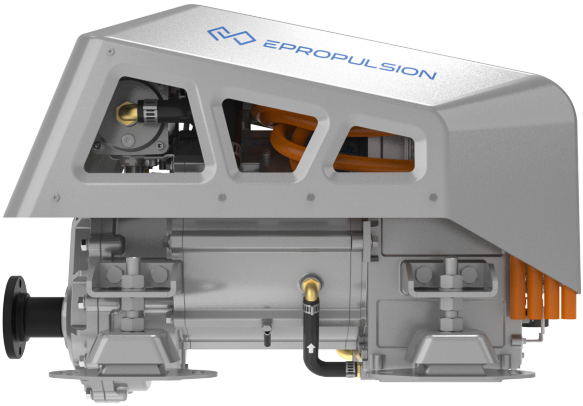
I-40 User Manual



2024.07 Version 1.0

Acknowledgement

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

Using This Manual

Before use of the product, please read this user manual thoroughly to understand the correct and safe operations. By using this product, you hereby agree that you have fully read and understood all contents of this manual. ePropulsion accepts no liability for any damage or injury caused by operations that contradict this manual.
Due to ongoing optimization of our products, ePropulsion reserves the rights of constantly adjusting the contents described in the manual. ePropulsion also reserves the intellectual property rights and industrial property rights including copyrights, patents, logos and designs, etc.
This manual is subject to update without prior notice, please visit our website www.ePropulsion.com for the latest version. If you find any discrepancy between your products and this manual, or should you have any doubts concerning the product or the manual, please visit www.ePropulsion.com.
ePropulsion reserves the rights of final interpretation of this manual.
This manual is multilingual, in case of any discrepancy in the interpretation of different language versions, the English version shall prevail.

Symbols

ePropulsion considers safety of great importance and recommends that anyone that comes into close contact with its products, such as those who install, operate, maintain or service ePropulsion products, exercise care, common sense and comply with the safety information in this manual and on the machine's safety decals.
The following are the relevant information marks in the user manual or the product labels:
Hazardous or warning signs indicate a potentially hazardous or hazardous situation which, if not avoided, will result in death or serious injury. Special attention and attention should be paid to the safety of you or the products involved.

Important warning:
Tips or important informations help quickly grasp the use of the inboard motor and improve efficiency.

Please read and follow the instructions following the safety warning signs.

 **Caution:**

When installing, operating, maintaining or serving ePropulsion products, there are many safety risks in the process. You need to be alert, perform relevant operations reasonably, and pay attention to safety. when installing, operating, maintaining or serving ePropulsion products, there are many safety risks in the process. 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 or PTO shaft. Keep hands, feet and tools away from all moving parts.

 **Electric shock hazard:**

The areas or equipment may be at risk of electric shock. The equipment uses 102.4V DC power. When operating electricity-related electrical connectors, switches, cables and other electricity-related items, power off operation to prevent electric shock.

 **Burn hazard:**

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.

 **Do not approach when the machine is running:**

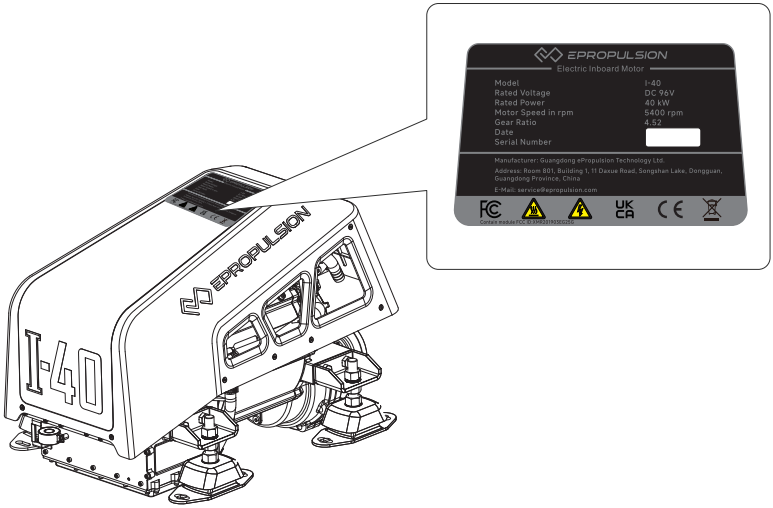
The machine and equipment are in operation. Do not approach or touch the machine to avoid dangers.

 **Do not plug or unplug when the machine is running:**

Do not plug or unplug electrical equipment when the machine is running to avoid the risk of electric shock.

Product Identification

Below picture indicates the serial numbers of the motor. Please note the position of the serial numbers and record them for access to warranty service and other after-sale services.



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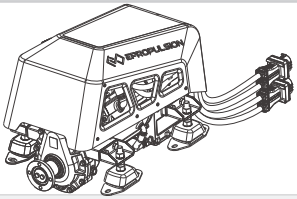
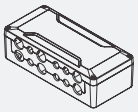
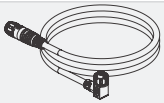
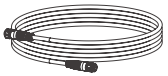
1 Product Overview

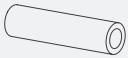
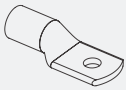
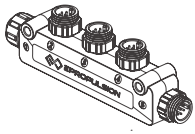
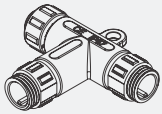
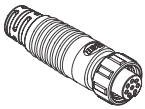
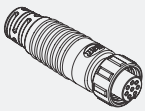
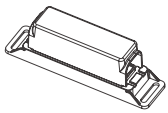
The I-Series 40kW inboard motor is an electric inboard motor with input power of 40kW, which is controlled by a smart throttle and smart display. The electric inboard motor is environmentally friendly, clean and efficient. The I-40 inboard motor is perfect for small and medium-sized recreational vessels, such as all types of yachts, leisure boats and sailboats, which range from 5 to 20m.

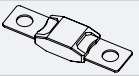
1.1 Product List

When you receive the inboard motor, unpack its package and check if all the items below are included in the package. If there is any loss or transport damage, please contact your dealer immediately.

1.1.1 In the Package

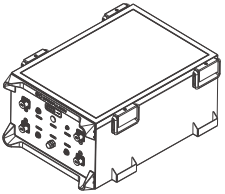
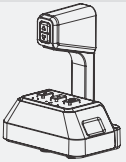
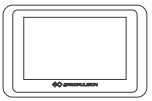
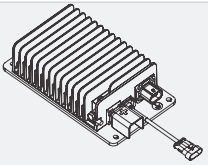
Items	Qty.	Figure	Function
I-40 main part	1		Provide the main propulsion of the boat
Bus bar	1		Transfers electrical energy from the power system's main circuit to different components or modules within the circuit.
96V Power Cable 5m	2		Transfer DC power from the battery to the power input of the motor.
CAN Communication cable 1m	1		Connect the motor and other devices such as the smart throttle, smart display and battery.
CAN comm extension cable 10m	1		Extend the communication distance of the CAN communication cable

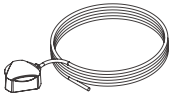
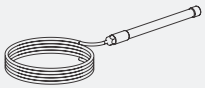
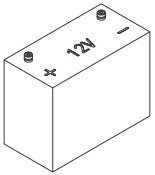
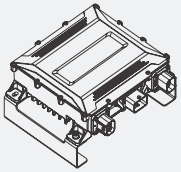
Items	Qty.	Figure	Function
Fasteners	/	Hexagon Head Bolt M12x25 8pcs Plain Washer M12x24x2.5 8pcs Spring Washer M12x3.1 8pcs Hexagon Head Bolt M10x40 4pcs Plain Washer M10x20x2 4pcs Spring Washer M10x2.6 4pcs Hex Locknut M10	Motor installation
Red Heat Shrink Tubing	2		Protect the main power cable after stripping it
Black Heat Shrink Tubing	2		Protect the main power cable after stripping it
Cable lug	12		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 Base	1		Protect the 12V circuit

Items	Qty.	Figure	Function
12V Fuse Connecting	1		Connect the fuse.
12V Fuse (DC150A)	1		Protect the 12V circuit.
Boat Sticker	2		Decorative use
User manual Warranty card	1		Give information about the features, functions, performance, purpose and maintenance of the product.

1.1.2 Accessories List

Other accessories not included in the package are also required to operate the inboard motor, such as smart throttle, smart display, battery, charger and communication cable, etc. Users can buy official accessories provided by ePropulsion from ePropulsion authorized dealers. The accessories list is shown below:

Items	Qty.	Figure	Function
G102 battery	1		Provides reliable power for the entire system
Smart throttle	1		Start, stop the motor and control the power output
Smart display	1		Display system information such as power, speed, battery level and set system functions
DC-DC	1		Used as 102.4V to 12V DC function, to provide a 12V stable power supply to the system

Items	Qty.	Figure	Function
GPS module	1		Obtaining a ship's Global Positioning System (GPS) signal can provide the ship's position and speed information, helping ship managers with ship management and adjusting course plans.
4G antenna	1		The 4G antenna is a kind of communication equipment. The machine realizes remote network connection through the 4G antenna to realize remote control and monitoring. At the same time, it can support high-speed data transmission, which is convenient for the crew to carry out online data sharing and backup operations.
12V battery	1		Provide electrical energy for the system's 12V power requirements equipment
3.3kW charger	1		Charge the G102 battery

⚠ The 12V battery (not supplied with motor) needs a minimum current output of 40A, a capacity of 80Ah.

⚠ The maximum output power of the DCDC is 500W. When selecting the batteries, ensure the charging capacity meets the batteries requirements.

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
4mm Allen key (hex key or hex bit)	4mm, suitable for M5 hex socket round head screws	1	Disassemble the motor cover for installation of lifting ring bolts and machine hoisting
24mm Hex socket	24mm, suitable for M16 hexagon bolts	1	Adjust the suspension height
18mm Hex socket	18mm, suitable for M12 hexagon bolts	1	Fix the suspension on the bracket
16mm Hex socket	16mm, suitable for M6 hexagon bolts	2	To install the output flange bolts
13mm Hex socket	13mm, suitable for M8 hexagon bolts	1	To connect and fix the bus box to the BDU busbar assembly
Torque Wrench	Torque range: 0~200Nm	1	Torque control
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	Peel/cut 50 square millimeters wire	1	For cutting the battery terminal power cables
Wire Stripper	Peel/cut 50 square millimeters wire	1	For stripping the battery terminal power cables
Crimping Plier	Crimp with SC50-8 copper nose	1	For crimping the battery terminal power cables
Heat Gun	/	1	For shrinking heat shrink tubes
100mm Hole saw	Meet the hole size: 100mm	1	Make holes for cable routing

1.2 Parts and Diagram

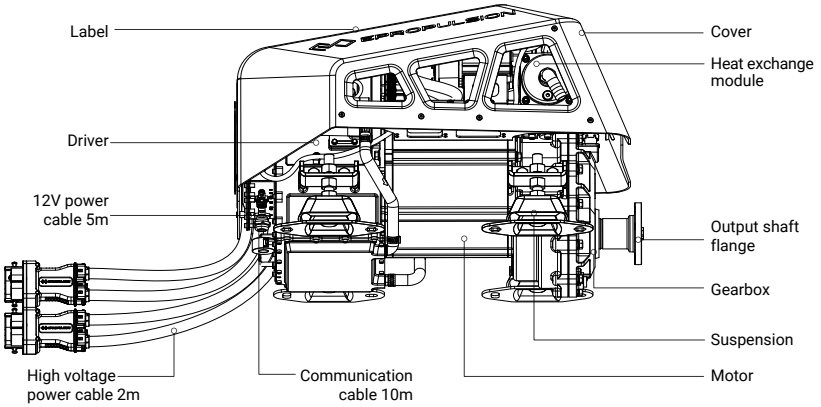


Figure 1-1

1.3 Specifications

Model	I-40
Rated power	40kW
Recommended battery	ePropulsion Lithium Iron Phosphate Battery
Rated input voltage	DC96Vdc
Input voltage range (high voltage)	86~115Vdc*
Input voltage range (low voltage)	10.5~16Vdc
Weight	93kg
Dimensions (L*W*H)	667mm×453mm×477mm

Model	I-40
Cooling method	Water cooling (air cooling optional)
Rated rotational speed	1200rpm
Rated power rotational speed range	900rpm~1500rpm
Operation temperature	-5°C ~ 55°C
Storage temperature	-25°C ~ 70°C
Operation and interaction mode	Remote control, display panel
ePropulsion Connectivity Service	Supported
Partial driver assistance	/
Vibration-damping components	Four-point elastic rubber mount
Protection class	IP67

When the high-voltage input voltage is below 96Vdc, there will be an undervoltage alarm, and the power will reduce to 0W when the voltage is 86V.

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 inboard 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 I40 (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 inboard 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 inboard.
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 inboard motor immediately (fastest method is to pull kill switch off throttle).

1.4.5 Specific to this Installation

1. If the inboard 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 inboard 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 inboard 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 inboard 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 Inboard Motor

Model: I40

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:

Machinery Directive	2006/42/EC
Electromagnetic Compatibility Directive	2014/30/EU
RoHS 2.0 Directive	2011/65/EU and (EU)2015/863

Applied Standards:

EN 60204-1:2018	IEC 62321-4:2017
EN ISO 12100:2010	IEC 62321-6:2015
EN 61000-6-2:2005	IEC 62321-7-1:2015
EN 61000-6-3:2007	IEC 62321-7-2:2017
IEC 62321-3-1:2013	IEC 62321-8:2017
IEC 62321-5:2013	

Manufacturer

Name: Guangdong ePropulsion Technology Limited

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

Signature:  **Date:** 2nd of June, 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 ca use 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 protectio n against harmful interference in a residential installation. This equipment generates, uses and c an radiate radio frequency energy and, if not installed and used in accordance with the instructio ns, may cause harmful interference to radio communications. However, there is no guarantee th at interference will not occur in a particular installation. If this equipment does cause harmful int erference 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 co nnected.

—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 steps and notices

2.1 Safety Notice

- Use appropriate safety equipment, wear gloves, protection shoes and other safety props;
- Ensure that all safety and measures are understood before operation;
- Due to the large weight of the product, ensure that at least two people operate;

2.2 Tools and equipment required for unpacking

- Prepare unpacking tools, such as rubber hammer, screwdriver, etc.
- Handling tools: wheelbarrow/forklift.

2.3 Check the packaging

- Check the wooden case for obvious damage or transportation damage and record;
- Verify that the label on the package is consistent with the product purchased;

2.4 Check the packaging

1. Carefully insert the forklift into the wooden bracket, ensure the wooden case is stable, and move the wooden case to the appropriate unpacking area;
2. Straighten the iron sheet around the upper wooden cover plate with a tool and remove the cover plate;
3. Remove the manual and maintenance card;
4. Take out the communication cable, 12V power cable, heat shrink tubes, high voltage bus cable, accessory pack, bus bar in turn;
5. Remove the iron sheet of the package and remove the wooden frame;
6. Organize the machine communication cables and power cables;
7. Disassemble the accessory pack and remove the motor from the board with an open wrench (16-18).

- Pay attention to avoid damage to the product during unpacking. Check all accessories, and confirm that accessories are all complete.

The composition of the package is shown below:

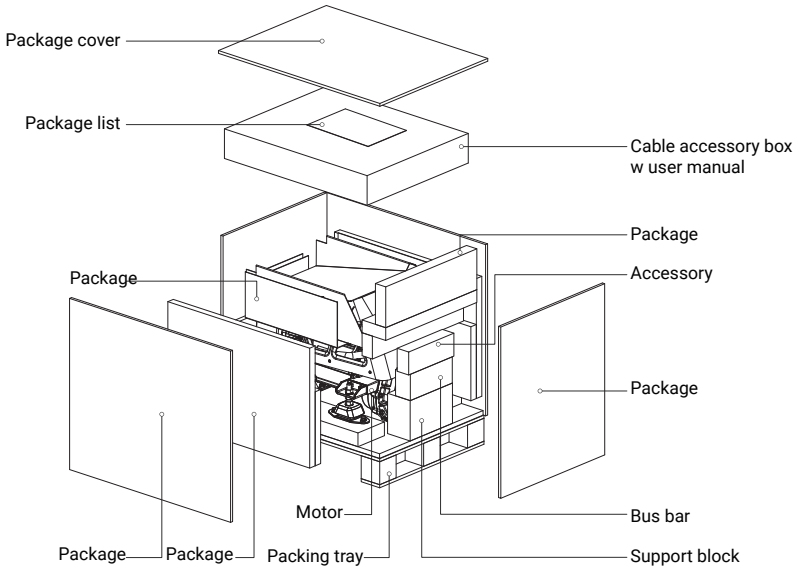


Figure 2-1

2.5 Remove the inner packaging 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 Dispose of discarded packaging materials

1. Classify and recycle packaging materials, such as wood, paper, etc.
2. Follow local environmental regulations to dispose of waste materials.


Make sure to read the user manual that come with the product carefully.


Please follow the local material handling requirements to recycle the package, reasonable disposal, to protect the environment.

3 Install the I-40 motor

3.1 Install the motor

The quality of installation plays a decisive role in the reliability of the whole system. Among them, the output shaft in the center and the suspension is the most critical. If you want the system to be stable and reliable, please refer to the following requirements for installation to ensure that the equipment works in a good state.

3.1.1 Before installation

1. Check the materials:

① Motor: Check the I-40 machine structure to ensure that there is no loosening or abnormality. Arrange the main power cables, 12V power cable, and communication cable and fix them in appropriate positions for easy handling.

② Tools: Prepare the tools referring to 1.1.3.

③ Accessories: Prepare the accessories in the package.

2. Confirm the drawing file of the motor:

I-40 dimensions are shown in the following. Before installation, please carefully check the size to ensure sufficient installation space, accurate installation position, convenient adjustment, to meet the installation requirements.

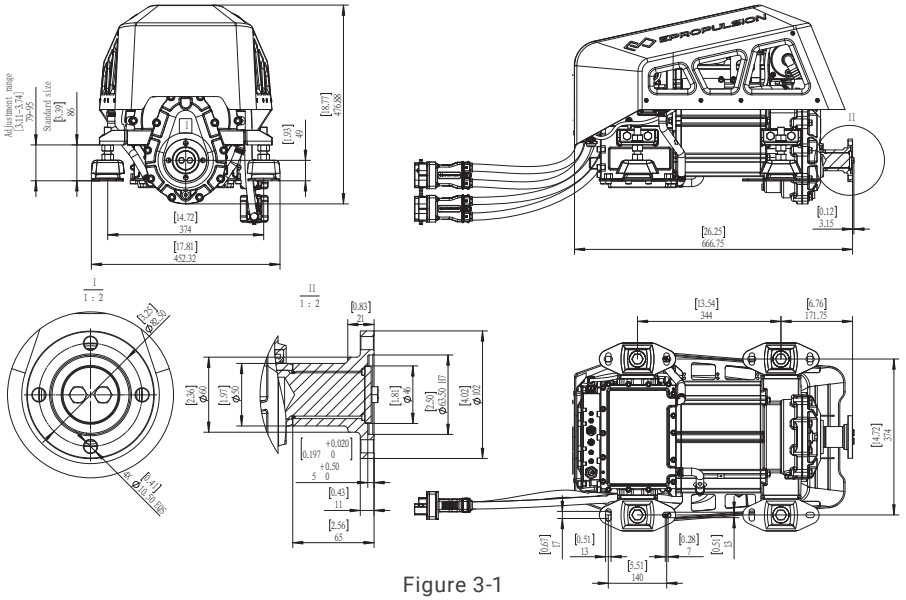


Figure 3-1

Suggestions for the mounting platform:

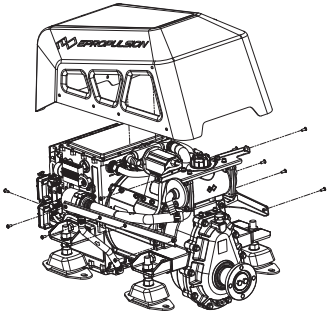
First, design the proper mounting platform according to the size model of the motor, the space inside the ship and the position of the stern shaft. The size of the fastening hole of the mounting platform is M10, and the size distribution is determined according to the position of the fixing hole of the suspension support foot. The motor platform is firmly fastened to the hull, and can bear a large thrust (greater than 3500N).

Pre-installation work:

1. Confirm the motor model: motor size, weight, voltage, power and the current ship match;
2. Design layout: read the user manual, need to consider the layout and design of the whole system. Machine and related system components must be installed in the appropriate position on the ship to ensure safe and efficient operation.
3. Simulate the installation process: according to the installation process of the user manual, simulate the relevant process to ensure that the installation is feasible and the installation process is low risk.
4. Clean the environment inside the ship: clean up irrelevant objects according to the simulation process, keep dry and clean. Ensure that the installation process is smooth and the commissioning process is normal.

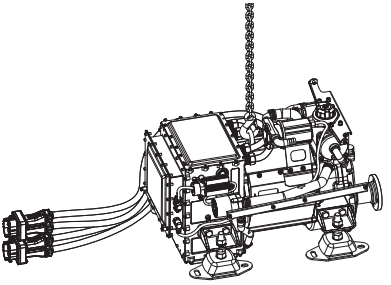
Suggestions for lifting:

Before hoisting, sort out the cables and fix them on the motor. Suspend two feet around the motor through the sling, complete the lashing of the rope, pass through the hook, adjust the position of the hook, and test hoisting. In the test hoisting, the machine is stable without tilting and shaking, then formal hoisting can begin.



1. Remove the cover.

2. Wrap the rope and hoist the machine



Lifting objects hazard: pay attention to safety when hoisting equipment or objects nearby to avoid being hurt or crushed by falling objects.

The cover shall be installed after the 4G antenna is installed.

3.1.2 Center the output shaft

1. Adjust the distance between the stern shaft and the motor mounting platform in advance according to the key dimensions of the figure, as the figure shown in the following.

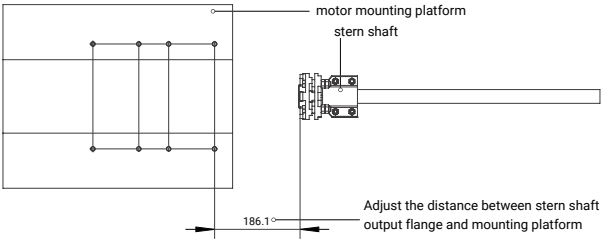


Figure 3-4

2. Hoist the motor to the mounting platform. The output shaft of the motor and the transmission center axis of the stern shaft are spatial crossing lines, which can not be aligned.

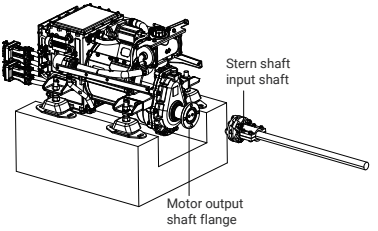


Figure 3-5

3. Move the motor so that the output shaft flange of the motor is close to the input shaft flange of the stern shaft, align the input shaft flange of the stern shaft, and compare the height difference between the output shaft and the input flange of the stern shaft. Adjust the suspension height, the ship machine shaft flange and the stern shaft input flange to adjust to the same height;

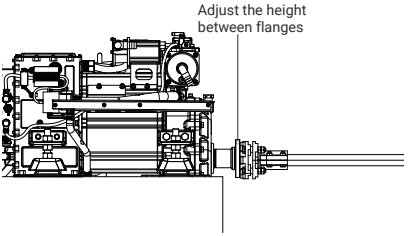


Figure 3-6

Adjust the height of the motor:

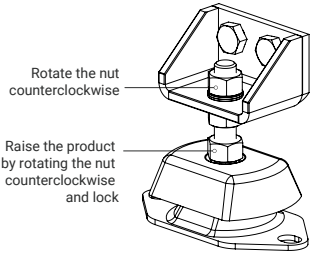


Figure 3-7 Product height adjustment

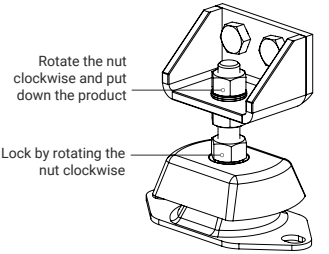


Figure 3-8 Product height adjustment

4. Confirm the height adjustment. Adjust the height to be consistent by observation and touch.

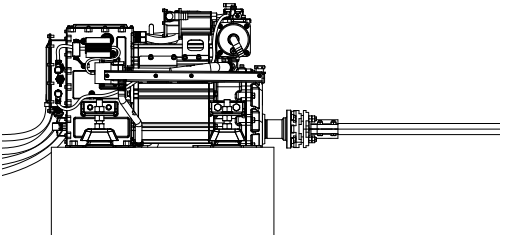


Figure 3-9 After the height adjustment

5. Flange surface fitting, flush the outlet flange with the stern shaft input flange end face, so that the positioning boss is embedded in the output shaft flange, so that the two flange faces fit, observe the size of the gap. (Note: pay attention to the mounting position of the suspension simultaneously)

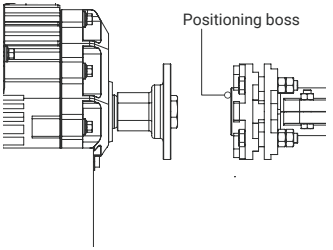


Figure 3-10

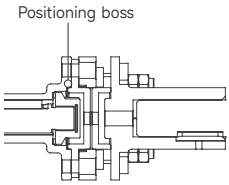


Figure 3-11

6. Fine tune, observe the size and distribution position of the gap, and fine tune the suspension to ensure the gap can not be seen.

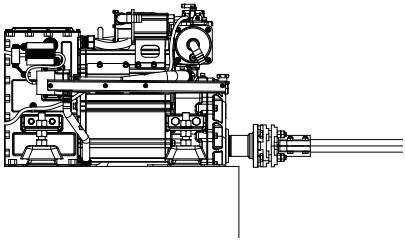


Figure 3-12

3.1.3 Lock the output shaft and fix the suspension

1. Lock the output shaft flange and stern shaft flange.

Preferably use a flexible rubber coupling between the engine flange and the propeller shaft. This prevents vibration in the boat and compensates for imperfections caused by the quality of the propeller shaft system or the alignment of the propeller shaft.

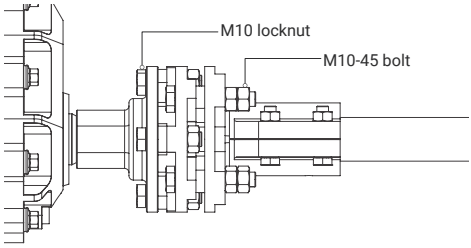


Figure 3-13

2. Fix the suspension, observe whether the suspension and the bench are flush, do appropriate fine tuning, make the bottom surface of the suspension stick to the upper surface of the installation platform, lock the fixing bolts of the suspension.

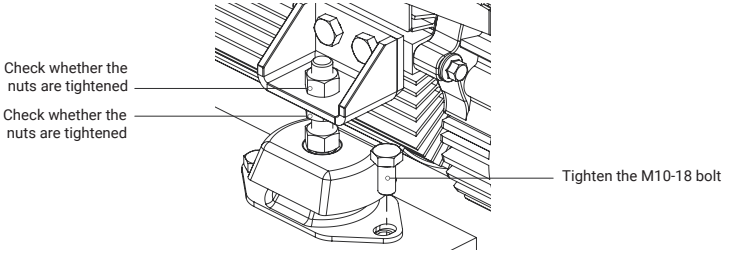


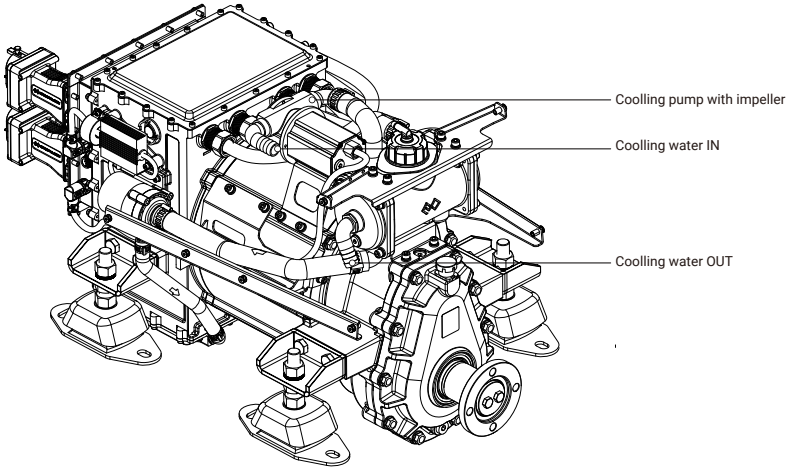
Figure 3-14

After the output shaft alignment is completed, the output shaft is locked and suspension is fixed, manually rotate the flange for one circle to check whether there is any obvious abnormality in the overall structure.

Caution: when installing, operating, maintaining or serving ePropulsion products, there are many safety risks in the process. You need to be alert, perform relevant operations reasonably, and pay attention to safety.

3.2 Connect seawater inlet and outlet pipes

The machine has a water pump. According to the logo in the above figure, the water pipes with an inner diameter of 19mm are selected to be connected to the water inlet and the water outlet respectively, and the water pipes are fixed on the pagoda joint with clamps.



Note:

1. Water pipes and clamps are provided by the customer.
2. The suction head of the pump is limited. Please control the length of the inlet pipe within 5m to avoid the impeller not pump water if the pipeline is too long.
3. When replacing the water pump impeller, you only need to remove the left and right bolts of the front end of the water pump.
4. Sediment and aquatic plants in the water will greatly reduce the service life of the impeller. It is recommended that customers add filters to the water inlet of the boat to remove large foreign bodies such as aquatic plants, and set filters in the water inlet line to separate sediment and other small foreign bodies, and regularly clean the filter.

When the impeller pump's operating speed is unstable or the water flow is continuously abnormal, it is necessary to open the pump cover to check if the impeller is damaged. If the impeller structure is intact, you should add grease to the pump chamber.

The maximum suction lift of the impeller pump is 0.5 meters, and the maximum length of the inlet pipe is 10 meters.

The maximum head of the impeller pump is 2.0 meters, and the maximum length of the outlet pipe is 5 meters.

4 Connect the system before operating the machine

4.1 System connection diagram

4.1.1 System connection diagram of the single-motor

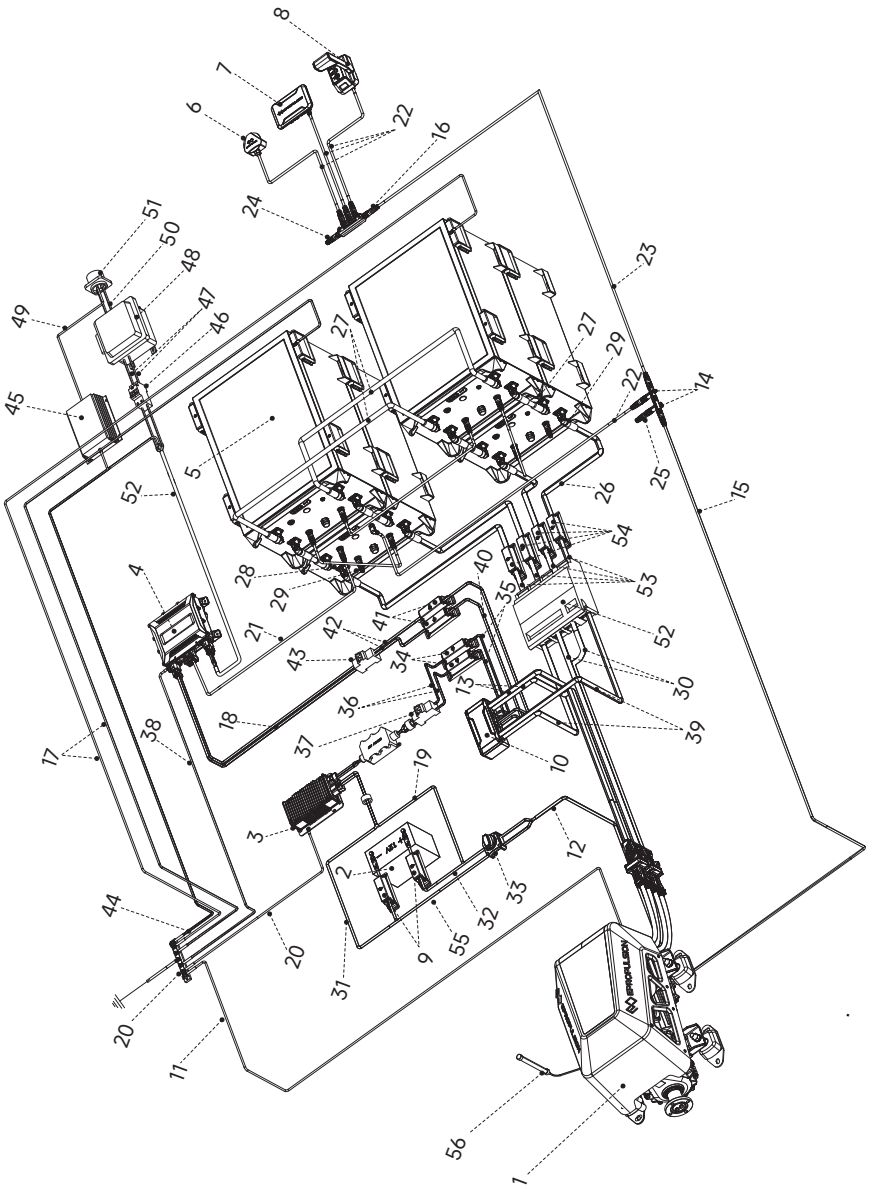
The accessories marked * are not included in the package. Users need to adjust according to local regulatory requirements, such as fuses, circuit breakers and cables.

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 necessory, 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 I40 system can support up to four motors and two consoles. For setups not shown here, please contact your ePropulsion dealer for assistance.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1. I40 Electric Inboard Motor
2. 12V battery
3. DCDC 96V-12V
4. G Battery Charger 16A
5. G102-100 Battery
6. GPS
7. Smart Display 5"
8. Smart Throttle
9. 12V Fuse（150A）
10. Bus Box
11. Outboard Grounding Line 5m (Come with Motor)
12. Outboard 12V Power Cable 5m (Come with Motor)
13. Motor to bus bar power cable
14. eSSA Communication 3-way T Connector
15. Outboard Communication Cable 10m (Come with Motor)
16. eSSA Communication 5-way T Connector
17. G102-100 Battery Grounding Line
18. Charger output power cable
19. 12V Fuse Connecting Cable (Positive)
20. Grounding Bus Bar
21. Charger Communication Cable
22. eSSA Communication Cable 1m
23. eSSA Communication Extension Cable 10m
24. eSSA Communication Terminator 120Ω
25. eSSA Communication Terminator 360Ω
26. Battery to fuse power cable
27. G Battery Bridging Cable (Positive & Negative)
28. Battery Communication Cable
29. Battery Communication Terminator
30. Motor and Battery Output Fuse Connecting Cable
31. 12V Fuse Connecting Cable (Negative)
32. 12V Fuse to Switch Cable (Positive)
33. 12V Battery Two-Way Switch
34. DCDC Input Fuse(50A)
35. Bus Box to DCDC Input Fuse Connecting Cable
36. DCDC Input Fuse to Circuit Breaker Connecting Cable
37. DCDC Input Circuit Breaker (40A)*
38. G Battery Charger Grounding Line
39. Bus Box and Battery Output Fuse Connecting Cable
40. G Battery Charger Output Fuse and Bus Box Connecting Cable
41. G Battery Charger Output Fuse (45A)*
42. G Battery Charger Output Fuse and Circuit Breaker Connecting Cable
43. G Battery Charger Output Circuit Breaker (40A)*
44. Current Isolator Grounding Line
45. Current Isolator
46. G Battery Charger Input Leakage Protector
47. G Battery Charger Input Fuse and Leakage Protector Connecting Cable
48. G Battery Charger Input Fuse (24A)*
49. Charging Port Grounding Line
50. G Battery Charger and Fuse Connecting Cable
51. G Battery Charger Input Port
52. 4 Way Fuse Switch Circuit Breaker (250A)*
53. Bus Fuse and Circuit Breaker Connecting Cable
54. Bus Fuse (DC 400A)
55. 12V Fuse to Switch Cable (Negative)
56. 4G Antenna

4.1.2 System connection diagram of the dual-motor

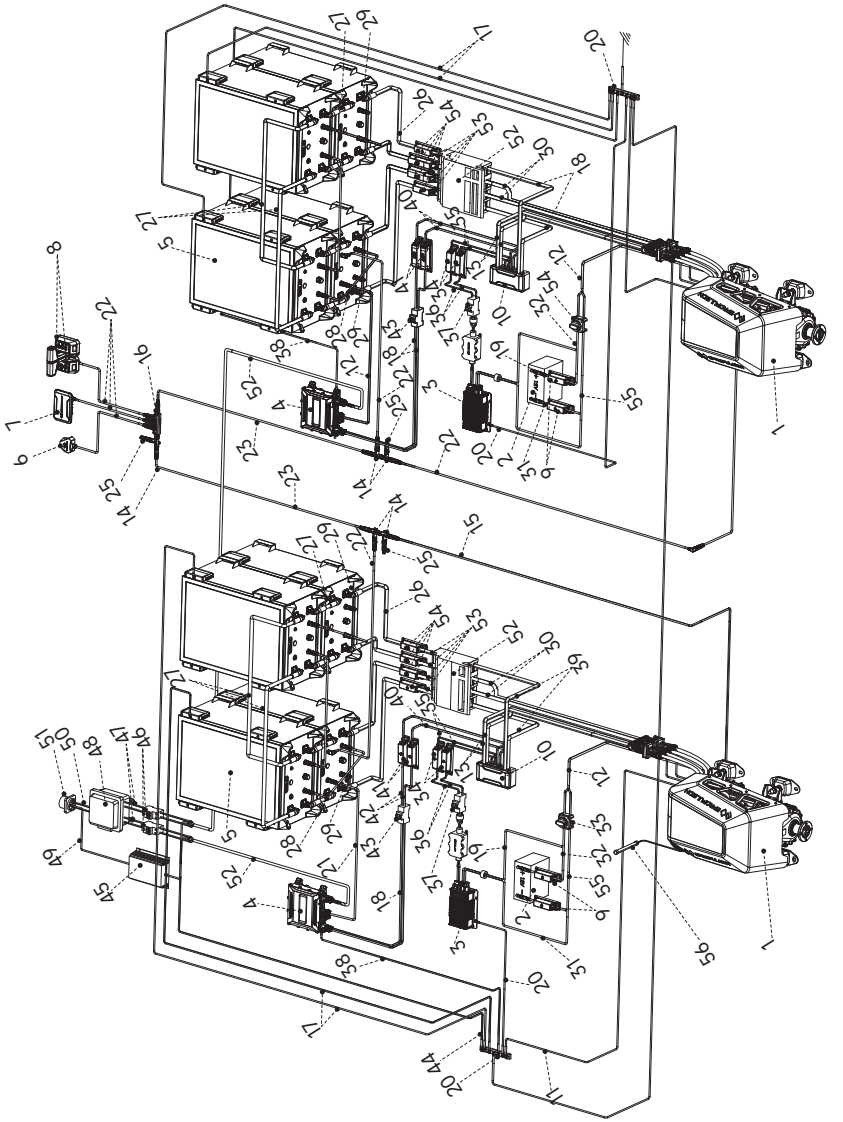
The accessories marked * are not included in the package. Users need to adjust according to local regulatory requirements, such as fuses, circuit breakers and cables.

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 necessory, 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 I40 system can support up to four motors and two consoles. For setups not shown here, please contact your ePropulsion dealer for assistance.



1. I40 Electric Inboard Motor
2. 12V battery
3. DCDC 96V-12V
4. G Battery Charger 16A
5. G102-100 Battery
6. GPS
7. Smart Display 5"
8. Smart Throttle
9. 12V Fuse（150A）
10. Bus Box
11. Outboard Grounding Line 5m (Come with Motor)
12. Outboard 12V Power Cable 5m (Come with Motor)
13. Motor to bus bar power cable
14. eSSA Communication 3-way T Connector
15. Outboard Communication Cable 10m (Come with Motor)
16. eSSA Communication 5-way T Connector
17. G102-100 Battery Grounding Line
18. Charger output power cable
19. 12V Fuse Connecting Cable (Positive)
20. Grounding Bus Bar
21. Charger Communication Cable
22. eSSA Communication Cable 1m
23. eSSA Communication Extension Cable 10m
24. eSSA Communication Terminator 120Ω
25. eSSA Communication Terminator 360Ω
26. Battery to fuse power cable
27. G Battery Bridging Cable (Positive & Negative)
28. Battery Communication Cable
29. Battery Communication Terminator
30. Motor and Battery Output Fuse Connecting Cable
31. 12V Fuse Connecting Cable (Negative)
32. 12V Fuse to Switch Cable (Positive)
33. 12V Battery Two-Way Switch
34. DCDC Input Fuse(50A)
35. Bus Box to DCDC Input Fuse Connecting Cable
36. DCDC Input Fuse to Circuit Breaker Connecting Cable
37. DCDC Input Circuit Breaker (40A)*
38. G Battery Charger Grounding Line
39. Bus Box and Battery Output Fuse Connecting Cable
40. G Battery Charger Output Fuse and Bus Box Connecting Cable
41. G Battery Charger Output Fuse (45A)*
42. G Battery Charger Output Fuse and Circuit Breaker Connecting Cable
43. G Battery Charger Output Circuit Breaker (40A)*
44. Current Isolator Grounding Line
45. Current Isolator
46. G Battery Charger Input Leakage Protector
47. G Battery Charger Input Fuse and Leakage Protector Connecting Cable
48. G Battery Charger Input Fuse (24A)*
49. Charging Port Grounding Line
50. G Battery Charger and Fuse Connecting Cable
51. G Battery Charger Input Port
52. 4 Way Fuse Switch Circuit Breaker (250A)*
53. Bus Fuse and Circuit Breaker Connecting Cable
54. Bus Fuse (DC 400A)
55. 12V Fuse to Switch Cable (Negative)
56. 4G Antenna

4.1.3 System connection diagram of the dual-motor and two consoles

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 necessory, 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 I40 system can support up to four motors and two consoles. For setups not shown here, please contact your ePropulsion dealer for assistance.

1. I40 Electric Inboard Motor
2. 12V battery
3. DCDC 96V-12V
4. G Battery Charger 16A
5. G102-100 Battery
6. GPS
7. Smart Display 5"
8. Smart Throttle
9. 12V Fuse（150A）
10. Bus Box
11. Outboard Grounding Line 5m (Come with Motor)
12. Outboard 12V Power Cable 5m (Come with Motor)
13. Motor to bus bar power cable
14. eSSA Communication 3-way T Connector
15. Outboard Communication Cable 10m (Come with Motor)
16. eSSA Communication 5-way T Connector
17. G102-100 Battery Grounding Line
18. Charger output power cable
19. 12V Fuse Connecting Cable (Positive)
20. Grounding Bus Bar
21. Charger Communication Cable
22. eSSA Communication Cable 1m
23. eSSA Communication Extension Cable 10m
24. eSSA Communication Terminator 120Ω
25. eSSA Communication Terminator 360Ω
26. Battery to fuse power cable
27. G Battery Bridging Cable (Positive & Negative)
28. Battery Communication Cable
29. Battery Communication Terminator
30. Motor and Battery Output Fuse Connecting Cable
31. 12V Fuse Connecting Cable (Negative)
32. 12V Fuse to Switch Cable (Positive)
33. 12V Battery Two-Way Switch
34. DCDC Input Fuse(50A)
35. Bus Box to DCDC Input Fuse Connecting Cable
36. DCDC Input Fuse to Circuit Breaker Connecting Cable
37. DCDC Input Circuit Breaker (40A)*
38. G Battery Charger Grounding Line
39. Bus Box and Battery Output Fuse Connecting Cable
40. G Battery Charger Output Fuse and Bus Box Connecting Cable
41. G Battery Charger Output Fuse (45A)*
42. G Battery Charger Output Fuse and Circuit Breaker Connecting Cable
43. G Battery Charger Output Circuit Breaker (40A)*
44. Current Isolator Grounding Line
45. Current Isolator
46. G Battery Charger Input Leakage Protector
47. G Battery Charger Input Fuse and Leakage Protector Connecting Cable
48. G Battery Charger Input Fuse (24A)*
49. Charging Port Grounding Line
50. G Battery Charger and Fuse Connecting Cable
51. G Battery Charger Input Port
52. 4 Way Fuse Switch Circuit Breaker (250A)*
53. Bus Fuse and Circuit Breaker Connecting Cable
54. Bus Fuse (DC 400A)
55. 12V Fuse to Switch Cable (Negative)
56. 4G Antenna

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 I-40. 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	/

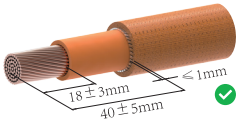
Crimping cable connectors:

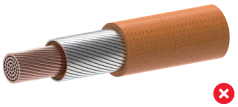
MAKING THE BATTERY TO BUS BOX AND BUS BOX TO MOTOR POWER CABLES

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:

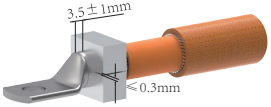
1. Strip back the insulation/shielding as follows:

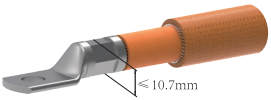
- outer sheath and metal shielding layer by 40±5mm. When cut, the metal shielding layer must not extend more than 1mm beyond the outer sheathing. (Contact between the metal shielding layer and terminals or inner cores will cause insulation failure.)
- inner sheaths (on positive and negative cables) by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

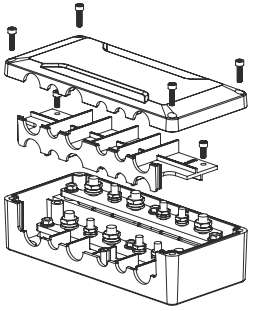


Figure 4.3

(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 goes 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

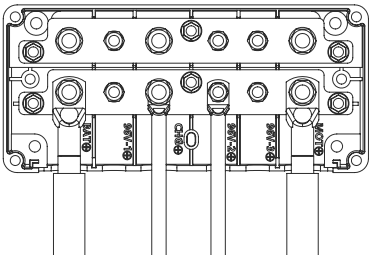


Figure 4.4

(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 goes 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.

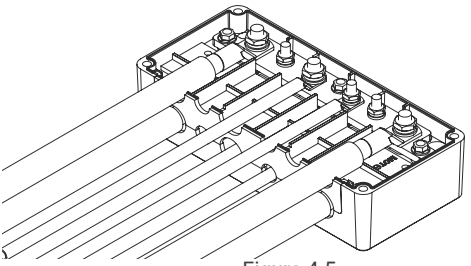


Figure 4.5

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) Connect the bus box and DC-DC Module

Connect the DC-DC input cable to the any of the 96V-1-,96V-2 or 96V-3 of the bus box, shown in the figure 4-6.

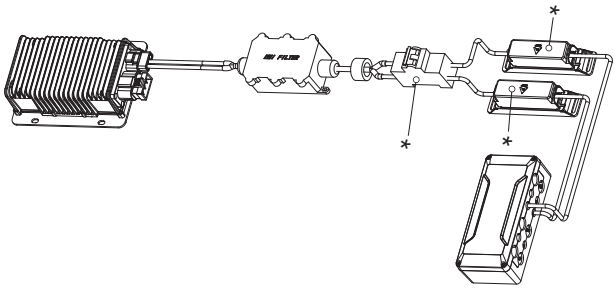


Figure 4.6

The fuse and circuit breaker marked * are not included in the package. Users need to adjust according to local regulatory requirements.

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

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

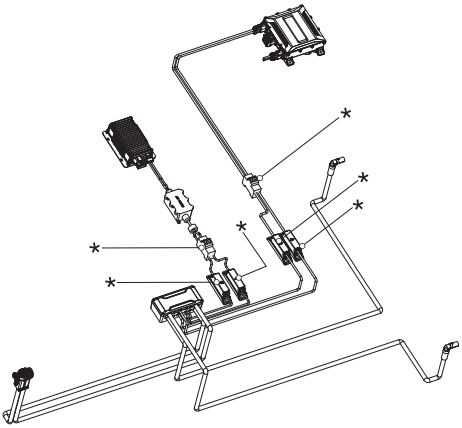


Figure 4.7

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, outboard motor and system caused by incorrect positive and negative connection.

The fuse and circuit breaker marked * are not included in the package. Users need to adjust according to local regulatory requirements.

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

Connect the DC-DC output cable to the positive and negative terminals of the 12V battery while the red cable to the positive terminal and the black cable to negative terminal, and tighten the screws.

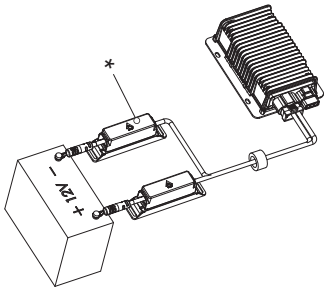


Figure 4.8

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, outboard motor and system caused by incorrect positive and negative connection.

The fuse and circuit breaker marked * are not included in the package. Users need to adjust according to local regulatory requirements.

4.2.4 Connecting the G102-100 Battery Bank

4.2.4.1 Required Accessories and Tools

1. G102-100 battery bank (at least 4 G102 batteries are needed, connected in parallel, to operate I-40 motor)
2. Bus box part completed in step 4.2.1 to 4.2.4
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.

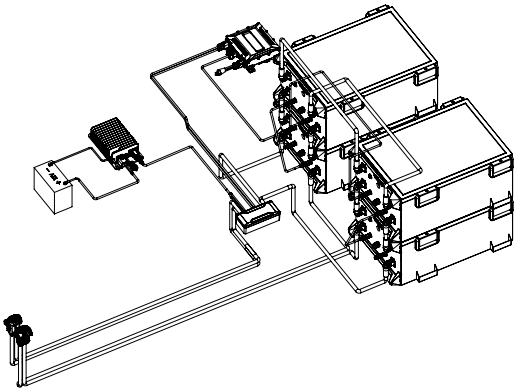


Figure 4.9

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.

The fuse and circuit breaker marked * are not included in the package. Users need to adjust according to local regulatory requirements.

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

4.2.5.1 Required Accessories and Tools

1. Inboard motor

2. Bus box, DC-DC module and 12V battery after connecting according to step 4.2.3

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 4.11, and lifting the black handle as shown in Figure 4.12.

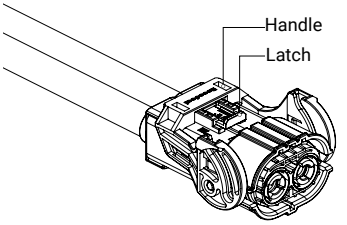


Figure 4.10 High-voltage interlock connector- Installation step 1

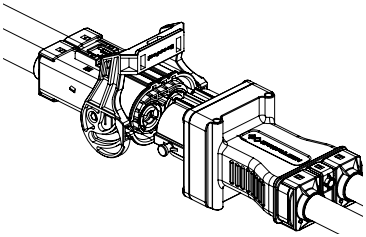


Figure 4.11 High-voltage interlock connector - Installation step 2

Insert the motor cable connector into the motor's orange plug, figure 4.13. Push down the black handle, figure 4.14.

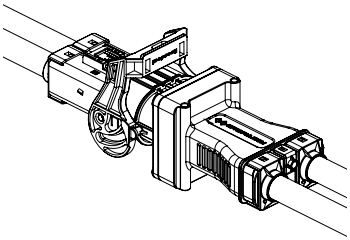


Figure 4.12 High-voltage interlock connector - Installation step 3

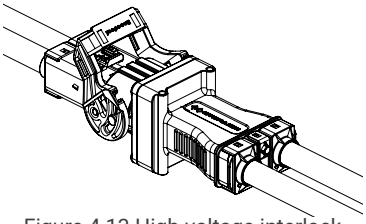


Figure 4.13 High-voltage interlock connector - Installation step 4

Press the black handle down firmly to secure the connector. Close the locking latch as shown in figure 4.15.

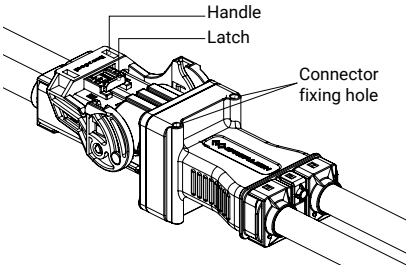


Figure 4.14 High-voltage interlock connector - Installation step 5

Step 2: Connecting the 2nd High Voltage Power Cable

The 2nd 96V power cable (supplied with I-40) does not need to be cut, nor routed via the bus box. It's connected directly to the battery and the second motor plug, following same steps as above.

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 inboard 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 inboard motor.

Step 3: Connecting the Low-Voltage Power Cable

Connect the red and black twin cables from the inboard 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 inboard motor).

Before connecting the high-voltage connector, it is necessary to check whether there are water droplets condensing inside the connector. If there are water droplets condensing inside the connector, it is necessary to dry the water droplets before connecting the connector.

After the high-voltage connector is connected, the connector and cable should not be soaked in water.

When the high-voltage connector is unconnected, it is necessary to use the protective cover that comes with the connector or tape to cover the unplugged connector, keep the metal conductive terminals inside the connector dry, and avoid water splashing into the connector, which may cause corrosion of the metal conductive terminals. Do not charge high voltage connectors when they are not connected, as charging unconnected connectors can cause rapid corrosion of the internal terminals of the connectors, and charging high voltage connectors when they are not connected poses a risk of electric shock.

After installing according to the above steps, you can appropriately unfold or roll up and fix it according to the distance from the battery to the motor.

Please insulate the connection position of the extension cable, otherwise it may cause battery short circuit, battery damage and fire.

4.3 Connection of Communication Devices (helm, throttle etc)

This example is for a single-inboard 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 Required Accessories for Single Motor System Connection

1. GPS module ×1
2. Smart throttle ×1
3. Smart display 5'' ×1
4. G102-100 battery ×4 (4 is the minimum for single I-40 inboard installations. More may be needed depending on range requirements.)
5. CAN Communication 1m Extension Cable ×4
6. CAN Communication 10m Extension Cable ×1
7. CAN Communication 5-Way T-Connector ×1 & CAN Communication 3-Way T-Connector ×2

4.3.2 Installation Steps

4.3.2.1 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 or 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.

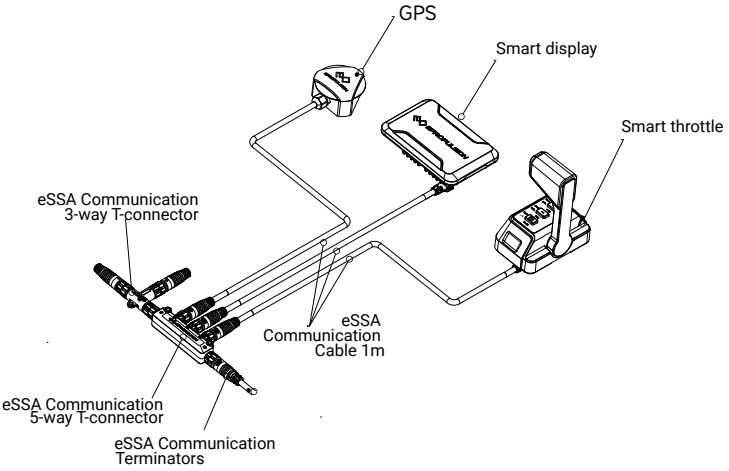


Figure 4.15

4.3.2.2 Smart throttle connection

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

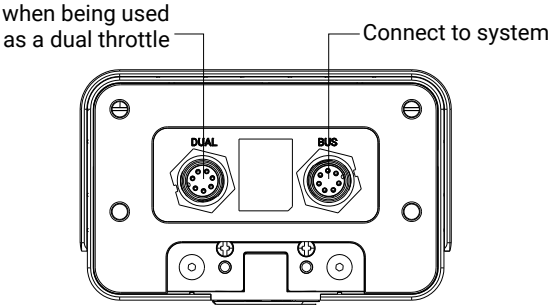


Figure 4.16

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.

All operations must be done without power. Do not connect or disconnect the cables while there is power.

4.4 External 4G & GPS Antenna

The X-series inboard motor has integrated 4G and GPS modules under the top cover. Avoid covering this area if possible. If the installation does affect signal strength, external 4G and/or GPS modules can be used (not supplied, available as accessories).

4.4.1 Installation of the 4G Antenna

Step 1:

Insert the SMA connector at the end of the 4G antenna cable into the socket as indicated below. Fasten tightly. Route the 4G antenna cable through the wire slot.

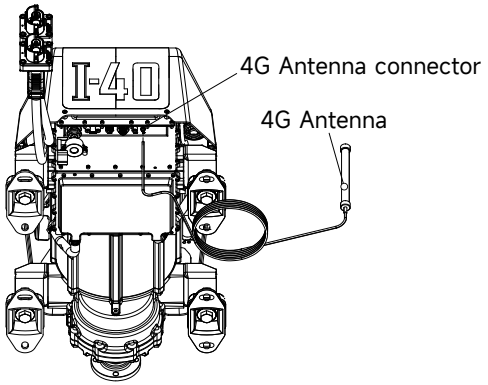
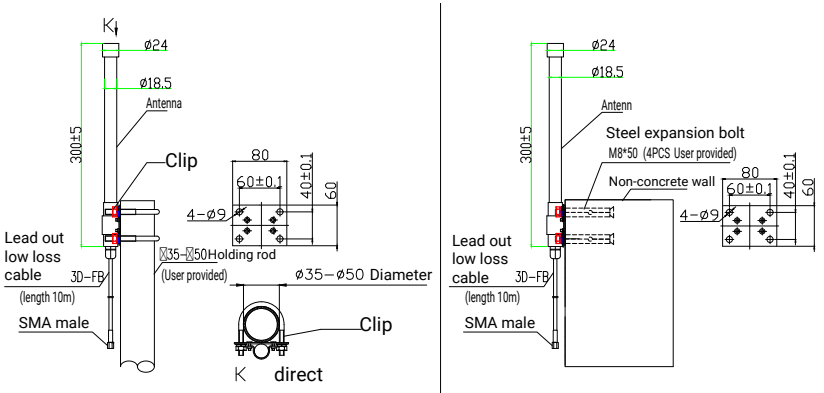


Figure 4.17 Connection between the 4G antenna and the inboard motor

Step 2:

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 4.18

- Pole Mounting: The customer provides a pole with an outer diameter of Φ35~Φ50mm. Then, use a supporting bracket to secure the 4G antenna tightly to the pole.
- Fixing to an existing structure: choose an area that's likely to have a clear signal, such as the top of a cabin or communication arch. Drill holes as appropriate and fix the aerial in place using 4x 8mm bolts (not supplied).

4.4.2 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.

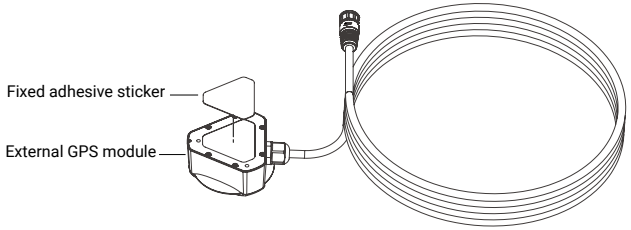


Figure 4.19 GPS external module adhesive pad fixing

• **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.

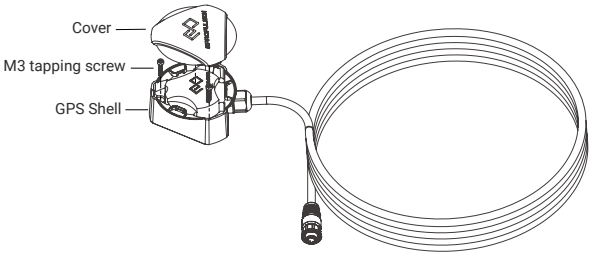


Figure 4.20 GPS External Module Screw Fixing

4.5 Grounding

In order to ensure safety and stability of system operation, the I series inboard motor (with a 5m grounding line), DCDC module, G102-100 battery, and 12V battery (purchased by the user) must be grounded during system installation.

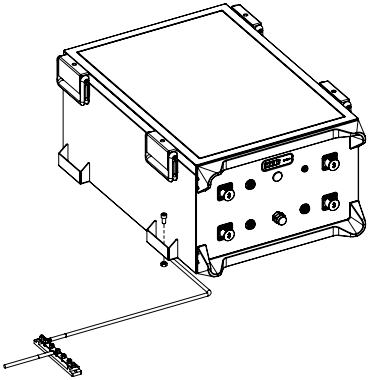
Grounding preparation and operation:

Hull grounding bolt, or grounded copper bar/bus bar and connected to the hull grounding point

Users or operators can prepare grounding line, connection terminals, bolts and other materials by combining the DCDC module, G102-100 battery, 12V battery layout position, and grounding bolt or grounding copper bar/bus position. Refer to the following instructions for grounding.

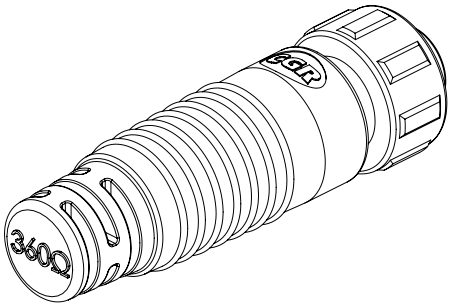
1. The inboard motor comes with a 5m long grounding wire harness. Please prepare your own grounding bolts or grounding busbars to connect to the hull grounding.

2. Refer to the figure below, prepare the grounding wire yourself, connect one end to the mounting foot of the G102-100 battery through the M8 fastener (prepare yourself), and connect the other end to the grounding bus or hull grounding point.



4.6 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.



Quantity of motors	Using an external GPS module			Not using external GPS modules		
	Communication Terminator 1	Communication Terminator 2	Communication Terminator 3	Communication Terminator 1	Communication Terminator 2	Communication 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.
Dock	Dock mode: In Dock Mode maximum power is limited to 50%, for smoother handling when mooring etc. Press once, to enter or exit Dock mode. This button only works with throttle lever in neutral.

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.

Button	Function
	Not work.
	Not work.

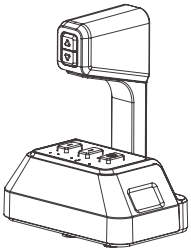
- **Dual-throttle operation**

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.

Dock and Turbo modes cannot be accessed at the same time.

Button	Function
	Not work.
	Not work.

Kill Switch Notes



- 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 5.11) to solve the problem.

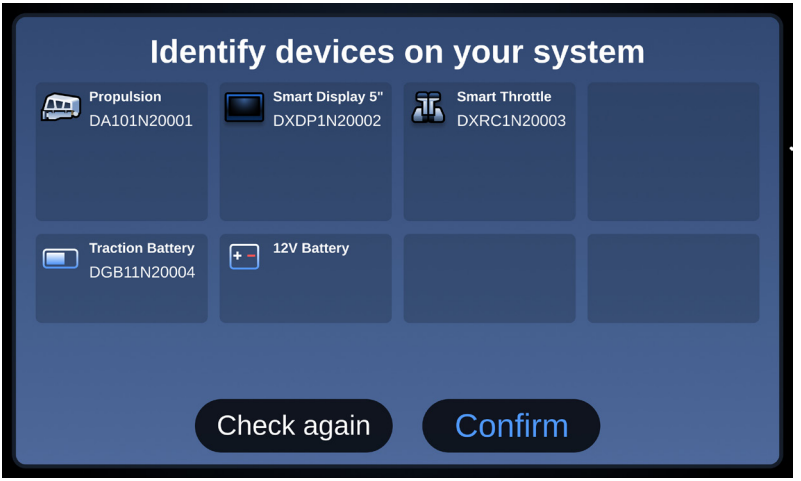
5.3 Perform initial configuration

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.

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

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



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

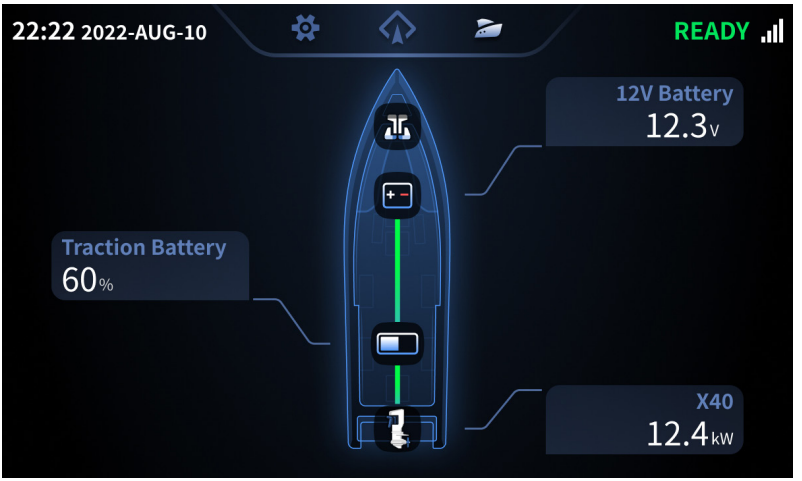
No.	Function	Description
1	Setting page	Click to go to the setting page.
2	Home page	Click to go to the home page.
3	Propulsion page	Click to go to the propulsion page.
4	Warning	When the system fails, it will prompt a fault icon.
5	System status	READY indicates that the system is ready to start.
6	4G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

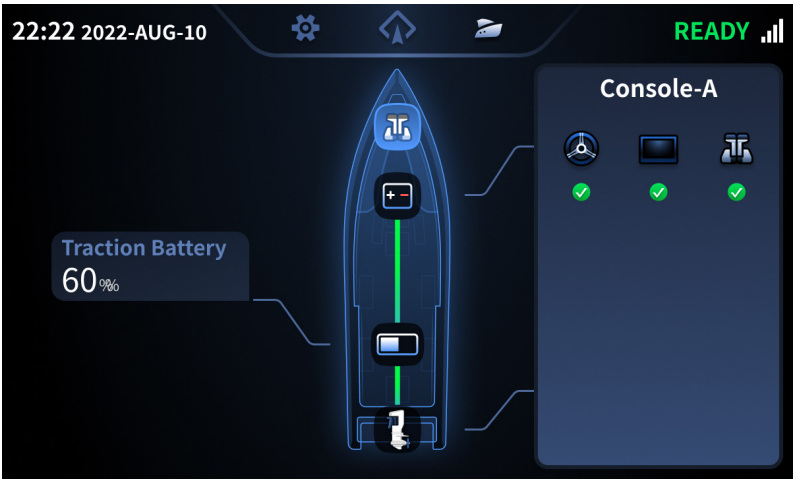
5.5 Propulsion Page

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

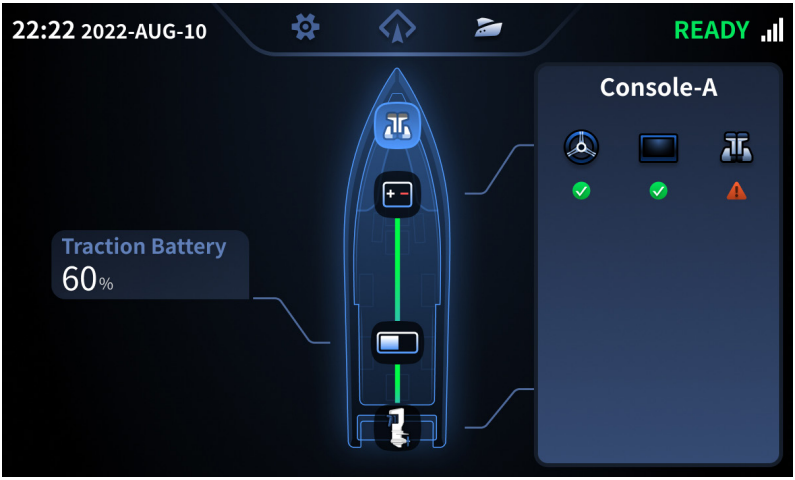
5.5.1 Control Console

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



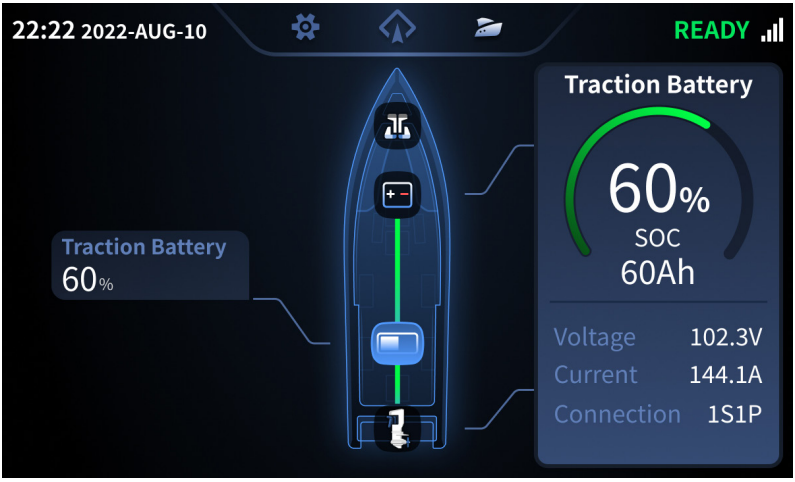


If an accessory fails, its icon will turn orange or red. Click the fault icon to view the problem in more detail.



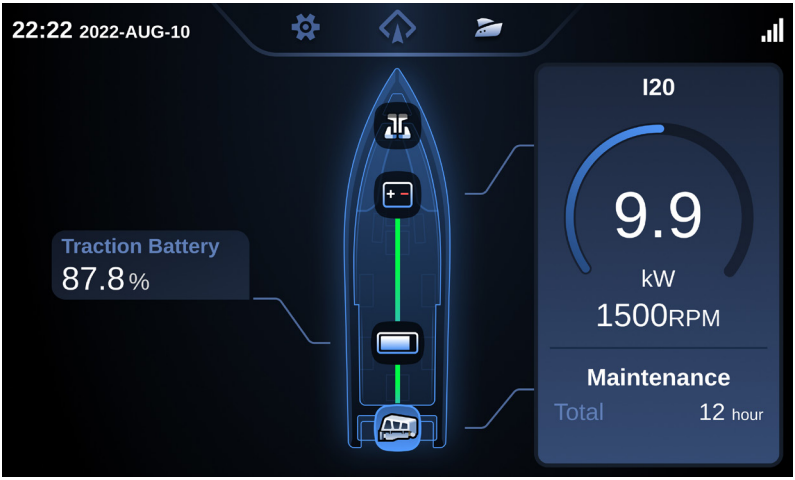
5.5.2 Traction Battery

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



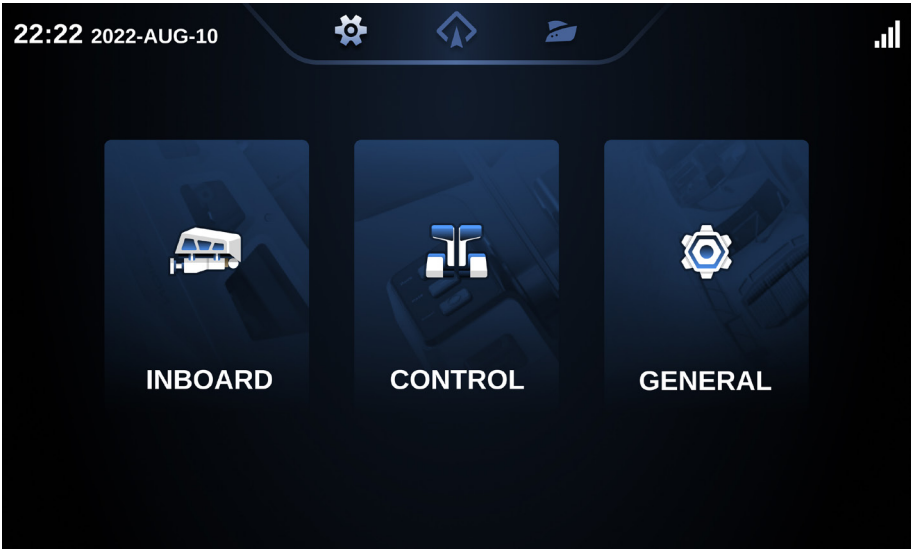
5.5.3 Motor(s)

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: Inboard, Control and General.



Button	Function
Inboard	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 Inboard 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

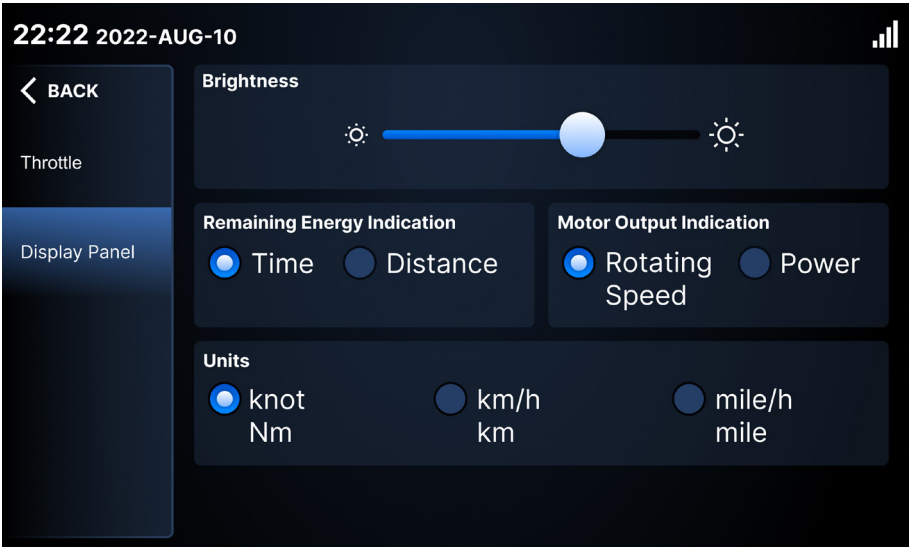
1. Single-throttle Settings

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 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 output 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 (kilometers 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 0200 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

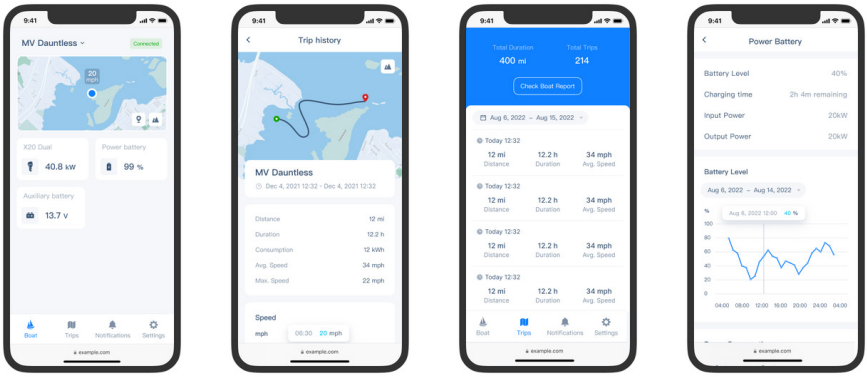
The system automatically calculates the maintenance time based on various maintenance items. When the maintenance time is reached, the system will notify the user on the display. After the user completes the maintenance, they can click "Maintenance Complete" to reset the timer.

5.6.3.3 Connectivity

The ePropulsion Link

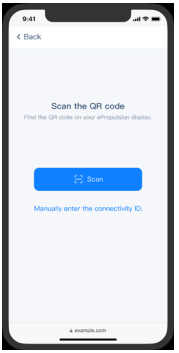
I-40 offers connectivity capabilities by communicating with the ePropulsion cloud through its 4G antenna. You can link your product to the ePropulsion Link, a user-friendly software designed for personal boat owners, enabling them to monitor their boat's status remotely on their mobile devices. ePropulsion Link offers various features, including but not limited to:

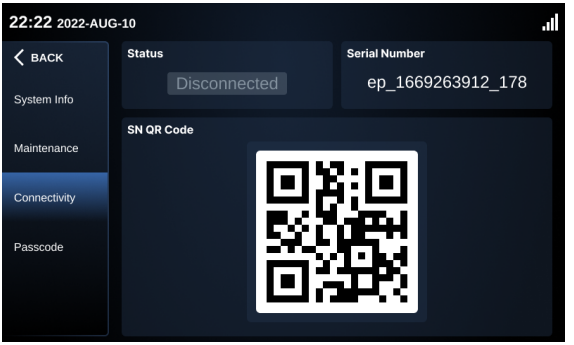
- Real-time location and speed tracking
- Monitoring the battery level and estimating remaining charging time
- Creating geofences and monitoring speed violations
- Automatically generating trip histories and boat reports
- Sharing data access with co-owners
- Setting up text message notifications



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.





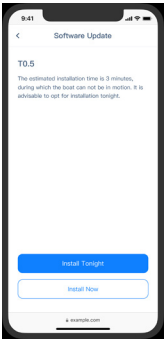
OTA Update

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 Motor 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

A	B	C
Fault	Cause	Operation
Abnormal noise	Cover bolts are loose	Tighten
	Deflector bolts are loose	Tighten
	Fan bolts are loose	Tighten
Abnormal vibration	The output shaft of the motor	Adjust the output shaft position
	Loose parts or fasteners	Maintenance or replace
	Loose parts or fasteners	Tighten
Fan stalled	Abnormal control/fan damage	Check or replace
Over-temperature alarm	The air deflector of the host is too dusty and the heat dissipation is poor	Clean

5.8.2 System faults

Module	Fault		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 overdrive	P101113	1. Check the operating conditions 2. Replace the rotation 3 Replace the motor controller
	Storage data failure		Replace the motor controller.
	Emergency stop	P101603	Check whether the emergency stop button is pressed
	The bus is overcurrent	P100C03	1. Check the operating condition 2. Check whether there is short circuit in the power supply of the system
	The phase current overcurrent hardware is faulty	P100C03	1. Check the operating condition 2. Check whether there is short circuit in the power supply of the system
	The phase current overcurrent software is faulty	P100D03	Check the operating condition
	Blocked	P101203	1. Check the operating conditions 2. Overhaul the transmission system;
	The generator is severely overvoltage	P100603	Check the high voltage supply circuit.
	The generator is severely undervoltage	P100813	1. Check the battery SOC 2. Check the status of the main contactor
	The generator is generally overvoltage	P100712	Check the high voltage supply circuit.

Module	Fault		Solution
Drive motor	The generator is generally undervoltage	P100912	Check the battery SOC
	The MOS is severely overtemperature	P100003	1. Check the operating condition. 2. Check whether the heat dissipation channel is blocked. 3. Check the coolant level
	The motor is severely overtemperature	P100203	1. Overhaul the motor or transmission system. 2. Check whether the heat dissipation channel is blocked. 3. Check the coolant level
	The MOS is generally overtemperature	P100402	1. Check the operating condition. 2. Check whether the heat dissipation channel is blocked.
	The motor is generally overtemperature	P100502	1. Check the operating condition. 2. Check whether the heat dissipation channel is blocked.
	Auxiliary power overvoltage	P100A13	Check the external input 12V power supply.
	Auxiliary power supply undervoltage	P100B13	Check the external input 12V power supply.
	busoff failure	P101443	1. Check the cable and communication terminator; 2. Confirm the presence of interference
ECU	Short circuit of GPS antenna	P130321	1. Check the GPS antenna wiring. 2. Replace the X-ECU and contact after-sale processing
	Open GPS antenna	P130421	1. Check the GPS antenna wiring. 2. Replace the X-ECU and contact after-sale processing
	CAN_A BUSOFF	P130843	1. Do not need to be processed if it is recoverable 2. Check whether the cable is in poor contact

Module	Fault		Solution
ECU	CAN_B BUSOFF	P130941	1. Do not need to be processed if it is recoverable 2. Check whether the cable is in poor contact
	CAN_C BUSOFF	P130A43	1. Do not need to be processed if it is recoverable 2. Check whether the cable is in poor contact
	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
	The BMS node is missing	P130D41	1. Check the BMS cables 2. Verify that the BMS are connected and powered properly
	The drive motor controller node is 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
	The remote control node is missing	P131143	1. Verify that the smart throttle is powered on 2. Check the wiring and cable of the smart throttle 3. Confirm whether the Smart throttle is connected and the power supply is normal
	Display panel node is missing	P131441	1. Check the cable and cable of the display 2. Check whether the display is connected and the power supply is normal
	High voltage interlock 1 signal failure	P132002	1. Recheck the high voltage interlock signal 1 cable 2. Replace the high voltage cable
	High voltage interlock 2 signal failure	P132102	1. Recheck the high voltage interlock signal 2 cable 2. Replace the high voltage cable

Module	Fault		Solution
Smart throttle	Abnormal throttle calibration data	H120203	1. Recalibrate away from strong magnetic fields 2. If it occurs repeatedly, contact after-sales treatment
	Abnormal throttle Angle	H120003	Stay away from strong magnetic fields
	Abnormal safety switch	H120403	Check that the safety switch is properly sucked into the slot
Smart display	CAN BUSOFF	H110041	1. Do not need to be processed if it is recoverable 2. Check whether the cable is in poor contact
	ECU LOST	H110141	1. Do not need to be processed if it is recoverable 2. Check whether the cable is in poor contact

6 Maintenance

6.1 Repair and maintenance

6.1.1 Daily maintenance

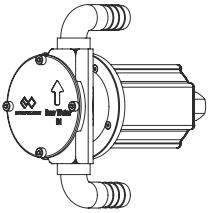
Items	Operations	Frequency
After sailing in sewage waters	After each sailing in heavily polluted waters, start the external circulation pump in clean water areas for circulating flushing. If the ship needs to operate in polluted waters for an extended period, it is recommended to install a three-way pipe on the water intake pipe, connecting it to fresh or clean water for flushing.	After each use
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
Check the motor grounding lines	Regularly check the grounding wire for damage or disconnection, and ensure that the fixing screws are not loose.	Every three months
Check the external circulating water pipes	Regularly check the external circulation pipes for leaks, blockages, air suction, and wear.	Every three months
Check the impeller pump impellers	Regularly inspect the impeller of the impeller pump for abnormalities or damage.	Every three months
Check the integrity of the entire machine	Check bolts and nuts for looseness, breakage, or falling off.	Every three months

6.1.2 Repair and maintenance

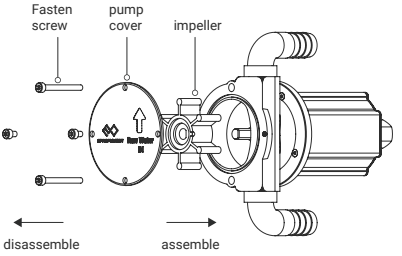
Maintenance cycle								
Components	Items	Operation	Work	First maintenance		Every interval thereafter		
				100hrs/ 3months	200hrs/ 6months	200hrs/ 6months	500hrs/ 1year	1000hrs/ 2years
Suspension	Foot pads of suspension	Check for abnormal deformation, cracks, or damage. Replace damaged mounts, referring to section 3.1.2.	Check/ Replace	●			●	
	Bolts of suspension	Check for loose mounting bolts and tighten any loose bolts, referring to section 3.1.2.	Check/ Replace	●			●	
Gear box	Gear oil	Drain the old gear oil and refill with new gear oil, referring to section 6.2.3.	Check/ Replace	●				●
	Drain bolt	Replace gear oil during gear oil changes, referring to section 6.2.3.	Check/ Clean/ Replace	●				●
	Oiling bolt	Replace gear oil during gear oil changes, referring to section 6.2.3.	Check/ Replace	●				●
Heat exchanger system	Internal circulation coolant	Check for low or leaking coolant. Repair leaks and refill coolant, referring to section 6.2.4.	Check/ refill		●			●
	External circulation pump impeller	Remove the impeller pump cover and inspect the impeller. Replace any damaged or abnormal impellers, referring to section 6.2.1.	Check/ Replace	●			●	
	Heat exchanger	Drain the coolant from the heat exchanger, remove the heat exchanger tube bundle, and clean any dirt, referring to section 6.2.2.	Check/ Clean		●		●	

6.2 Part of the repair and maintenance guide

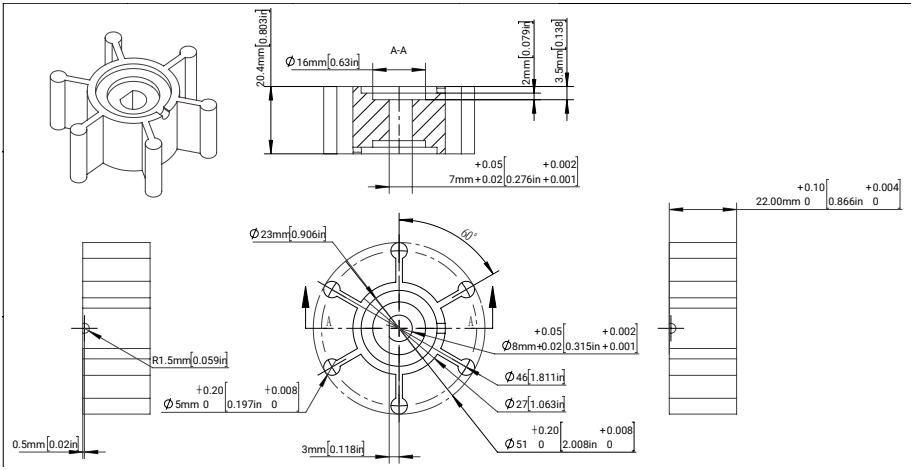
6.2.1 Repair flexible impeller pump



Water pump Assy



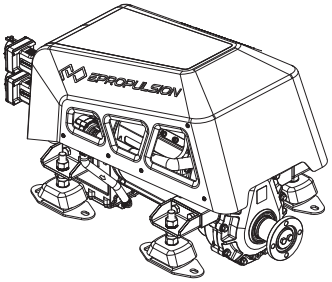
Figure



Size:Φ51mm x 22mm shaft:Φ8mm Blade Number:6 Material:NBR

1. Close the inlet and outlet water pipe valves (if any), otherwise, coolant will flow out during impeller pump maintenance.
2. Use a 4mm hex wrench to remove the 4 fastening bolts on the pump cover of the impeller pump, and remove the pump cover;
3. Remove the old impeller. Use a rag to clean the residual grease, sand and other sundries inside the pump body and on the surface of the pump cover until no visible particles can be;
4. Check the O-ring and new impeller on the pump casing for damage (if any, it needs to be replaced);
5. Thin-coated grease on the pump casing cavity, impeller surface, inside of pump cover and O-ring surface (Brand: PROUNOL lubricant);
6. Align the impeller with the flat position of the motor shaft;
7. Install the impeller pump cover and tighten the fastening bolt;
8. Power on to check whether the pump is working normally.

6.2.2 Regular cleaning of heat exchanger



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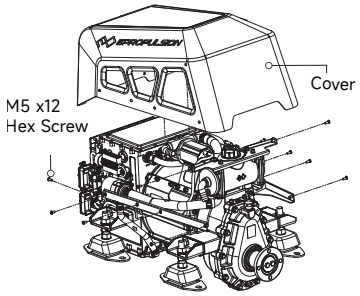

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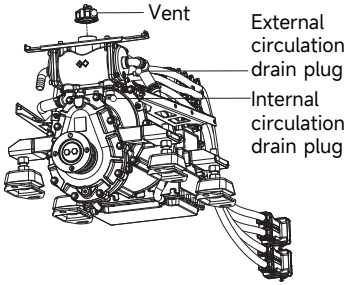

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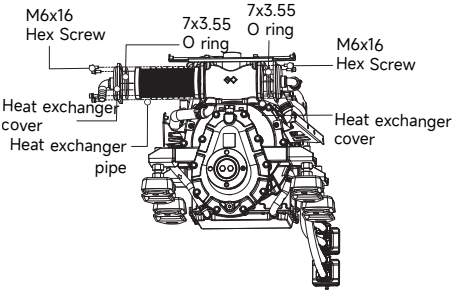


4

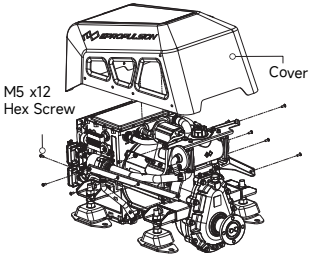
1. Use a 4mm internal hexagon wrench to remove 10 M5 × 12 internal hexagon bolts (5 on each side of the shell and 2 on the back), and remove the shell as shown in Figure 2.
2. Use a 5mm internal hex wrench to remove the external circulation plug of M10 × 1, as shown in Figure 3, to drain the external circulation water in the heat exchanger housing. Please pay attention to the placement of the container;
3. Unscrew the ventilation valve on the heat exchanger housing by hand, as shown in Figure 3. If it cannot be turned, it can be disassembled with a movable wrench, but please pay attention to protecting the ventilation valve.
4. Use a 10mm internal hex wrench to remove the domestic circulation drain plug of G1/2, as shown in Figure 3, and drain the domestic circulation coolant in the heat exchanger housing. Please pay attention to the placement of the container;
5. Use a 5mm internal hexagonal wrench to disassemble a total of 8 M6 × 16 internal hexagonal triple combination bolts on both sides of the heat exchanger, remove the heat exchanger end cover, and expose the heat exchanger tube bundle and O-ring, as shown in Figure 4.

6. Carefully remove the 75x3.55O-rings on both sides and check the status of the O-rings. If there are any abnormalities, please replace them.
7. Take out the heat exchanger tube bundle from the left side and soak it in marine biological remover such as Barnacle Buster for 12 hours. After soaking, wash the outer surface and inner pipeline with water. If the maintenance cycle is short, only use a high-pressure water gun to blow off the foreign objects inside and outside the heat exchanger tube bundle.
8. Restore the heat exchanger assembly and load in order: heat exchanger tube bundle, O-ring, end cap, M6 × 16 bolts, G1/2 domestic circulation drain plug, M10 × 1 external circulation drain plug. The tightening torque of the corresponding bolts is referred to in Section 6.3;
9. Inject ethylene glycol coolant (grade: Shell OTA-45°C) through the water inlet of the heat exchanger. During the injection of the coolant, the liquid level will slowly decrease as the air overflows. After the coolant level drops, continue to inject the coolant until it reaches the designated position. Refer to Section 6.2.4 for ethylene glycol coolant replacement.
10. Tighten the ventilation valve so that the exhaust port of the ventilation valve faces backward, and after confirming that there are no abnormalities, cover the housing and lock the bolts.

After the internal circulation pump is running, the liquid level may further decrease. If the liquid level decreases, please replenish the coolant.

When the storage temperature is below 0°C, it is recommended to drain the external circulation water in the heat exchanger housing by unscrewing the external circulation drain plug.

6.2.3 Replace Oil



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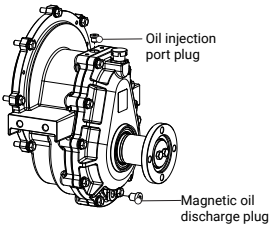

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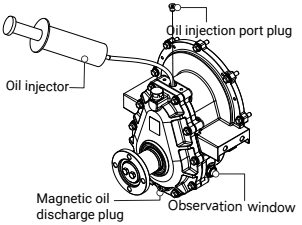


3

1. Use a 4mm internal hexagon wrench to remove 12 M5 × 12 internal hexagon bolts (5 on each side of the shell and 2 on the back), and remove the shell as shown in Figure 1.
2. Use a 6mm hexagonal wrench to first remove the M12 × 1.5 magnetic oil discharge plug, and the oil will slowly flow out. Then remove the M10 × 1 oil injection port plug to speed up

the oil discharge, as shown in Figure 2. Please pay attention to the position of the container to prevent lubricating oil from leaking and polluting the environment.

3. Clean up the iron filings or foreign objects adsorbed on the magnetic oil drain plug, check whether the rubber ring on the magnetic oil drain plug is damaged (if it is damaged, the magnetic oil drain plug needs to be replaced), and then install and tighten the magnetic oil drain plug after the gearbox oil is drained (under normal installation posture, no oil can be continuously dripped, allowing residual oil < 30ml), as shown in Figure 3.
4. Choose the appropriate oil injector. It is recommended to use an oil injector with an outer diameter less than 8mm, as shown in Figure 3. Inject 350ml of lubricating oil (brand: FOSS BluEV EDF special oil 4101) into the gearbox through the oil injector. After checking that the rubber ring of the oil injector plug is not damaged (if it is damaged, the oil injector plug needs to be replaced), install and tighten the oil injector plug, as shown in Figure 3.
5. Check for oil leakage. You can check the status of oil injection through the oil observation window, as shown in Figure 3.
6. Install and lock the housing.

When adding gear oil, please add a certain amount of 350ml of oil. Too little oil will cause insufficient lubrication, decrease the service life of the whole machine, or damage the sealing parts. Excessive oil will increase the efficiency loss of the system and cause serious overheating of the gearbox.

Selection of lubricating oil:

Kinematic viscosity (40 °C): 18~ 30 (mm ²/s)

Kinematic viscosity (100 °C): 4~ 7 (mm ²/s)

Viscosity index: ≥ 145

Brinell viscosity (-40 °C) ≥ 2700 (mPa.s)

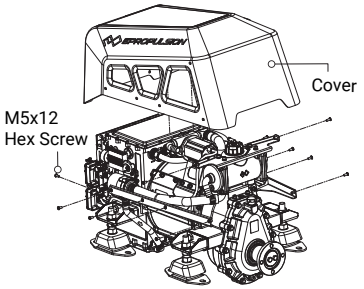
Pour point: ≤ -40 °C

Flash point: ≥ 200 °C

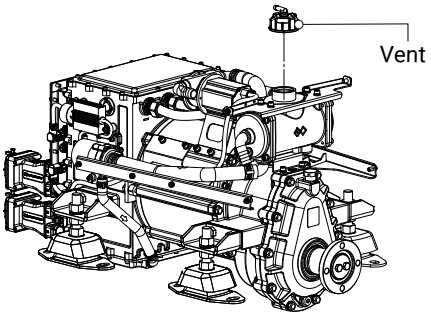
Recommended oils: Fuchs BluEV EDF special oil 4101; Mobil ATF660, ZF Lifeguard Fluid AG9.

6.2.4 Replace Glycol Coolant

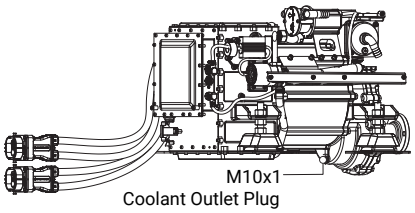
1. Use a 4mm hexagon wrench to remove 12 M5×12 screws (5 on each side of the cover and 2 on the back), and remove the I-40 cover referring to figure 1.
2. Unscrew the heat exchanger vent referring to figure 2. If it cannot be turned, it can be disassembled with a movable wrench, but please pay attention to protecting the vent.
3. Unscrew the bottom M10x1 coolant outlet plug referring to figure 3. Please pay attention to the position of the container to prevent coolant leakage and pollution of the environment.



1



2



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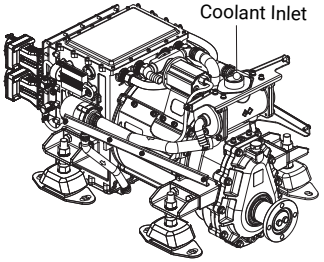

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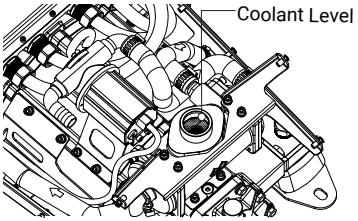
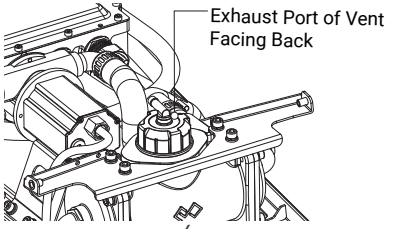


5



6

4. After draining the old coolant, reinstall and lock the M10x1 coolant outlet plug;
5. Fill ethylene glycol coolant from the coolant inlet (Shell OTA-45 ° is recommended). Stop filling each time you reach the coolant level position shown in Figure 5. The air will slowly overflow. After the coolant level gradually decreases, add ethylene glycol coolant to the coolant level position shown in Figure 5. Repeat the above process until about 1550mL of ethylene glycol coolant is injected. The overflow of air inside the pipeline can be accelerated by moving the domestic circulation pump.
6. After confirming that the coolant has been injected into the position shown in Figure 5 and the coolant level is no longer decreasing, install and tighten the vent, paying attention to the direction of the vent exhaust port facing back, as shown in Figure 6.
7. Install and lock the cover.

When injecting domestic circulation coolant, in order to fully exhaust the internal air, please click the domestic circulation pump 1 or 2 times through the smart display to ensure that the pump stops running for 60s, the coolant level is in the qualified range shown in Figure 5, and the coolant is full of the pipeline. If it is not full, the domestic circulation pump will detect abnormalities, and might cause motor overtemperature failure.

During maintenance or repair, if there is residual coolant inside, the actual filling amount is less than 1550mL, subject to the coolant level no longer decreasing.

6.3 List of fasteners

Assembly to be fastened	Items	Specifications	Locking reference moment (Nm)
Cover	Hex socket flat head screw	M5x12, A2-70	1.5~2.0
Impeller pump cover	Hex socket round head screw	M4×45, A2-70	1.5~2.0
Impeller pump cover	Hex socket round head screw	M4×8, A2-70	1.5~2.0
Suspension foot fasteners	Hexagon bolt	M12×25, Class8.8	70~75
Suspension mounting sheet metal	Hex nut	M16×2, Class8.8	120~125
Suspension lock nut - down	Hex nut	M12x1.75	21~23
Output shaft flange locking bolt	Hexagon bolt	M10x40, Class10.9	55~60
Output shaft flange locking nut	Hex nut	M10x1.5, Class 10	55~60
Oil discharge port	Magnetic oil discharge plug	M12×1.5	10~11
Oil injection port, coolant outlet port	Hex seal plug	M10×1.0	6~7
Coolant outlet port	Hex seal plug	G1/2	17~18

Apply Loctite 243 to all screws of the machine when tightening them before leaving the factory. Apply thread glue to the screws when tightening them again for anti-loosening.

7 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 date of delivery of products to end customers (the “Limited Warranty Period”), the I series motor and G battery will have another extend 36 months warranty period after registration on the official website. 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-conform parts. Any warranty claim must be made within six (6) months of discovery of issues as provided below.

If the Limited Warranty Period expires, you can still enjoy maintenance services from dealers/ distributors authorized by ePropulsion (the “ePropulsion Service Partners”) with minimum maintenance charge per occurrence.

In all warranty cases, ePropulsion will only bear the repair cost and other costs (such as those related to product installation, disassemble, transportation, financing, rental, etc.) as a direct result for issues covered by the Limited Warranty only. Any costs irrelevant to or out of the scope of the Limited Warranty will be born by the Customer alone., which shall NOT include costs irrelevant such as those related to product installation, disassemble, transportation, financing, rental, etc.

Beyond the Limited Warranty, the Customer may have statutory rights in your 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 for commercial/professional use, 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 Use refers to application cases that have high use frequency, high-reliability requirement or aim for money making, etc.**

To keep your warranty valid, you shall follow:


Keep the product label intact and record the Serial Number shown on the label. Never tear the label off the product. A product without the original product label is not covered by the Limited Warranty provided by ePropulsion;


The Limited Warranty is not transferable and will not be reissued;


The Limited Warranty may change from time to time. Pls 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 period of up to 5 years.

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 Out of Warranty

ePropulsion may refuse a warranty claim if:

- Any improper operation contradicts what is written in the user manual;
- Accident, misuse, dropping, improper care or storage, willful abuse, physical damage, overcharging, over discharging, or unauthorized repair;
- Water ingress caused by external sources such as fishing nets, submerging underwater, etc;
- Product modification, alternation, disassembly, or parts/accessories attachment, which are not expressly permitted or recommended by ePropulsion;
- Failure of, or damage caused by, any 3rd party products;
- Repositioning of the high-voltage batteries in the boat;
- The battery incorrectly charging, overcharging, over-discharging, operating in temp out of scope described in the user manual;
- Consumables are out of warranty scope (like propeller, anode...etc.);
- Purchases of product from unauthorized dealers or seller;
- Normal wear and tear and routine servicing are excluded from the warranty;

- The product gets further damaged due to improper packing during delivery. The further damaged part will be deemed as out of warranty coverage;
- Lithium battery is classified as a UN9 hazardous item, posting and packing must be in accordance with the relevant law of the local country directive. Non-compliance may result in out of warranty coverage.

7.2 Limited Warranty Claim Procedures

The Customer shall follow the warranty claim process to make a Limited Warranty claim:

1. Contact your nearest ePropulsion Service Partners and they will provide further instruction to you if such defects are covered by the Limited Warranty or theirs.
2. Send the defective product to them together with Proof of 1(st)-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 shall be kept intact. The warranty is valid only when the information above is correct, genuine, and complete;
3. Make sure the product is properly packed during delivery, the original package is highly recommended.
4. The ePropulsion Service Partners will conduct diagnosis and examination on 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 bearded by you.
6. In case your warranty claim be rejected, a repair/replace 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.

WARRANTY CARD || ePropulsion Control System

(*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.	

Scan to register your product

Product tutorial

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