

Auto Pilot System Series

Model A P S-JJB-β



APS(Auto Pilot System) co., Ltd

We gratefully appreciate you purchasing from APS(Auto Pilot System) Corp.

This operating user manual shows how to install and operate our systems and matters that demand special attention.

In order for this equipment we recommend that you maintain its quality with care to use its full capabilities as well as carefully reading the manual before use.

Furthermore, this manual should be kept in a fixed place to prevent it from being lost or damaged. Especially it has got to be kept in a steering house during a ship sailing. If resold or transferred, it should also be given to the new owner.

On the Precision of Automatic Steering Gear

1. The Outside Effect of Magnetic Compass

The Auto Pilot(APS-JJB -) detects the direction(course) by a magnetic compass. If the magnetic compass is influenced by the outside, not only does its accuracy get bad but may also cause the ship turn abruptly because the compass card in the magnetic compass is likely to spin. For instance, they could take place if a tool with magnetism is put on the magnetic compass, a person with a tool touche it, or a ship with magnetism passes by.

2. The Precision in Navigation Mode

In navigation mode the Auto Pilot controls the gear from the signals of navigation device connected with APS-JJB- . Therefore, the accuracy of the navigation device reinforces the location accuracy of magnetic line. The precision of G.P.S known as a mainstream is not absolute, because it's sent by G.P.S satellite, thus means users can't control it. Moreover, its accuracy changes spontaneously as scores of meters, in its best condition, and hundreds of meters in its worst condition. However one should keep in mind that sailing a rather differently with the course directed from the navigation device because a ship is always influenced by both winds and waves. Sailing accuracy is dependent on direction angle ratio modulation, declining modulation, receptive modulation, and the directional precision of the magnetic compass, but its accuracy is normally maintained between 4 to 5 meters, or between about 30 to 40 meters in worst conditions.

In short, a course can be off the intended course by more than 50 meters. It can not be completely trusted at all because it is operated by automatic navigation steering. Hence, it is advised to always be alert.

The System Installation

Prior to Installation

1. Keep away from the following places.

- places exposed to seawater or rainwater.
- places that are hard to monitor, protect and pipe laying.
- places exposed to direct rays of light or places that a high temperature.
- places with excess vibration, such as, near engines.

Matters that Demand Special Attention When Installed

1. Auto Pilot(Control Unit : (APS-JJB -)

- Do not install in places that hinder steering a ship.
- Do not install in places that cover other necessary equipment, exposed to high temperatures or exposed to seawater or rainwater. The equipment may get damaged.
- In case of an emergency learn how to switch to manuel operation.

2. Direction Sensor

- Install away from devices that generate magnetism. A ship can turn uncontrollably due to the magnetism.
- Confirm that it is not influenced by magnetism, placed at least 50 centimeters away from any device generating magnetism. And tools with magnetism should not be used around it.
- Attach the magnetic compass device tightly to the ship body.

3. Solenoid Valve Block

- Install the electric coil flat. It will work if not installed vertically.

4. Remote Control

- It may break if dropped or mistreated.

5. Radar Sensor

- Do not install in places with excess vibration, high temperatures or exposed to seawater or rainwater.

6. Piping

- With piping work do not use a saw to cut the copper pipes.
- Take care of the pipes and connecting parts to make sure they are kept clean.
- Cut a vertical hem at the right angle using an only piping cutter.

7. Wiring

- Install wiring with the power supply off. If installed with a power supply on, a short circuit can occur and the instrument can be damaged.
- Set the terminal plate and connector into the terminal signal or mark tube. If set differently, the instrument may be damaged. Make sure to secure using a screw and connector.
- Do not put extra weight on the power cable or there may be a fire or an electric shock.

8. The Effect of Wireless Equipment

- If possible Install away from wireless equipment. It may be influenced by the wireless equipment. Place the wires related to wireless equipment away from the Auto Pilot wires. Wireless equipment power and system power should be installed separately.

Matters that demand special attention when using

1. In use

- Do not sail a ship in the narrow waterways of a harbor where many vessels come and go, in places with several obstructions, and do not sail a ship when maritime conditions are poor.
- Stay alert around other ships or on a course while using it.
- In case of emergency learn how to switch into manual-operation by using the remote control.
- Do not expose to water because the Auto Pilot magnetic compass and solenoid valve block are not waterproof. If water is exposed to it, accidents, such as, fire, electric shock and equipment breakdown may occur. In that situation the power supply should be shut off and be examined.

2. Power Supply Fuse Cable

- The power supply should be used with the proper voltage(DC24V). Otherwise there can be fires, electric shocks, or damage.
- The Auto Pilot fuse should be used with the designated one. If a different fuse is used, a fire may occur.
- Attach the magnetic compass device tightly to the ship body.

3. Putting In A Power Supply

- Do not start the engine after connecting a power supply in the Auto Pilot. If doing so, the voltage may change suddenly, causing the equipment can not work properly.

4. Dial Remote Control

- In the case that the remote control needs to avoid an obstacle it lists to port or starboard in the middle of sailing, immediately switching to manual operation. After veering the remote control should be reset to zero degrees to automatically sail on the original course

6. The Falling Of A Thunderbolt And Electric Shock

- Do not touch metal parts of the power supply switch in the presence of lightning. It can cause a shock if induced by lightning.

System Installation

Auto Pilot System

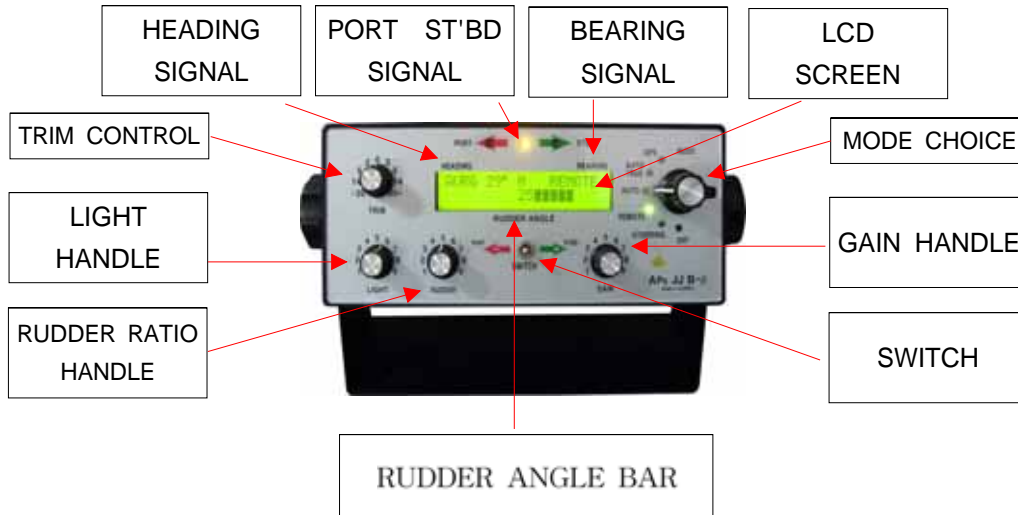
High technology maritime electric equipment that can operate remote operation anywhere inside a ship.

1. Characteristics

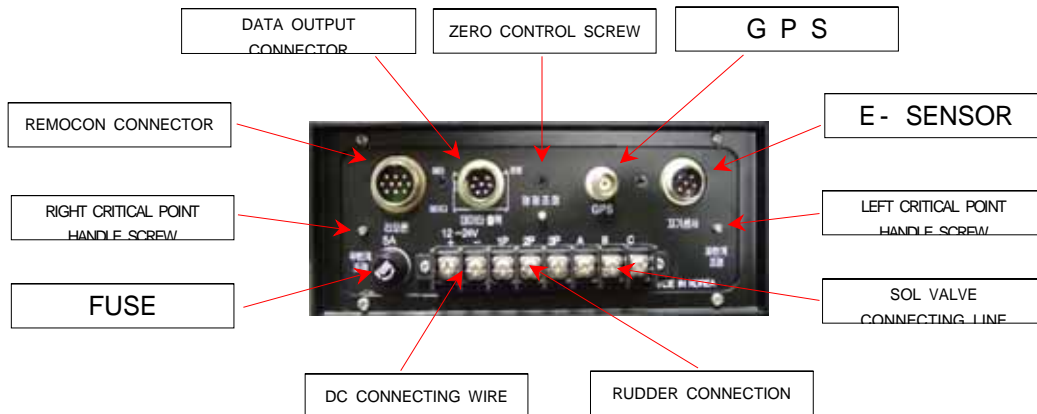
- World first class technology in programming by incorporating analog technology with digital technology.
- Reduction of labor force by using automatic steering anywhere in a ship using just one remote control.
- Reduction in fuel consumption by sailing directly to the destination and increase in efficiency by shortening sailing time.
- Convenient and precise sailing by turning a dial or pushing a switch, rather than previously using a handle or oil pressure handle.
- Excellent efficiency and competitive price compared to other imported items, because it was developed and designed for domestic vessels.
- Compatible with G.P.S plotter and 180 degree U-TURN possible.
- Superior safety with the optimal design for ships.

APS Automatic Steering Device Manual

1. JJB - Respective Term



JJB - Reverse Side Term



Turn the dial [MODE] to [REMOTE] and turn [GAIN] to 9. After checking the left and right arrows blink in turn, turn the [GAIN] dial from 9 to 5, and set it until the blinking left and right arrows stop blinking.



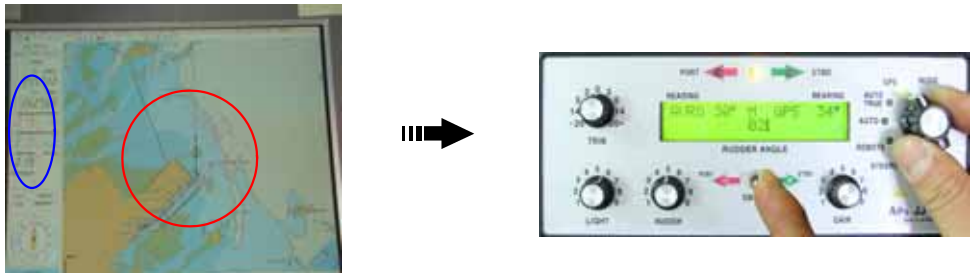
Set [REMOTE CONTROL] to 0 and turn the [TRIM] volume to the left and to the right for a ship to go forward not to roll and pitch. Then, set it to the place that a ship goes straight and put the switch [MODE] to [AUTO]. Turn the [REMOTE CONTROL] to 0 at the bow direction wanted, it will sail keeping the current bow direction automatically, with the buzzer "pip, pip, pip."



[RUDDER] riation control is normally tuned to "5" and handle it when a ship moves in the form of "s". Tune the switch to the straight turning to the left and to the right.



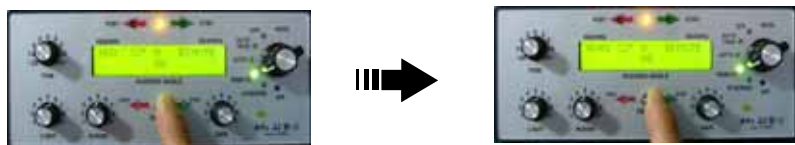
If you set the switch [MODE] to [GPS] after setting your destination with a G.P.S plotter or electric chart, your destination line and the bow line will be align. If not, make the bow line match with your destination pushing the [SWITCH] to the left or to the right.



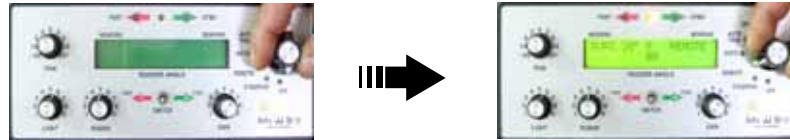
5. If the destination line and bow line are matched, all the controls are set. If you want to turn your bow, turn to the (REMOTE CONTROL) or [TRIM] volume. After that, if you tune (REMOTE CONTROL) to "0", it sails set to the original destination.



6. The [AVRG] below [HEADING] is normally used and if ship speed is more than 30KNOTS, it is very exact to tune to the [REMOTE] and push the [SWITCH] to the left in order to used (HDG).



7. If the automatic steering gear does not function normally, turn it off and back on in five seconds.



8. Course Breakaway Warning : If the course from the original direction breaks away over 20 degrees while automatically being sailed, the buzzer "pip, pip, pip" will keep ringing according to the I.M.O. regulations. If you don't hear the buzzer but identify it in sight, turn the switch [MODE] to STEERING and return it to the original condition. The buzzer will then stop and only HEADING DATA will blink. To remove it, turn it off.

9. (Alpha Radar) (Heading Data) Data Out NO.3 is positive(+) and NO.4 is negative(-) which output as NMEA 0183, 4800BPS : HTD, HTC, HDT,HDG. And receive data as VTG. RMC. APB. BWC. RMB. PLT.



10. (Alpha Radar) (Heading Data) are [Data Output Connector NO.3] is positive(+) and NO.4 is negative(-). And they are output as NMEA 0183, 4800BPS : VHW, HDT, HDG, HDM.

11. (Direction Angle Meta) connecting pin is that NO.1 is negative(-) and NO.2 is positive(+). And the power supply for lights is that NO.4 is negative(-) and NO.6 positive(+).

*Warnings Matter

Do not ever sail while intoxicated or drowsy nor in narrow waterways. Furthermore, do not use in areas where field of vision is limited as it is dangerous.

APS8000 E-Compass Deflection Correction

Compass Calibration

Turn off the switch [MODE] and turn it on again. After that, set it to [REMOTE] and push the [SWITCH] to the left. If the buzzer "pip" will beep nine times, the abbreviation [CALI] appears below [HEADING]. Turn the switch [MODE] to [AUTO], and [REMOTE CONTROL] to 25 degrees on the port and starboard, spin the ship one full circle(360 degrees), and then turn off the switch [MODE] and turn it on again.



Real coordination correction to Hand-Operation

If pushing [SWITCH] to PORT and the buzzer "pip, pip" will beep twelve times after setting the switch [MODE] to [REMOTE], [TRUE] appears in [HEADING]. This time, if the bow direction is revised after fitting the switch [MODE] to [GPS] and pushing the [SWITCH] to [PORT] or [ST' BOARD], turn the switch [MODE] off and return it to [REMOTE] again.



If the direction angle does not abruptly move at as it is turned to a certain direction, it means that extraneous substances are covering the solenoid valve. In this case, fully push the edge of both valve sides by using a 5 mm driver.

setting LIMIT Value

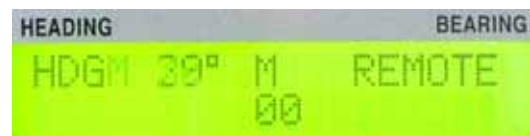
If pushing the [SWITCH] TO [ST' BOARD] for 2 to 3 seconds after setting the switch [MODE] to [REMOTE], you will see [LIM] appear in the upper left part of the screen. And set the number coming out on the upper right to [PORT] or [ST' BOARD] by 5 degrees respectively by using the [SWITCH]. You can set the LIMIT value in five seconds. (to the left decreases) (to the right increases)



Zero Control and Left, Right Critical Point Control

1. Zero Control :

If the direction angle is not zero, zero control is needed. Set the switch [MODE] to [STEERING] and then fit [ZERO CONTROL] volume to [00] using a flat edge screw driver to the left and right.



Set the number to Zero

2. Left Limit Control :

Stop the ship and set the switch [MODE] to [STEERING]. Then, push the [LEFT, RIGHT KEY SWITCH] to the left until the direction angle stops. Turn the [LEFT CRITICAL POINT] volume on the left back of the automatic steering gear to the right with a flat edge screw driver and fix it till the buzzer "pip, pip" starts beeping as turning slowly to the left.



3. Right Limit Control :

Stop the ship and set the switch [MODE] to [Manuel-OPERATION]. Push the [LEFT, RIGHT KEY SWITCH] to the right until the direction angle stops. Turn the [RIGHT CRITICAL POINT] volume on the right back of the automatic steering gear to the left using a flat edge screw driver and fix it till the buzzer "pip, pip" starts beeping by turning slowly to the right.



An oil pressure pump and hose may be damaged if remote control is used while the left and right critical point are not controlled.

If the direction angle does not abruptly move at all as it is turned to a certain direction, it means that extraneous substances are covering the solenoid valve. In this case, fully push the edge of both valve sides by using a 5mm driver.

The models made in A.P.S. Corp. may be changed with prior notice in order to create the best products.

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Always wishing a safe navigation

The A.P.S. Co., Ltd.