

ONWA[®]
KEC-70G

KEC-70G

OPERATOR'S MANUAL

ELECTRONIC COMPASS

CE FC

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SAFETY INSTRUCTIONS

Safety Instructions for the Operator

WARNING

Do not open the equipment.

Only qualified personnel should work inside the equipment.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a **ONWA** agent for service.

Use the proper fuse.

Use of a wrong fuse can damage the equipment or cause fire.

Be sure the power supply is compatible with the equipment.

Incorrect power supply may cause the equipment to overheat.

The useable temperature range for the antenna unit is -25°C to 70°C; -15°C to 55°C for the display unit.

Use of the equipment out of those ranges may damage the equipment.

Safety Instructions for the Installer

WARNING

Do not open the cover unless totally familiar with electrical circuits and service manual.

Improper handling can result in electrical shock.

Turn off the power at the switchboard before beginning the installation.

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

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

Connection of an incorrect power supply can cause fire or equipment damage.

Use the proper fuse.

Use of a wrong fuse can damage the equipment or cause fire.

NOTICE

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

	Standard Compass	Steering Compass
Display unit KEC-70G	0.4 m	0.3 m
Electronic Compass	1.2 m	1.2 m

FOREWORD

Thanks you for purchasing the ONWA KEC-70G Electronic Compass. Your equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless properly installed and maintained.

Please carefully read and follow the operation, installation and maintenance procedures set forth in this manual.

We would appreciate feedback from you.

Thank you for considering and purchasing ONWA.

FEATURES

The KEC-70G can work with different kinds of heading sensors to suit different demands of customers.

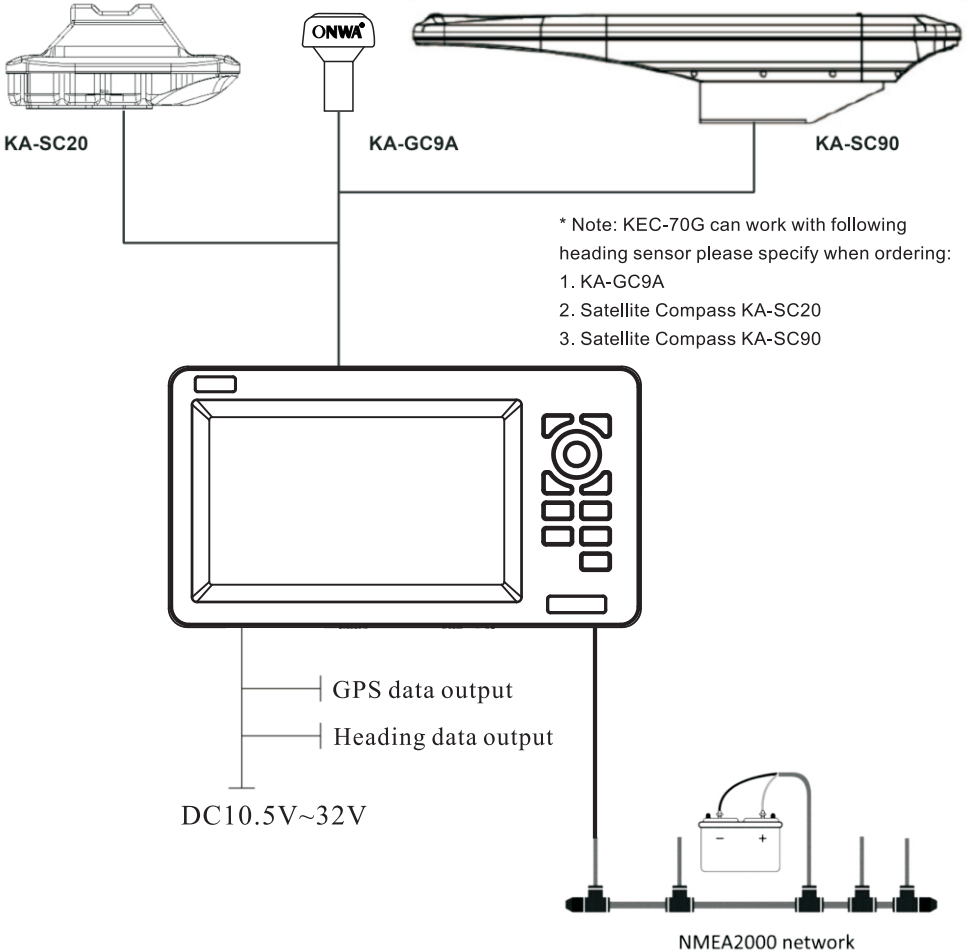
The KEC-70G is a Electronic Compass designed with ONWA's advanced color LCD high resolution display technology. This compass provides a wide range of applications for any type of ships at sea.

The main features are

- Perfect for use as heading sensor for Radar/ARPA, AIS, ECDIS, scanning sonar
- There are no mechanical parts such as gimbals or rotating motor, thus the compass is free from routine maintenance
- It can work with various heading sensors, such as ONWA KA-GC9A and Satellite Compass
- The KEC-70G can correct magnetic deviation manually or automatically.
- Beside heading information KEC-70G can also provide GPS information, Lon/Lat, SOG and COG
- Provide NMEA0183 and NMEA2000 heading and GPS output
- 2 NMEA0183 output are RS422 electrical interface

SYSTEM CONFIGURATION

The KEC-70G consists of a Display unit and a Electronic Compass Sensor unit



1. OPERATION

1.1 Controls



Open menu

Select the display mode

1. Exit the menu item

2. Select the display mode

To identify or modify the selection

Reserve for future use



Display NMEA data

Modules Information


Long press : Power on/off

Short press : Adjust the screen brightness and control panel dimmer



1.2 Turning the power on/off

Turning power on by press  once to switch on the unit with a “beep” sound.
Turning power off by press and hold  key until the unit display turn off.



1.3 Display brightness and panel dimmer adjust

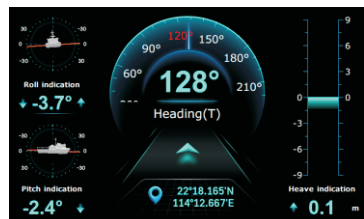
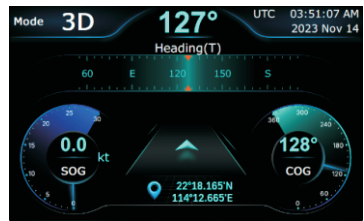
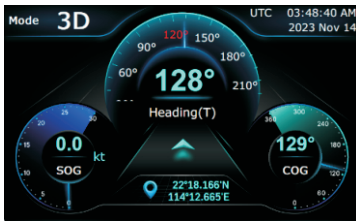
1. Short press the  key.



2. Press ▲ or ▼ to adjust LCD display brightness.
3. Press ► or ◀ to adjust panel dimmer.
4. Press  key to cancel or  key to confirm.

1.4 Display modes

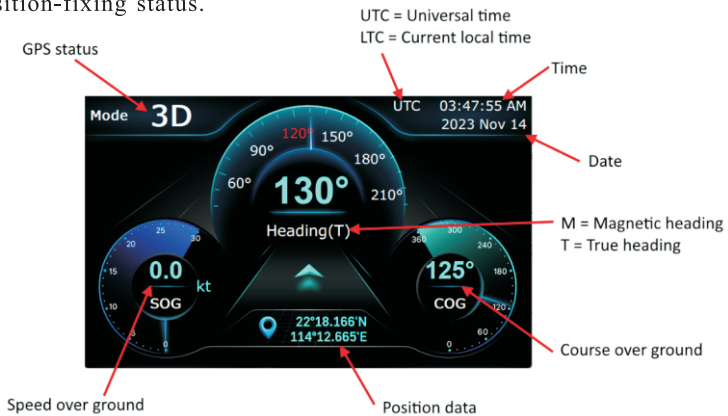
Press  or  key to change the display modes in following sequences:



Modes of display

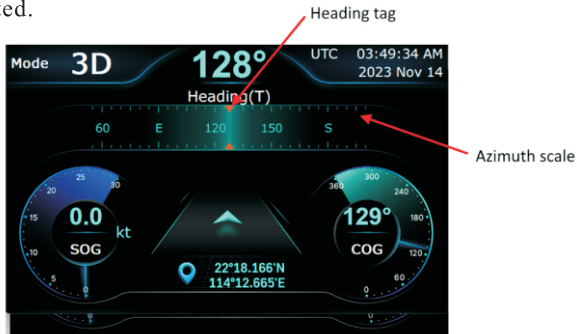
Navigation data display

The navigation data display shows magnetic heading, COG, SOG, date, time and position-fixing status.



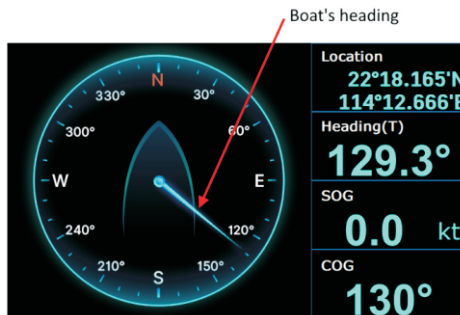
Steering display

The steering display shows heading in digital and analog form. SOG and COG are also indicated.



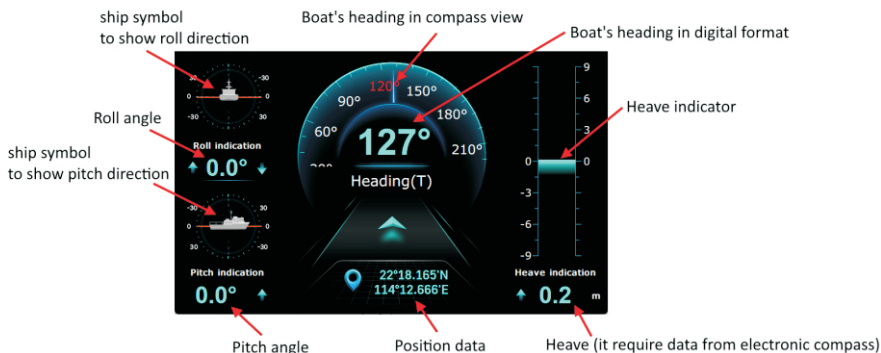
Compass display

The compass display shows heading by compass direction. The compass rotates with heading.



Roll and Pitch Display

The roll and pitch display is only available in using with heading sensor KA-GC9A or Satellite Compass. It shows roll and pitch data together with heading, COG, SOG and position.



1.5 Menu settings

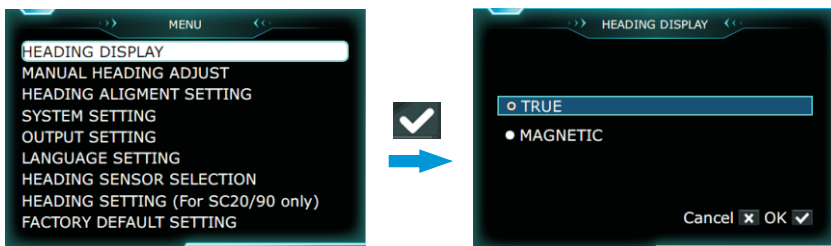
Menu function provides settings of heading display in true or magnetic, fixing supplement, rectification azimuth angle, time setting, output selection options, heading sensor selection and factory default.

Press key in any display mode :

1.5.1 Heading Display

User can choose the heading on all display modes is displayed as True heading or Magnetic heading. In the menu select "HEADING DISPLAY" and press

key. The following window appears:

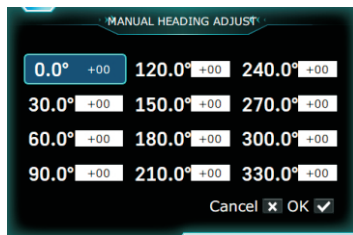
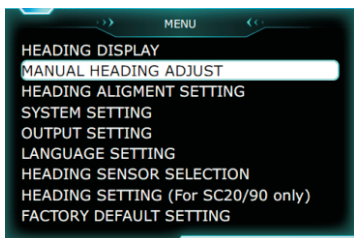


1.5.2 Manual Heading Adjust

Manual Compensation is a supplement to the type of single orientation parabola to adjacent 10 degrees. But this method could only be done by qualified personnel.

1. In the menu select "MANUAL HEADING ADJUST" and press key.

The following window appears:



2. Use up, down key to select the direction angle need to be modified, then use left, right key to increase or decrease the number of angle in Degree. The highest may adjust $\pm 10^\circ$.

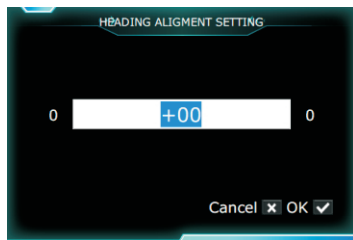
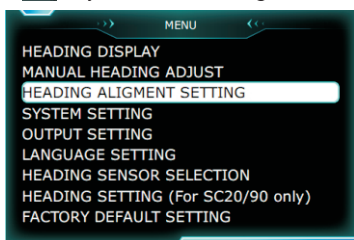
3. Press key to save.

Note: Anyway ship's magnetic compass and electronic fluxgate compass shows each azimuth are unlikely to maintain consistent.

1.5.3 Heading Alignment Setting

Adjustment of heading might be needed during the installation. Usually a fixed error in all direction would exist. It is due to the mechanical error when fixing the Bearing/GPS sensor. The function "HEADING ALIGNMENT SETTING" is used to correct this error.

1. In the menu select "HEADING ALIGNMENT SETTING" and press key. The following window appears:

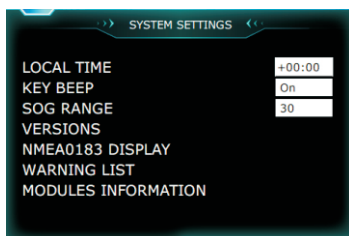


2. Press or to change the direction and angle in degree.

3. Press key to save or press to quit without save.

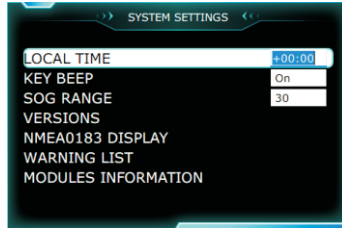
1.5.4 System Setting

In System Setting there are many sub items:



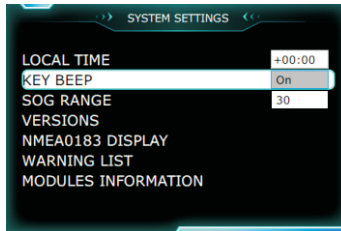
1.5.4.1 Local Time

Use ▲ or ▼ and ► or ◀ to set the time difference of local time and the GMT.



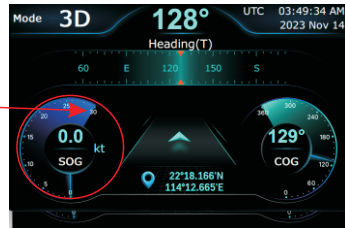
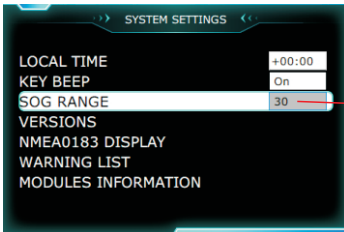
1.5.4.2 Key Beep

To turn the key beep sound ON or OFF.



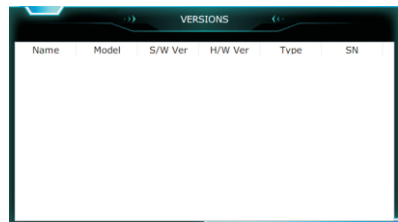
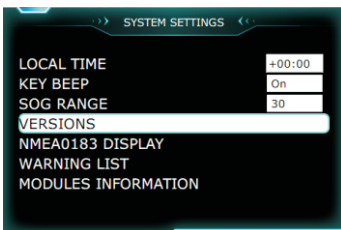
1.5.4.3 SOG range

The maximum SOG range can be set to 30kt, 60kt and 90kt to suit different kind of vessels.



1.5.4.4 Versions


The main firmware and the keyboard firmware version can be displayed in Versions.




1.5.4.5 NMEA018 display

The NMEA0183 output ports data can be checked here, it is usually for trouble shooting purposes.

Press  to switch between two output ports

Press  to stop and start data scrolling



Remark : It can press  key to display NMEA data in any display mode.

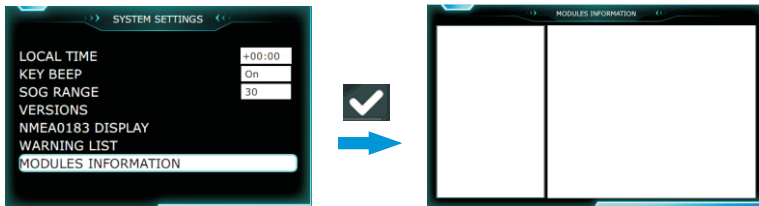
1.5.4.6 Warning List


It is to check the warning message history.



1.5.4.7 Modules information

To check hardware information of Electronic Compass connected and all hardware in the KEC-70G.

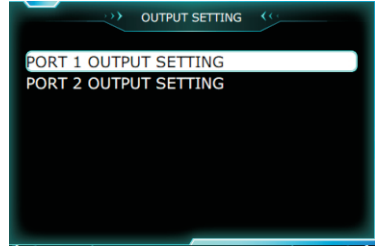
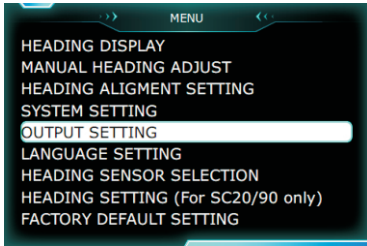


Remark : It can press  key to check modules information in any display mode.

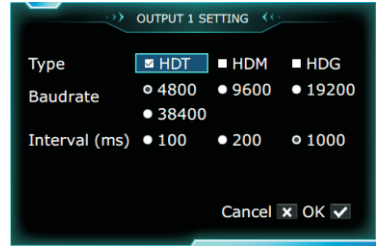
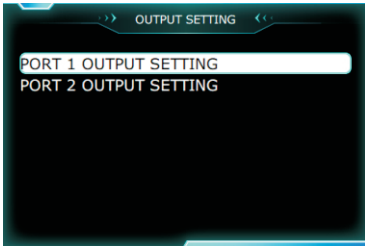
1.5.5 Output Setting

To configure below settings of two NMEA0183 output ports:

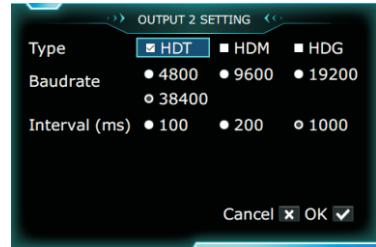
- Heading output data among HDT, HDM and HDG.
- Heading output baudrate.
- Heading output intervals.



Port 1:



Port 2:



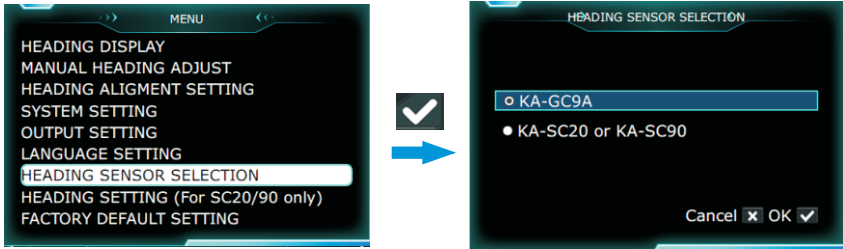
1.5.6 Language Setting

To select the language, now only English and Chinese are available.



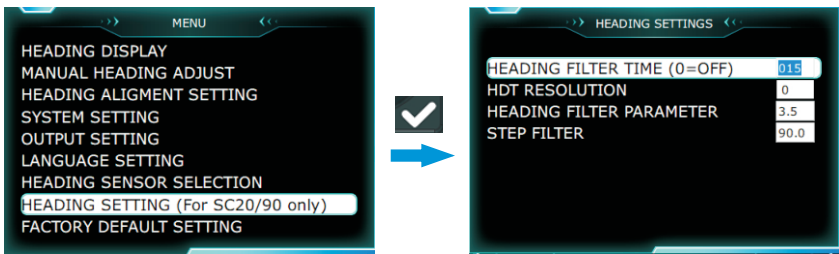
1.5.7 Heading Sensor Selection

It is very important to select the heading sensor options during installation. Make sure what heading sensor options come with KEC-70G, then set during installation.



1.5.8 Heading Setting(For SC20/90 only)

This menu provides advance settings for GPS Compass KA-SC20 and KA-SC90. Remark : Please consult Onwa dealer before carry out any setting in this menu, otherwise it might affect the performance of the GPS Compass.



1.5.9 Factory Default Setting

In some circumstances, it might want to return to factory default setting. After enter the Factory Default, press to confirm or press to quit without carry out return factory default.

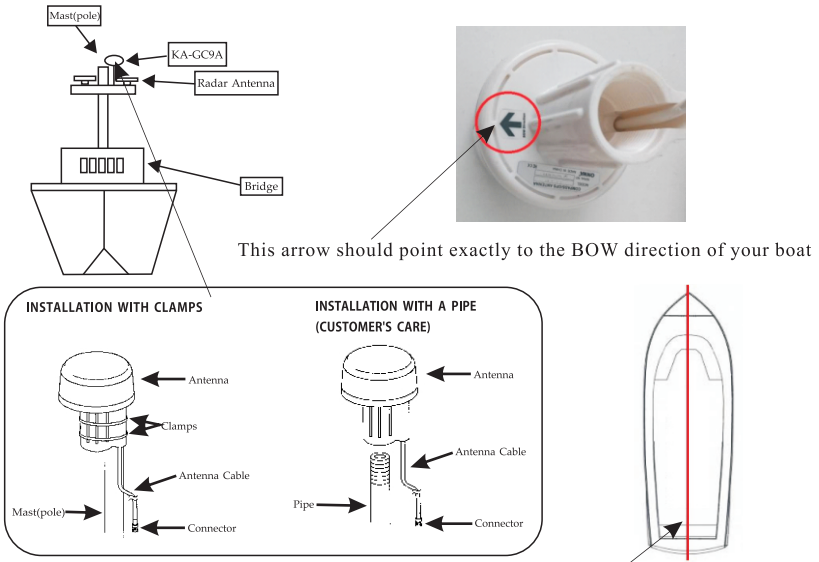


Note: When you select to load factory default setting all saved settings would be cleared. This action can not reversible.

2. INSTALLATION & MOUNTING CONSIDERATIONS

2.1 Installation of GPS/Compass sensor KA-GC9A

When you turn over the KA-GC9A you can see an arrow sign on the antenna base. Please make sure this arrow should point exactly to the BOW direction.



This arrow should point exactly to the BOW direction of your boat

Considerations before installation:

- Please install the KA-GC9A as close as the central axis of your boat in order to get more accurate GMS (rolling and pitching data) output.
- Please install the KA-GC9A outside, ensure that the GPS is not covered.
- Keep the length of the cable in mind when selecting a mounting location.
- It should be installed with a minimum of 1 meter to prevent the influence of iron and steel or other magnetic materials.
- Do not use magnetic screws for fixing KA-GC9A.
- Select the vertical way position for installation.

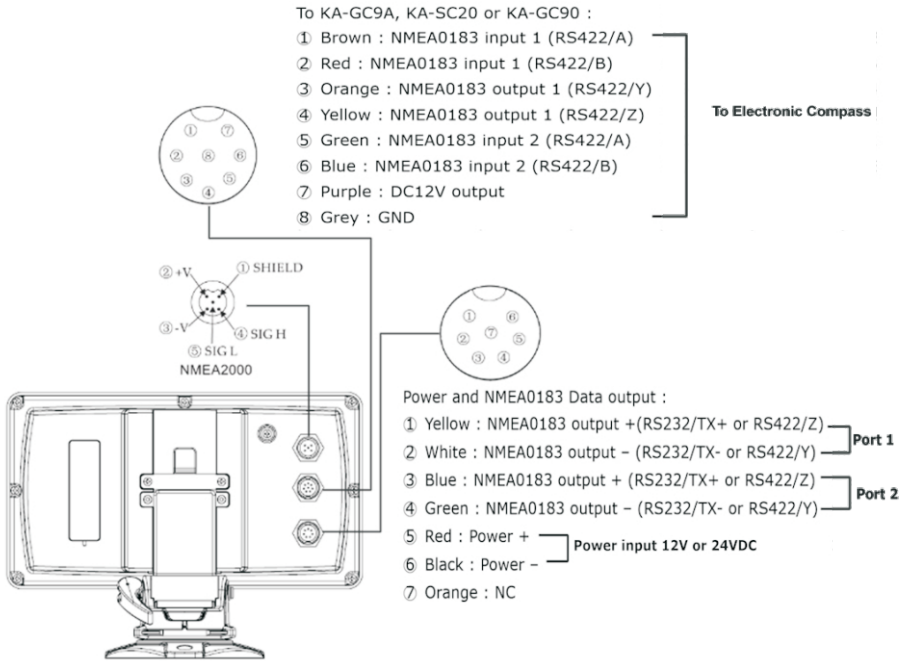
2.2 Installation of Satellite Compass KA-SC20 or KA-SC90

Please refer to the operator manual of KA-SC20 and KA-SC90

2.3 Installation of Display Unit

- Choose a location where vibration and shock are minimal.
- Install the unit well away from location subject to rain and water splash.
- Locate the unit away from air conditioner vents.
- Keep the unit out of direct sunlight because of heat that can build up inside their cabinets.
- Choose a well-ventilated location.
- Choose a location where it can be easily operated.
- Leave sufficient space around the units to permit access for maintenance. See the outline drawing for recommended maintenance space.

2.4 Interconnection Diagram



3. MAINTENANCE, TROUBLESHOOTING

WARNING



ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.

3.1 Preventive maintenance

Regular maintenance is important for good performance . A maintenance program should be established and should include the following points.

- Check connectors on the electronic compass and display unit for tightness.
- Check for water leakage in the interconnection cable between electronic compass and display unit. Clean or replace as necessary.
- Remove dust and dirt from the display unit and electronic compass with a dry, soft cloth. For the LCD, wipe it carefully to prevent scratching, using tissue paper and an LCD cleaner. To remove stubborn dirt, use an LCD cleaner, wiping slowly with tissue paper so as to dissolve the dirt. Change paper frequently so the dirt will not scratch the LCD. Do not use chemical cleaners for cleaning they can remove paint and markings.

Note: do not use contain chemical cleaners clean, it might help to eliminate paint and equipment will be marked.

3.2 Troubleshooting

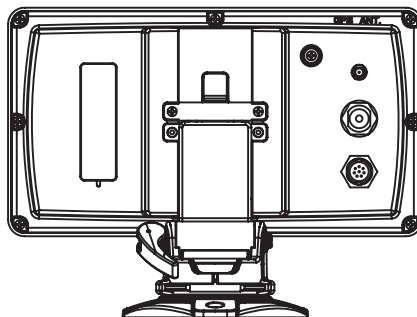
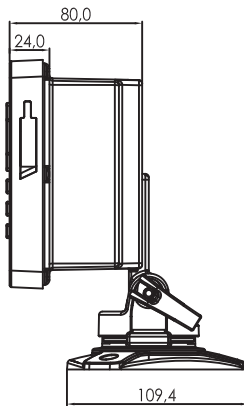
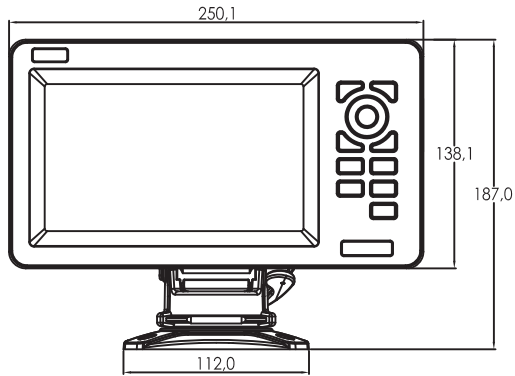
This section provides basic troubleshooting procedures which the user may follow to restore normal operation.

Troubleshooting

Symptom	Cause	Remedy
Cannot turn on the power	Power cable on the display unit	Firmly connect the power cable
	Power supply failure	Check the power supply.
	Blown fuse	Have a qualified technician check the fuse.
Heading indication changes randomly when ship is at anchor or does not change when ship moves.	Heading sensor or electronic compass trouble	Change the heading sensor or electronic compass
Heading output from KEC-70G does not appear on external equipment.	Connection between KEC-70G and external equipment has loosened.	Firmly fasten the connector.
	Display trouble	Call Onwa dealer

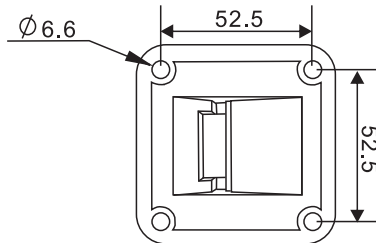
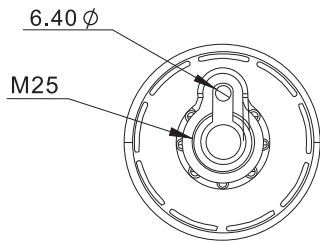
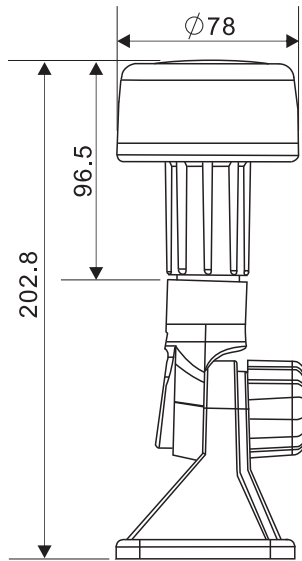
If large heading error occurs or heading indication is frequently interrupted, contact your dealer for advice.

4. DIMENSION



All measurements are in millimeters (mm)

KA-GC9A SIZE



Specifications

1. Power supply

1.1 Electrical: 10.5 – 32VDC

1.2 Protection: overcurrent, overvoltage, power transient and accidental reverse polarity protection

2. Output/Input (IEC61162-1)

2.1 Output : 2 x NMEA0183 (RS422)

2.1.1 Output port 1

a) Output sentences: GGA, GSA, HEV, RMC and selectable sentences among of HDT, HDM and HDG

b) Support sentences: RMC, GGA, GSA, GSV, HDT, HDG, HDM, HEV, GMS,

c) Baudrate: Selectable among 4800, 9600, 19200, 38400

d) Heading output intervals : Selectable among 100ms, 200ms and 1000ms

2.1.2 Output port 2

a) Output sentences: Sentences from the heading sensor and selectable sentences among of HDT, HDM and HDG

b) Support sentences: RMC, GGA, GSA, GSV, HDT, HDG, HDM, HEV, GMS,

c) Baudrate: Selectable among 4800, 9600, 19200, 38400

d) Heading output intervals : Selectable among 100ms, 200ms and 1000ms

2.2 NMEA2000

Supported transmit PGN :

126992, 127250, 129025, 129026, 129029, 129033, 129539

3. Environmental conditions

3.1 Ambient temperature: -5°C to +55°C

3.2 Humidity: 93% \pm 3% on 40°C

3.3 Waterproofing: IPX6

4. Supported heading sensor

a) KA-GC9A

b) KA-SC20

c) KA-GC90

Remark : All specifications are subject to change without further notice.