Pod Power Steering Module
User Manual

2025.09 Version 1.0

Acknowledgement

Thanks for choosing ePropulsion products, your trust and support in our company are sincerely appreciated. We are dedicated to providing high-performance electric marine propulsion systems, electric outboards, sup/kayak motors, reliable lithium batteries and accessories. Welcome to visit www.epropulsion.com and contact us if you have any concerns.

Using This Manual

Before use of the product, please read this user manual thoroughly to understand the correct and safe operations. By using this product, you hereby agree that you have fully read and understood all contents of this manual. ePropulsion accepts no liability for any damage or injury caused by operations that contradict this manual.

Due to ongoing optimization of our products, ePropulsion reserves the rights of constantly adjusting the contents described in the manual. ePropulsion also reserves the intellectual property rights and industrial property rights including copyrights, patents, logos and designs, etc.

This manual is subject to update without prior notice, please visit our website www.epropulsion.com for the latest version. If you find any discrepancy between your products and this manual, or should you have any doubts concerning the product or the manual, please visit www.epropulsion.com.

ePropulsion reserves the rights of final interpretation of this manual.

This manual is multilingual, in case of any discrepancy in the interpretation of different language versions, the English version shall prevail.

Symbols

The following symbols will help to acquire some key information.

 Important instructions or warnings

 Useful information or tips

Product Serial Number

The serial number is located as s hown below. Please note and keep in a safe place, as it may be needed when purchasing accessories, or if you need service or warranty, or if your motor is stolen.

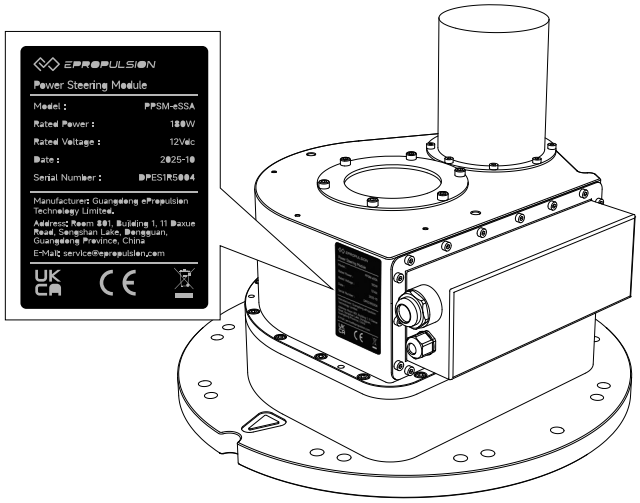


Table of Contents

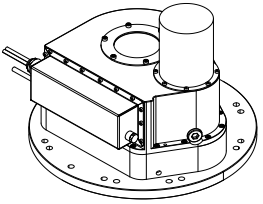
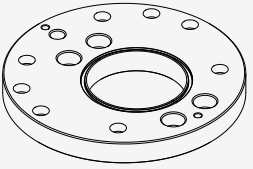
1 Product Introduction

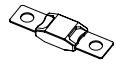
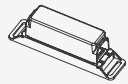
The Power Steering Module is powered by a 12V battery and controlled by a P12 or P20 Drive eSSA driver, providing steering function for a P12 or P20 motor.

1.1 In the Package

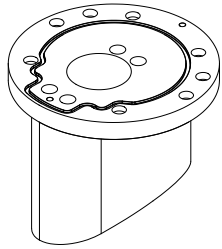
When opening the packages, please check contents against the list below. If anything is missing or damaged, please contact your dealer.

1.1.1 Power Steering Module Packaging List

Items	Qty.	Figure	Function
P12/P20 Power Steering Module	1		Provides 360° rotation for P12/P20
P20 Power Steering Module Adapter Plate	1		Mounts P20 to the steering module Note:P12 Power Steering Module Adapter Plate is an optional accessory.
Cable Support Bracket	1	/	Protect the three-phase cables and signal cable of P12/P20 during steering.
12V Fuse Connecting Cable	1		10 sq.mm cable, 500mm length, with SC10-8 copper lugs on both ends

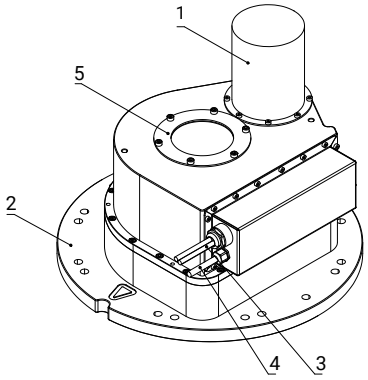
Items	Qty.	Figure	Function
12V Fuse	1		/
12V Fuse Base	1		/
Installation Kit	/	/	Includes: • M6x16 screws (2 pcs) • M12x25 screws (12 pcs) • M4x12 screws (3 pcs) • M8x15 lifting eyes (2pcs) • 12x30 pins (1 pcs) • 6x14 pins (2 pcs) • 8mm L Wrench (1pcs) • 315x8mm hull sealing O-ring (1 pcs) • 89x2.5mm P20 adapter plate sealing O-rin
User manual	1	/	Give information about the features, functions,performance, purpose and maintenance of the product.

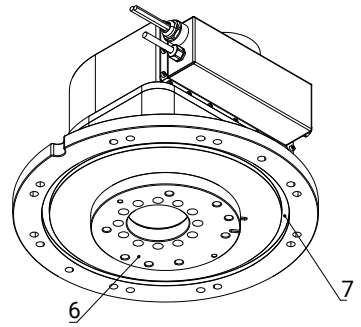
1.1.2 Optional Accessory List

Items	Figure	Function
P12 Power Steering Module Adapter Plate		Mounts P12 to the steering module.

1.2 Parts and Diagram

1. Steering motor
2. Hull adapter plate
3. 12V power cable
4. Signal cable
5. Oil seal cover
6. Upper adapter plate
7. Hull seal groove





1.3 Specification

Power Steering Module	
Rotation Angle	-90° to +90°
Rated Input Voltage	12 Vdc
Input Voltage Range	10.5 to 16 Vdc
Rated Current	15 A*
Net Weight	40 kg
Dimensions (ØxH)	400 mm x 335 mm

Power Steering Module	
Rotation Speed	4s/180°
Operation & Interface	Digital Helm Smart Throttle Smart Display 5"
Compatible Motors	P12 / P20
Communication Protocol	eSSA Communication cable
Operating Temperature	-5°C to 55°C
Storage Temperature	-25°C to 70°C
Ingress Protection (IP)	IP67
Hull Water Ingress Protection	Triple-layer fluororubber oil seals with integrated leak sensor between 2nd/3rd seals

12V battery (purchase separately,shared with P12 or P20 Drive eSSA) requirements:

- Charging current ≥36A
- Continuous discharge ≥40A
- Recommended capacity ≥80Ah (≥120Ah for lead-acid).

If a conventional lead - acid battery is used, the recommended capacity is ≥120Ah.

1.4 Notice

1. This product must only be operated by adults who have fully read and understood this manual. ePropulsion accepts no liability for any damage or malfunction caused by operations that contradict the content of this manual.
2. Install this product on your vessel in accordance with the product instructions. It is recommended that this product be installed on your vessel by certified boat builders or professional installers. If you have no prior experience in installing POD products on a vessel, do not attempt to install the POD by yourself.

3. If the product malfunctions, the display will show error messages. Refer to the detailed instructions and corresponding solutions.
4. Do not make sharp, sudden emergency turns at large angles when navigating at high speeds to prevent the vessel from capsizing.

1.5 EU Declaration of Conformity

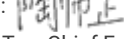
We Guangdong ePropulsion Technology Limited, hereby, declares that this equipment is compliance with the applicable Directives and European Norms, and amendments.

Object of the Declaration:
Product:PowerSteeringModule
Model**:** PPSM-eSSA

The object of the declaration is in conformity with the following directives and regulation:
Electromagnetic Compatibility (EMC) Directive 2014/30/EU
Restriction of Hazardous Substances Directive 2011/65/EU and Delegated Directive (EU) 2015/863
EC REACH Regulation (EC 1907/2006)
Regulation on General Product Safety 2023/988

Applied Standards:
ENIEC61000-6-3:2021
ENIEC61000-6-2:2019

This declaration of conformity is issued under the sole responsibility of the manufacturer:
Guangdong ePropulsion Technology Limited.
Address: Room 801, Building 1, 11 Daxue Road, Songshan Lake, Dongguan, Guangdong Province, China

Signature:  Date: 2025.5.20
Shizheng Tao, Chief Executive Officer & Cofounder of
Guangdong ePropulsion Technology Limited

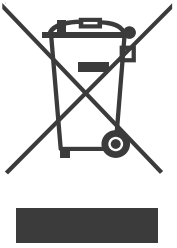
1.6 FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

1.7 Disposal and Environment

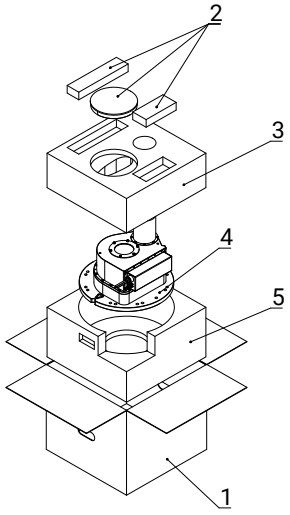


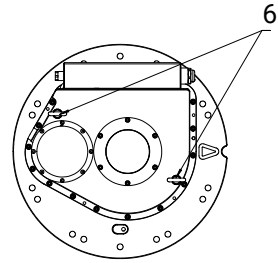
This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

2 Unpacking

Two people should carry the carton to an appropriate unpacking area. Before opening the packaging, ensure that the machine is stably positioned and will not tilt. Place the carton in the direction indicated as the upward side of the carton, and cut open the outer layer of adhesive tape.

The packaging structure of the whole machine is as follows. After unpacking the carton, following the top-to-bottom steps, a single person should use both hands to take out Accessory 2 (adapter plate, cable support bracket, and installation kit) from the top layer in sequence. Then, take out the upper buffer material 3, and use the 2 lifting eyes from Accessory 2 to lift the power steering module.





3 Installation

3.1 Before Installation

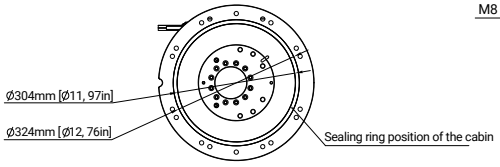
3.1.1 Installation Tools Lis

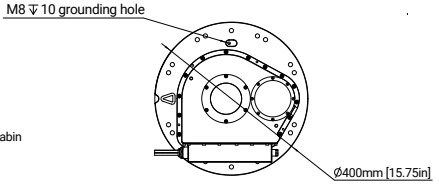
Tools: Prepare the tools and equipment required for installation as follows:

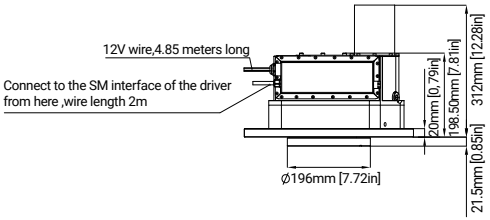
Tool	Specification	Qty.	Purpose	Torque (N·m)
Torque Wrench	Range: 0-100 Nm	1	To control the torque during the installation of the machine and boat mounting bolts	/
3mm Allen Bit	for M4 hex socket screws	1	Secures the cable support bracke	1.5~2.0 N.m
6mm Extended Allen Bit	≥60mm length, for M8 screws	1	Installs P12 adapter plate to P12 motor	12-13
10mm Allen Bit	for M12 hex socket screws	1	Mounts P20 adapter plate to motor housing and upper adapter plate	42-43
13mm Hex Socket	For M8 hex bolts/nuts	1	Connects 12V power cables	12-13
16mm Hex Socket	For M10 hex bolts	1	Installs full-rotation module to the hull	24-25
Crane	Lifting capacity ≥100 kg	1	To lift and install the machine	/
Lifting Rope	Load capacity ≥100 kg	1	To lift and install the machine	/
Thread Sealant	Loctite 243	1	For thread anti-loosening, apply to threads before thread	/
Multimeter	/	1	Conductivity check after installation	/
Waterproof Sealant	THREEBOND 1215	1	For waterproof sealing parts during product installation	/

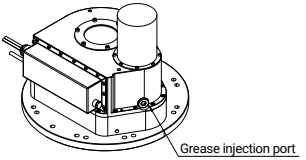
3.1.2 Power Adjusting

Check the size and space of the machine installation position on the hull. Ensure that there will be no interference with the hull and other components during various movement states of the machine. Also, make sure that the installation position is accurate, easy to adjust, and meets the installation requirements. The dimension diagrams are as follows:

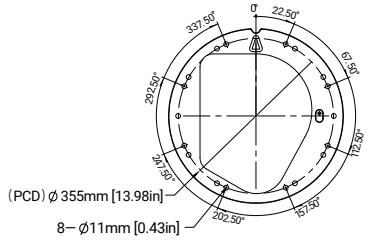




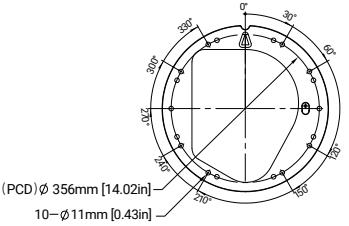


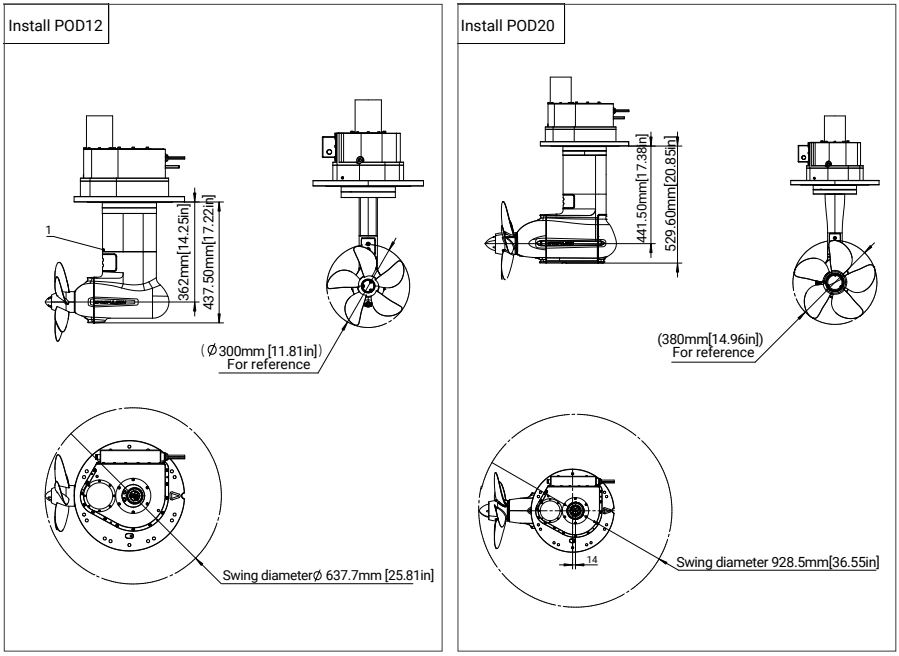


For YANMAR SD25 engine bed



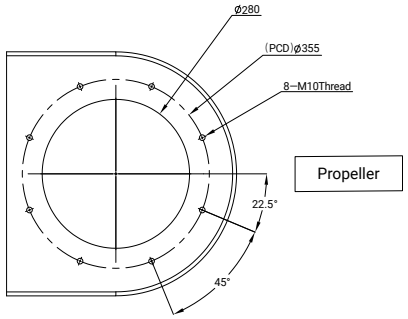
For VOLVO PENTA 120S/130S/150S engine bed

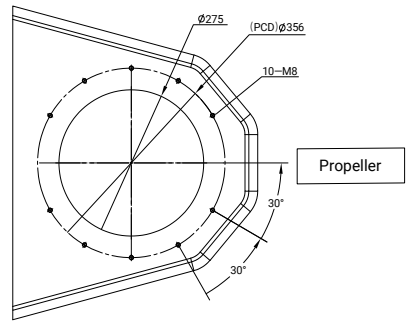




Note: The P12 adapter plate shown in Figure 1 is an optional accessory.

Use a base compatible with Yanmar SD25 or Volvo Penta 120S/130S/150S models. The specific hole patterns for the base are detailed as follows:



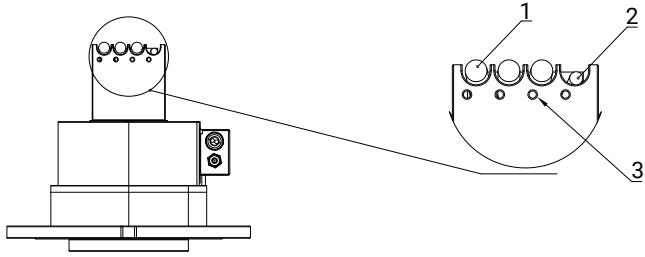


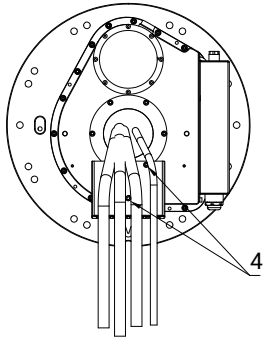
3.1.3 Cable Routing Notes

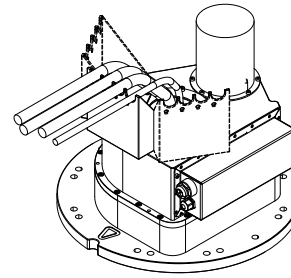
To prevent damage to the motor and cables during 360° rotation, route the cables using the cable support bracket as shown below. The bracket can be installed in any of the three directions shown (60° apart) based on the wiring layout.

The four holes in the support bracket are for cable tying. Follow these steps:

1. Refer to Chapter 5, adjust the angle to 0° by using the digital helm.
2. Install cable support bracket with 3 M4*12 screw 4.There are three outlet positions with 60° intervals to choose.
3. Three-phase cables 1 and signal cable 2 are placed on the bracket.
4. Arrange the cables so individual wires are not twisted. ensure three-phase cables 40 to 60mm of cable slack, and signal cable 70 to 90mm of cable slack. Then tie tightly with cable tie through hole 3
5. Use the digital helm to turn between -90° and +90° slowly, ensuring that the cables are not significantly curled or pulled.





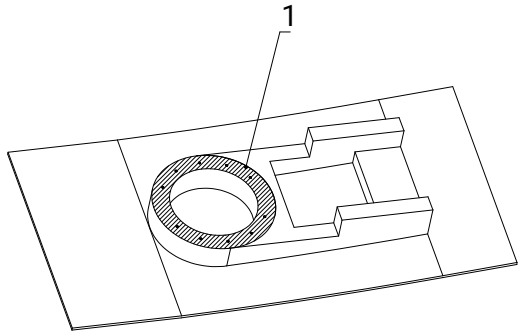


When routing cables inside the hull, ensure the bending radius is greater than 5 times (P20≥80mmm,p12≥60mm) the cable outer diameter. Secure cables effectively with ties to avoid excessive bending or abrasion that could damage the cables.

3.2 Install the Power Steering Module of P20

1. Apply Waterproof Sealant on the Base

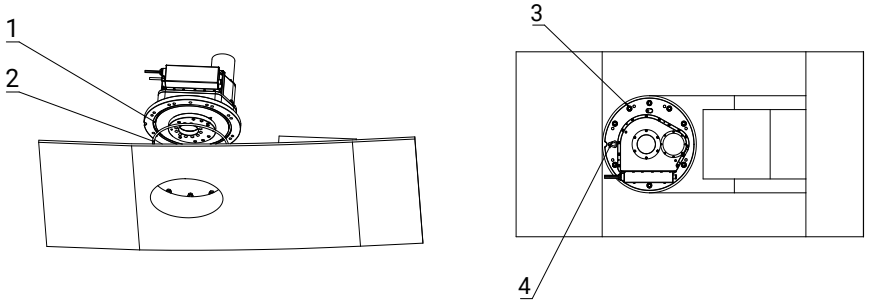
On the top surface of the base, apply waterproof sealant fully within the gridded area marked φ400 (Region 1) that contacts the power steering module. Recommended sealant: THREE-BOND 1215.



If using an old base, first remove any oil stains from the base and grind the mounting surface. After grinding, perform a trial installation with the power steering module to ensure the contact gap does not exceed the thickness of a single A4 paper.

2. Install Power Steering Module

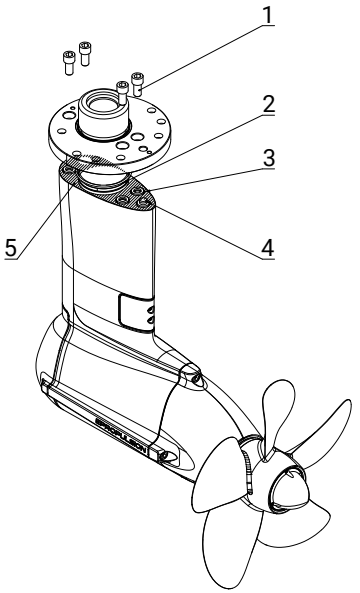
Place the hull sealing strip 2 (outer diameter 315 mm, cross-section diameter 8 mm) into the O-ring groove 1 of the hull adapter plate. Align the triangular mark 4 toward the bow. Using the eight M10x45 hex head screws 3 provided with the P20 motor, apply the Loctite 243 and tighten to a torque of 24–25 N·m.



If the base has M8 installation holes, please prepare your own screws. It is recommended to use M8*35 stainless steel screws and tighten with a torque of 12-13 N·m.

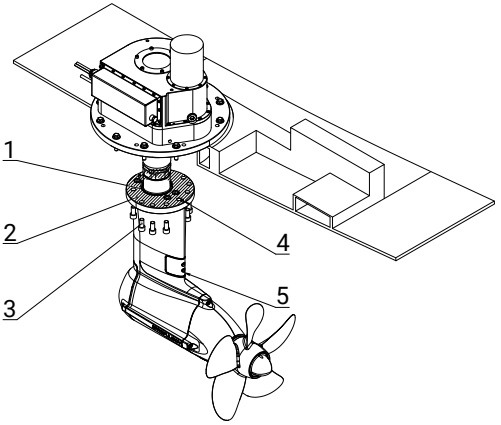
3. Install P20 Adapter Plate

Slide the P20 motor supplied O-ring 2 (outer diameter 80mm, cross-section diameter 4mm) and the five M12 screw seals 3 onto the motor. Apply waterproof sealant fully within the gridded area (Region 5) where the P20 adapter plate contacts the pod motor. Position it using the 12x30 pins 4. Secure with the four M12x25 hex socket head cap screws 1, applying Loctite 243 and tightening to a torque of 42-43 N·m.



4. Connect Upper and Lower Adapter Plates

Place the adapter plate seal 1 (outer diameter 89mm, cross-section diameter 2.5mm) onto the adapter plate. Apply waterproof sealant fully within the gridded area (Region 2) between the P20 adapter plate and the upper adapter plate. Route the pod's three-phase power cable and communication cable through the center through-hole of the power steering module. Align by the 6x14 locating pins 4. Secure with the eight M12x25 hex socket head cap screws 3, applying Loctite 243 and tightening to a torque of 42-43 N·m.



5. Conductivity Check After Installation

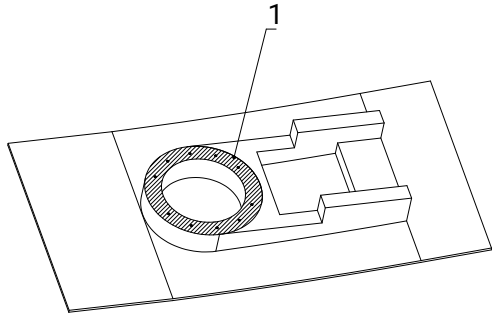
After the installation, use a multimeter to measure conductivity between the mounting screw 5 of the anode on the P20 motor and the screw 3 of the lower adapter plate. Qualified conductivity is required.

The overall electrical connection for corrosion protection is achieved through the pins in Steps 3 and 4. Ensure these pins are not omitted during installation.

3.3 Install the Power Steering Module of P12

1. Apply Waterproof Sealant on the Base

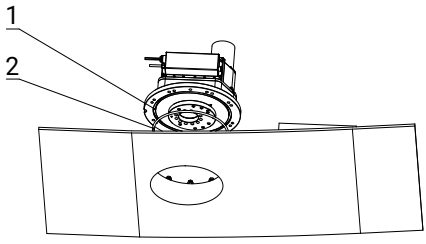
On the top surface of the base, apply waterproof sealant fully within the gridded area marked φ400 (Region 1) that contacts the power steering module. Recommended sealant: THREEBOND 1215.

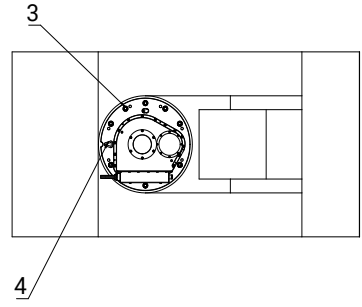


If using an old base, first remove any oil stains from the base and grind the mounting surface. After grinding, perform a trial installation with the power steering module to ensure the contact gap does not exceed the thickness of a single A4 paper.

2. Install Power Steering Module

Place the hull sealing strip 2 (outer diameter 315 mm, cross-section diameter 8 mm) into the O-ring groove 1 of the hull adapter plate. Align the triangular ma rk 4 toward the bow. Using the eight M10x45 hex head screws 3 provided with the P20 motor, apply the Loctite 243 and tighten to a torque of 24–25 N·m.

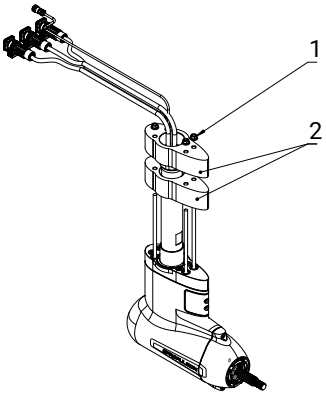


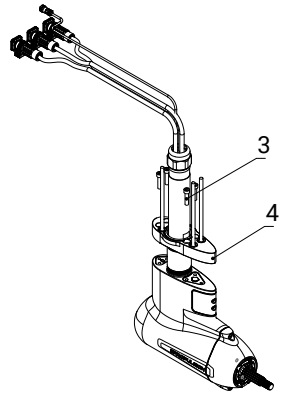


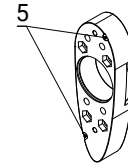
If the base has M8 installation holes, please prepare your own screws. It is recommended to use M8*35 stainless steel screws and tighten with a torque of 12-13 N·m.

3. Remove the P12 Adapter Pad

Loosen the four M8 hex flange nuts 1 and remove the two adapter pads 2. Then remove the four M8 bolts 3. Pry at the indicated points 5 to remove the adapter pads 4.

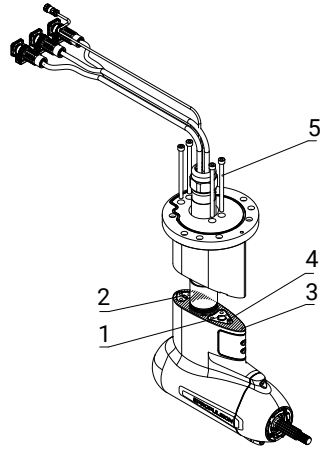






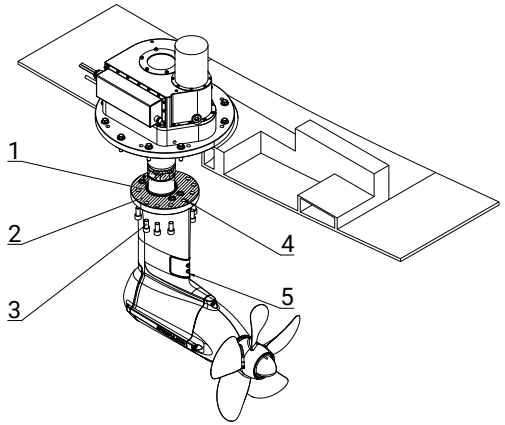
4. Install P12 Adapter Plate

Remove the front seal 1 and rear seal 2 installed on the P12. Clean residual sealant from the gridded area 3 where the adapter plate contacts the pod motor. Apply new waterproof sealant fully within area 3. Position using the 6x14 pins 4. Secure with the four M8x120 hex socket round head screws 5, applying Loctite 243 threadlocker and tightening to a torque of 12~13 N·m.



5. Connect Upper and Lower Adapter Plates

Place the provided P12 adapter plate seal 1 (outer diameter152mm, cross-section 3 mm) onto the adapter plate. Apply waterproof sealant fully within the gridded area 2 between the P12 adapter plate and the upper adapter plate. Route the pod's three-phase cables and communication cables through the center through-hole of the power steering module. Align using the 6x14 locating pins 4. Secure with the eight M12x25 hex socket round head screws 3, applying Loctite 243 and tightening to a torque of 42-43 N·m.



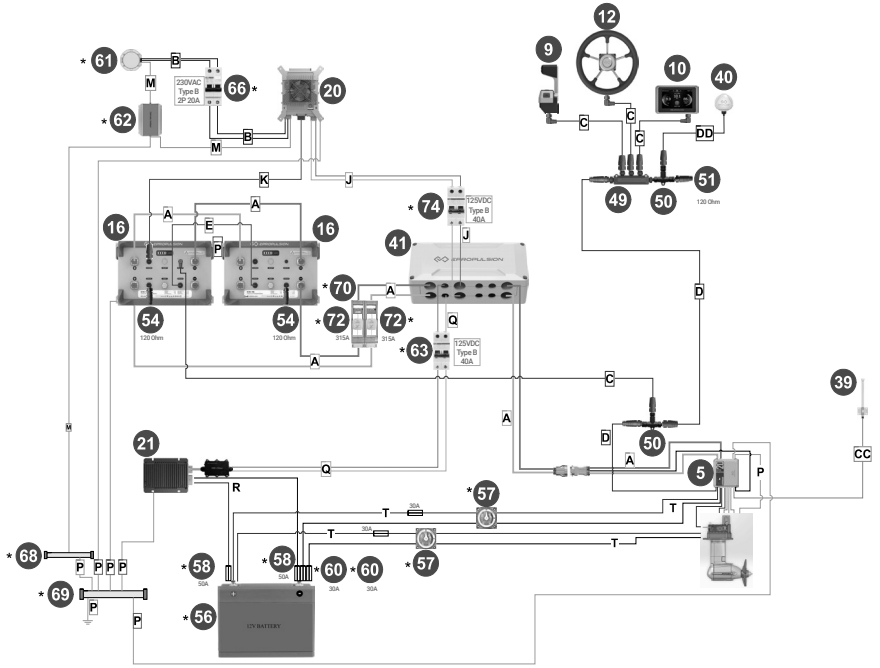
6. Conductivity Check After Installation

After the installation, use a multimeter to measure conductivity between the mounting screw 5 of the anode on the P20 motor and the screw 3 of the lower adapter plate. Qualified conductivity is required.

The overall electrical connection for corrosion protection is achieved through the pins in Steps 4 and 5. Ensure these pins are not omitted during installation.

4 Connections

4.1 Single Motor System Connection



Number	Notes	Number	Notes
5	P12/P20 Pod Drive Motor with Power Steering Module	21	DCDC 96V-12V
9	Smart Throttle	39	4G Antenna
10	Smart Display 5"	40	GPS Module
12	Digital Helm	41	Bus Box
16	G102-100 Battery	49	eSSA Communication 5-way T Connector
20	G Battery Charger 16A	50	eSSA Communication 3-way T Connector

Number	Notes	Number	Notes
51	eSSA Communication Terminator 120Ω	A	96V DC Power Bus (includes positive and negative)
54	Battery Communication Terminator 120Ω	B	G battery Charger AC Input Cable
56	12V battery*	C	eSSA Communication Cable 1m
57	Motor 12V Switch*	D	eSSA Communication Extension Cable 10m
58	50A Fuse*	E	G102-100 Battery Communication Parallel Cable*
60	30A Fuse*	J	G battery Charger DC Output Cable
61	AC Charging Socket*	K	G battery Charger Communication Cable
62	Shore Power Ground Line Isolator*	M	AC Equipment Ground Line*
63	10A DC Circuit Breaker (DC125V)*	P	DC Equipment Ground Line (Whole-Vessel Ground Line)*
66	20A AC Circuit Breaker (230VAC, with leakage protection)*	Q	DC-DC 96V-12V(500W) Input Cable
68	AC Equipment Grounding Copper Bar*	R	DC-DC 96V-12V(500W) Output Cable
69	Boat Grounding Copper Bar*	T	Pod Drive Motor & Steering Module 12V Power Cable
70	96V DC Bus Fuse Holder (NH2)*	CC	4G Antenna RF Signal Cable
72	96V DC Bus Fuse (NH2, 315A)*	DD	GPS Module Communication Cable
74	40A DC Circuit Breaker (DC125V)*	/	/

⚠ The accessories marked * are not included in the package. Users need to adjust accoring to local regulatory requirements, such as fuses, circuit breakers and cables.

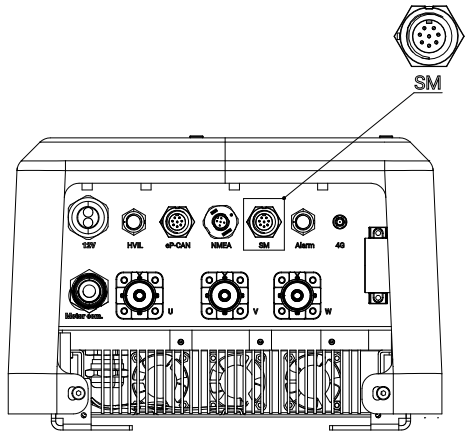
⚠ Two 12V Fuse is included in the package, which should be installed between the positive of the 12V battery to P12/P20 driver and power steeing module. If local regulations require the installation of fuses for both positive and negative, customers need to purchase and install fuses based on local regulations.

⚠ This manual uses a single motor system to illustrate the connection between thesteering module and the P12/P20 system. For multi-motor system connections,please refer to the wiring diagrams for the P12/P20 motors.

4.2 Cable Connection of Power Steering Module

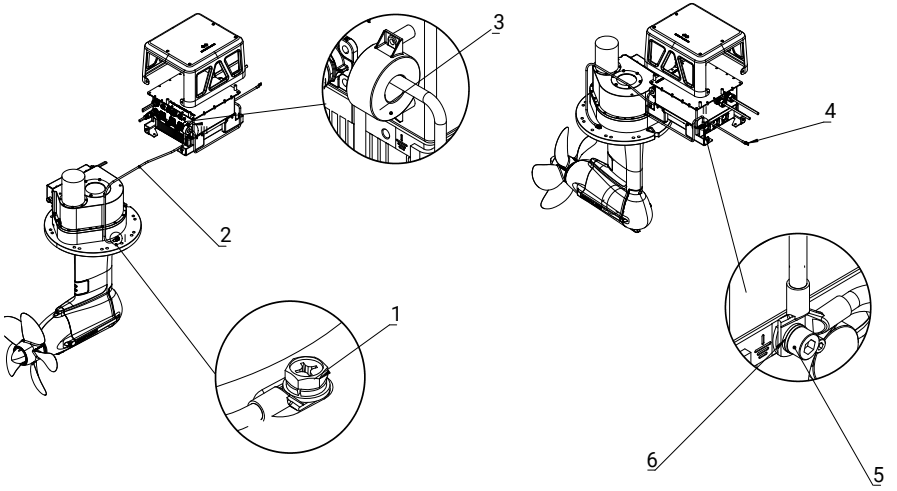
As shown in section 4.1, connect the Steering Module's 12V power cable to the 12V battery via M8 lug connectors, wired in parallel.

Connect the Steering Module's communication cable to the port marked "SM" on the P12/P20 controller, as shown below.



Use the M8x16 hex triple-combination screws 1 to secure the M8 lug of the ground cable 2 (provided with the main unit) to the power steering module. Secure the other end (M6 lug) of the ground cable to the driver's ground port 4 using the M6x14 hex socket head cap screw and M6 double lock washer 6.

Note: The P20 grounding cable must pass through the magnetic ring 3 before connecting to the driver location shown in the right figure. When routing along the side, keep the cable close to the lower edge of the controller.



5 Operation

5.1 Perform initial configuration

The Power Steering Module is automatically recognized and matched by the Pod Drive Motor, and no manual configuration is needed.

Step 1: Read the system devices

After all accessories are assembled, power on, turn on the smart throttle, and the Smart display will automatically read the Serial Numbers (SN) of the devices in the system.

Manually check whether the SN of all parts on board are displayed. If it is correct, click Next; If SN of any part is not displayed, check the connections and click Check again. The system will scan again for connected devices.

5-3-1

5-3-2

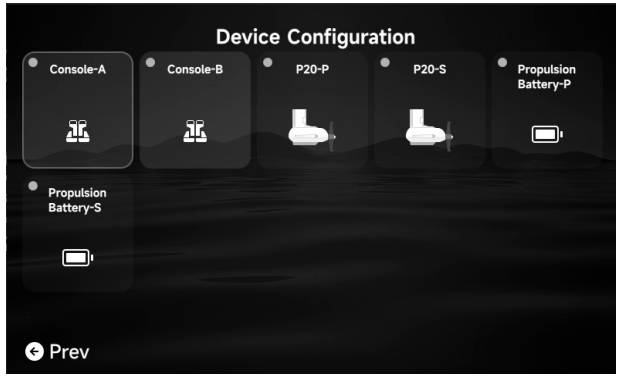
Step 2: Configure the location of the equipment

When there is only one console and motor, the system will automatically complete the system initialization settings and press Next to enter the home page.

5-3-3

If the system includes more than one console or motor, the user needs to configure the console accessories and the position of the motors. The following illustrates the configuration process with two sets of consoles and two motors.

After the system finishes reading SNs, click the Next button. The display will jump to the Configure Device Locations page.

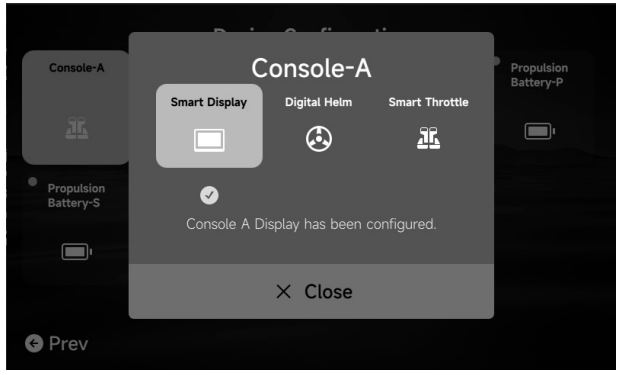


5-3-4

5.1.1 Configure Display

Follow the blue highlighted prompts in order. Click the Console A button and configure the interactive devices as prompted.

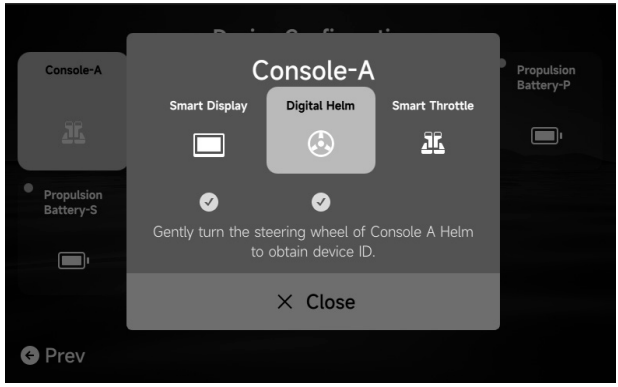
When there are two consoles, the display will display two consoles. By default, the console where the current display is located is Console A.



5-3-5

5.1.2 Configure Digital Helm

Click the Digital Helm button. Rotate the digital helm clockwise or counterclockwise as prompted until a green "Configuration Complete" icon appears on the display.

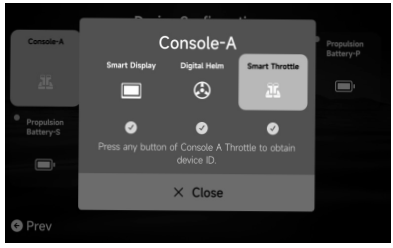


5-3-6

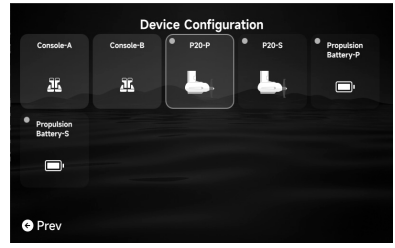
5.1.3 Configure Smart Throttle

When it is a single-throttle, manually click any button of the throttle to match successfully. When it is a dual-throttle, click any button of the left and right throttles respectively to match successfully.

After console A is configured, the remaining parts will be automatically matched to console B.



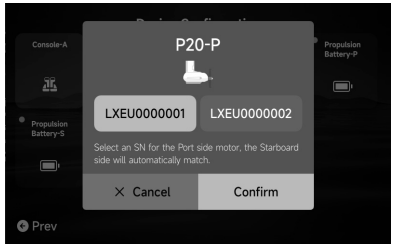
5-3-7



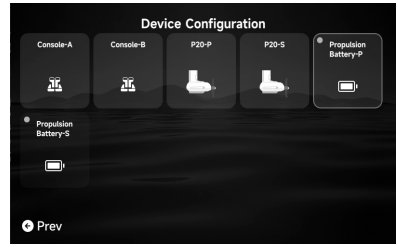
5-3-8

5.1.4 Configure Motors

Click the SN of the motors to configure them to the port and starboard sides of the boat.



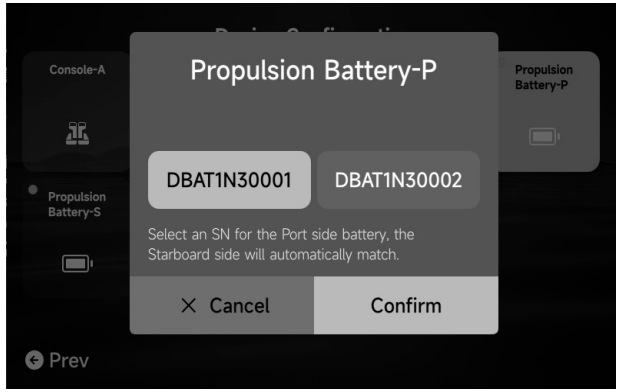
5-3-9



5-3-10

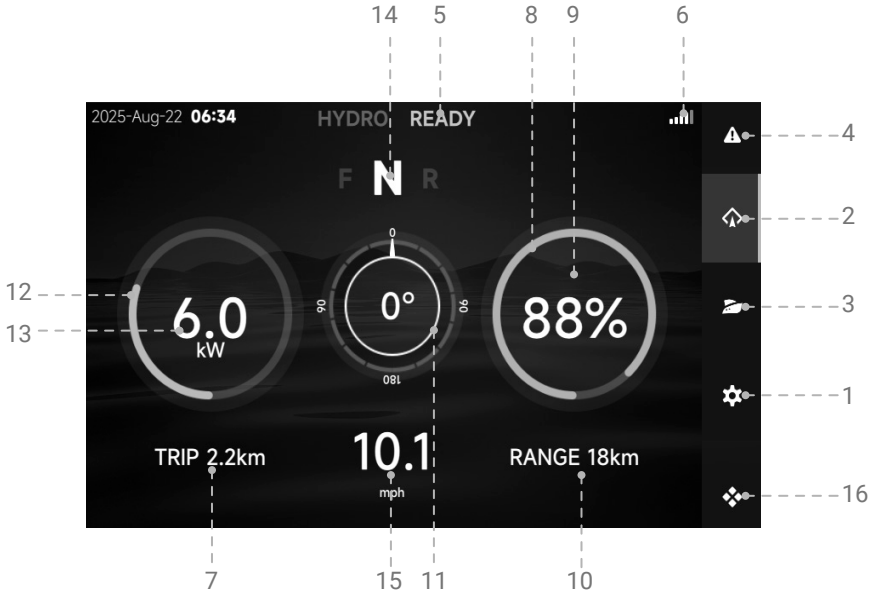
5.1.5 Configure Batteries

Click on the battery's SN. After confirming the selected battery SN matches the actual port-side battery on the vessel, click Comfirm to assign it to port. The other SN battery will be auto-assigned to starboard. All device locations are now configured, and the display will automatically jump to the home page.



5-3-11

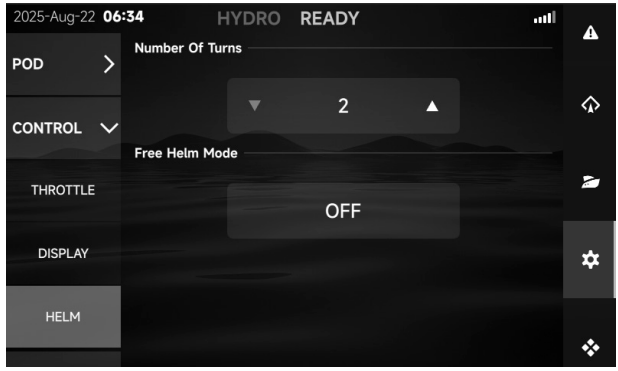
5.2 Display Home Page



No.	Function	Description
1	Setting page	Click to go to the setting page.
2	Home page	Click to go to the home page.
3	Propulsion page	Click to go to the propulsion page.
4	Warning	When the system fails, it will prompt a fault icon.
5	System status	READY indicates that the system is ready to start.

No.	Function	Description
6	4G network signal strength	/
7	Travelled time/ distance	You can switch between trip distance and time in settings.
8	Battery indicator bar	The indicator changes with battery level.
9	Battery level	/
10	Remaining distance or time	The remaining distance/time supported by the current battery level. You can switch between distance and time in the settings.
11	Steering angle	steering angle of the machine
12	Power indicator	The indicator will change as the power output changes.
13	Current power/ Current RPM	You can switch between current power or current RPM in the setting
14	Gear	F: Forward gear N: Neutral R: Backward gear
15	Speed	Current speed, which can be switched between KNOTS, KM/H, and MPH in the settings.
16	Function	Press to enter the function page to enter the Dock mode, adjust the lightness and so on.

5.3 Digital Helm Setting



Function	Introductions
Number of turns	Click the plus or minus button to set the number of digital helm turns corresponding to a rotation of ±90 degrees , Range: 2 to 9 turns. Recommended range: 4 to 8 turns based on personal preference.
Free Helm Mode	When at Free Helm Mode, The helm can rotate but the electric steering will not move at the limit positions.

5.4 Digital Helm Control

Fix the digital helm to the console using screws. Connect the system's CAN communication cable to the communication port at the base of the digital helm, integrating it into the system. Press and hold the power button on the smart throttle to turn on the digital helm and the Power Steering Module. Rotate the digital helm to control the steering module.

5.5 Troubleshooting

*If it occurs repeatedly, contact after sales processing.

Fault position	Fault name	Fault name	Fault code
Power Steering Module	Motor Overtemperature Failure	P110123	1. No action required if functional after cooling. 2. Replace motor or motor controller.
	MOS Overtemperature Failure	P110213	1. No action required if functional after cooling. 2. Replace Steering Motor Controller.
	Software Overcurrent Shutdown	P110323	Ignore if no recurrence after restart. If fault recurs, replaceSteering Motor Controller.
	DC Bus Undervoltage	P111713	If other nodes report faults, prioritize troubleshooting othersubsystems and the high-voltage power supply circuit.
	DC Bus Overvoltage	P111813	1. If other nodes report faults, prioritize troubleshooting othersubsystems and the high-voltage power supply circuit.2. Replace Steering Motor Controller.
	Auxiliary Power Undervoltage Failure	P111913	If other nodes report faults, prioritize troubleshooting othersubsystems and the low-voltage power supply circuit.
	Auxiliary Power Overvoltage Failure	P112013	If other nodes report faults, prioritize troubleshooting othersubsystems and the low-voltage power supply circuit.
	Hardware Overcurrent	P112123	1. Check wiring. 2. Check resolver. 3. Check motor. 4. Replace Steering Motor Controller.
	Motor Hall Initialization Failure	P112213	1. Replace cables. 2. Replace Hall sensor. 3. Replace Steering Motor Controller.

Fault position	Fault name	Fault name	Fault code
Power Steering Module	Motor Hall Fault	P112313	1. Replace cables. 2. Replace Hall sensor. 3. Replace Steering Motor Controller
	Motor Stal	P112403	1. No action required if stall condition resolves. 2. If fault reported during non-stall conditions, first check resolver electrical angle. 3. If resolver angle is normal, confirm software version. 4. Replace Steering Motor Controller.
	Upper SwitchBreakdown	P112623	Replace Steering Motor Controller.
	Lower SwitchBreakdown	P112623	Replace Steering Motor Controller.
	Calibration Failure	P112703	1.Check surroundingsfor opstacles afterrepowering.If none, retry calibration. 2. If unrecoverable, replace Steering Motor Controller.
	Controller Hardware Fault	P112823	Replace Motor Controller if problem persists after repowering.
	Node Missing	P112923	Check communication cable connection between electricpower steering and other devices.
	Angle Mismatch Fault	P113003	Check electric steering motor shaft for abnormalities, e.g. ooseness or breakaae.
	Busbar Undervoltage Derating	P113332	If other nodes report faults, prioritize troubleshooting othersubsystems and the high-voltage power supply circuit.
	MOS Overtemperature Derating	P113412	1. No action required if functional after cooling. 2. Replace Steering Motor Controller.

Fault position	Fault name	Fault name	Fault code
Power Steering Module	Motor Overtemperature Deratind	P113512	1. No action required if functional after cooling. 2. Replace motor or Steering Motor Controller.
	MOS Temperature Sensor Fault Derating	P113622	Replace Steering Motor Controller
	Motor Temperature Sensor Fault Derating	P113722	Check motor temperature line. If no issues found, replaceSteering Motor Controller.
	Angle Mismatch Warning	P115031	Check electric steering motor shaft for abnormalities, e.g. ooseness or breakage.
	Electric Steering Controller Requires Calibration	P115131	Perform automatic calibration via display
	Steering Angle Sensor Fault	P115301	11.Check if maqnet is missing from steering module. 2. Check cable integrity. 3.If unresolved, replace Steering Motor Controller
	Steering PWM Sampling Anomaly	P115411	1.Perform automatic calibration via display 2.Check steering module magnet installation (abnormal position or excessive distance from magnetic encoder chip)3. Check for obstacles restricting steering travel.
	Impact Event Fault	P115501	Promptly investigate if obstacles are near the vessel (boat).
	Phase Current ZeroPoint Anomaly	P115621	Replace or repair Motor Controller
	Line Voltage Zero PointAnomaly	P115721	Replace or repair Motor Controller.
	Lock Device Anomaly	P115811	1.Check if electromagnetic brake drive cable is properlyconnected. 2. Replace electromagnetic brake.

5.6 Temporary Running Mode

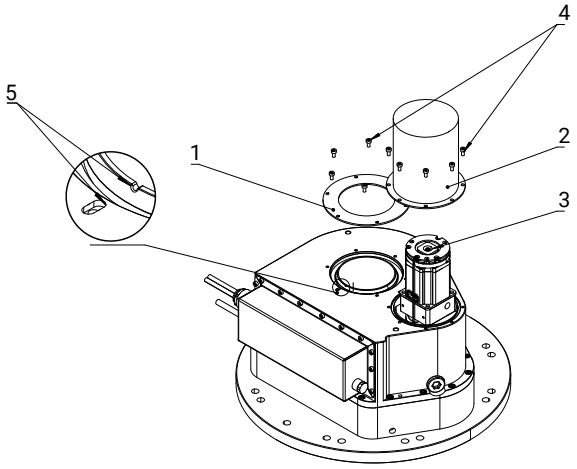
If some serious faults occur and the steering module is fault, users can top the motor first confirm system safety and then enter the temporary running mode through the display screen. In this mode, the steering needs to be manually controlled by the operator as chapter 6, and the maximum power to the motor will be limited to half of the maximum power.

6 Emergency Handling for Electric Steering Failure

If the Power Steering module suffers an impact or other accident causing electric steering failure, follow these steps for manual steering:

1. Use a 3mm hex key to unscrew the M4 hex screws on the oil seal cover plate 1 and remove the plate.
2. Use a 3mm hex key to unscrew the M4 hex screws on the motor cover 2 and remove the cover.
3. Use the provided 8mm L-wrench to turn the M5 nut 3 at the rear of the motor, driving the power steering module to turn. The 0° steering angle is indicated when the shaft mark aligns with the housing mark. Adjust according to the target position. Note: Due to a primary gear reduction, the rotation direction of the motor tail is opposite to the rotation direction of the main unit.

Do not attempt to rotate the P12/P20 motor directly. The reduction ratio from the steering motor to the motor rotation mechanism is 350:1. The locking torque required to turn the main unit exceeds 500 N·m, making it impossible to turn by human force.



7 Maintenance

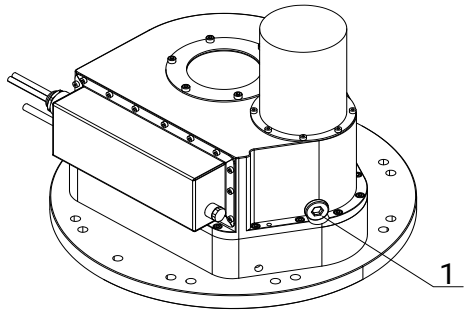
Maintenance	Method of operation	Main work	Maintenance cycle		
			First maintenanc	Ongoing maintenance	
			100 hours (or 6months)	250 hours (or 1years)	1000 hours (or 4years)
Inspect whole machine	Check whether the machine is fixed securely and the screws and nuts areloose, broken or falling off.	Check	•	•	/
Inspect cable wear	Regularly check the reliability of the cable fixation and whether there iswear with the hull through-holes, etc.	Check	•	•	/
Replenish grease	Refer to the section below. Regularly replenish grease through the grease injection port .	Add	/	/	•

7.1 Greasing Points

The product contains rotating gear sets. Regularly replenish grease. Grease specification: Universal Lithium Base Grease #2 or #3. Recommended amount per application: 50g.

Procedure:

- Use a 10mm hex key to loosen the grease injection screw 1 shown below. Attach a grease gun nozzle to the port.
- Referring to Section 6 of this manual, manually rotate the central shaft 360° while injecting grease. Ensure gears on the central shaft are adequately lubricated.
- Tighten the grease injection screw 1 after greasing.



8 Limited Warranty

Guangdong ePropulsion Technology Limited. (“ePropulsion”), China, warrants its products to be free of defects in material and workmanship under normal usage with proper installation and routine maintenance for a period of twenty-four (24) months from the date of delivery of invoice (the “Limited Warranty Period”). The Limited Warranty is provided to the first end customer of ePropulsion products ONLY. The Customer is entitled to free repair or replacement of defective or non-conforming parts. Any warranty claim must be made within six (6) months of discovery of issues as provided below.

If the Limited Warranty Period has expired, you can still enjoy maintenance services from dealers/distributors authorized by ePropulsion (the “ePropulsion Service Partners”) who will endeavour to keep costs to a minimum.

In all warranty cases, ePropulsion will only bear the repair or replacement cost for items that are covered by the Limited Warranty. Any costs not covered by the Limited Warranty – such as those related to product installation, disassembly, transportation, financing, rental, etc – shall be borne by the customer alone.

Beyond the Limited Warranty, the Customer may have statutory rights in their jurisdiction according to applicable laws. Nothing in this Limited Warranty affects such rights. The Customer may have warranty claim rights arising from the purchase contract with ePropulsion Service Partners in addition to the rights granted by this Limited Warranty.

Products used for commercial or professional purposes*, even if only temporarily, are not covered by the Limited Warranty. Instead, the statutory warranty in your jurisdiction shall apply. You are encouraged to consult with ePropulsion Service Partners for applicable warranty and advice before engaging in such use.

*** Commercial/Professional Purposes include those where the product is used with the intention of making profit, or high frequency, or very high reliability requirements, etc.**

To keep your warranty valid, please note the following:

- Products without the original product label will not be covered by ePropulsion’s Limited Warranty. Keep the product label intact and record the serial number from it. Never remove the label from the product;
- The Limited Warranty is not transferable and will not be reissued;

TThe Limited Warranty may change from time to time. Please visit our website (http://www.epropulsion.com) for the latest version.

Capacity guarantee for high-voltage batteries

A guarantee of the capacity of the high-voltage batteries, in addition to the standard guarantee. Depending on the long-term average temperature and the usage profile, this guarantee runs for a longer life.

Comment on average temperature:

The average temperature is calculated using the Arrhenius equation; this means that higher temperatures are given a greater weighting.

8.1 Warranty Exclusions

ePropulsion may refuse a warranty claim if:

- The product is operated in contradiction to what is written in the user manual;
- Damage is caused by accident, misuse, dropping, improper care or storage, wilful abuse, physical damage, unauthorized repair;
- Water ingress is caused by external sources such as fishing nets, submersion, etc;
- Product has been modified, altered, dismantled, or had parts/accessories attached in any way not expressly permitted or recommended by ePropulsion;
- Due to failure of, or damage caused by, any 3rd party products;
- The high-voltage batteries have been repositioned in the boat, without contacting ePropulsion service. Repositioning may result in changes to cabling, and other risks to system operation;
- The battery has been incorrectly charged, overcharged, over-discharged, or operated in temp out of scope described in the user manual;
- Consumables (such as replacement propeller, anodes, oil/fluids...etc.);
- Purchases of products from unauthorized dealers or sellers;
- Normal wear and tear and routine servicing;
- Damage caused by improper packing or handling of the product during its return. The additional damage part will be deemed out of warranty;
- Incorrect shipping of lithium batteries. These are classed as a UN9 hazardous item, and must be shipped in accordance with regulations in your jurisdiction. Non-compliance may result in warranty exclusion.

8.2 Limited Warranty Claim Procedures

The process shown below must be followed in order to make a Limited Warranty claim:

1. Contact your nearest ePropulsion Service Partner with details of the problem. They will advise if such defects are covered by the Limited Warranty or any additional rights you may have from your purchase.
2. Send the defective product to them (or the Service Partner they advise) together with Proof of 1(st)-time (first time) Purchase (e.g., receipt, invoice, etc., with information of product purchased and date of purchase), the Confirmation of Online Warranty Registration, ex-factory Serial Number, etc. Note that all labels must be kept intact. Warranty claims will only be valid only when the information above is correct, genuine, and complete.
3. Make sure the product is properly packed during delivery, the original packaging is highly recommended.
4. The ePropulsion Service Partner will examine and diagnose the defective products to check the validity of the warranty claim.
5. If your warranty claim is accepted, the Product or its defective components/parts will be either repaired or replaced free of charge. Note that any delivery cost incurred in the process shall be borne by you.
6. If your warranty claim is rejected, a repair/replacement cost and fee with round trip delivery cost will be estimated and sent to you for confirmation. ePropulsion Service Partners will only begin the work after your written confirmation that you wish to proceed with the repair/replacement and will pay for it.

ePropulsion

(*In order to validate warranty, please fill in this form first and read the Warranty Policies.)

|| OWNER INFO. ||

Owner Name			
Address			
Phone		Email	

|| DEALER INFO. ||

Store Name			
Address			
Phone		Email	

|| PRODUCT INFO. ||

Date of Purchase (mm/dd/yyyy)	
Serial No.	

Thanks for reading this user manual.
If you have any concerns or find any problems while reading, please don't hesitate to contact us. We are delighted to offer service for you.

Guangdong ePropulsion Technology Limited
Website: www.epropulsion.com
E-Mail: service@epropulsion.com