EPROPULSION

P12 User Manual

2024.08 Version 1.0

THANK YOU

Thank you for purchasing a product from ePropulsion, world leaders in clean, safe and reliable electric marine propulsion systems. We are sure you'll be pleased with your new motor and welcome your feedback at www.epropulsion.com

Conditions of Use

Before using this product, please read this user manual thoroughly to understand how to use the product correctly and safely. By using this product, you indicate that you have fully read and understood, and agree to, all the contents of this manual. Do not use the electric outboard motor until you have understood how it operates. Do not lend the outboard motor to anyone who is not familiar with its operation. ePropulsion is not responsible for any economic loss or personal injury resulting from operations that do not comply with the instructions in this manual.

Please note that ePropulsion has a policy of continuous product optimisation, and reserves the right to update the contents of this manual at any time. Please visit www.epropulsion.com to obtain the latest version. If you find any discrepancies between your product and this manual or have any questions about the product or this manual, please visit the website www.epropulsion.com or contact us. ePropulsion reserves the right to make the final interpretation of this manual. This manual is available in multiple languages, and in the event of any discrepancies between different language versions, the English version shall prevail.

ePropulsion also retains all relevant intellectual property and industrial rights, including copyrights, patents, trademarks, and designs.

Safety Warning

ePropulsion attaches great importance to safety and reducing risk to individuals and property. We advise any person who comes into close contact with our products to exercise caution, use common sense, follow the instructions in this manual, and pay particular attention to the safety information in the manual and on product labels. Such persons include those who install, operate, maintain and service the product.

The following information symbols are found in the user manual and/or on labels attached to the product:

Danger or Warning Signs:

These signs indicate potential hazards or significant risks that, if not avoided, could result in

death or serious personal injury. Extra caution and attention should be exercised regarding your safety or the safety of the product.

 **Important warning:**

Tips or important points of information that help quickly grasp the use of the pod drive motor and improve efficiency. Please read and follow the instructions following the safety warning signs.

 **Caution:**

When installing, operating, maintaining or servicing ePropulsion products, there are many safety risks. You need to be alert, perform relevant operations reasonably, and pay attention to safety.

 **Entanglement hazard:**

Rotating parts can cause severe injury or death. Never wear jewelry, unbuttoned cuffs, ties or loose-fitting clothing and always tie long hair back when working near moving/rotating parts such as the flywheel, PTO shaft and propeller. Keep hands, feet and tools away from all moving parts.

 **Electric shock hazard:**

These areas or components may pose a risk of electric shock. The equipment uses 102.4V DC power. When accessing or opening electrical connectors, switches, cables and other electricity-related items, turn off the power to prevent electric shock.

 **Burn hazard:**

Some parts of the pod drive become very hot during operation and may remain hot when turned off. Keep hands and other body parts away from these areas.

 **Do not approach when the pod drive is running:**

These parts of the pod drive are potentially dangerous when operating - keep clear of these areas when the pod drive is running, or about to start.

 **Do not connect or disconnect when the pod drive is running:**

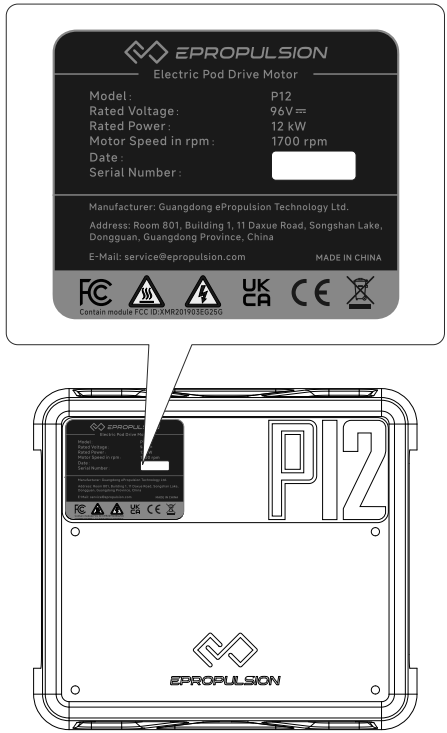
These parts of the pod drive may pose a risk of electric shock if connected to or disconnected from the power supply during operation.

 **Warning:**

This product can expose you to chemicals including arsenic, which is known to the State of California to cause cancer. For more information, go to www.P65Warnings.ca.gov.

Product Serial Number

The serial number is located as shown 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.



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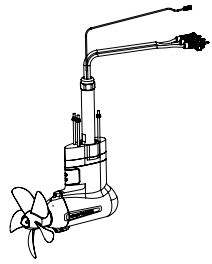
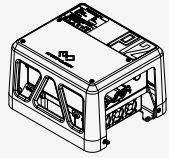
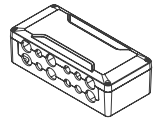
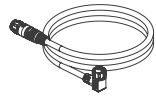
1 Product Introduction

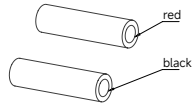
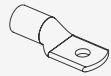
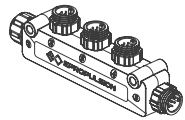
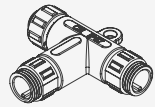
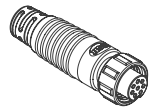
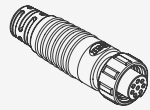
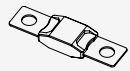
Pod Drive 12 eSSA is a pod drive motor with an input power of 12kW, which is controlled by smart throttle and smart display 5". The Pod Drive 12 eSSA is environmentally friendly, clean, and efficient. It is perfect for small and medium-sized recreational vessels, such as all types of yachts, leisure boats and sailboats, which is less than 30m.

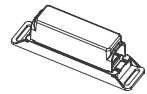
1.1 In the Package

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

1.1.1 P12 Packaging List

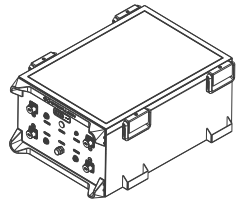
Items	Qty.	Figure	Function
Pod Drive Motor	1		Provide the main propulsion of the boat
Driver	1		Control the motor start and stop, rotate right or left, and the rotational speed
Bus box	1		Transfers electrical energy from the power system's main circuit to different components or modules within the circuit
96V Power Cable 5m	1		Transfer DC power from the battery to the power input of the motor
eSSA Communication Cable 1m	1		Connect the motor and other devices such as the smart throttle, smart display and battery.

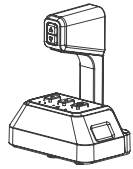
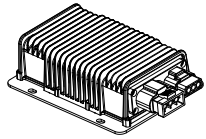
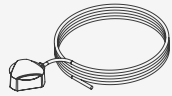
Items	Qty.	Figure	Function
Heat Shrink Tubing	2		Protect the main power cable after stripping it
Cable connector	6		Terminals to fit on cut ends of 96V power cable
eSSA Communication 5-way T Connector	1		Connect the motor and each device to the CAN communication network (controller LAN)
eSSA Communication 3-way T Connector	2		Connect the motor and each device to the CAN communication network (controller LAN)
eSSA Communication Terminator 120Ω	1		Improve the quality of communication
eSSA Communication Terminator 360Ω	1		Improve the quality of communication
12V Fuse Connecting Cable	1		/
12V Fuse	1		/
eSSA Communication Extension Cable 10m	1		Extend the communication distance of the CAN communication cable.

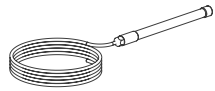
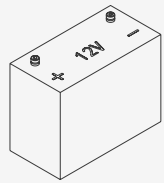
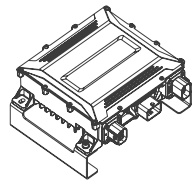
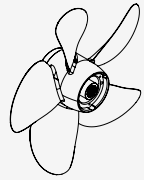
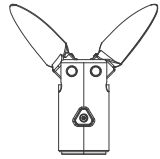
Items	Qty.	Figure	Function
12V Fuse Base	1		/
Installation Accessory Pack	/	1. 4 M5x25 Hex Flange Self-Taping Screw 2. 2 M6x16 Self-Taping Screw 3. 4 M5x25 Hex Combination Screw	1. For driver 2. For fixing the fuse base 3. For fixing the driver
User manual Warranty card	1		Give information about the features, functions, performance, purpose and maintenance of the product.

1.1.2 Optional Accessory List

Other accessories not included in the package are also required to operate the pod drive motor such as propellers, smart tiller, smart throttle, smart display 5", G102 battery, battery charger, and communication cables. Users can buy official accessories provided by ePropulsion Technology authorized dealers.

Items	Figure	Function
G102 Battery and Cables		ePropulsion LiFePo4 system battery, 10kWh capacity. Provides safe and reliable electrical power.

Items	Figure	Function
Smart Throttle		Start, stop the motor and control the power output.
Smart Display 5"		Display system information such as power, speed, battery level and set system functions.
DC-DC Converter		DC-DC Converter to charge the 12V battery from the high voltage batteries.
GPS		Provides information including position and speed.

Items	Figure	Function
4G antenna		For use if signal from motor's inbuilt 4G antenna is weak. Enables high speed data transmission for remote control, monitoring and backup
12V battery		Provide power to the system's 12V equipment.
G battery charger		Charge the G102 battery.
X12/P12 Propeller 11 13/16" x 9 13/16" RH		Provide the main propulsion of the boat
Folding Propeller		Suitable for the sailboat

⚠ The 12V battery (not supplied with motor) needs a minimum current output of 120A, a capacity of 120Ah.

⚠ The maximum output power of the DC-DC Converter is 500W. When selecting the system's 12V equipment, ensure this charging capacity meets the battery's requirements.

In the case of twin-motor or multi-motor setups, it is recommended to use a combina-tion of RH and LH propellers to achieve better-balance between the motors and easier steering.

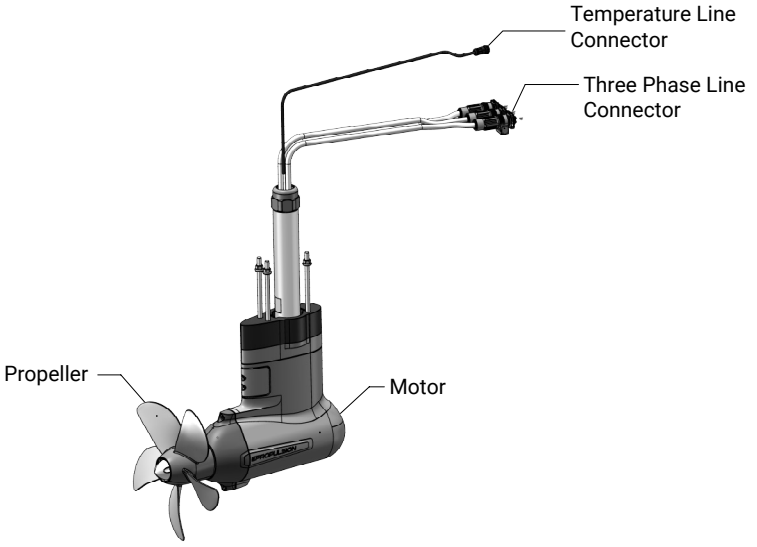
1.1.3 Installation Tools List

Before installing the pod drive motor, the user or installation engineer needs to prepare the following tools.

Tool	Specification	Qty.	Purpose
3mm Allen key (hex key or hex bit)	3mm, suitable for M4 hexagon socket cap screws	2	To disassemble the pod drive's top cover, facilitating the installation of eye bolts and hoisting
17mm Hex socket	17mm, suitable for M10 hexagon bolts	2	To install the main bolts in the boat's transom
10mm Hex socket	10mm, suitable for M6 hexagon bolts	1	/
13mm Hex socket	13mm, suitable for M8 hexagon bolts	1	To connect and fix the bus box to the BDU busbar assembly
27mm Socket wrench	27mm, suitable for M16 nuts	1	To install the propeller
M10 Torque Wrench	Torque range: 0~100Nm	1	To control the torque during the installation of the pod drive and boat mounting bolts
Cross-head Screwdriver	/	1	For DCDC and other installations
Crane	Lifting capacity ≥ 500kg	1	To lift and install the pod drive
Lifting Rope	Bearing capacity ≥ 500kg	1	To lift and install the pod drive
Wire Cutter	EC-50M	1	For cutting the battery terminal power cables
Wire Stripper	SW-1018	1	For stripping the battery terminal power cables

Tool	Specification	Qty.	Purpose
Crimping Plier	/	1	For crimping the battery terminal power cables
Heat Gun	/	1	For shrinking heat shrink tubes
Electric Drill	Hole requirement: φ11mm	1	Drill holes in the boat for pod drive installation
Drill bit	Hole requirement: φ11mm	1	Drill holes in the boat for pod drive installation
Hole saw	Meet the hole size: 100mm	1	Make holes for cable routing
Sealant	Structural adhesive	1	Seal up holes to prevent water ingress

1.2 Parts and Diagram



1.3 Specification

Model	P12
Rated input power	12 kW
Recommended battery	ePropulsion Lithium Iron Phosphate Battery
Rated rotational speed	1700 rpm
Input power range	4 to 12 kW
Input voltage range (high voltage)	86-115 Vdc
Input voltage range (low voltage)	10.5-16 Vdc
Weight	35 kg
Dimensions	484 x 436 x 300 (mm)
Cooling method	Motor: Natural Cooling Driver: Fan Cooling
Rated power rotational speed range	600 to 2000 rpm
Operating Temperature	-5 to 55 °C
Storage Temperature	-25 to 70 °C
Control System	Smart Throttle, Smart Display 5"
ePropulsion Connectivity Service	Supported

When the high-voltage input voltage is below 96Vdc, there will be an undervoltage alarm.

1.4 Important Notes

1.4.1 Motor Selection

Please follow the instructions of the boat manufacturer and ePropulsion authorised dealer in choosing a suitable pod drive motor. Do not exceed the maximum power permitted, and do not overload the motor.

1.4.2 Motor Installation

This manual gives installation advice that must be followed as a condition of use, in addition to which:

1. We strongly advise professional installation of the whole motor system.
2. Specifically, you must not attempt installation if you don't have the necessary electrical, mechanical, boatbuilding and regulatory knowledge and experience.
3. Regulations vary but for example many authorities will class the P12 (which operates at 96V) as a "high voltage" installation, requiring the electrical work to be undertaken or at least thoroughly checked by a person with relevant qualifications. Other regulations that vary between countries and authorities may cover further aspects of the installation such as safety standards, risk assessment and documentation.
4. It is the responsibility of the installer to ensure that the installation complies with all regulations and standards that apply to the intended area of operation.
5. If you are in any doubt about the installation work please consult your dealer.

1.4.3 Users

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. You should only use this motor system if you are also familiar with all other aspects of operating your boat. If the boat is new to you, you should learn how the boat behaves in different conditions, including tide, wind and waves. Take professional advice and/or instruction as necessary.
3. If you are in any doubt about the operation of the motor or boat please consult your dealer before use.

1.4.4 General Boating Advice

Before operation:

1. Familiarize yourself with all the functions and operations of the motor and the boat it's fitted to. Make sure at least one other person on board is sufficiently familiar with the boat and its systems that they could take over from you in the event of emergency

2. Check the weather conditions and refer to weather forecasts before boating. Avoid boating in hazardous weather conditions.
3. Check there is sufficient and operational safety equipment, including but not limited to: life jackets, buoyancy aids or other personal flotation devices, fire extinguishers, bells and whistles, communication equipment, and paddles, etc.
4. Check that the boat and equipment comply with local boating safety regulations.
5. If the electric pod drive motor is the only power source for your boat, make sure the batteries on board have sufficient charge for your round trip. As a minimum you need to calculate distance and battery consumption over that distance, making allowance for the effects of wind, tide and other variables that may affect range.
6. Always report your voyage plan to family, friends and authorities where relevant.
7. Do not operate the boat under the influence of alcohol or drugs. About 50% of boating accidents are related to alcohol consumption

During Operation:

1. All members of the crew should be equipped with, and wear, a PFD (personal flotation device, eg life jacket, buoyancy aid). Please always wear a PFD when boating.
2. Driver should always wear the kill cord (kill switch), by attachment of the lanyard to a secure position on their wrist, ankle, or item of clothing (buoyancy aid, jacket etc). If the driver falls overboard (or accidentally leaves the helm), the lanyard will pull the kill cord off the throttle and stop the pod drive.
3. Watch carefully for other vessels, swimmers and other objects in the water. Proceed with particular caution when near to harbour, shore or beach and avoid swimming areas if possible.
4. If someone falls overboard, or there's a collision, stop the pod drive motor immediately (fastest method is to pull kill switch off throttle).

1.4.5 Specific to this Installation

1. If the pod drive motor hits an object in the water, stop operation immediately. Return to the nearest port and seek assistance from your dealer.
2. Only operate the pod drive motor when the propeller is submerged in the water; operating it in air is strictly prohibited.
3. If the boat is powered by other means, such as sails, do not leave the pod drive motor in the water if boat speed may exceed 30 km/h.
4. The GPS and 4G antennae are inside the motor cowling. Avoid covering this area to avoid signal attenuation (loss).
5. The distance and speed values shown are measured by the Global Positioning System (GPS) and may be subject to errors in the event of weak GPS signal or changes in external forces such as atmospheric conditions, ocean currents, wind, etc.

6. If the pod drive malfunctions, the smart display will display an error message and the system may stop or enter a limp home (reduced power) mode. The most likely reason for malfunctions include: collision, obstruction (eg seaweed or rope around the propeller or steering), motor or motor driver temperature too high, and low battery voltage. Refer to the Troubleshooting section of this manual for detailed information and corresponding solutions.

1.5 Declaration of Conformity

Object of the Declaration:

Product: Electric Pod Drive Motor

Model: P12

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

The object of the declaration is in conformity with the following directives:

Outboardry Directive	2006/42/EC
Electromagnetic Compatibility (EMC) Directive	2014/30/EU

Applied Standards:

EN 61000-6-2: 2005

EN 61000-6-3: 2007+A1: 2001

EN ISO 12100:2010

EN ISO 60204-1:2018

Manufacturer

Name: Guangdong ePropulsion Technology Limited

Address: Room 801, Building 1, 11 Daxue Road, Songshan Lake, Dongguan, Guangdong Province, China

Signature: 陶师正 **Date:** 15th of September, 2023

Shizheng Tao, Chief Executive Officer & Cofounder of

Guangdong ePropulsion Technology Limited

1.6 Statement

Operation is subject to the following three 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.

(3) This device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Note:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

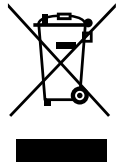
—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

1.7 Correct Disposal of this product



This marking indicates that this product should not be disposed of 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 environmentally safe recycling.

2 Unpacking

2.1 Safety Notice

- Use appropriate safety equipment, including gloves, safety shoes, and other protective tools.
- Familiarize yourself with all safety measures before proceeding with the operation.
- Due to the product's substantial weight, at least two people are required for handling.

2.2 Tools and Equipment Required for Unpacking

- Prepare unboxing tools, such as a rubber hammer, phillips screwdriver, etc.
- Utilize a forklift or other appropriate equipment for transportation.

2.3 Check the Package

- Check for any noticeable damage or transportation-related issues with the packaging.
- Verify that the labels on the packaging match the purchased product.

2.4 Unpacking

Step 1

Use a forklift according to the forklift symbol on the external packaging to move the product. Before opening the packaging, ensure that the crate is stably positioned and will not tilt.

Step 2

Remove the carton straps and the carton.

Step 3

Remove the top cardboard, take out the buffer material, the accessory box and the user manual.

Step 4

Remove the top cover and screw in the lifting eye bolt and washers. Attach the lifting strap to the lifting the eye. Apply gentle upward tension to the strap, such that the pod drive won't fall over as you detach it from the base.Hoist the pod drive for transfer to the stern for installation.

- Please check the product for any damage or missing parts. If there are any issues, please contact customer support.
- During the unpacking process, be careful to avoid damaging the product. Check all accessories and ensure they are complete.

2.5 Remove the Package and Inspect the Product

1. Remove the protective bubble bag of the motor and check whether there is any abnormal appearance, such as deformation, scratching, etc.;
2. Unpack the motor cables (high-voltage power cables, 12V power cables, communication cable) to check whether the cables are complete or damaged;
3. Open the bus bar package, and check whether the components are damaged, abnormal in appearance, or missing;
4. Take out CAN communication extension cable, CAN communication cable, main power cable, check whether the appearance is abnormal;
5. Sort out the motor, accessories, packaging and other related materials.

Check the product for broken or missing parts, if there is a problem, please contact ePropulsion after-sales service for help.

2.6 Disposal of packaging materials

1. Recycle packaging materials, such as wood, paper, etc., by sorting them accordingly.
2. Follow local environmental regulations for the proper disposal of waste materials.
3. Please make sure to read the user manual provided with the product.

Dispose of packaging materials in accordance with local regulations to protect the environment.

3 Mount the Pod Drive Motor

The quality of the installation plays a crucial role in the overall reliability of the entire system. Key aspects such as securing the pod drive to the boat, propeller installation, and wiring connections must be carefully considered and adhered to in order to ensure stable and reliable system operation. Please follow the installation requirements below to ensure the equipment functions optimally.

3.1 Before Installation

1. Preparation:

(1) Motor main part: Check the pod drive motor for any damage. Organize and secure power cables and communication cables in suitable positions for easy handling.

(2) Tools: Prepare the tools and equipment required for installation as listed in section 1.1.3.

(3) Accessories: Ensure all the accessories from the product package are ready.

2. Installation Preparation:

① Confirm the motor model: Check if the motor's specifications (size, weight, voltage, and power) match the boat and other parts of the system.

② Design layout: Read the user manual and consider the entire system's layout and design. Ensure that the pod drive and related system components are properly installed on the boat for safe and effective operation.

③ Simulate the installation process: Follow the instructions in the user manual and simulate the relevant procedures before drilling holes etc, to ensure a low-risk installation process.

④ Organise the boat interior: based on the simulation process, clear away items that may obstruct the installation, and make sure the interior is dry and tidy. This will all help to ensure a smooth installation and debugging process.

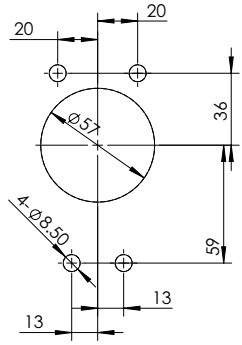
3.2 Mount the Pod Drive Motor

3.2.1 Adjusting Pad Version

⚠ Step 2, Step 3 and Step 4 should be completed as quickly as possible to avoid prolonged pauses, which might cause the glue to solidify and result in poor adhesion between the mating parts.

Step 1: Drill holes

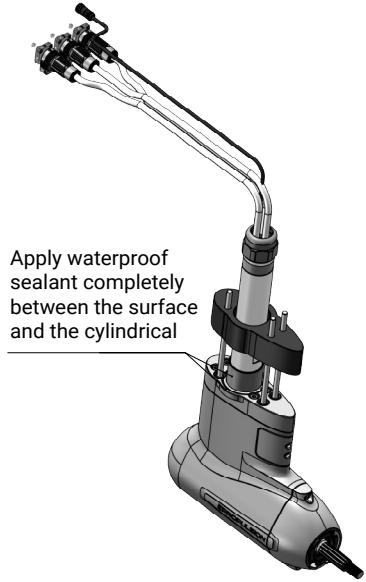
Please refer to the mount template to drill holes for pod drive motors on the suitable position of the hull.



Propeller position

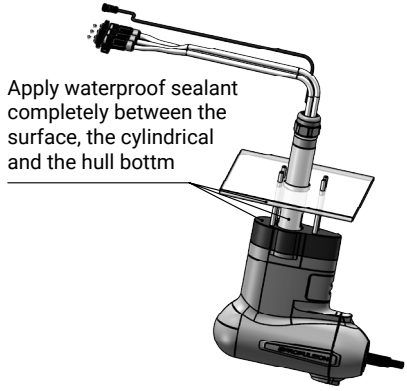
Step 2: Mount the adjusting pad

Apply waterproof sealant completely between the mating surface and the mating cylindrical surface.



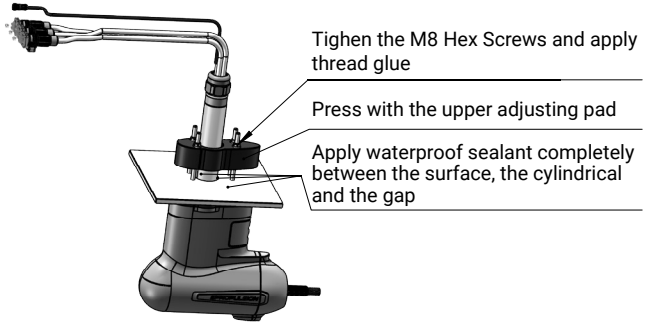
Step 3: Motor through the hull hole

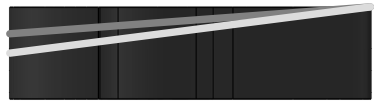
Apply waterproof sealant completely between the mating surface and the mating cylindrical surface.



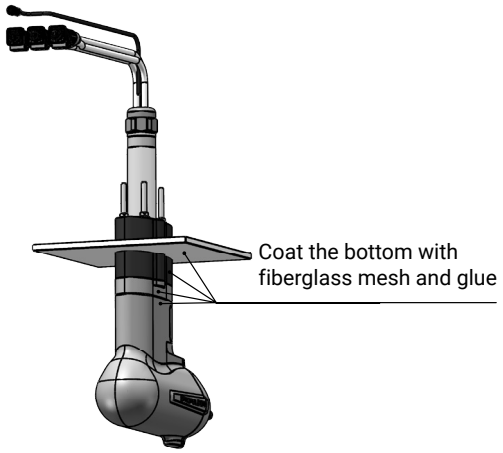
Step 4: Motor through the hull hole

Apply waterproof sealant completely between the mating surface and the mating cylindrical surface. The lower adjusting pad can be cut to match the shape of the hull bottom.





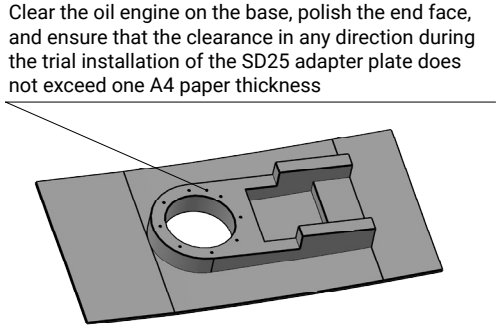
Step 5: Coat the bottom with fiberglass mesh and glue



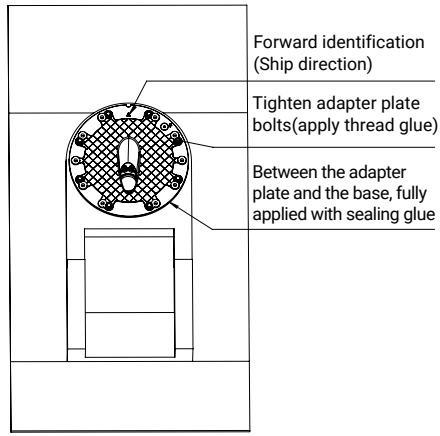
Step 6: Apply primer and anti-biological adhesion coating on the outside of the motor

3.2.2 Saildrive Version

Step 1: Clean the oil engine unit and polish the end face

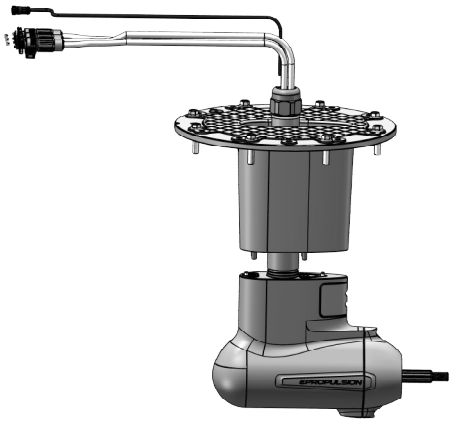


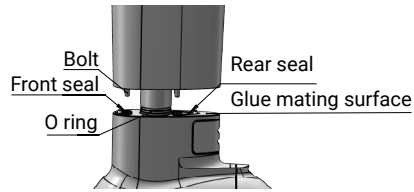
Step 2: Mount the SD25 adapter plate



Step 3: Mount underwater motor

The motor passes through from the bottom of the ship to the top in sequence. The O-ring needs to be greased, and the front and rear seals need to be greased on both sides. The bolts and threaded holes are pre-coated with threaded glue for bolt tightening and assembly.





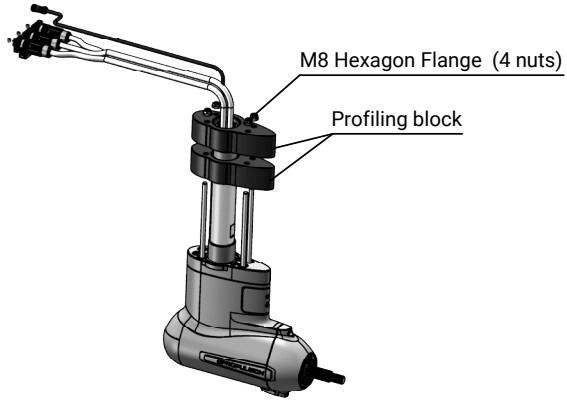
4: Apply primer and anti-biological adhesion coating on the outside of the motor

Lifting objects hazard: when hoisting the pod drive keep well clear of people and objects that may be crushed or damaged in the event of a fall.

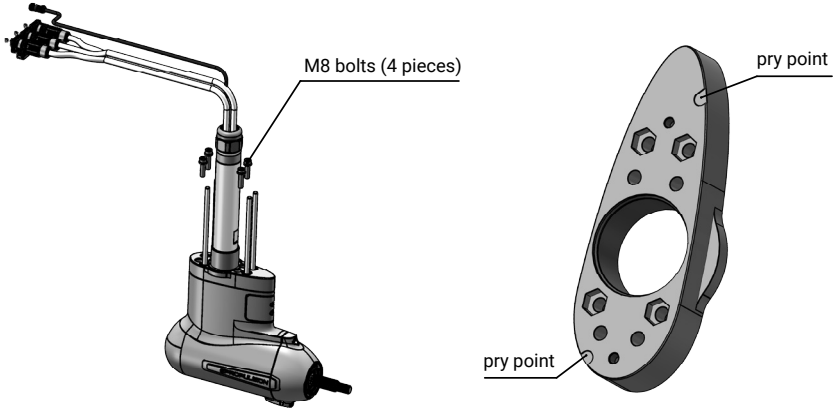
When installing, operating, maintaining or servicing ePropulsion products, there are many safety risks. You need to be alert, perform relevant operations reasonably, and pay attention to safety.

3.2.3 Switch to saildrive version from adjusting pad version

Step 1: Remove the following components from the adjusting pad version.



Step 2: Remove the fixing bolts, and remove the adjusting pad through the pry point.

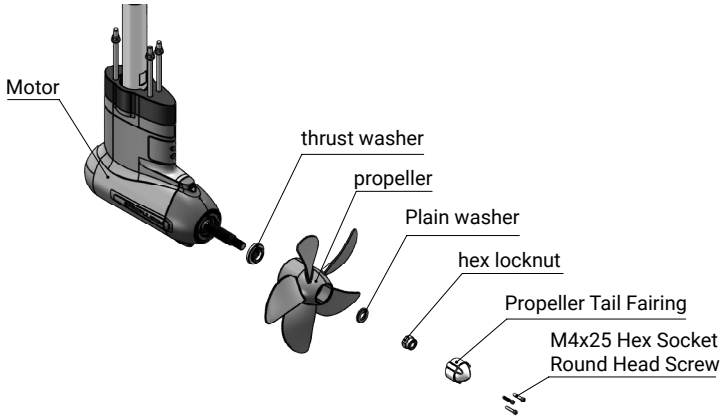


Step 3: After removal, it can be mounted according to the process of the saildrive version;

3.3 Propeller Installation/Replacement

Please install or replace the propeller referring to the following steps.

⚠ It is mandatory to shut down and disconnect the power supply of the motor before removing and installing the propeller.



After installing the castellated propeller nut, insert the cotter pin and bend it to secure it in place.

⚠ Caution: There are various safety risks during the installation process, so it is essential to be vigilant and perform operations with caution to ensure safety.

⚠ During trial runs, please stay away from the propeller to avoid any risk of being cut or injured.

4 Connections

4.1 P12 Examples System Setup

4.1.1 Single Motor System Connection

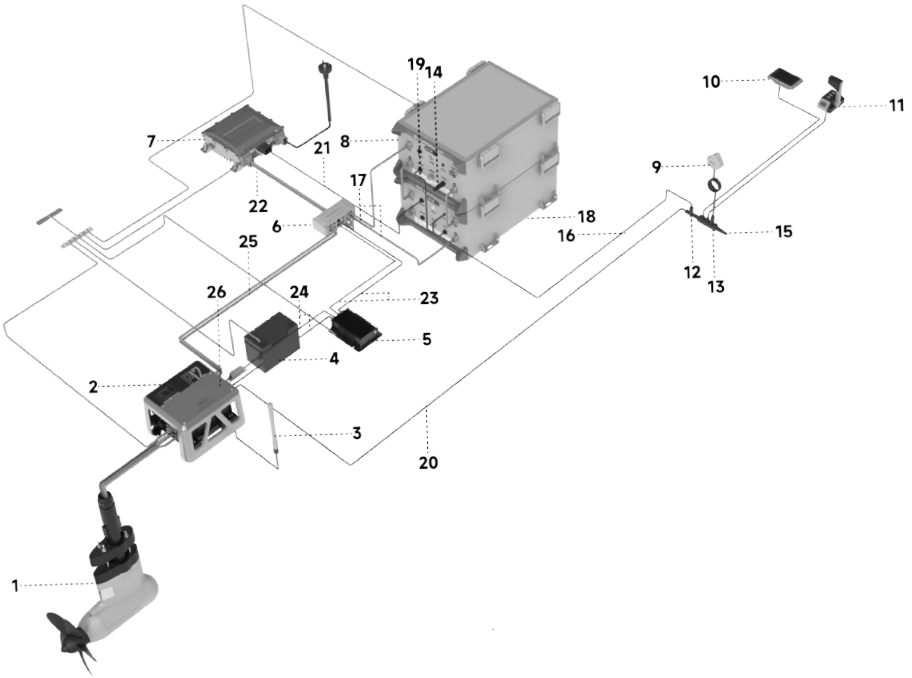
The accessories marked * are not included in the package. Users need to adjust according to local regulatory requirements, such as fuses, circuit breakers and cables.

One 12V Fuse is included in the package, which should be installed between the 12V power cable of the inboard motor and the positive of the 12V battery. If local regulations require the installation of fuses for both positive and negative, customers need to purchase and install fuses based on local regulations.

When the communication cable length is insufficient and a communication extension cable is neccessory, please contact the ePropulsion authorized dealers. When the length of the communication cable from the inboard to the interaction system or battery exceeds 30m, the communication terminators need to be replaced from one 360Ω and one 120Ω to two 120Ω. Please contact the ePropulsion authorized dealers for purchase the 120Ω communication terminator.

Whether the negative pole of the 12V battery is grounded needs to be adjusted according to local regulations.

The X40 system can support up to four motors and two consoles. For setups not shown here, please contact your ePropulsion dealer for assistance.



1. Pod Drive 12 eSSA motor
2. Driver
3. 4G Antenna
4. 12V battery
5. DC-DC
6. Bus Box
7. G battery charger
8. G102-100 battery
9. GPS module
10. Smart Display 5”
11. Smart Throttle
12. eSSA communication 3-way connector
13. eSSA communication 5-way connector
14. Battery communication terminator
15. eSSA communication terminator 120Ω
16. eSSA communication cable 1m
17. Battery to bus bar power cable
18. Battery communication cable
19. Battery Bridging Cable (Positive & Negative)
20. eSSA communication extension cable 10m
21. Charger communication cable
22. Charger output power cable
23. Bus Box to DCDC connecting cable
24. DCDC to 12V battery connecting cable
25. 96V power cable 5m
26. 12V power cable 5m

4.1.2 Twin Motor System Connection

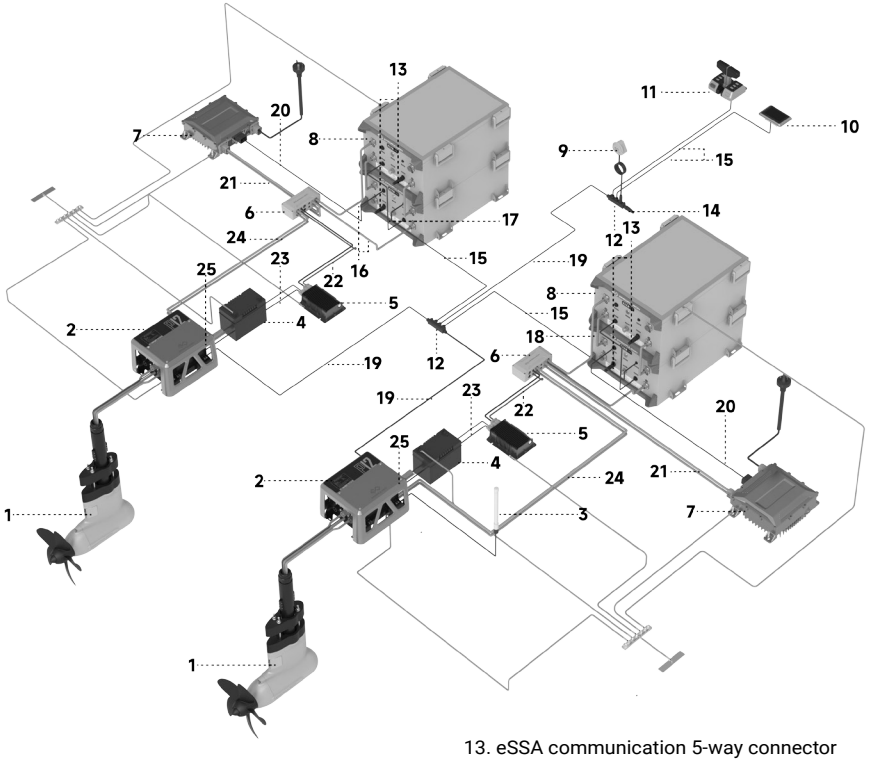
⚠ The accessories marked * are not included in the package. Users need to adjust according to local regulatory requirements, such as fuses, circuit breakers and cables.

⚠ One 12V Fuse is included in the package, which should be installed between the 12V power cable of the inboard motor and the positive of the 12V battery. If local regulations require the installation of fuses for both positive and negative, customers need to purchase and install fuses based on local regulations.

⚠ When the communication cable length is insufficient and a communication extension cable is neccessory, please contact the ePropulsion authorized dealers. When the length of the communication cable from the inboard to the interaction system or battery exceeds 30m, the communication terminators need to be replaced from one 360Ω and one 120Ω to two 120Ω. Please contact the ePropulsion authorized dealers for purchase the 120Ω communication terminator.

⚠ Whether the negative pole of the 12V battery is grounded needs to be adjusted according to local regulations.

The X40 system can support up to four motors and two consoles. For setups not shown here, please contact your ePropulsion dealer for assistance.



1. Pod Drive 12 eSSA motor
2. Driver
3. 4G Antenna
4. 12V battery
5. DC-DC
6. Bus Box
7. G battery charger
8. G102-100 battery
9. GPS module
10. Smart Display 5”
11. Smart Throttle
12. eSSA communication 3-way connector
13. eSSA communication 5-way connector
14. Battery communication terminator
15. eSSA communication terminator 120Ω
16. eSSA communication cable 1m
17. Battery to bus bar power cable
18. Battery communication cable
19. Battery Bridging Cable (Positive & Negative)
20. eSSA communication extension cable 10m
21. Charger communication cable
22. Charger output power cable
23. Bus Box to DCDC connecting cable
24. DCDC to 12V battery connecting cable
25. 96V power cable 5m

4.2 High Voltage Cables Connection

4.2.1 Making the Power Cables

The 96V power cable included is 5m long, with the end connectors for the battery and motor already fitted. You need to cut it to allow for inclusion of the bus box, with the cut position determined by the relative positions of the motor, bus box and battery. Once you have made the cut you will need to fit 4 cable lugs (2 each side) for connection to the bus box. When this process is complete, you will have made the 96V power cable into a "battery to bus box cable" and a "bus box to motor cable".

PLEASE NOTE: Two 96V power cables are provided with the P12. You only need to cut one of them for connection to the bus box, the other one will go directly from batteries to motor, see section 4.2.5.

Tools needed to make the cable:

No.	Tools	Recommended model
1	Wire cutter	EC-50M
2	Wire stripper	SW-1018
3	Crimping plier	/

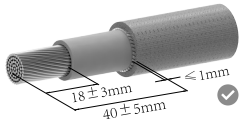
Crimping cable connectors:

MAKING THE BATTERY TO BUS BOX AND BUS BOX TO MOTOR POWER CABLES

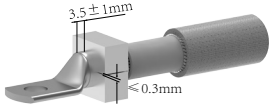
Cut one of the two 96V power cables into two pieces, paying attention to which end is which and the distance from each to bus box (battery and motor connectors are different). Then:

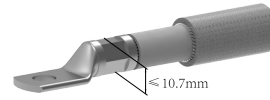
1. Strip back the insulation/shielding as follows:

- outer sheath and metal shielding layer by 40±5mm. When cut, the metal shielding layer must not extend more than 1mm beyond the outer sheathing. (Contact between the metal shielding layer and terminals or inner cores will cause insulation failure.)
- inner sheaths (on positive and negative cables) by 18±3mm



2. Slide the terminals over the inner cores and crimp at approx. 3.5mm from the terminal end. After crimping the height of the uncrimped sides should be 10.7mm or less (if more, crimp again).





1. Fit heat shrink tubing over the joints between the terminals and the inner cables, and (separately) over the shielding layer. Leaving the joints or the shielding exposed to air may result in insulation and system failure.

⚠ Please use the crimping tool corresponding to the specifications of the terminal to ensure a proper crimping process. Make sure the crimping is fully seated. Otherwise, poor crimping may lead to local heating and severe damage.

⚠ During the crimping process, pay special attention to prevent the shield layer from contacting the terminal and core wire, to avoid leakage or short circuits.

4.2.2 Connecting Cables to the bus box

4.2.2.1 Required accessories and tools

① Bus box
② Motor to bus box power cable
③ Battery to bus box power cable
④ Bus box to DC-DC power cable
⑤ 3.3kW charger (for G102 battery)
⑥ M4 hex wrench, M6 hex wrench, M8 hex wrench

4.2.2.2 Installation

The cables that go into the bus box should be installed by reference to the symbols next to the terminals, as follows:

a.BAT - connected to G102 battery bank
b.96V-1, 96V-2, 96V-3 - connect to the DC-DC module or other 102.4V electrical equipment
c.CHG - connect to charger
d.MOT - connect to the motor

(1) Remove the top cover of the bus box (4x M4 screws). Then remove the positive/negative baffle plate, to access the positive terminals.

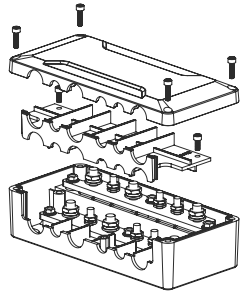


Figure 4.3

(2) Connect the positive cables for Motor, Battery, Charger & DC-DC Module

1. Undo the terminal nuts, and remove the spring and flat washers.
2. Install the positive cables (red sleeves) to the terminals on the lower copper bar. The battery cable goes to BAT+, the motor cable goest to MOT+, the DC-DC module goes to 96V-2+, and the charger cable goes to CHG+.

The terminal should go on first, followed by the flat washer, the spring washer and the nut.
Note the locking torque for the M6 nuts should be 5N.m, and M8 nuts 10N.m.

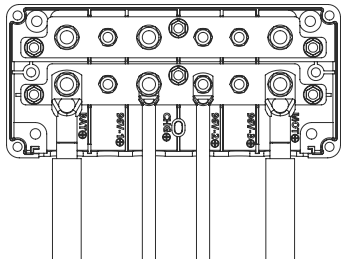


Figure 4.4

(3) Reinstall the baffle plate.

Once the positive cables are installed as above, put the baffle plate back in place with its holding screws.

(4) Connect the negative cables for Motor, Battery, Charger & DC-DC Module

1. Undo the terminal nuts, and remove the two washers.
2. Install the positive cables (red sleeves) to the terminals on the lower copper bar. The battery cable goes to BAT+, the motor cable goest to MOT+, the DC-DC module goes to 96V-2+, and the charger cable goes to CHG+.

The terminal should go on first, followed by the flat washer, spring washer, nut.
The locking torque for the M6 nuts should be 5N.m, and M8 nuts 10N.m.

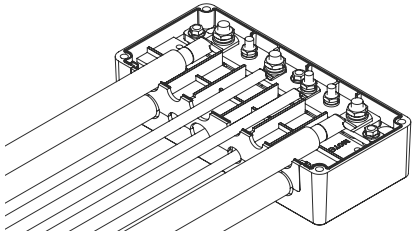


Figure 4.5

⚠ If parallel connecting the batteries, the positive and negative connectors of the battery output cable need to connect with the first battery and the last battery respectively. Otherwise, it might cause overcurrent alarms or parallel faults, which shortens the battery life.

(5) Bus Box installation

The bus box should be fitted to a flat surface, as far from sources of moisture and heat as is reasonably practical. Depending on the mounting surface, M6 screws or bolts can be used to fix it in place. M6 locking torque is 8N.m.

IMPORTANT. The positive and negative terminals must be connected correctly for both the battery and charger (input) and motor and DC DC module (outputs). Reverse polarity may cause severe damage and invalidate warranty.

(6) Put bus box cover back on (with screws)

When the bus box connections have been made it should look like this.

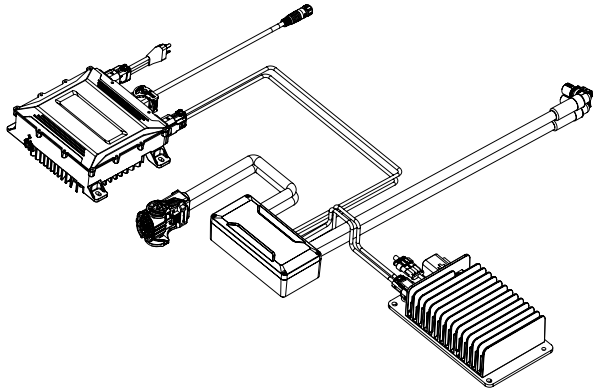


Figure 4.6

Before connecting the DCDC, please determine the positive and negative identification of the input and output terminals, and connect them one by one with the positive and negative copper bars of the bus box and the positive and negative of the battery to avoid damage to the DCDC, battery, pod drive motor and system caused by incorrect positive and negative connection.

Please configure the fuses, circuit breakers in accordance with local regulations, and purchase separately.

4.2.3 Connecting the DC-DC Module and 12V Battery

4.2.3.1 Required Accessories and Tools

① Bus box part completed in step 4.2.2

② M6 hexagon wrench

③ 12V battery (purchased by the user)

④ Hex socket wrench suitable for 12V battery terminal screws and nuts

4.2.3.2 Installation Steps

Step 1: Connecting the Bus Bar with the DC-DC Module

See 4.2.2 if not already done.

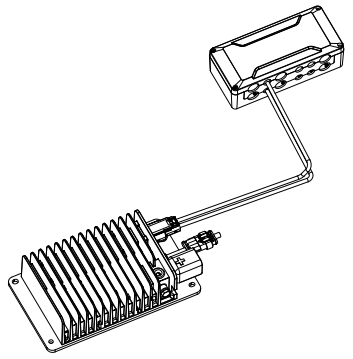


Figure 4.7

Step 2: Connecting the DC-DC Output and 12V Battery

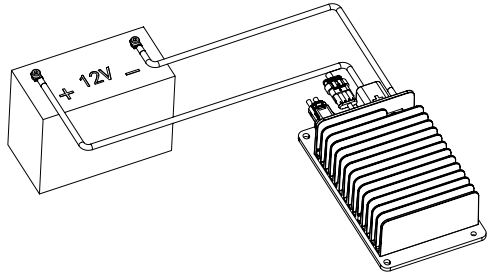


Figure 4.8

When connecting DC-DC and 12V battery, pay attention to avoid short circuits.

Before connecting the DCDC, please determine the positive and negative identification of the input and output terminals, and connect them one by one with the positive and negative copper bars of the bus box and the positive and negative of the battery to avoid damage to the DCDC, battery, pod drive motor and system caused by incorrect positive and negative connection.

Please configure the fuses, circuit breakers in accordance with local regulations, and purchase separately.

4.2.4 Connecting the G102-100 Battery Bank

4.2.4.1 Required Accessories and Tools

① G102-100 battery bank

② Bus box part completed in step 4.2.2

③ 96V power cable

Ensure that the main switch is turned off before connecting the batteries.

Users can also connect multiple batteries in parallel to increase battery capacity. Refer to the G102 battery user manual for battery usage and cautions.

4.2.4.2 Installation Steps

Insert the battery connector leads from the bus box into the corresponding color terminals on the G102-100 battery. After installation, refer Figure 4.10.

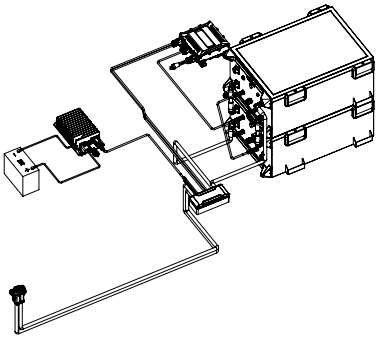


Figure 4.9

After the batteries are connected in parallel, the positive and negative poles of the battery power output cable need to be connected to the first and last batteries respectively. Otherwise, it may cause overcurrent alarms or parallel faults, thereby shortening the battery life.

Please configure the fuses, circuit breakers in accordance with local regulations, and purchase separately.

4.2.5 Connecting the pod drive motor's Main Power and 12 volt Cables

4.2.5.1 Required Accessories and Tools

① Pod drive motor

② Bus box, DC-DC module, and 12V battery connected in step 4.2.3

If you need to extend the 12V cable, prepare the following:

① 12V extension cable (user should purchase a specified cable not exceeding 3m in length)

② M8 hexagon screws and nuts

③ M8 hex socket wrench

④ Heat shrink tubing, electrical tape, etc.

4.2.5.2 Installation Steps

Step 1: Connecting the High-Voltage Motor Power Cable from the bus box

Connect the orange self-locking plug on the motor power cable from the bus box to the motor's orange connector. Follow these steps:

Open the locking mechanism of the orange self-locking connector, by sliding the latch as shown in Figure 4.10, and lifting the black handle as shown in Figure 4.11.

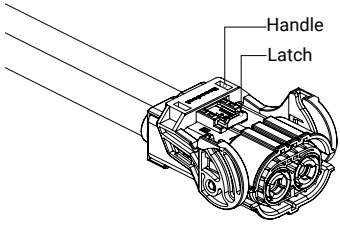


Figure 4.10 High-voltage interlock connector- Installation step 1

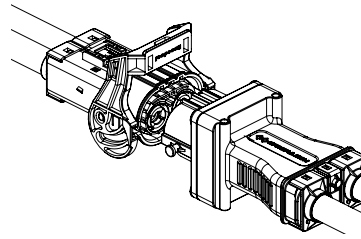


Figure 4.11 High-voltage interlock connector - Installation step 2

Insert the motor cable connector into the motor's orange plug, figure 4.12. Push down the black handle, figure 4.13.

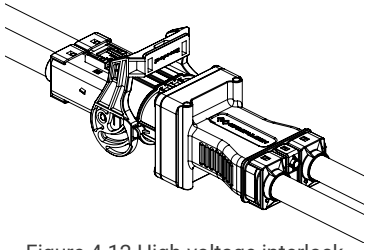


Figure 4.12 High-voltage interlock connector - Installation step 3

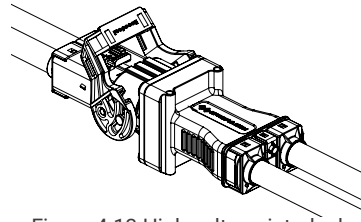


Figure 4.13 High-voltage interlock connector - Installation step 4

Press the black handle down firmly to secure the connector. Close the locking latch as shown in figure 4.14.

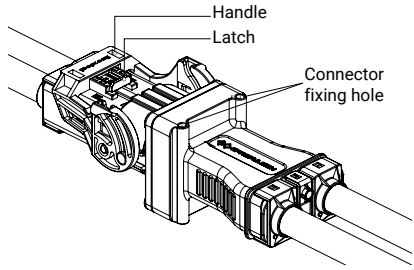


Figure 4.14 High-voltage interlock connector - Installation step 5

The high-voltage interlock plug can be fixed to the boat using two M4x80mm screws (not supplied) in the fixing holes shown above.

If the "96V power cable 5m" provided with the pod drive is not long enough for your installation needs, please contact your dealer to purchase a longer high-voltage extension cable.

After cutting and crimping the cables, check to ensure that the positive and negative poles are correctly matched to avoid damage to the pod drive motor.

Step 2: Connecting the Low-Voltage Power Cable

Connect the red and black twin cables from the pod drive to the 12V battery. Match the red cable with the positive pole and the black cable with the negative pole of the 12V battery. Connect them to the 12V battery terminal screws and tighten the nuts. (Note: The 12V battery should be placed near the pod drive motor).

Whilst completing the above installation steps, the 12V cable can be shortened or extended based on the distance between the battery compartment and the motor.

12V Cable Extension: The X-series pod drive motor's 12V cable is approximately 5m long. If the length is not suitable for your installation requirements, please contact your dealer to purchase a dedicated extension cable, and have a professional handle the installation, ensuring that the total length of the low-voltage cable does not exceed 8m (extension cable specification requirements: copper conductor cross-sectional area should be larger than 35 square millimetres).

Proper insulation treatment should be carried out at the connection position of the extension cable to prevent battery short circuits and potential fire hazards.

4.3 Connection of Communication Devices (throttle etc)

4.3.1 Remote Control Scenario: Connecting Interactive Devices and Accessory Communication Cables

This example is for a single-pod drive system with a single group of G102 batteries. The setup and connections for other scenarios should be based on the "System Device Connection Plan." Contact an authorised ePropulsion dealer to purchase accessories and for further information. Professional installation recommended.

4.3.1.1 Required Accessories for Single Motor System Connection

1. Smart throttle ×1
2. Smart display 5'' ×1
3. G102-100 battery ×1 (More may be needed depending on range requirements.)

4. CAN Communication 1m Extension Cable ×4
5. CAN Communication 10m Extension Cable ×1
6. CAN Communication 5-Way T-Connector ×1 & CAN Communication 3-Way T-Connector ×2

4.3.1.2 Installation Steps

4.3.1.2.1 Connecting Interactive Devices and Accessories

Referring to Figure 4.16, connect the components using the cables as shown.The components are as follows:

1. CAN communication cable 10m.
2. 5-way T-connector ×1
3. 3-way T-connector ×1
4. Communication terminator(s) - see 4.5
5. CAN communication extension cable 1m (one end with a 90° right-angle connector, connected to the MOTOR interface of the G102 battery, smart throttle, smart display 5")

After connecting the interactive devices, make sure to tighten the threads of each connector to ensure stability and waterproofing.

After the communication connector is connected, the connector and cable cannot be soaked in water, and there should be no connectors with metal conductive pins exposed.

If the connector with metal conductive pins is exposed, please check whether the communication cable connection is carried out according to the user manual, or add and tighten the waterproof cover of the communication connector.

Unconnected communication connectors need to tighten the waterproof cap of the connector to avoid splashing water and steam entering the connector.

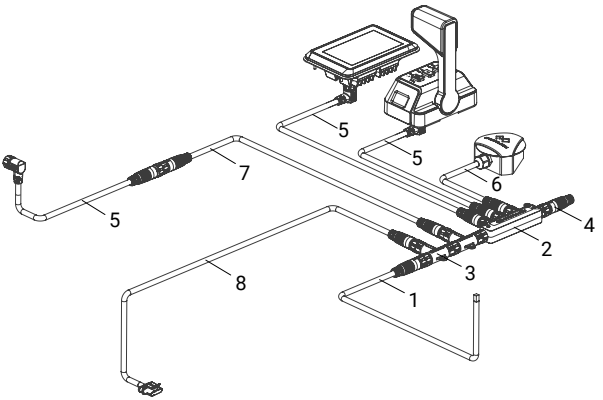


Figure 4.15

4.3.1.2.2 Smart throttle connection

Each smart throttle has a **BUS** port and **DUAL** port at the bottom.

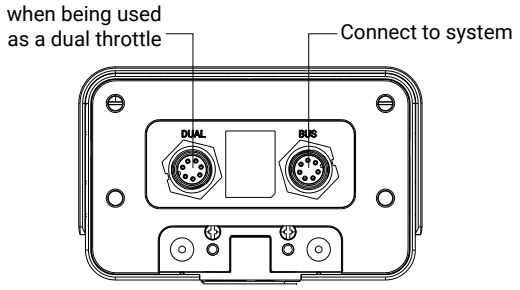


Figure 4.16

The ports are connected as follows:

- **Single Smart Throttle Installations**

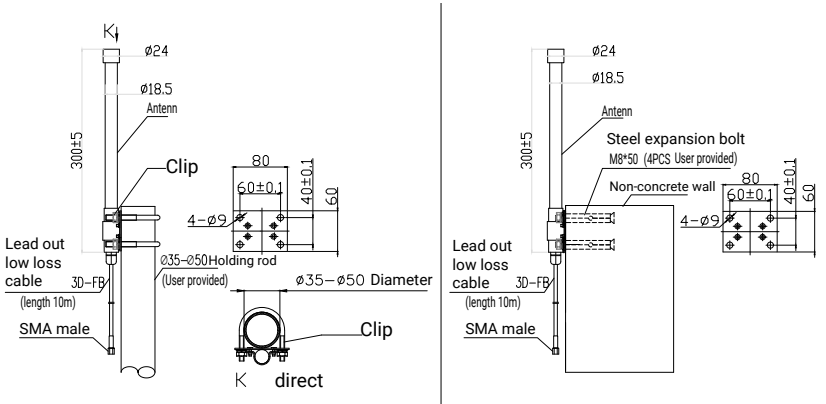
  Connect a CAN communication cable between the BUS port and the 5-way CAN bus T-connector. The DUAL port is not used.

- **Dual Smart Throttle Installations**

  For the first smart throttle, the BUS port should be connected to the CAN bus, and the DUAL port should be linked to the DUAL port of the second smart throttle. The second smart throttle's BUS port must be left without connection.

Step 1:

Fix the 4G antenna on the boat (outdoors). There are two fixing options, as shown in the following images.



Pole Mount installation method

Wall installation method

Figure 4.17

4.3.2 Installation of the External GPS Module

Step 1:

Connect the CAN communication port of the external GPS module to the 3-way T-connector, instead of one of the communication terminators. See diagram 4.16, and select the communication terminators according to section 4.5.

Step 2:

Select a location for the GPS module that's outdoors, open to the sky, flat, and out of the way (won't get trodden on etc). There are two fixing options.

• **3M Adhesive Attachment**

Attach the double-sided adhesive pad to the back of the GPS module as shown below. Make sure the chosen location is clean and dry, then stick the module in place. The bond will take a few hours to acquire full strength.

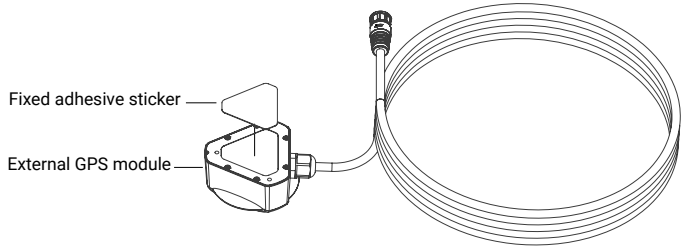


Figure 4.18 GPS external module adhesive pad fixing

• **Self-Tapping Screws**

Opening the decorative cover of the external GPS module, and use the three M3 self-tapping screws provided to secure the external GPS module in place. Check all three screws are tight and push the cover back on to the module, using the logos for alignment.

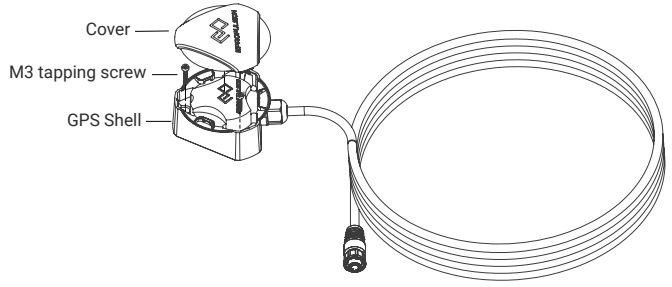


Figure 4.19 GPS External Module Screw Fixing

4.3.3 Communication Terminator Connection

Communication terminators are needed to ensure stable communication within the system. Different combinations are required, depending on how many motors are in the system and whether an external GPS module is connected, as shown in the table below. The resistance value of the terminator is marked on the tail.

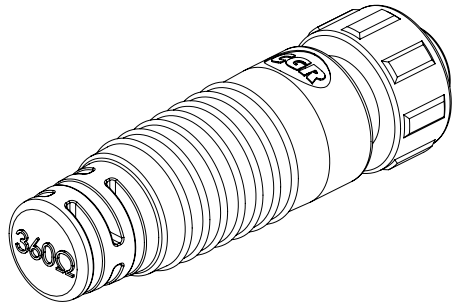


Figure 4.20

Quantity of motors	Using an external GPS module			Not using external GPS modules		
	Communi-cation Terminator 1	Communi-cation Terminator 2	Communi-cation Terminator 3	Communi-cation Terminator 1	Communi-cation Terminator 2	Communi-cation Terminator 3
1	120Ω	/	/	120Ω	360Ω	/
2	120Ω	120Ω	/	120Ω	120Ω	360Ω
3	120Ω	360Ω	360Ω	120Ω	120Ω	/
4	120Ω	360Ω	/	120Ω	360Ω	360Ω

5 Operation

5.1 Smart Throttle Button Functions (single & double throttles)

- **Single-throttle operation**

Button	Function
Power	Press and hold down this button for 1 second to power the system on or off. Switch console (when two throttles are fitted): When the system is turned on, press the Power button twice on the inactive console to activate it.
Hold	Direction holding function or anchor mode: Press twice to enter Hold mode, and when in Hold mode press once to exit. This function is under development.
Dock	Dock mode: Press once to enter Dock mode. In Dock Mode maximum power is limited to 50%, for smoother handling when mooring etc. When the throttle lever in neutral, press once to exit the Dock mode.

The factory default for the throttle handle is Starboard mode, ie the handle is to the right of the main unit when facing forwards on the boat. To change to Port mode please refer to section 5.6.2.1.

- **Dual-throttle operation**

Button	Function
Power	Press and hold down this button for 1 second to power the system on or off. Switch console: When the system is turned on, press the Power button twice on the inactive console to activate it.

Hold	Direction holding function or anchor mode: Press twice to enter Hold mode, and when in Hold mode press once to exit.This function is under development.
Dock	Press once, to enter or exit Dock mode. In Dock Mode maximum power is limited to 50%, for smoother handling when mooring etc. This button only works when throttle lever is in neutral.
1Lever	Press once to enter left lever control mode. Press twice to enter right lever control mode. Press three times to exit mode. In 1Lever control mode the chosen throttle adjusts power input to both throttles simultaneously. This mode can only be entered with both throttles in neutral position.
Turbo	Not work.
FN	Function button: Press once to enter or activate the function, and press again to exit the function. For function configuration, please use the Smart Display to select.

Kill Switch Notes

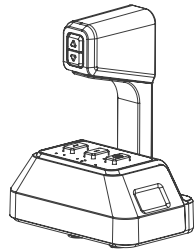


Figure 5.1

- Kill Switch can be placed on either end of the Smart Throttle, depending which way throttle is facing.
- Motor will not work without kill switch in place.
- Kill switch should be removed when motor is turned off.
- In an emergency, motor can be stopped by pulling kill switch off throttle.
- Motor can be restarted after emergency stop by first putting throttle in neutral position, then replacing the kill switch, and operating as normal.

5.2 Starting the System

5.2.1 Start

Long press the Power button for 1s to start the system. When the smart throttle panel lights up, the system is started.

After powering on the system, wait until the Power button light is steady green and "READY" shows on the smart display before driving.

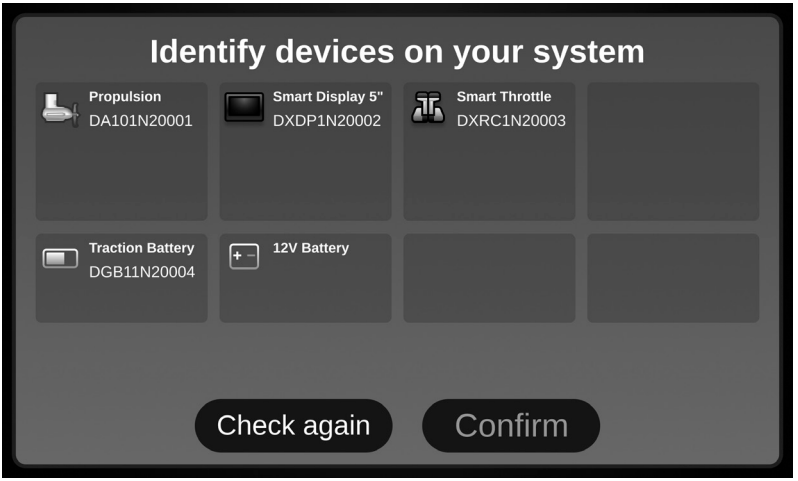
5.2.2 System problem feedback method after startup

If the smart throttle chirps after the system is started and the display displays an error message, refer to Troubleshooting (section 5.8) to solve the problem.

5.3 Perform initial configuration

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.



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 directly enter the home page.

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.

1. Configuration display

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

2. Configure smart throttle

When it is a single-throttle, manually click any button of the throttle to match successfully.

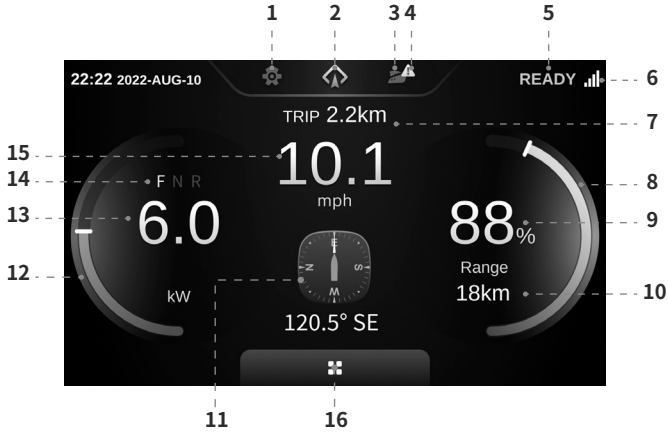
When it is a dual-throttle, click any button of the left and right throttles respectively to match successfully.

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

4. Configure motors

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

5.4 Home Page



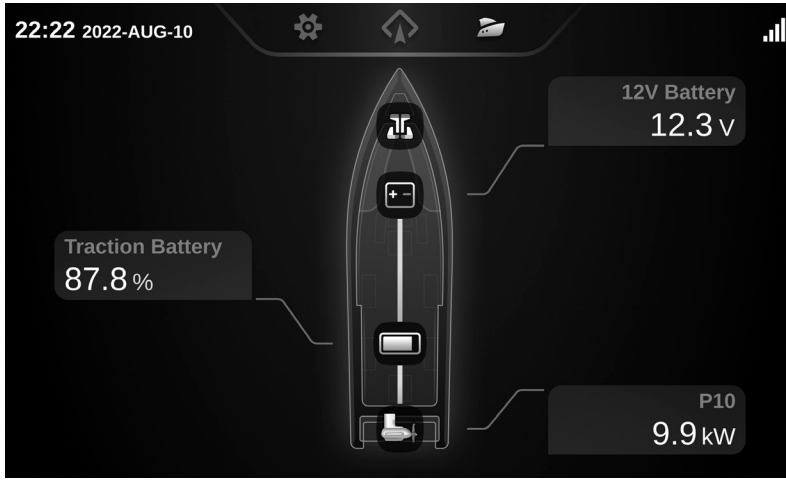
No.	Function	Description
1	Setting page	Click to go to the setting page.
2	Home page	Click to go to the home page.
3	Propulsion page	Click to go to the propulsion page.
4	Warning	When the system fails, it will prompt a fault icon.
5	System status	READY indicates that the system is ready to start.
6	4G 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	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	Compass	/
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 settings.
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 or adjust the lightness

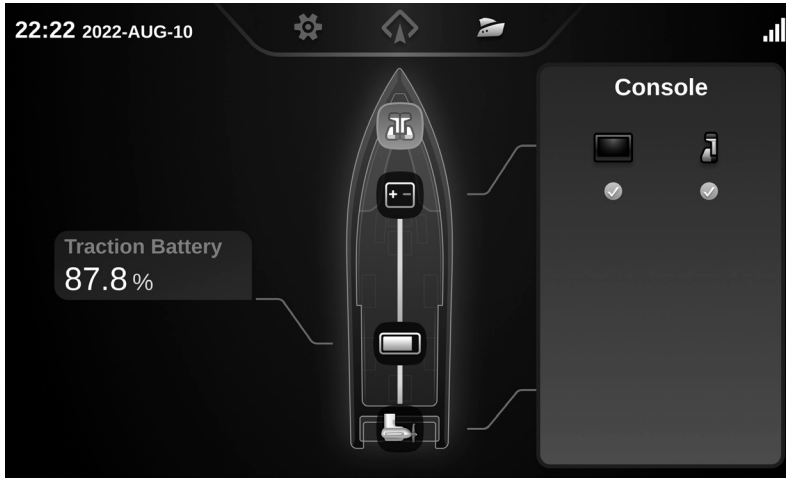
5.5 Propulsion Page

The propulsion system page is accessed by clicking the boat icon, just to the right of top centre on the screen.

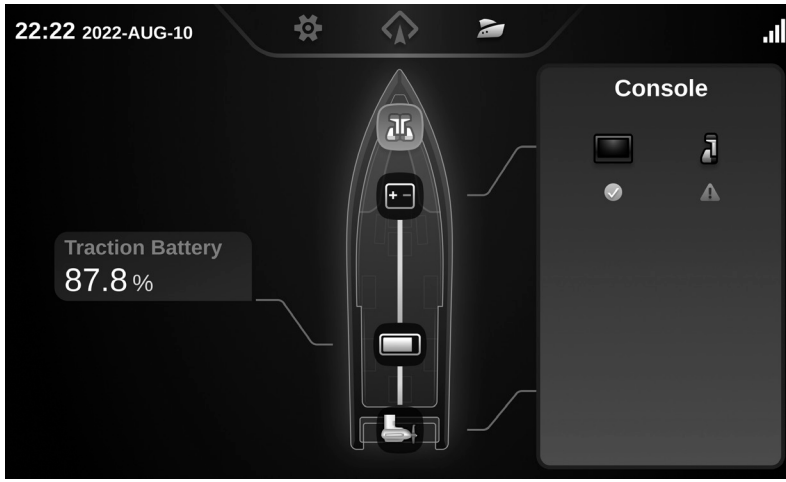
5.5.1 Control Console

Click on the console icon to view the accessories for each console.



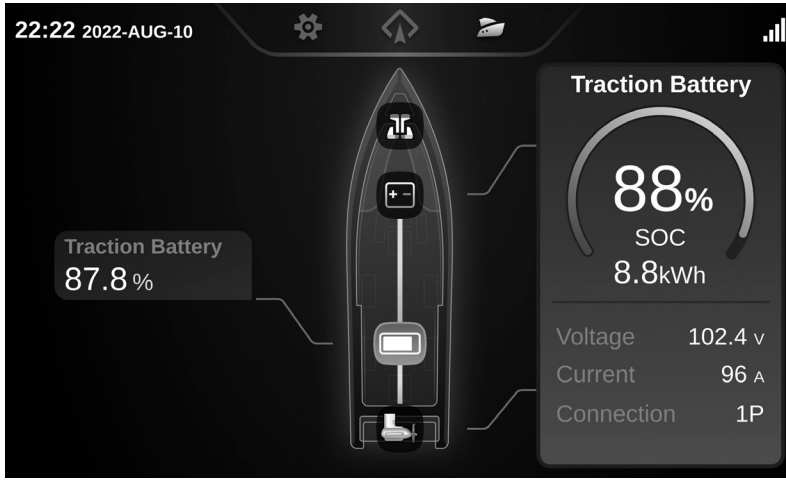


If an accessory fails, its icon will turn orange or red. Click the fault icon to view the problem in more detail.



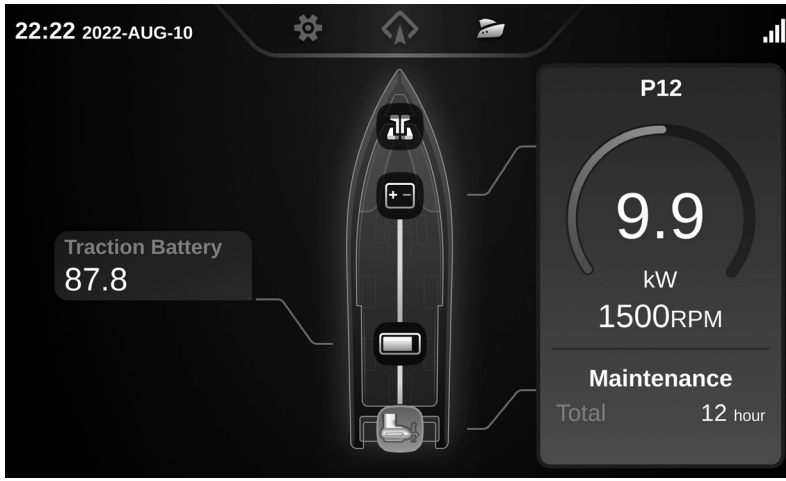
5.5.2 Traction Battery

Click on the Traction Battery icon to view the remaining power, voltage, and current.



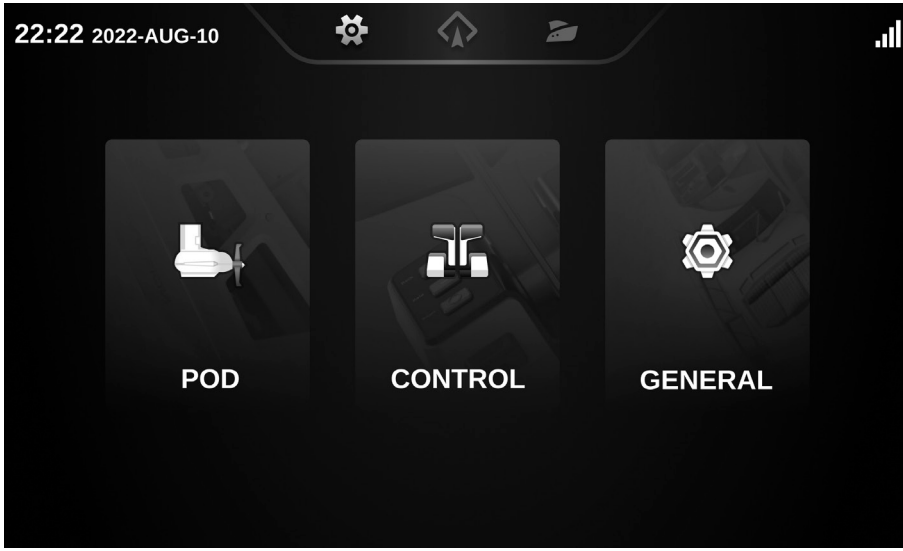
5.5.3 Motor(s)

Click on the Motor icon(s) to view current power, rotational speed and cumulative run time.



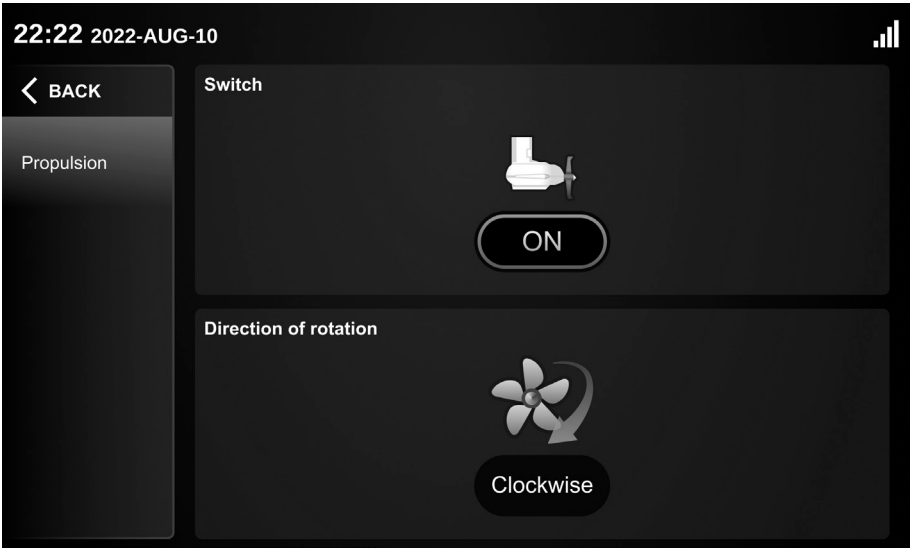
5.6 Setting

The Settings page is accessed by clicking the gear icon, just to the left of top centre on the screen. This covers three groups of settings: Pod, Control and General.



Button	Function
POD	Click to enter the propulsion setting page, where you can access the propulsion, steering and DC-DC output settings
CONTROL	Click to enter the console setting page, you can set single-throttle assembly, dual-throttle FN function, Smart display, etc.
GENERAL	Click to enter the general setting page to set firmware update, maintenance, connectivity and more.

5.6.1 Propulsion Setting

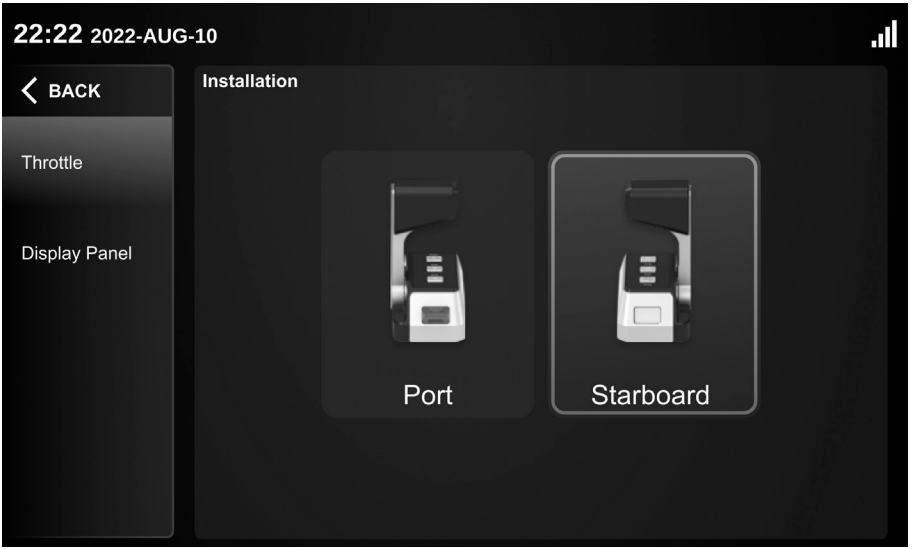


Function	Description
Switch	Click to switch the motor on or off. If the switch springs back, the setting has failed.
Direction of rotation	Click to switch the rotational direction of the propeller. If the switch bounces back, the setting fails.

5.6.2 Control console Settings

5.6.2.1 Smart throttle settings

1. Single-throttle Settings

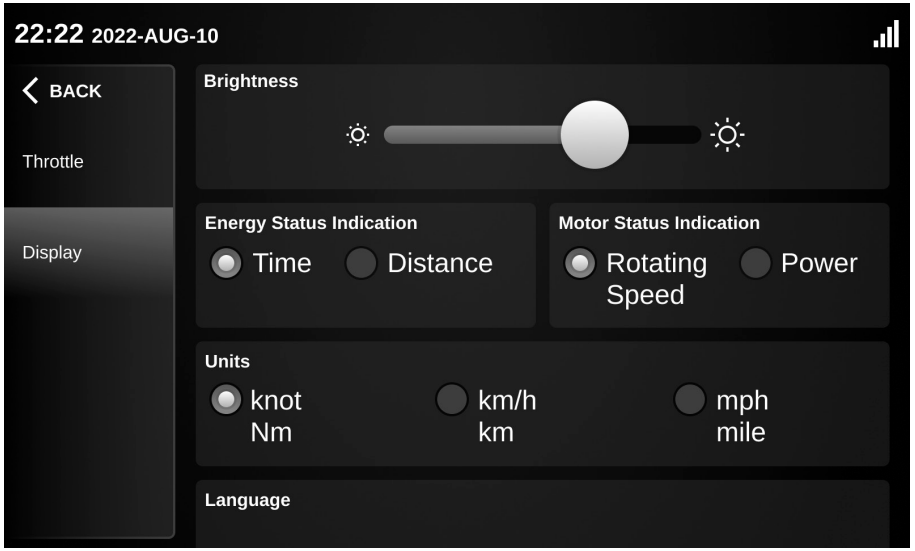


Function	Description
Starboard	Click and set the smart throttle installation mode to starboard installation. If it springs back, the setting fails.
Port	Click and set the smart throttle installation mode to port installation. If it springs back, the setting fails.

2. Set dual-throttle

Function	Description
None	Set the FN function of smart throttle as invalid after clicking.
Sync	Set the FN function to synchronise left and right hand throttles when clicked.With Sync on, if the left and right throttle power settings are similar, the system will make them the same. If the power settings are significantly different, those different settings are maintained.
Limit	After clicking, set the smart throttle FN function to limit speed. The maximum speed of the limit can be customized on the Settings page. **PLEASE NOTE: This function under development.**

5.6.2.2 Display settings



Button	Function
Brightness	Drag to adjust the brightness of the display. This setting is retained between sessions.
Energy status indication	Switch between Time or Distance remaining, taking current speed and battery level into account. This will change the display on the home page.
Motor status indication	Switch between the Rotational Speed (RPM) and Power input to the motor. This will change the display on the home page.
Units	Switch speed and distance units between knots (nautical miles per hour), km/h (kilometres per hour) and mph (miles per hour). This will change the display on the home page and ePropulsion setting page.

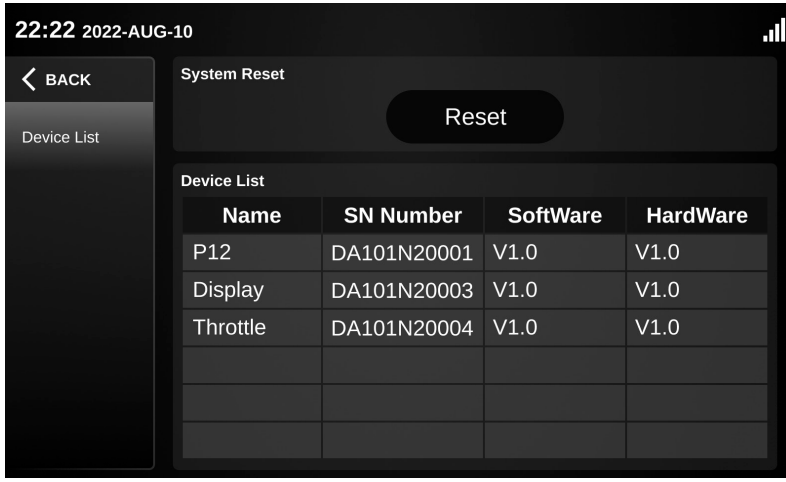
5.6.3 General settings

5.6.3.1 System firmware information

Function	Description
System version	Display the system/software version.
Serial number	Click Device List to go to the device serial number list page. You can view all device SN and software and hardware version.
New version update	When there is a new version available, you will be prompted with the content of the new version and the estimated time to update.Users can choose to update immediately or in the early morning. If early morning update is chosen, this will be at 02:00 the next day. **Note:** 1. Update must meet two conditions: 1) 12V supply voltage > 10V; 2) The system has no operating power. ie high voltage side is turned off. 2. The system cannot run during the update process, so it is recommended to choose early morning update or update when the boat is not in use.

Device list page

1. Click Reset to reset the device original factory settings.
2. Device List displays the SN and software and hardware versions of all components of the propulsion.



5.6.3.2 Maintenance - All maintenance timing tips

The system automatically calculates the maintenance time based on various maintenance items. When the maintenance time is reached, the system will notify the user on the display. After the user completes the maintenance, they can click "Maintenance Complete" to reset the timer.

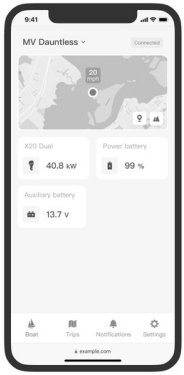
Regular maintenance helps to improve the service life of the machine. Please maintain it in time after receiving the reminder.

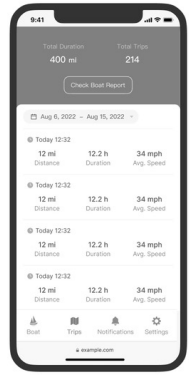
5.6.3.3 Connectivity

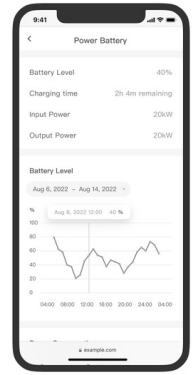
The ePropulsion Link

X40 offers connectivity capabilities by communicating with the ePropulsion cloud through its 4G antenna. You can link your product to the ePropulsion Link, a user-friendly software designed for personal boat owners, enabling them to monitor their boat's status remotely on their mobile devices. ePropulsion Link offers various features, including but not limited to:

- Real-time location and speed tracking
- Monitoring the battery level and estimating remaining charging time
- Creating geofences and monitoring speed violations
- Automatically generating trip histories and boat reports
- Sharing data access with co-owners
- Setting up text message notifications

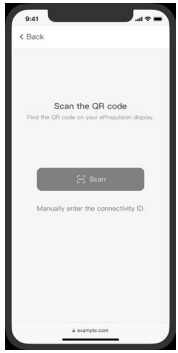


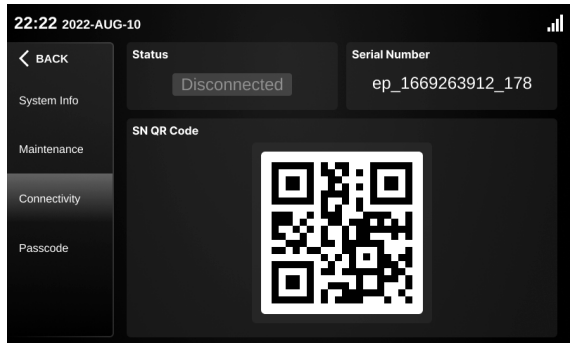




To connect your ePropulsion system to the ePropulsion Link, follow these steps:

1. Visit https://link.epropulsion.com.
2. Click "Sign Up" and create your account.
3. Upon visiting the home page for the first time, click "Create Boat" to register your first boat.
4. After registering your first boat, click "Connect Now" to access the connection page. Additionally, locate the QR code for connection on the boat's display by navigating to Settings > General > Connectivity. You can either scan the QR code or manually enter the serial number to establish a connection.
5. Once successfully connected, you can access real-time information such as the boat's location and battery level on your home page.





OTA Update

An over-the-air (OTA) update involves wirelessly delivering new software to local devices. Regular OTA updates not only introduce new features but also enhance the user experience. Boat owners benefit from both time and cost savings as remote software updates eliminate the need to physically visit a dealership.

To check if a new software version is available, access the boat display through the following path: Settings > General > System Info.

If your ePropulsion system is connected to the ePropulsion Link, you will also receive notifications about new software versions within the ePropulsion Link. OTA access can be found on the propulsion system page.

You can choose to either install the update immediately or schedule it for later, typically during the night. The installation time varies depending on the changes and the number of components involved but usually takes less than 30 minutes. After a successful installation, you will see that your system is running the latest version on the boat display, and you will receive a notification of the successful update within the ePropulsion Link.

5.7 Operation

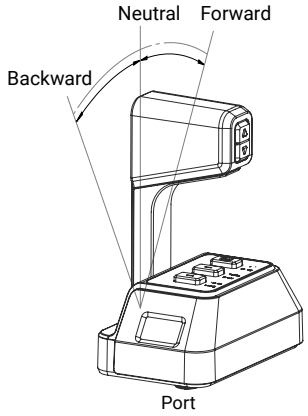
5.7.1 Start

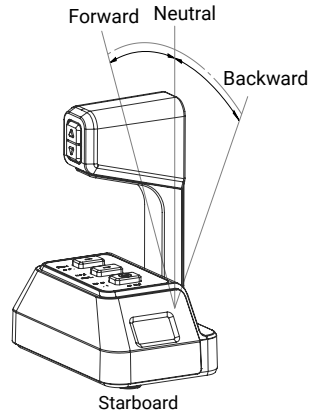
1. Place the kill switch on the smart throttle.
2. Attach the buckle cord to your wrist or to your life jacket.
3. Press the Power button for 1 second to turn on, and do not drive until the Power light is steady green and the display "READY" lights up.

5.7.2 Adjust power

When the battery is well connected and switched on, power on the control system to start the inboard, then slowly push the throttle forward position to increase the power.

- Before power on the smart throttle, please reset the throttle to zero position.
- If you find a blinking “RESET” on the display panel, you are reminded to reset the throttle to zero position.
- If you pull the throttle from the forward position to the backward position directly, the motor will first stop shortly, then start turning to the reverse direction.





5.7.3 Stop

This product can be stopped in one of four ways

1. Turn throttle to zero position.
2. Remove the Kill Switch.
3. Switch off the power button.
4. Disconnect the power cable.

5.7.4 Notices

1. In abnormal situations like a fall over emergency, it's recommended to stop the inboard motor by removing the kill switch from the smart throttle.

In malfunction situations, the inboard motor will stop immediately for protection. The inboard motor will stop if one of the following situations occurs.

1. The throttle is in zero position.
2. The power button is switched off.
3. The kill switch is removed.
4. The connection between tiller and battery is cut.
5. The battery is empty.
6. The inboard motor malfunctions (e.g.the motor is blocked or the battery voltage drops below 33V).

2. Rotating parts can cause severe injury or death. Never wear jewelry, unbuttoned cuffs, ties or loose-fitting clothing and always tie long hair back when working near moving/rotating parts such as the flywheel or PTO shaft. Keep hands, feet and tools away from all moving parts.

3. Some of the machine surfaces become very hot during operation and shortly after shutdown. Keep hands and other body parts away from hot machine surfaces.

5.8 Troubleshooting

5.8.1 Mechanical Faults/Solutions

NOTE: most "abnormalities" are caused by external factors such as weed or rope around propeller, foreign objects caught in steering mechanism, etc. Please check for such issues before assuming there is a mechanical fault!

Failure	Possible Reasons	Possible Solutions
Abnormal noise	Pod drive motor is loose on hull	Tighten mounting bracket bolts
	Housing bolt loose	Tighten
	Propeller loose on shaft	Tighten
Abnormal vibration	Propeller loose on shaft	Tighten
	Propeller damage	Replace
	Parts or fasteners loose	Tighten
Fan stops	Control abnormal or fan damage	Check or replace
Over temperature alarm	Water intake fouled by seaweed or other marine life	Clean

5.8.2 System Faults/Solutions

Fault position	Fault name	Fault code	Solution
Drive motor	Encoder fault	P101003	1. Check the external wiring. 2. Replace the rotary encoder. 3. Replace the motor controller.
	Power tube pass-through failure	P100F03	1. Check the external wiring. 2. Check the insulation of the motor. 3. Replace the motor controller.
	Motor overspeed	P101113	1. Check the operating conditions 2. Replace the rotation 3. Replace the motor controller
	Emergency stop	P101603	1. Check if the emergency stop button is pressed
	Phase current overcurrent hardware failure	P100C03	1. Check the operating conditions 2. Check whether there is a short circuit in the system power supply
	Phase current overcurrent software failure	P100D03	1. Check the operating conditions
	Motor stalled	P101203	1. Check the operating conditions 2. Overhaul the transmission system
	Severe overvoltage of bus	P100603	1. Check the high voltage power supply circuit.
	Severe bus undervoltage	P100813	1. Check the battery SOC 2. Check the main contactor status
	General overvoltage of bus	P100712	1. Check the high voltage power supply circuit.
	General bus undervoltage	P100912	1. Check the battery SOC
	MOS severe overtemperature	P100003	1. Check the operating conditions. 2. Check whether the heat dissipation channel is blocked. 3. Check coolant level

Fault position	Fault name	Fault code	Suggested measures
Drive motor	The motor is seriously overheated	P100203	1. Overhaul the motor or drive system. 2. Check whether the heat dissipation channel is blocked. 3. Check coolant level
	MOS general overtemperature	P100402	1. Check the operating conditions. 2. Check whether the heat dissipation channel is blocked.
	Motor general overtemperature	P100502	1. Check the operating conditions. 2. Check whether the heat dissipation channel is blocked.
	Auxiliary power overvoltage	P100A13	1. Check the external input 12V power supply.
	Auxiliary power supply undervoltage	P101443	1. Check the cable and end point resistance; 2. Confirm whether there is interference
	Communication loss	P101543	1. Check whether the communication cable or motor controller is disconnected
ECU	GPS antenna short circuit	P130321	1. Check the GPS antenna line. 2. Replace X-ECU and contact after-sales processing
	Open GPS antenna	P130421	1. Check the GPS antenna line. 2. Replace the X-ECU and contact after-sale processing
	CAN_A BUSOFF	P130843	1. If recoverable, no processing is required 2. Troubleshoot the cable for poor contact
	CAN_B BUSOFF	P130941	1. If recoverable, no processing is required 2. Troubleshoot the cable for poor contact
	CAN_C BUSOFF	P130A43	1. No need to process if recoverable 2. Troubleshoot the cable for poor contact

Fault position	Fault name	Fault code	Suggested measures
ECU	Auxiliary power overvoltage	P130B11	1. Check the external input 12V power supply
	Auxiliary power supply undervoltage	P130C11	1. Check the external input 12V power supply
	BMS node lost	P130D41	1. Check the BMS line and cable 2. Confirm whether the BMS is connected and the power supply is normal
	Drive motor controller node missing	P130E43	1. Check the drive motor controller circuit and cable 2. Confirm whether the drive motor controller is connected and the power supply is normal
	Wired remote operation box node is lost	P131143	1. Confirm whether the cable remote operation box is turned on 2. Check the cable remote operation box line and cable 3. Confirm whether the cable remote operation box is connected and the power supply is normal
	Display node missing	P131441	1. Check the display line and cable 2. Confirm whether the display is connected and the power supply is normal
	High voltage interlock 1 signal failure	P132002	1. Re-check the high voltage interlock signal 1 wire device 2. Replace the high voltage wiring harnes
	High voltage interlock 2 signal failure	P132102	1. Re-check the high voltage interlock signal 2 wire device 2. Replace the high voltage cable

Fault position	Fault name	Fault code	Suggested measures
Wired remote operation box	Throttle calibration data abnormal	H120203	1. Keep away from strong magnetic fields and recalibrate 2. If it occurs repeatedly, contact after-sales processing
	Abnormal throttle angle	H120003	1. Keep away from strong magnetic fields and recalibrate
	Kill switch abnormality	H120403	1. Check whether the kill switch is properly located in the slot
Display screen	CAN BUSOFF	H110041	1. If recoverable, no processing is required 2. Troubleshoot the cable for poor contact
	ECU LOST	H110141	1. If recoverable, no processing is required 2. Troubleshoot the cable for poor contact

6 Maintenance

6.1 Maintenance

6.1.1 Routine maintenance

Maintenance items	Maintenance methods	Maintenance frequency
Regular inspection of machine cable wear and tear	Regularly check the reliability of harness connections and fixations, and inspect for wear and tear with the hull or through-holes.	Every three months
Replace the anode	/	Check every 12 months

6.2 Repair and maintenance

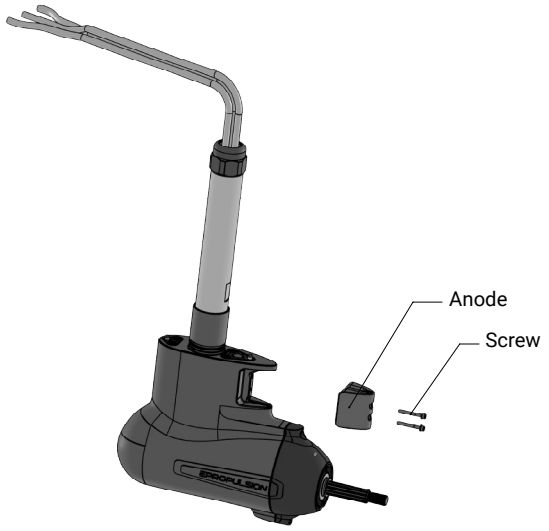
Maintenance cycle						
Components	Items	Operation	First maintenance		Ongoing maintenance	
			50hrs/ 3months	100hrs/ 6months	250hrs/ 1year	1000hrs/ 2years
Cooling system	Fan's flow channel	Check and cleam		●	●	
Machine	Bolts and nuts	Check	●		●	

6.3 Partial Maintenance and Care Guidelines

6.3.1 Anode Inspection & Replacement

The pod drive motor has an anode on the underwater part. This anode is essential for corrosion protection, and must be inspected/replaced regularly in order to maintain warranty cover. This

is especially the case when used in seawater, which can accelerate corrosion. Anodes must be replaced well before they are completely eroded (recommended when between 33 and 50%). NOTE: the surface of the anode and the metal it touches should not be painted or coated, as this will reduce the protection given by the anode.



6.3.2 Propeller

The propeller is an important component of the pod drive motor. To ensure safe navigation and optimal performance, the propeller should be regularly removed and inspected. During the inspection, pay attention to the following:

(1) Check the propeller blades for wear or other damage.

(2) Check if the propeller shaft is damaged.

(3) Check if there are fishing lines, water plants, or other foreign objects wrapped around the propeller shaft, and remove if necessary.

(4) Check whether the propeller shaft oil seal is damaged.

(5) For propeller removal and installation methods, please refer to section 3.1.3 - "Propeller Installation".

Apply Loctite 243 to all bolts of the pod thruster when tightening before leaving the factory. Please apply thread glue to the bolts to prevent loosening when tightening again.

7 Limited Warranty

Guangdong ePropulsion Technology Co., Ltd. (“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;

The 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.

7.1 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.

7.2 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
Webseite: www.epropulsion.com
E-Mail: service@epropulsion.com