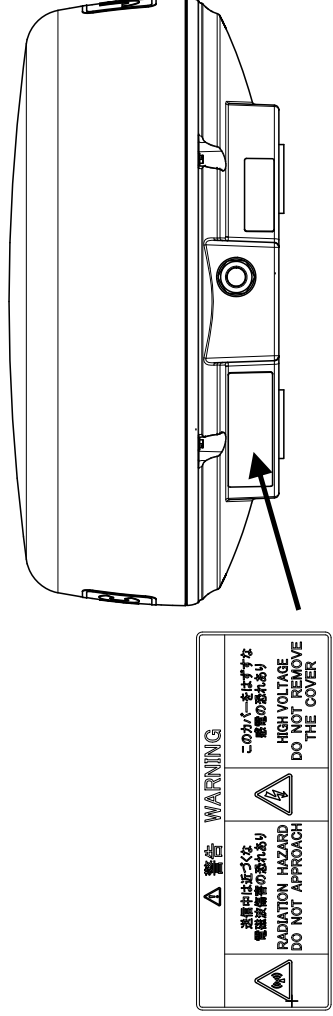
When cleaning the display screen, do not wipe it too strongly with a dry cloth. Also, do not use gasoline or thinner to clean the screen.
Failure to comply will result in damage to the screen surface.

WARNING LABEL MOUNTING POINT

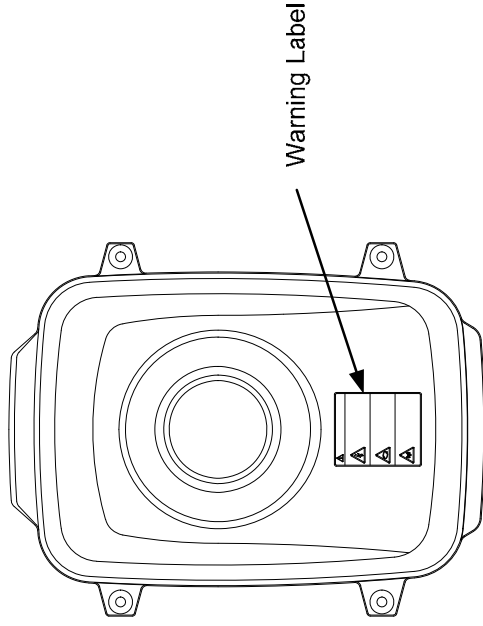
WARNING LABEL MOUNTING POINT



NKE-2042 Scanner Unit

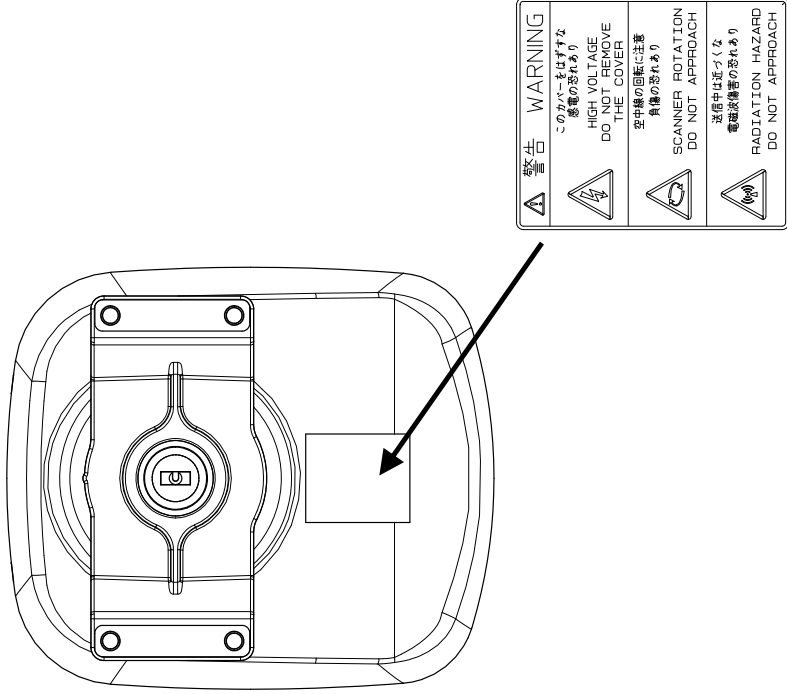


NKE-2043 Scanner Unit

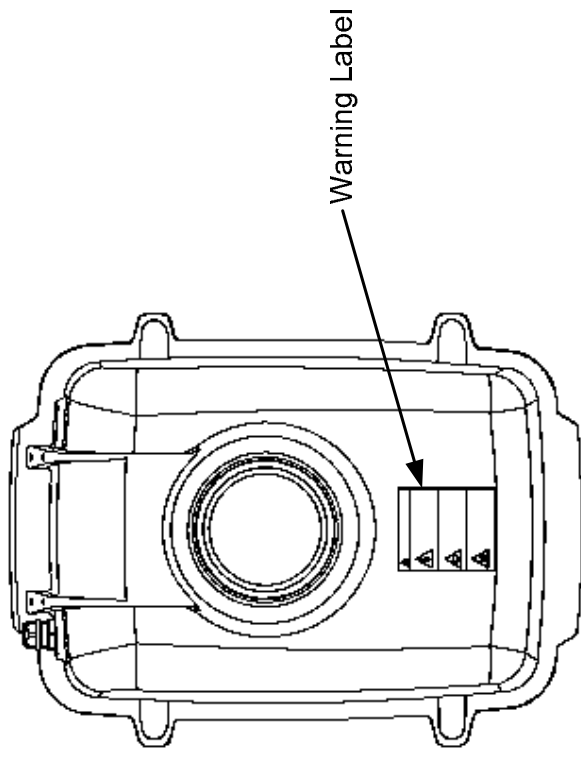


NKE-2062/HS Scanner Unit

WARNING LABEL MOUNTING POINT

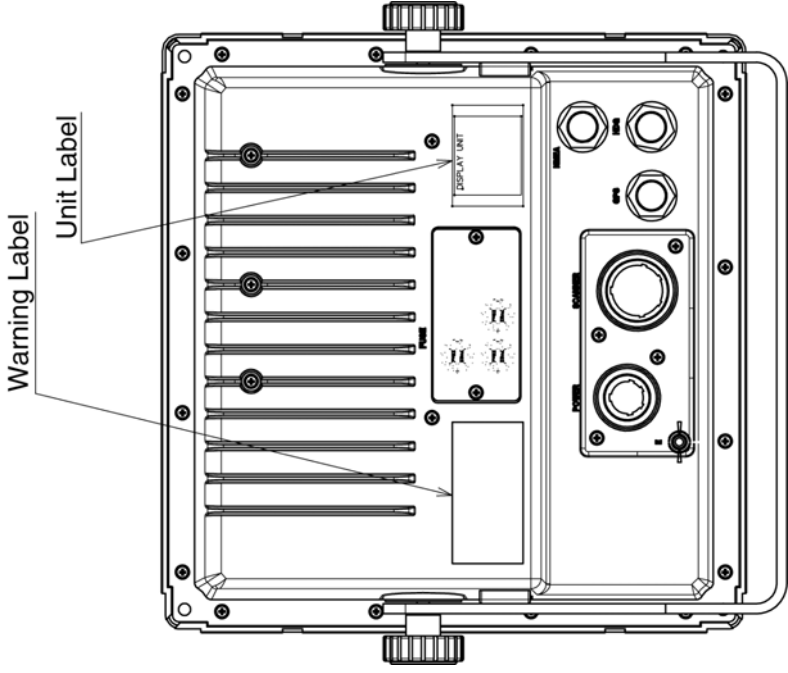
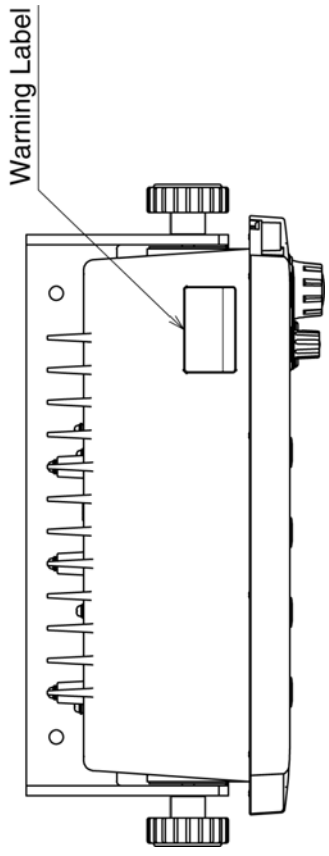


NKE-2063/HS Scanner Unit



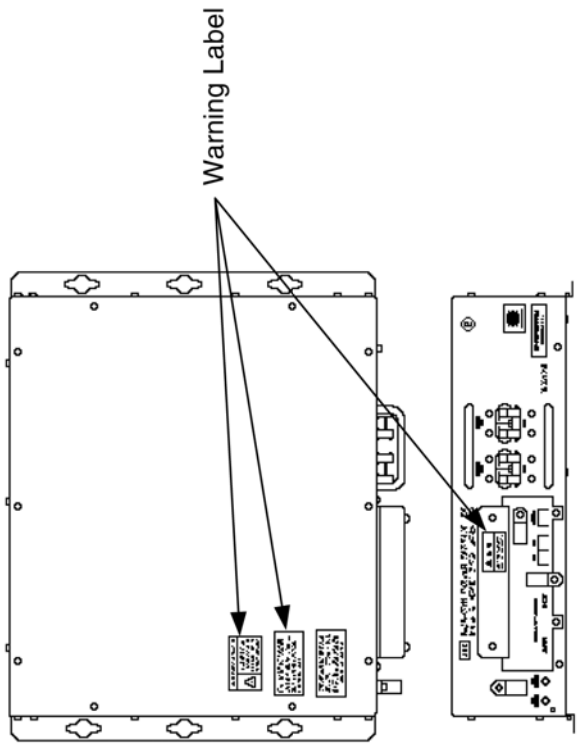
NKE-2103-4/6/4HS/6HS Scanner Unit

WARNING LABEL MOUNTING POINT

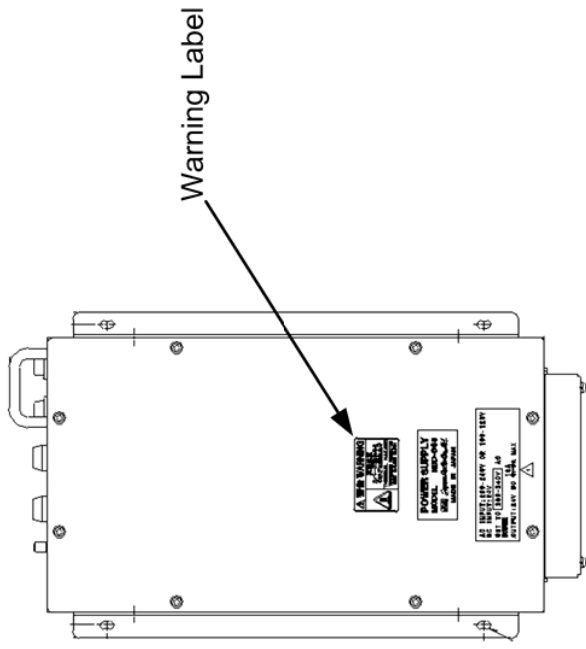


NCD-2182 Display Unit

WARNING LABEL MOUNTING POINT



NBA-5111 Power Supply



NBD-865 Rectifier unit

EQUIPMENT APPEARANCE



Scanner Unit Type NKE-2042 (2 feet)



Scanner Unit Type NKE-2043 (2 feet)



Scanner Unit Type NKE-2062/HS (3.9 feet)



Scanner Unit Type NKE-2063/HS (3.9 feet)



Scanner Unit Type NKE-2103-4/4HS (4 feet)



Scanner Unit Type NKE-2103-6/6HS (6 feet)



NCD-2182 Display Unit

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APPENDIX

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GLOSSARY

This section describes the main terms used for this equipment and general related maritime terms.

A

AZ Acquisition/Activation zone
A zone set up by the operator in which the system should automatically acquire radar targets and activate reported AIS targets when entering the zone.

Activated target A target representing the automatic or manual activation of a sleeping target for the display of additional information.

AIS Automatic Identification System
A system which enables ships and shore stations to obtain identifying and navigation information about other ships at sea, using an automated transponder.

Anti-clutter rain Rain/snow clutter suppression.

Anti-clutter sea Sea clutter suppression.

AZI AZ/Imuth stabilization mode

B

BCR/BCT Bow Crossing Range and Bow Crossing Time

C

C up Course up
Own ship's course is pointed to the top center of the radar display.

CCRP The Consistent Common Reference Point
A location on own ship, to which all horizontal measurements such as target range, bearing, relative course, relative speed, CPA or TCPA are referenced, typically the conning position of the bridge.

Clutter Unwanted reflections on a radar screen, from sea surface, rain or snow.

COG Course Over Ground
The direction of the ship's movement relative to the earth, measured on board the ship, expressed in angular units from true north

CORREL Correlation

CPA/TCPA The distance to the Closest Point of Approach and Time to the Closest Point of Approach. Limits are set by the operator and are related to own ship.

CTW Course Through Water
The direction of the ship's movement through the water

D

DRIFT The current velocity for manual correction or the current speed on the horizontal axis of the 2-axis log is displayed.

GLOSSARY

E

- EBL** Electronic Bearing Line
An electronic bearing line originated from own ship's position.
- ENH** Enhance
- ETA** Estimated Time of Arrival

G

- Ground stabilization** A display mode in which speed and course information are referred to the ground, using ground track input data.

H

- HDG** Heading
The horizontal direction that the bow of a ship is pointing at any instant, expressed in angular units from a reference direction .
- HL** Heading line
A graphic line on a radar presentation drawn from the consistent common reference point to the bearing scale to indicate the heading of the ship
- H up** Head up
Own ship's heading line is always pointed to the top center of the radar display.

I

- IR** Radar Interference Rejecter

L

- Lost AIS target** A target symbol representing the last valid position of an AIS target before the reception of its data was lost, or its last dead-reckoned position.

- Lost tracked target** One for which target information is no longer available due to poor, lost or obscured signals.

- LP** Long Pulse

- MMSI** Maritime Mobile Service Identity

- MOB** Man OverBoard

- MP** Medium Pulse

N

- NM** 1NM=1852m

- NSK** North Stabilization Kit

- N up** North up
The north is always pointed to the top center of the radar display.

O

- Own track** Display function of own ship's track

P

PI	Parallel Index line
Past positions	Equally time-spaced past position marks of a tracked or AIS target and own ship.
POSN	Position
PRF	Pulse Repetition Frequency The number of radar pulses transmitted each second.
PROC	Process Radar signal processing function

R

Radar beacon	A navigation aid which responds to the radar transmission by generating a radar signal to identify its position and identity
Radar cross-section	Radar cross-section of a target determines the power density returned to the radar for a particular power density incident on the target
Range Rings	A set of concentric circles labeled by distance from CCRP.
Reference target	A symbol indicating that the associated tracked stationary target is used as a speed reference for the ground stabilization
Relative course	The direction of motion of a target relative to own ship motion
Relative speed	The speed of a target relative to own ship's speed data
Relative vector	A predicted movement of a target relative to own ship's motion
RM	Relative Motion A display on which the position of own ship remains fixed, and all targets move relative to own ship.
RM(R)	Relative Motion. Relative Trails.
RM(T)	Relative Motion. True Trails.
ROT	Rate Of Turn Change of heading per time unit.
Route	A set of waypoints.
RR	Range Rings

GLOSSARY

S

SART	Search And Rescue Transponder Radar transponder capable of operating in the 9GHz band
Sea stabilization	A display mode in which speed and course information are referred to the sea.
Sea state	Status of the sea condition due to the weather environment, expressed as a sea state 0 for flat conditions with minimal wind, to sea state 8 for very rough sea conditions.
SET	The current direction for manual correction or the current speed on the horizontal axis of the 2-axis log is displayed.
Sleeping AIS target	A target indicating the presence and orientation of a vessel equipped with AIS in a certain location.
SOG	Speed Over the Ground The speed of the ship relative to the earth, measured on board of the ship.
SP	Short Pulse
STAB	Stabilization
STW	Speed Through Water The speed of the ship relative to the water surface.

T

TCPA	Time to Closest Point of Approach to own ship
Test target	Radar target of known characteristics used for test requirement
TM	True Motion A display across which own ship moves with its own true motion.
Trails	Display Radar Trails (Other Ships' Trails)
True course	The direction of motion relative to ground or to sea, of a target expressed as an angular displacement from north
True speed	The speed of a target relative to ground, or to sea
True vector	A vector representing the predicted true motion of a target, showing course and speed with reference to the ground or sea
TT	Target Tracking A computer process of observing the sequential changes in the position of a radar target in order to establish its motion. Such a target is a Tracked Target.
TTG	Time To Go. Time to next waypoint.
TXRX	Transceiver Unit

GLOSSARY

U

UTC Universal Time Coordinated.
The international standard of time, kept by atomic clocks around the world.

V

VRM Variable Range Marker
An adjustable range ring used to measure the distance to a target.

W

Waypoint A geographical location on a route indicating an event.

Chapter 1 GENERAL AND EQUIPMENT COMPOSITION

1.1 FUNCTIONS

This equipment is a marine radar equipment consisting of a scanner unit and an integrated color LCD display unit.

■ Function of This System

- Sensitivity adjustment
- Sea clutter suppression
- Rain/snow clutter suppression
- IR (Interference rejection)
- Bearing and range measurement using a cursor, fixed/variable range markers, and electronic bearing line
- Own ship's track display
- NAV line and marker displays
- TM (True Motion) presentation
- Self-diagnostic
- TT (manual and automatic target acquisition/automatic tracking, vector and trail displays and alarm displays)
- AIS

1.2 FEATURES

- **Equipping a Bright and Easy-to-see LCD Screen**
10.4-inch color LCD of 640X480 pixels (VGA) is equipped.

- **Easy Operation with the Soft keys and the Multi Control**
Simple and easy operations are provided so that you can operate without this instruction manual.

- **Target Detection by Latest Signal Processing Technology**
The system employs a signal processing technology of DSP to eliminate undesired clutter, thus improving the target detection.

- **TT and AIS functions as Standard Equipment**
High performance target tracking function which can automatically track targets (up to 10 targets) and AIS target display function (up to 50 targets) are provided.

1.3 CONFIGURATION

Radar Configuration and Ship's Mains

RADAR MODEL	Scanner	Display Unit	SHIP'S MAINS
JMA-3314	NKE-2042	NCD-2182	12/24 VDC
JMA-3334	NKE-2043		
JMA-3316	NKE-2062		24 VDC
JMA-3316HS	NKE-2062HS		12/24 VDC
JMA-3336	NKE-2063		
JMA-3336HS	NKE-2063HS		24 VDC
JMA-3340-4	NKE-2103-4		
JMA-3340-4HS	NKE-2103-4HS		
JMA-3340-6	NKE-2103-6		
JMA-3340-6HS	NKE-2103-6HS		

Scanners and Transmitted Output Powers

SCANNER TYPE		TRANSMITTED OUTPUT POWER	BAND	RATE OF ROTATION
JMA-3314	620mm Radome	4kW	X	27 rpm
JMA-3334				27 rpm
JMA-3316	3.9 FT SLOT ANTENNA	6kW		48 rpm
JMA-3316HS				27 rpm
JMA-3336				48 rpm
JMA-3336HS	4 FT SLOT ANTENNA	10kW		27 rpm
JMA-3340-4				48 rpm
JMA-3340-4HS	6 FT SLOT ANTENNA	10kW		27 rpm
JMA-3340-6				48 rpm
JMA-3340-6HS				27 rpm
			48 rpm	

Reference:

- 1 An optional rectifier NBA-5111 or NBD-865 is necessary for using Ship's Mains
100-120/220-240 VAC, 50/60Hz, 1 ϕ .
- 2 If connecting to gyro with synchro signal output or step signal output, optional NSK unit
NCT-4106A is required.

Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.3 CONFIGURATION

Supplied accessories

PRODUCT NAME/MODEL	QUANTITY	JRC CODE	REMARKS
Instruction manual 7ZPRD0787	1	7ZPRD0787	This manual
Installation manual 7ZPRD0789	1	7ZPRD0789	
Quick manual 7ZPRD0793	1	7ZPRD0793	
Power cord H-CFQ-5436-5	1	CFQ-5436-5	5 m RoHS compliance

Included accessories

PRODUCT NAME/MODEL	QUANTITY	JRC CODE	REMARKS
Fuse ST4-6.3ANI	4	7ZXRD0012	Scanner NKE-2042(DC12V) For the modulator(F2) JRC CODE: 5ZFCA00051 1 for installation 3 for spares
Fuse ST4-3.15ANI	4		Scanner NKE-2042(DC24V) For the modulator(F2) JRC CODE: 5ZFCA00047 1 for installation 3 for spares
Fuse ST4-6.3ANI	4	7ZXRD0012	Scanner NKE-2043(DC12V) For the compound modulator(F2) JRC CODE: 5ZFCA00051 1 for installation 3 for spares
Fuse ST4-3.15ANI	4		Scanner NKE-2043(DC24V) For the compound modulator(F2) JRC CODE: 5ZFCA00047 1 for installation 3 for spares
Fuse ST4-6.3ANI	4	7ZXRD0013	Scanner NKE-2062(DC12V) For the modulator(F2) JRC CODE: 5ZFCA00051 1 for installation 3 for spares
Fuse ST4-3.15ANI	4		Scanner NKE-2062(HS(DC24V) For the modulator(F2) JRC CODE: 5ZFCA00047 1 for installation 3 for spares

Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.3 CONFIGURATION

PRODUCT NAME/MODEL	QUANTITY	JRC CODE	REMARKS
Fuse ST4-5ANI	4		Scanner NKE-2062/HS For the scanner motor(F3) JRC CODE: 5ZFCA00050 1 for installation 3 for spares
Fuse ST4-6.3ANI	4		Scanner NKE-2063(DC12V) For the compound modulator(F2) JRC CODE: 5ZFCA00051 1 for installation 3 for spares
Fuse ST4-3.15ANI	4	7ZXRD0013	Scanner NKE-2063/HS(DC24V) For the compound modulator(F2) JRC CODE: 5ZFCA00047 1 for installation 3 for spares
Fuse ST4-5ANI	4		Scanner NKE-2063/HS For the scanner motor(F3) JRC CODE: 5ZFCA00050 1 for installation 3 for spares
Carbon brush 54531-01	2		Scanner NKE-2063/HS JRC CODE: BRXP05247 2 for spares
Fuse ST4-5ANI	4	7ZXRD0026	Scanner NKE-2103-4/4HS/6/6HS For the modulator(F2) JRC CODE: 5ZFCA00050 1 for installation 3 for spares
Fuse ST6-10ANI	4		Scanner NKE-2103-4/4HS/6/6HS For the power supply to motor(F3) JRC CODE: 5ZFCA00053 1 for installation 3 for spares

Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.3 CONFIGURATION

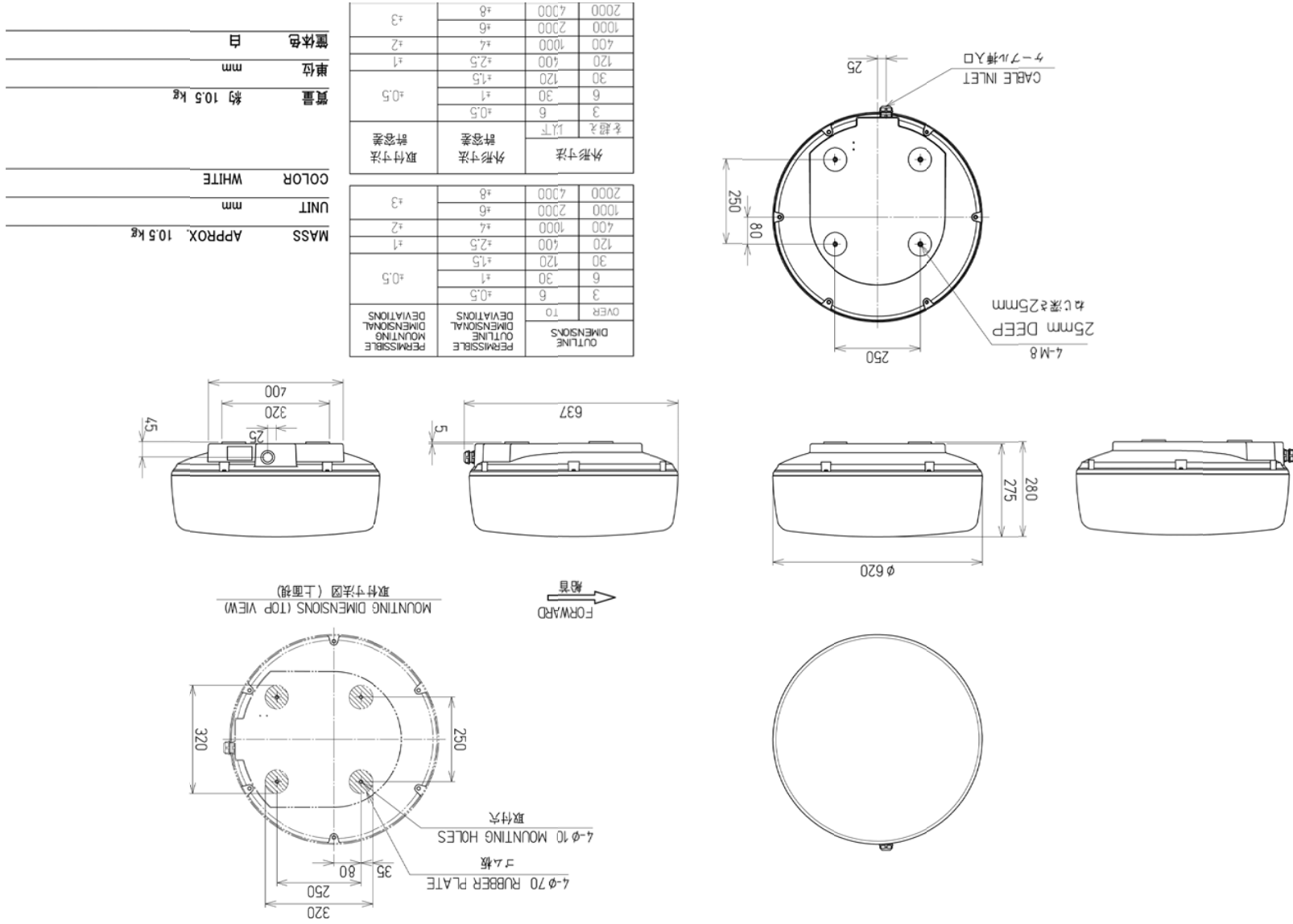
PRODUCT NAME/MODEL	QUANTITY	JRC CODE	REMARKS
Connector LTW-06BFFA-LL7001	1	7ZXR00028	Display Unit NCD-2182 For GPS connection(J3) JRC CODE: 5JCDX00032 1 for installation
Connector LTW-07BFFA-LL7001	1		Display Unit NCD-2182 For NMEA connection(J4) JRC CODE: 5JCDX00033 1 for installation
Connector LTW-08BFFA-LL7001	1		Display Unit NCD-2182 For GPS compass connection(J5) JRC CODE: 5JCDX00034 1 for installation

Option

PRODUCT NAME/MODEL	QUANTITY	JRC CODE	REMARKS
Rectifier NBA-5111	1	NBA-5111	For NKE-2042 NKE-2043 NKE-2062/HS NKE-2063/HS NKE-2103-4/4HS/6/6HS
Rectifier NBD-865	1	NBD-865	For NKE-2042 NKE-2043 NKE-2062 NKE-2063
Equipment cable H-CFQ-6912-5 H-CFQ-6912-10 CFQ-6912-15 H-CFQ-6912-20 H-CFQ-6912-30		CFQ-6912-5/10/15/20/30	Cable connecting the scanner unit and the display unit Length: 5/10/15/20/30 m Cable with connectors at both ends
Cable connecting a GPS compass H-CFQ-6934	1	CFQ-6934	For JLR-10
Cable connecting a GPS compass H-CFQ-5469	1	CFQ-5469	For JLR-20/30
Cable connecting NDW-51 H-CFQ-7082	1	CFQ-7082	Radar simulator Cable connecting NDW-51
NSK unit NCT-4106A	1	NCT-4106A	Gyro signal and log signal acquisition
Sun Hood MTV304869	1	MTV304869	

1.4 EXTERIOR DRAWINGS

Fig. 1.4-1 Exterior Drawing of Scanner Unit, Type NKE-2042



Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.4 EXTERIOR DRAWINGS

Fig. 1.4-2 Exterior Drawing of Scanner Unit, Type NKE-2043

PERMISSIBLE OUTLINE DIMENSIONS DEVIATIONS	PERMISSIBLE DIMENSIONS DEVIATIONS		PERMISSIBLE DIMENSIONS DEVIATIONS					
	OVER	TO	3	6	+0.5	+1	+2	+3
			2000	4000	+8	+8	+8	+8
			1000	2000	+6	+6	+6	+6
			400	1000	+4	+4	+4	+4
			120	400	+2.5	+2.5	+2.5	+2.5
			30	120	+1.5	+1.5	+1.5	+1.5
			6	30	+1	+1	+1	+1
			3	6	+0.5	+0.5	+0.5	+0.5

取付寸法 外形寸法	取付寸法 外形寸法		取付寸法 外形寸法					
	を 超え	以下	3	6	+0.5	+1	+1.5	+2
			2000	4000	+8	+8	+8	+8
			1000	2000	+6	+6	+6	+6
			400	1000	+4	+4	+4	+4
			120	400	+2.5	+2.5	+2.5	+2.5
			30	120	+1.5	+1.5	+1.5	+1.5
			6	30	+1	+1	+1	+1
			3	6	+0.5	+0.5	+0.5	+0.5

MASS	APPROX. 10 kg
UNIT	mm
COLOR	WHITE
質量	約 10 kg
単位	mm
色	白

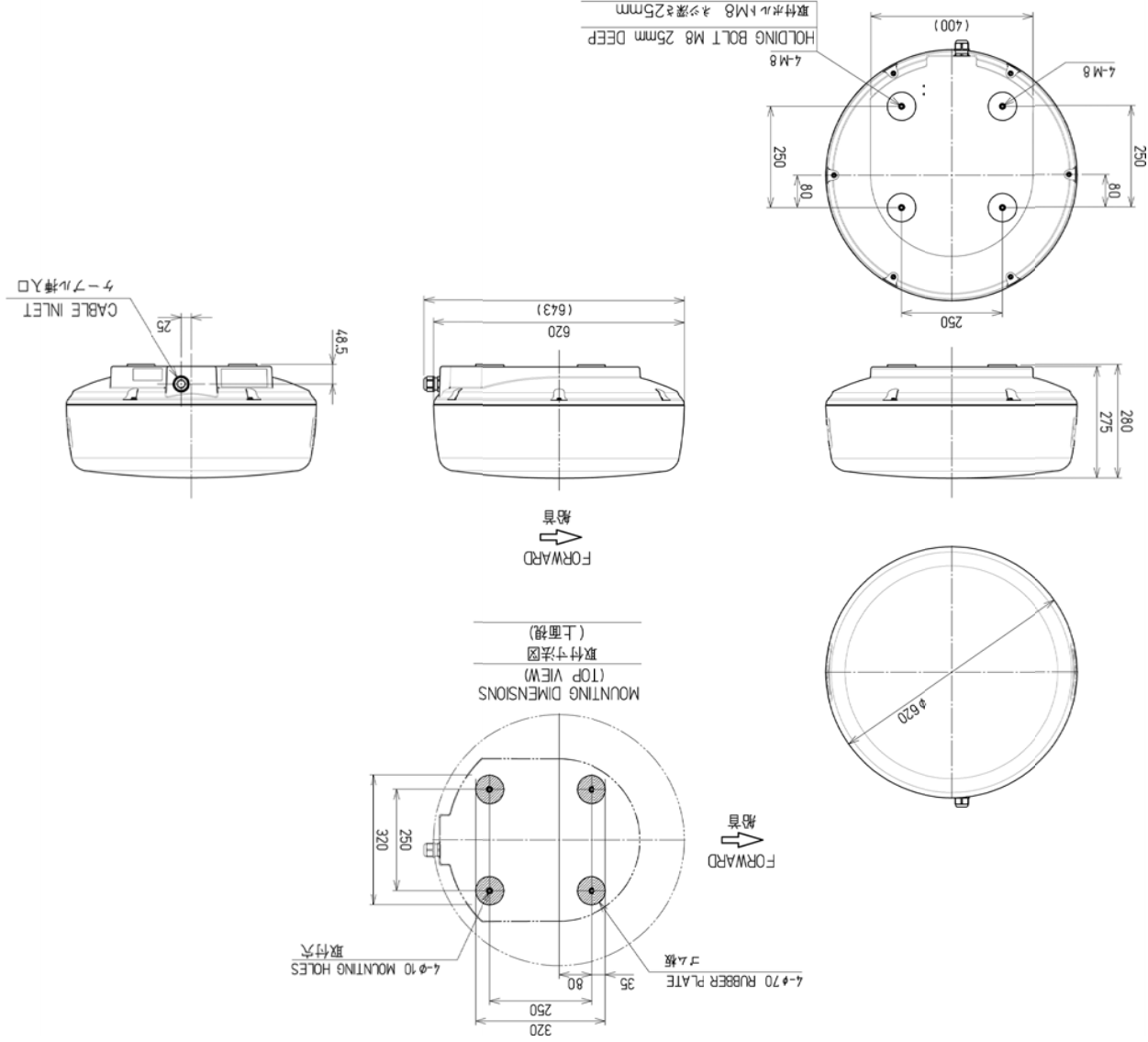
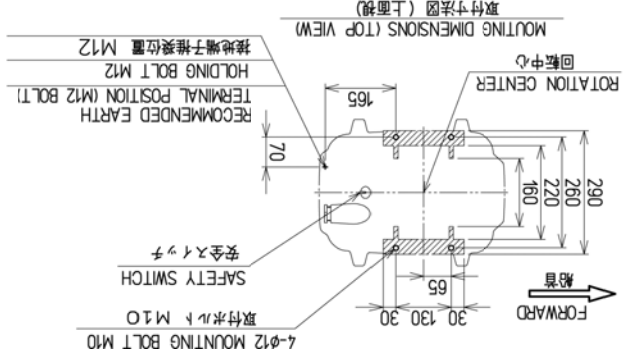
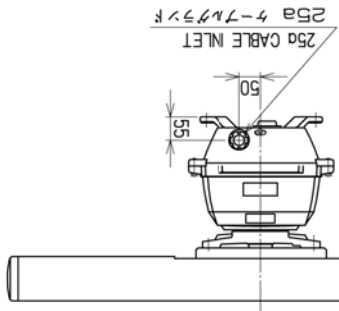


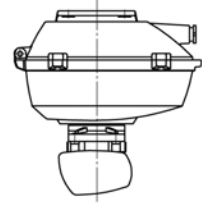
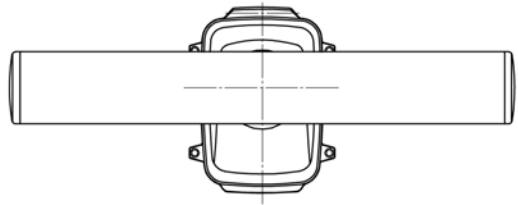
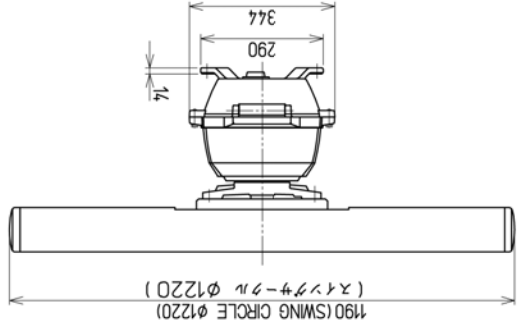
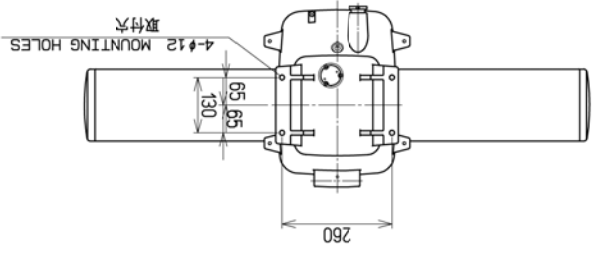
Fig. 1.4-3 Exterior Drawing of Scanner Unit, Type NKE-2062/HS

MASS	APPROX. 24 kg
UNIT	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
質量	約 24 kg
単位	mm
色	輻射部 白
色	支柱部分 白



PERMISSIBLE DIMENSIONAL DEVIATIONS	OUTLINE DIMENSIONS	
	OVER	TO
±0.5	3	±0.5
	6	±1
	30	±1.5
	120	±2.5
	400	±4
±1	1000	±2.5
	2000	±4
	4000	±6
	7000	±8
	20000	±10

PERMISSIBLE DIMENSIONAL DEVIATIONS	OUTLINE DIMENSIONS	
	OVER	TO
±0.5	3	±0.5
	6	±1
	30	±1.5
	120	±2.5
	400	±4
±1	1000	±2.5
	2000	±4
	4000	±6
	7000	±8
	20000	±10



Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.4 EXTERIOR DRAWINGS

Fig. 1.4-4 Exterior Drawing of Scanner Unit, Type NKE-2063/HS

UNIT	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
質量	約 21 kg
単位	mm
色	輻射部 白
色	ベース丸 白

MASS	APPROX. 21 kg
------	---------------

PERMISSIBLE OUTLINE DIMENSIONS	TO	外形寸法			
		取付寸法	許容差	許容差	取付寸法
±0.5	OVER	3	±0.5	6	±0.5
	TO	6	±1	30	±1
		30	±1.5	120	±1.5
		120	±2.5	400	±2.5
±1		400	±4	1000	±4
		1000	±6	2000	±6
		2000	±8	4000	±8
		4000	±8	2000	±8
±2		4000	±8	2000	±8
		2000	±6	1000	±6
		1000	±4	400	±4
		400	±2.5	120	±2.5
±3		120	±1	30	±1
		30	±0.5	6	±0.5
		6	±1	30	±1
		120	±1.5	120	±1.5

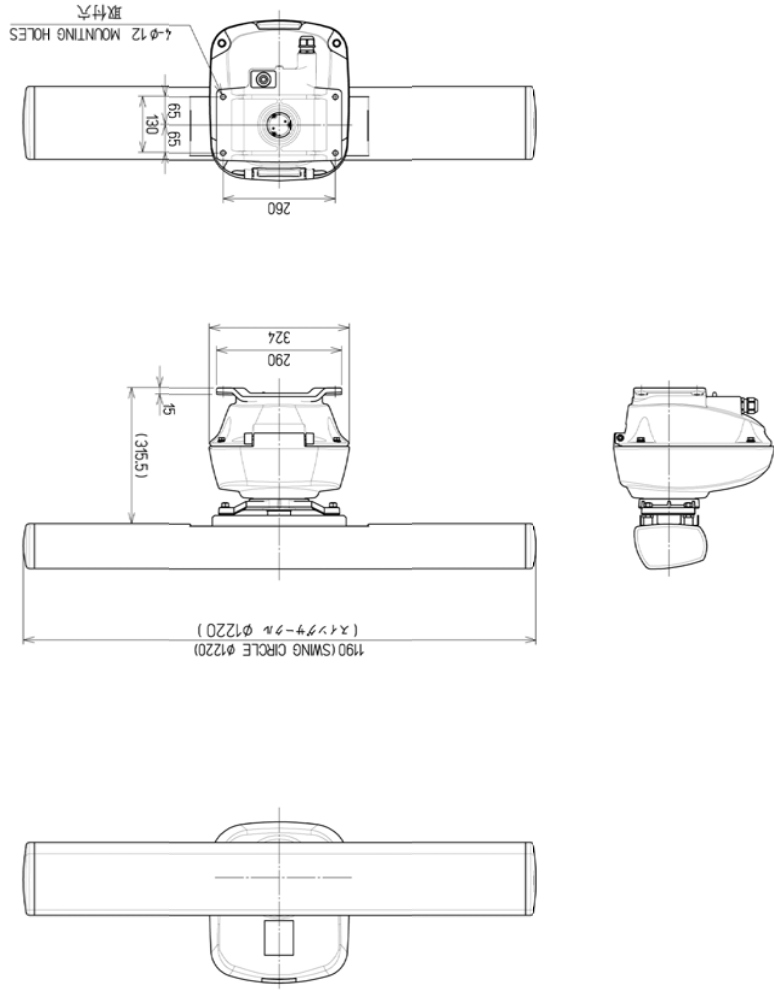
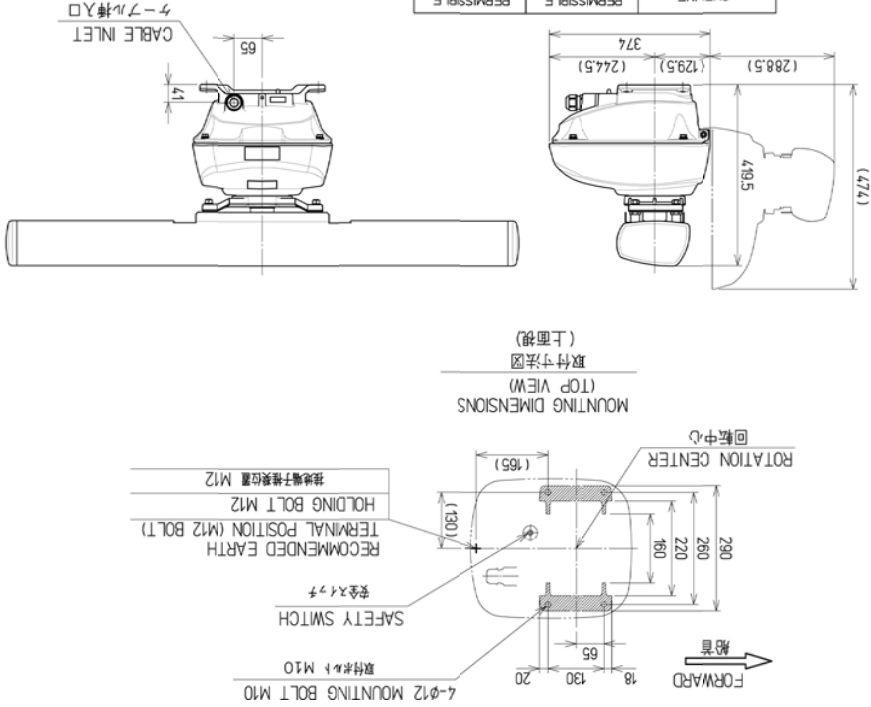
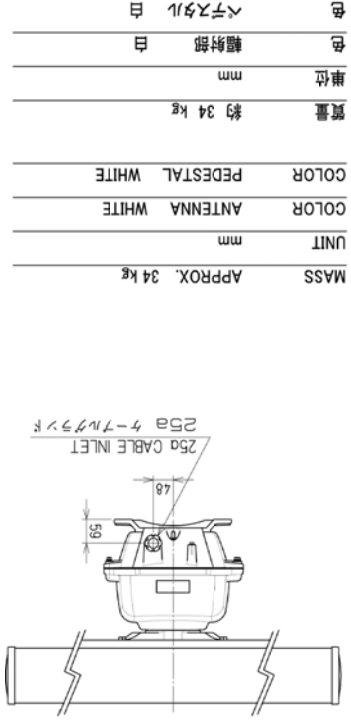
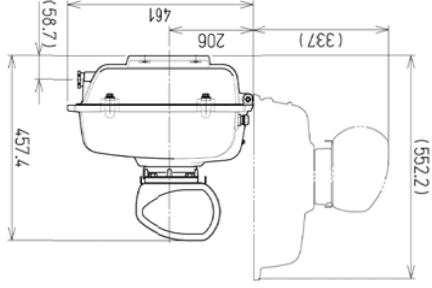
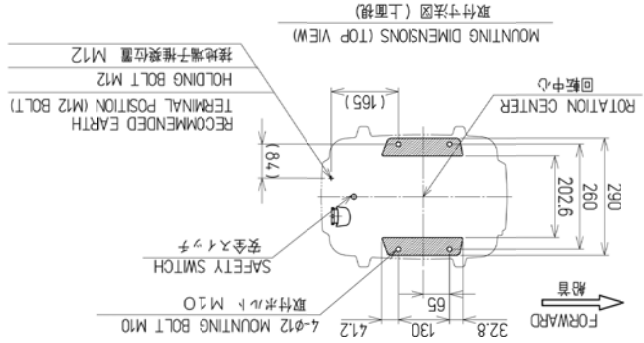


Fig. 1.4-5 Exterior Drawing of Scanner Unit, Type NKE-2103-4/4HS



UNIT	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
MASS	APPROX. 34 kg
UNIT	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
質量	約 34 kg
単位	mm
色	輻射部 白
色	ベース丸 白



PERMISSIBLE OUTLINE DIMENSIONS DEVIATIONS	OUTLINE DIMENSIONS	
	OVER	TO
外形寸法 許容差	3	+0.5
	6	+1
	30	+1.5
	120	+2.5
	400	+4
外形寸法 許容差	3	+0.5
	6	+1
	30	+1.5
	120	+2.5
	400	+4
外形寸法 許容差	2000	+8
	1000	+6
	2000	+6
	1000	+2
	400	+1

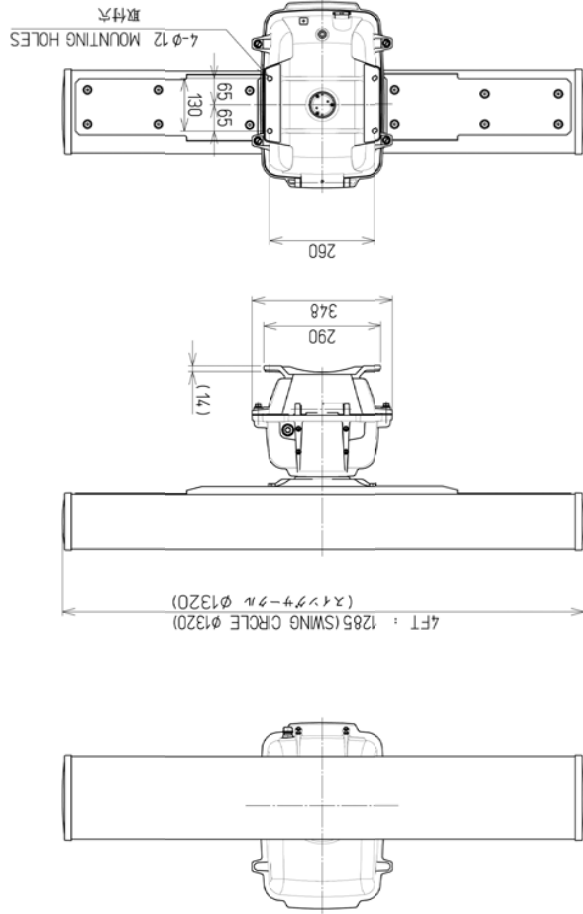
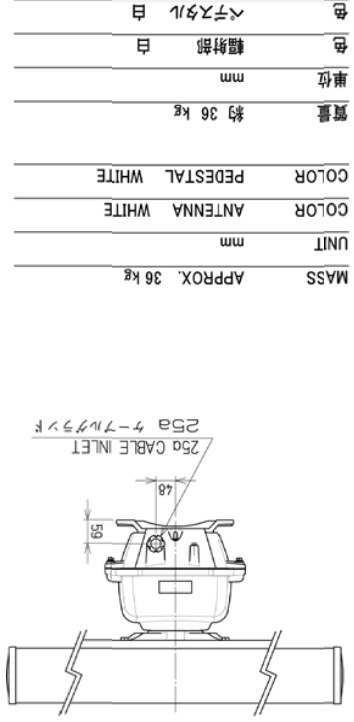
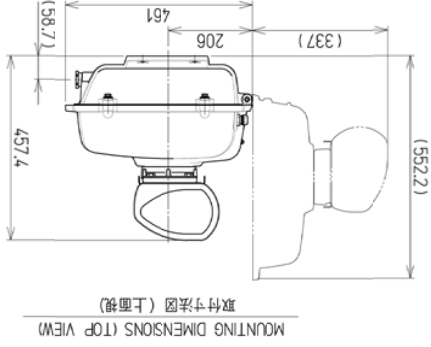
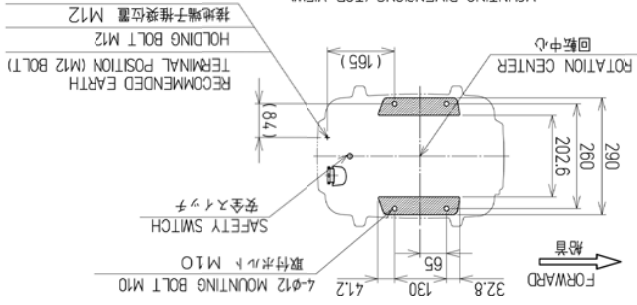


Fig. 1.4-6 Exterior Drawing of Scanner Unit, Type NKE-2103-6/6HS



質量	約 36 kg
単位	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE
質量	約 36 kg
単位	mm
COLOR	ANTENNA WHITE
COLOR	PEDESTAL WHITE



外形寸法	PERMISSIBLE DIMENSIONAL DEVIATIONS	
	TO	OVER
±0.5	±0.5	±0.5
±1	±1	±1
±1.5	±1.5	±1.5
±2.5	±2.5	±2.5
±4	±4	±4
±6	±6	±6
±3	±3	±3

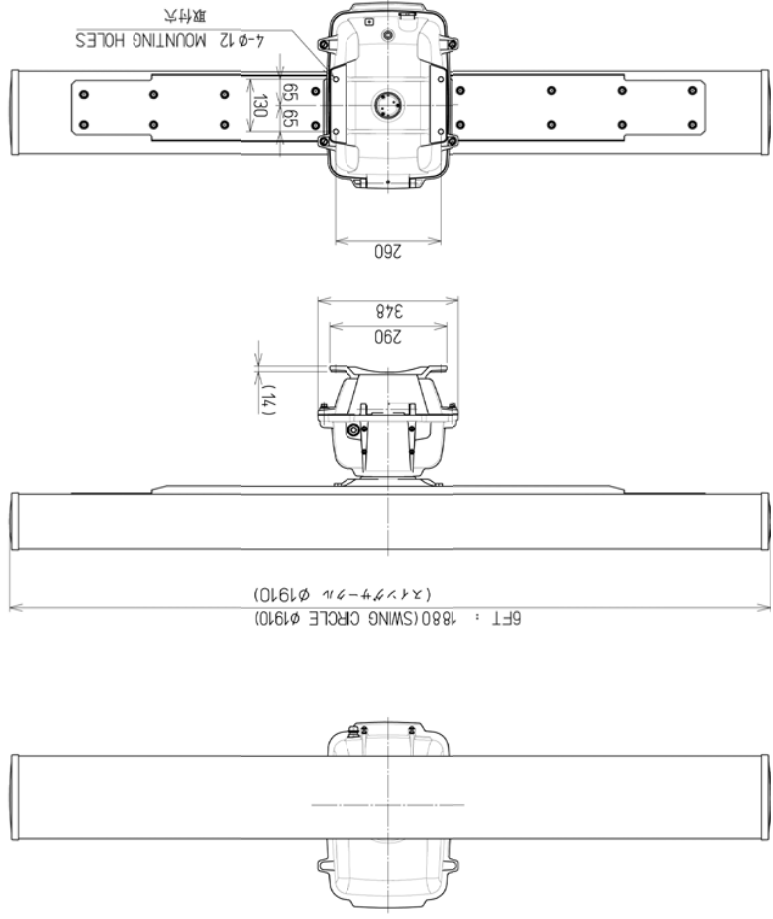
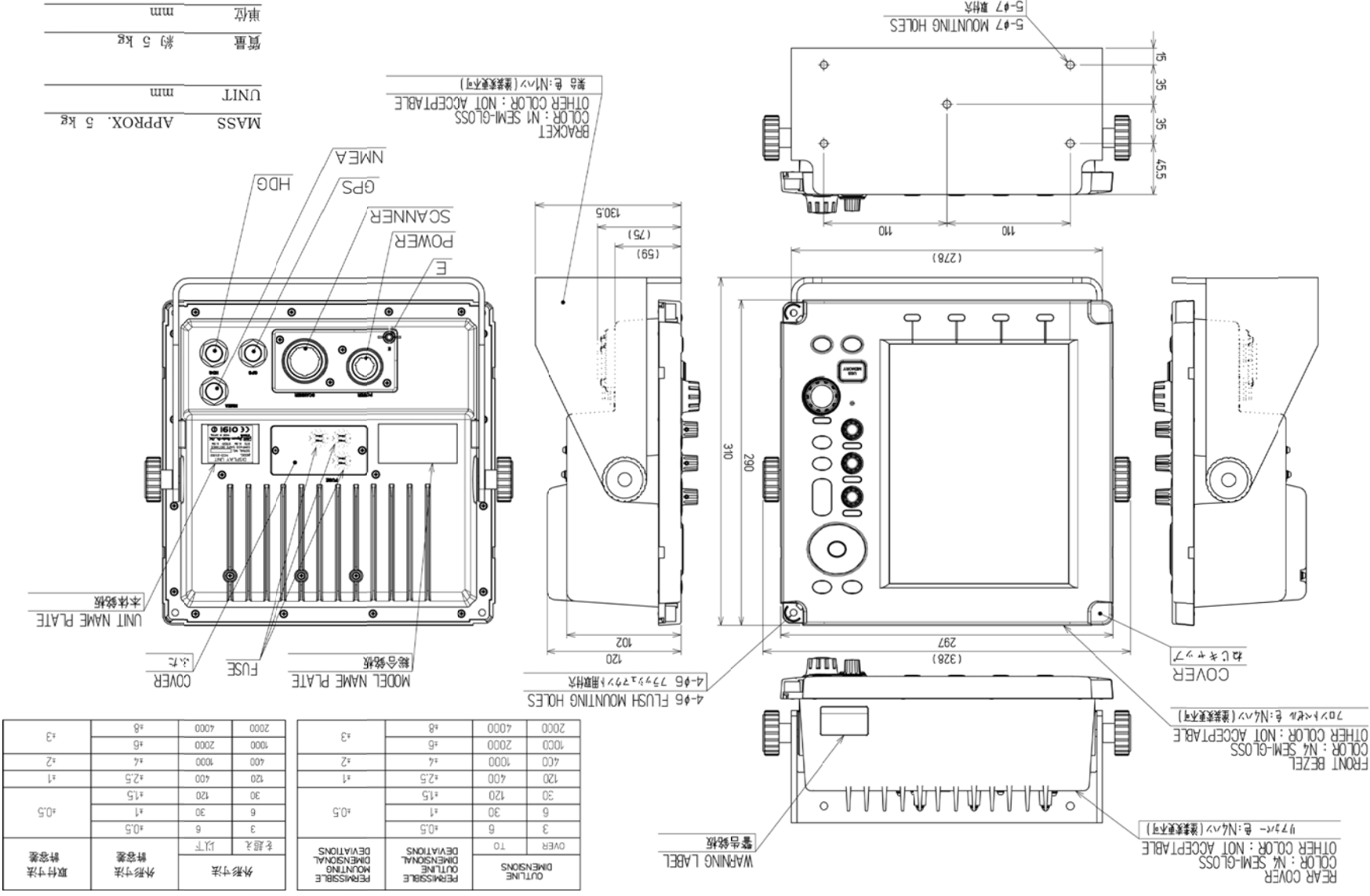
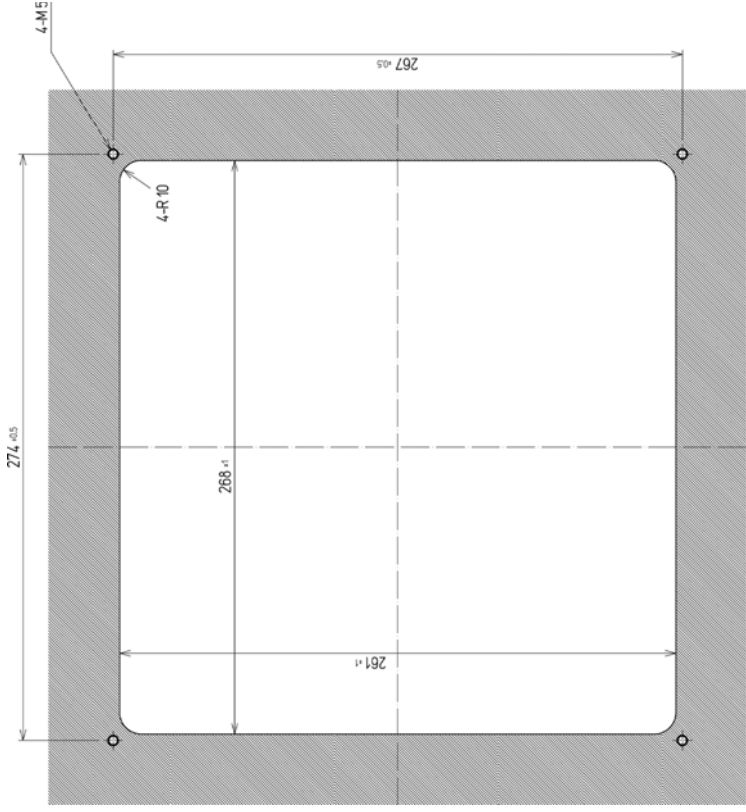


Fig. 1.4-7 Exterior Drawing of Display Unit, Type NCD-2182 (1/2)



Chapter 1 GENERAL AND EQUIPMENT COMPOSITION
1.4 EXTERIOR DRAWINGS

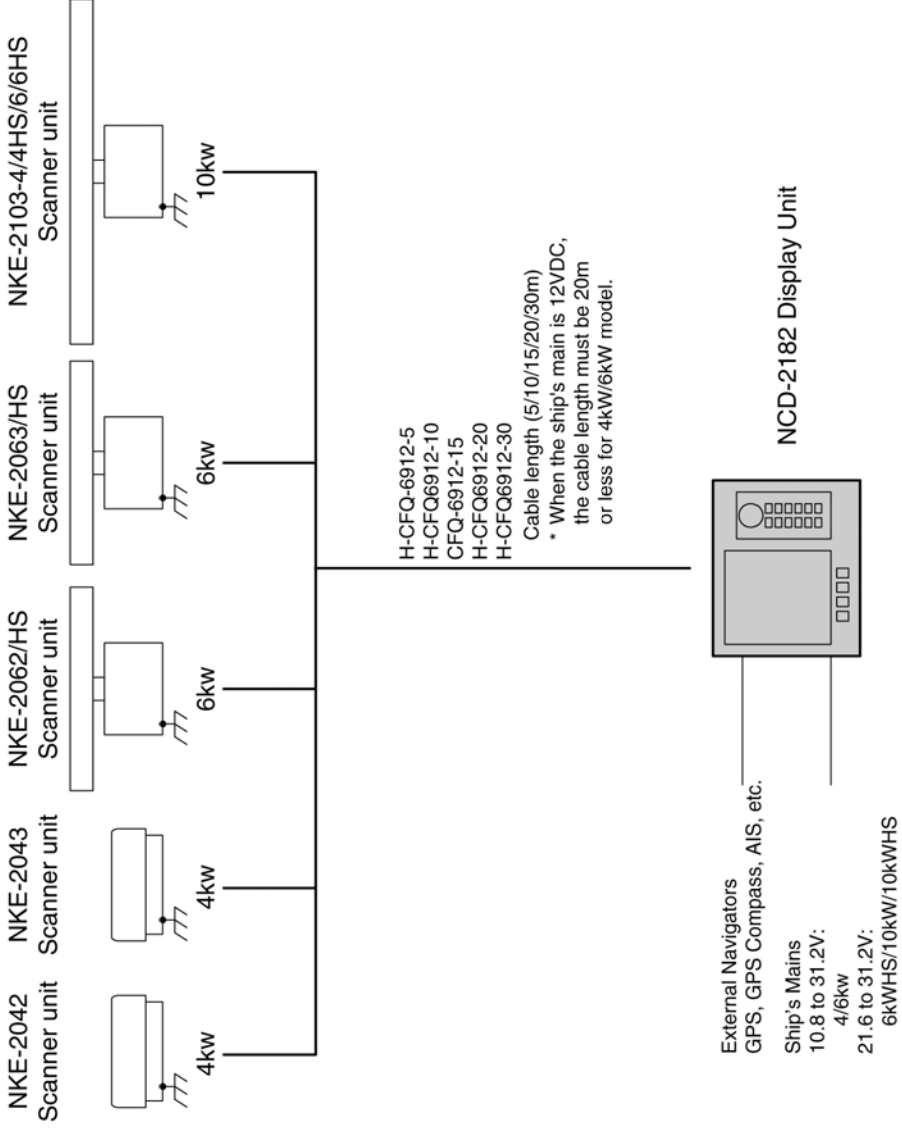
Fig. 1.4-7 Exterior Drawing of Display Unit, Type NCD-2182 (2/2)



FLUSH MOUNTING HOLES (1:2)

1.5 GENERAL SYSTEM DIAGRAMS

Fig. 1.5-1 General System Diagram of Radar



Reference:

Install the radar cable as far as from the cables of other radio equipment in order to prevent other radio equipment from interfering with the radar operations.

In particular, do not install the antenna cable parallel to the cables of other radio equipment.

