

WOLONG 卧龙

Power your future



Flowstar Series User Manual

2023.06 Version 2.5

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Acknowledgement

Thanks for purchasing the product and your trust and support in our company are sincerely appreciated.

We are dedicated to providing you with more safe, high-performance, comfortable, reliable and environmentally friendly propulsion equipment and entertainment products on water, such as electric outboard motors, electric inboard motors, sup/kayak motors, reliable lithium batteries and accessories, etc.

Welcome to visit Wolong Marine official website - www.wolong-electric.com and contact us if you have any concerns.

Using This Manual

Before using this product, please read this user manual carefully and thoroughly to understand the correct and safe operations methods. By using this product, you hereby agree that you have fully read and understood all contents of this manual. Wolong Marine is not responsible for any financial damage or personal injury incidents caused by operations that do not comply with the provisions of this manual.

Due to ongoing optimization of our products, Wolong Marine reserves the rights to constantly adjust the contents described in the manual. Wolong Marine also reserves 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.wolong-electric.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.wolong-electric.com.

Wolong Marine reserves the rights to 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

When reading this user manual, please refer to the following legend:



Instructions, precautions or operation reminders before use



Important instructions, warnings or precautions



Useful information or tips

Serial Number

Serial Number is the unique identification number of this product, which is an important certificate for after-sales services such as warranty, replacement and return of this product. The serial number label of the main body and battery of the Flowstar series electric outboard motor is located in the position shown in the figure below. Please find this label on the product and record the Serial Number shown. Do not tear off the label, otherwise the product after-sales services will be invalid.

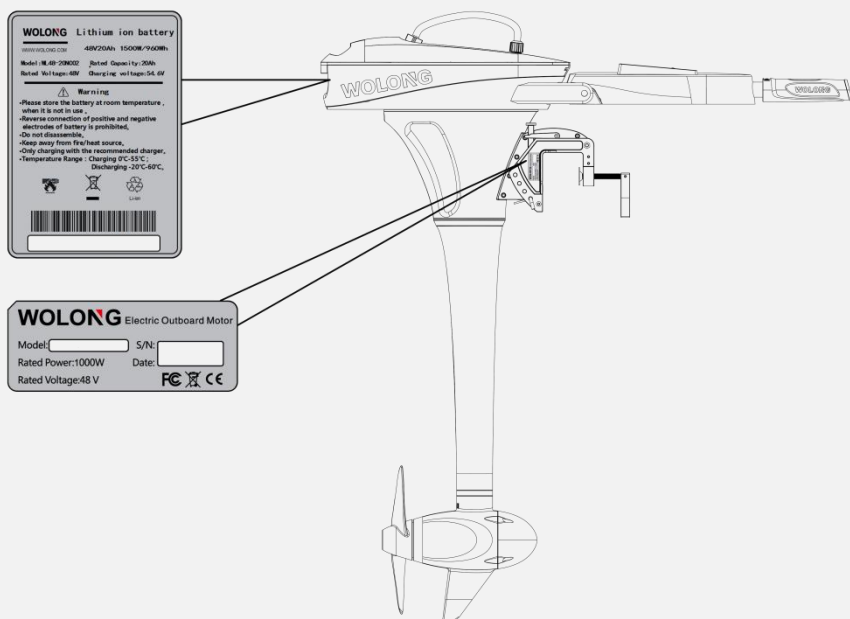


Figure 0-1

Table of Contents

Acknowledgement	- 1 -
Using This Manual	- 1 -
Symbols	- 1 -
Serial Number	- 2 -
Table of Contents	- 3 -
1. Product Overview	- 5 -
1.1 In the Package	- 5 -
1.2 Parts and Diagram	- 7 -
1.3 Technical Data	- 8 -
1.4 Declaration	- 10 -
2. Important Notes	- 11 -
2.1 Electric outboard motor	- 11 -
2.2 Battery	- 12 -
3. Installation	- 13 -
4. Operation	- 16 -
4.1 Checklist before Start	- 16 -
4.2 Starting	- 16 -
4.3 Stopping	- 17 -
4.4 Tiller Adjustment	- 18 -
4.5 Tilting up the Outboard Motor	- 19 -
4.6 Fixing the Steering Direction	- 20 -
4.7 Fixing for Easy Carrying	- 20 -
5. Control System	- 21 -
5.1 Display Panel	- 21 -
5.2 Calibration	- 23 -
5.3 Warning Messages	- 24 -
6. Battery Charging	- 26 -
7. Trim Angle Adjusting	- 28 -
8. Anti-grounding Mode	- 30 -
9. Maintenance	- 31 -
9.1 Notes	- 31 -
9.2 Propeller Maintenance	- 31 -
9.3 Replacing the Anode	- 32 -
9.4 Maintenance of Electrical Contacts	- 32 -
9.5 Maintenance Time Table	- 33 -
10. Transportation and Storage	- 34 -
10.1 Transportation	- 34 -
10.2 Placement	- 34 -
10.3 Storage	- 34 -

11. Emergency Situations - 35 -
 11.1 Impact Damage - 35 -
 11.2 Overboard - 35 -
 11.3 Low Battery Level - 35 -
12. Warranty terms - 36 -
 12.1 Warranty Policies - 36 -
 12.2 Out of Warranty - 36 -
 12.3 Warranty Claim Procedures - 37 -

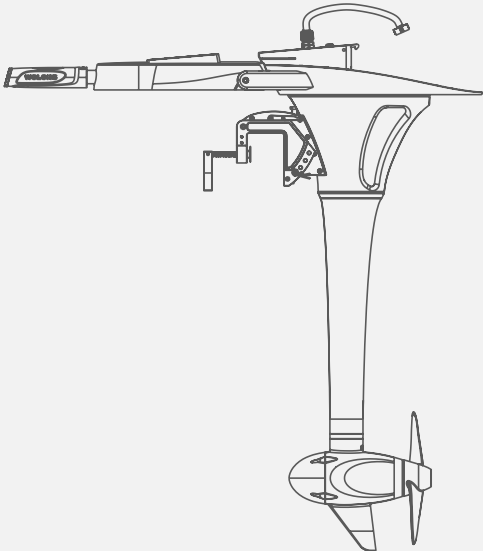
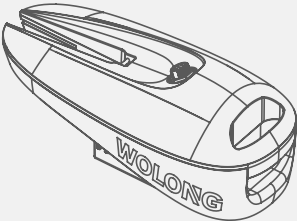
1. Product Overview



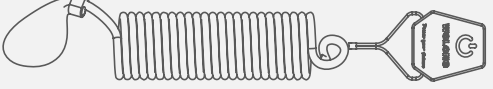
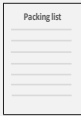
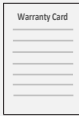
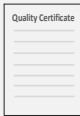


Flowstar series is designed to be an integrated electric outboard motor with high overall efficiency and long cruising duration. Flowstar 1.0 is equivalent to a 3hp petrol outboard engine in propulsive power but works quieter, while The power of Flowstar 1.5 performance comparable petrol outboard engine 5 hp in thrust. Both with Integrated foldable tiller design or remote control, it's easy to portability and store. All these high-performance features make Flowstar series an ideal option for tenders, dinghies and sailboats.

Flowstar series includes three models. Flowstar - S, Flowstar - L and Flowstar - XL, which have different shaft lengths for adaptation of different transom heights.

1.1 In the Package

Unpack the package and check all the items inside the package against the packing list below. below If there is any transport damage caused during transport or lack of any listed item, please contact your dealer immediately.

Items	Qty./Unit	Figure
Electric outboard motor (Main body)	1 Set	
Battery (Purchased separately)	1 Set	

Items	Qty./Unit	Figure
External Battery Cable (Purchased separately)	1 Piece	
Charger (Purchased separately)	1 Piece	
Security key	2 Piece	
User Manual, Packing list, Warranty Card & Quality Certificate	1 Sets	<div>    </div> <div>   </div>



Save the Wolong Marine's original package for the electric outboard motor storage.



Other accessories mentioned in this user manual need to be purchased by users From Wolong Marine authorized dealers.



Flowstar battery has four official chargers. They are standard charger, fast charger, solar charger And 12Vdc DC charger. Purchased separately from Wolong Marine Authorized Dealer if required.

1.2 Parts and Diagram

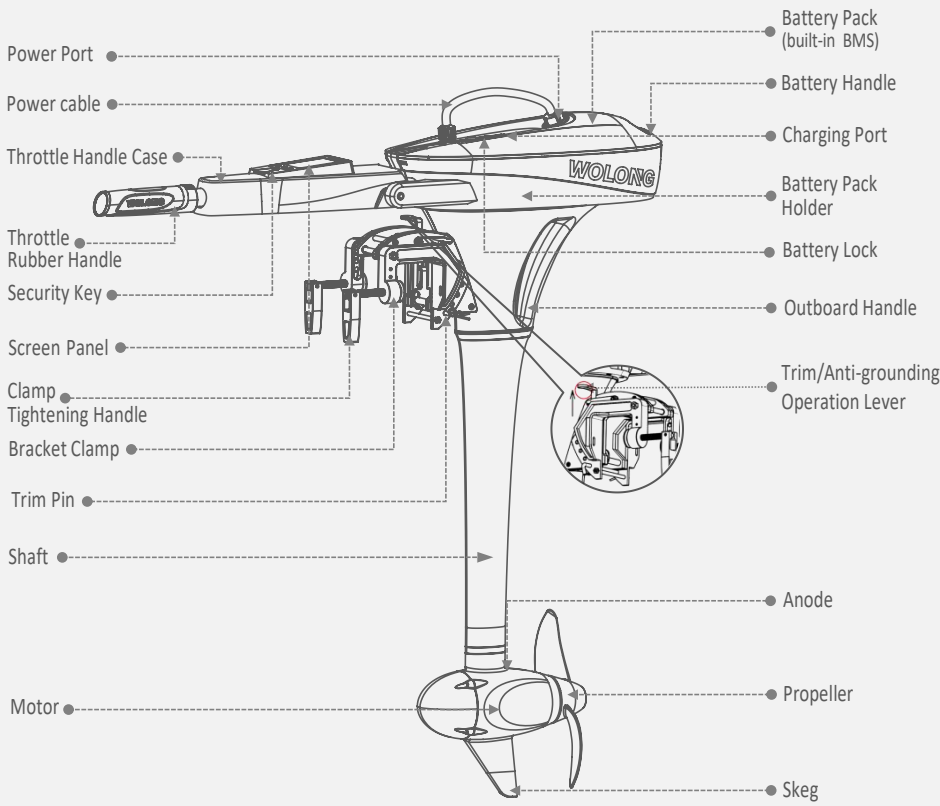


Figure 1-1

1.3 Technical Data

Model	「Flowstar 1.0 - S/L/XL」	「Flowstar 1.5 - S/L/XL」
Type	Electric outboard motor	
Input power	1 kW	1.5 kW
Comparable petrol outboards	3 HP in propulsive / 4 HP in thrust	4 HP in propulsive / 5 HP in thrust
Maximum overall efficiency	55%	49%
Rated propeller speed	1200 rpm	1800 rpm
Control system	Integrated Fold-able Tiller / Wireless Remote Control / Remote Control	
Weight *	14.66 kg / 32.32lbs (S) 、 15.31 kg / 33.75lbs (L) 、 16.80kg / 37.04lbs (XL)	
Dimensions (L × W × H) *	504.29 × 206.77 × 870.36 mm / 19.85 × 8.14 × 34.27 inches (S) 504.29 × 206.77 × 1027.84 mm / 19.85 × 8.14 × 40.47 inches (L) 504.29 × 206.77 × 1124.36 mm / 19.85 × 8.14 × 44.27 inches (XL)	
Shaft length	381.00 mm / 15 inches (S) 538.48 mm / 21.2 inches (L) 635.00 mm / 25 inches (XL)	
Trim Angles	Manual, 4 - step, 0°、7°、14°、21°	
Tilt Angles	Manual, with impact protection, 70°	
Propeller (diameter x pitch)	11"× 5.8" Two-bladed composite propeller	7.87"× 5.35" 3-bladed composite propeller

* The weight is only for the main body of an electric outboard motor, excluding the battery, control system and remote operation kit.

* This dimensions only refers to for the main body of the electric outboard motor without the tiller installed.

Flowstar Battery

Chemistry	Lithium-ion polymer battery
Nominal capacity	936 Wh / 20 Ah
Rated voltage	48 V dc
Cut-off voltage	36 V dc
Full charged voltage	57.6 V dc
Charging time	Standard Charger: 8.5 hours Fast charger: 2.5 hours
Battery Life	800 cycles at 80% DOD
Weight	6.13 kg
Recommended charging temperature	0°C to 45°C (32°F to 113°F)
Recommended discharge temperature	-10°C to 45°C (14°F to 113°F)

External Battery Requirement

Type	Lead acid battery or lithium battery
Rated voltage	48 V dc
Minimum voltage	36 V dc
Maximum voltage	57.6 V dc
Minimum sustained discharge current	28 A dc
Internal resistance	< 100 mΩ

Flowstar Battery Charger

Output power	180 W
Output voltage	54.6 V dc
Output current	3.5 A
Cut-off current	0.35 A
Temperature range	Operation: -10°C ~ 45°C (14°F ~ 113°F) Storage: -30°C ~ 70°C (-22°F ~ 158°F)
Rated input voltage	100 ~ 240 V AC
Output frequency	50 Hz / 60 Hz
Input current (max)	2.5 A @ 220 V
Efficiency	≥ 90%



It is strictly forbidden to use Flowstar series battery charger to charge other batteries, and it is strictly forbidden to charge the Flowstar series battery with unofficial standard charger .

1.4 Declaration

Object of the Declaration:

Products: Electric outboard motor

Model: Flowstar1.0 - S, Flowstar1.0 - L, Flowstar1.0 - XL,
Flowstar1.5 - S, Flowstar1.5 - L, Flowstar1.5 - XL,

Responsible Company: Wolong Electric Group Co., Ltd

Manufacturing Company: Wolong (ZHEJIANG)Wolong Marine Technology

Manufacturing Company Address:

No. 1801, West Section of Renmin Avenue, Cao'e Street, Shangyu District, Shaoxing City, Zhejiang Province

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

EMC - directive 2014/30/EU

RED - directive 2014/53/EU

Applicable standards:

EN IEC 61000-6-2:2019

EN 301489-1:2019

EN IEC 61000-6-4:2019

EN 301489-17:2020

EN 62479:2010

EN 301489-19:2019

EN 300328:2019

EN 3003413:2021

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

1. This device may not cause harmful interference and,
2. This device must accept any interference received, including interference that may cause undesired operation.

Signature: 

Xinyuan Pang , Chairperson and legal representative of Wolong Electric Group Co., Ltd.

2. Important Notes

Flowstar series electric outboard motor is designed to offer clean propulsion and excellent experience on water, For safety reasons, please read the following instructions and notes before using this product. By using this product you hereby :

- 1) agree to these notes and instructions;
- 2) agree not to use this product for purposes that infringe upon or contravene laws and regulations;
- 3) agree to be responsible for your own conduct while operating this product

2.1 Electric outboard motor



Notes

- ※ The product should only be used by adults who have fully read and voluntarily abide by this user manual, and teenagers must be used under the supervision of an adult.
- ※ Always have a paddle on board especially if the electric outboard motor is the only propulsion system.
- ※ Please be familiar with the basic operation of this product before use, including: start, stop, control direction and tilting operation.
- ※ Check the status of the electric outboard motor and battery level before each trip.
- ※ Follow the boat manufacturer's instructions on the maximum allowed electric outboard motor power of your boat, do not overload the boat or the electric outboard motor.
- ※ Only run the electric outboard motor while the propeller is under water, do not idle the propeller.
- ※ Stop the electric outboard motor immediately if someone falls overboard.
- ※ Do not leave the electric outboard motor in the water while the boat speed reach 35km/h.
- ※ Tilt up the electric outboard motor above water after use.
- ※ Wash the electric outboard motor with fresh water after operating in seawater.
- ※ For protection considerations, the motor will stop immediately if the battery voltage drops below the critical level during operation or when running.
- ※ Take seriousness of battery safety. Follow battery instructions, avoid short-circuit, overheat, overcharge and over-discharge.
- ※ To keep electric connectors in good condition, please spray the connectors about every 3 months with contact spray.
- ※ To store the electric outboard motor, put the machine in original Wolong Marine package and keep it in a dry and ventilated place without direct sun exposure.
- ※ If the communication cable is not connected, ensure to cover the cap of the communication connector on the machine, otherwise the connector will corrode and the machine will not be able to communicate.

2.2 Battery

The Battery specially designed for Flowstar series electric outboard motor can only be charged with a Wolong Marine original charger. The battery has a built-in battery management system which provides cell balancing function, over charging protection, over discharging protection, short-circuit protection, over temperature protection, under temperature protection, over current protection, communication function, etc. Though the battery has been tested to be reliable and safe during normal operation, it should be handled with care as safety is critically important. Please adhere to the following instructions when using it.

Notes

- ※ Do not drop, strike or squash the battery.
- ※ Do not disassemble the battery or conduct unauthorized repair, the battery disassembly can only be conducted by Wolong Marine service.
- ※ Never charge a broken or damaged battery.
- ※ Only charge the battery with an Wolong Marine original charger.
- ※ Do not charge the battery near flammable materials like carpet or wood.
- ※ Disconnect charger when not in use.
- ※ Though the battery is IP67 waterproof, it's suggested not to immerse it in water or store it in moist environment. Do not leave the electric outboard motor in the water while the boat speed reach 35km/h.
- ※ Keep conductive objects away from the discharging port and charging port to avoid damage of electronic components.
- ※ Use the port cap to avoid accidental short-circuit.
- ※ Never discharge the battery below 33V. Store the battery in a dry environment.
- ※ Charge the battery immediately after full discharge.
- ※ Before long storage time, ensure the battery charge level is 60% around. Store the battery at 15°C ~ 25°C (59° ~ 77°) ambient temperature. If the battery level is larger than 60% for more than ten days without activity, the battery itself will discharge with a small current around 100mA until it reaches the 60% battery level.
- ※ Battery will actively discharge to 75% after 20 days without charging or discharging.
- ※ If battery level is low for a long time, it will enter sleep mode. Charge to wake it up.
- ※ After a long storage time, fully charge the battery before use.
- ※ Do not leave the battery in a hot or pressurized container, such as trunk of the vehicle on hot days.
- ※ During long time storage, activate the battery every 3 months by a charge condition and keep the battery charge level at 60% around. This activation is very important and it can help to keep the battery in good condition.
- ※ Dispose of unusable or damaged batteries in a container specially reserved for this purpose, follow appropriate local guideline and regulations. For further information you can contact your local solid waste collecting point or your dealer.
- ※ Never dispose the battery as general household waste or in fire.

3. Installation

Step1: Hang the electric outboard motor on the transom and tighten the two clamp handles.

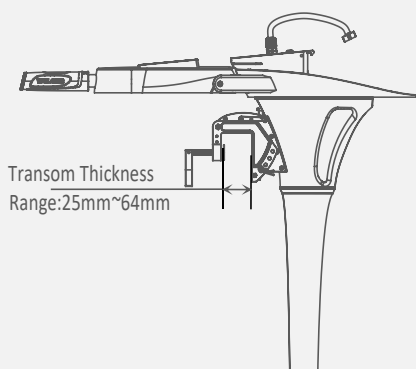


Figure 3-1

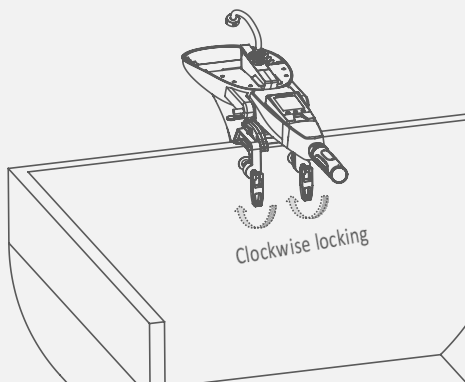


Figure 3-2

After tightening the clamp handles fully, the users can also use two screws to fix the outboard to the boat. The dimensions of the two mounting holes are shown below.

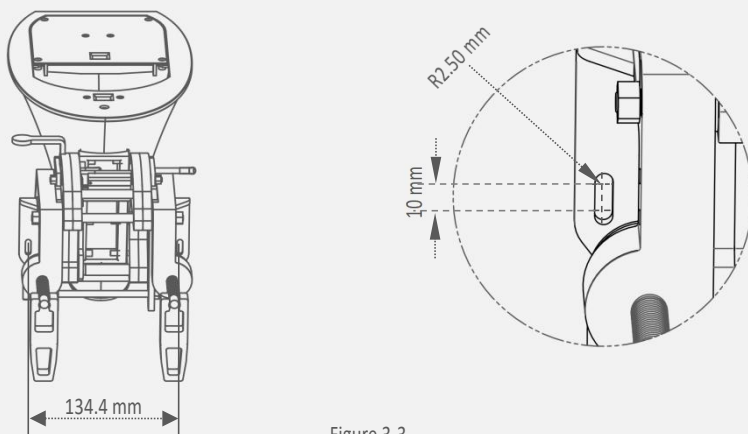


Figure 3-3



Never use screws to fix the electric outboard motor when the clamp handles are not fully tightened.



Ensure the electric outboard motor is firmly fixed as loosened clamp screws may cause the electric outboard motor to fall into water or get damaged. Check the screws or clamps every time before use since they may be loosened because of mechanical vibrations.



A cable is recommended to be used to avoid complete loss of your electric outboard motor in case it falls off the transom. Use the cable to connect your electric outboard motor and a secure mounting point on the boat.



For single-engine boat, ensure to mount the electric outboard motor on the center line of your boat. For twin-engine boat, ensure to mount the electric outboard motor equidistant from the center line and the minimum space between electric outboard motor is 840mm. If the boat shape is asymmetric, please consult your dealer to get proper solution.

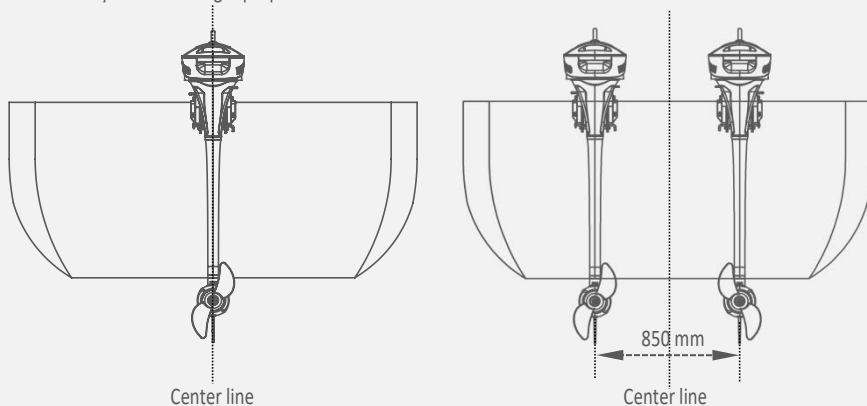


Figure 3-4

The mounting height of the electric outboard motor affects the running speed seriously. When the mounting height is too high, ventilation may occur to waste power. When the mounting height is too low, the water resistance will increase and it will lead to efficiency and running speed reducing. Please install this product correctly to ensure that the distance of the top of the propeller from the boat bottom is about 140mm.

Transom Height	Recommended Model
Use requirements of shallow water or mini boats	Flowstar 1.0 / 1.5 - S
400mm~500mm	Flowstar 1.0 / 1.5 - L
≥ 500 mm	Flowstar 1.0 / 1.5 - XL

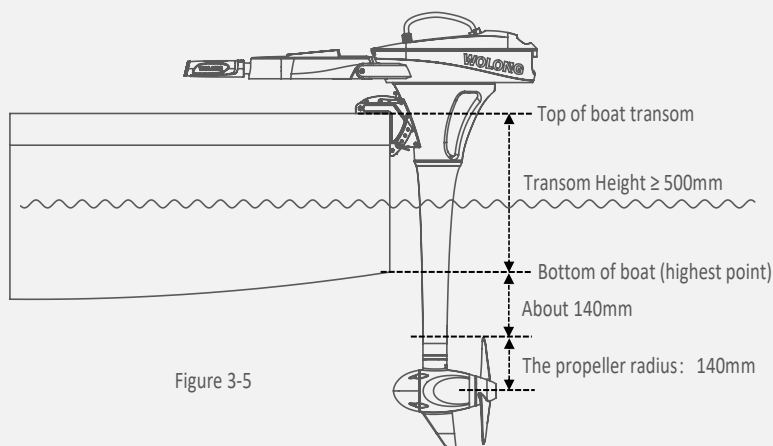


Figure 3-5



Select a proper model according to your transom height and applications. The optimum mounting height is affected by the conditions of boat and requirements. It's recommended to test running at a different height to help obtain the optimum mounting height. You can consult your dealer to get more information.

Step2: Install Flowstar Control System. Please refer Flowstar Control System Installation Guide, mount the Flowstar Remote Control/ Flowstar Integrated Tiller on the boat/outboard, and complete the wiring between Flowstar Control System and Electric outboard motor.

Step3: Lift the battery by gripping the handle, align the two slots on the battery edge and push horizontally towards to the blocks on the battery bracket until the battery lock is stuck on the fixed shaft of the battery bracket.



Ensure you hold the battery handle before detaching or mounting the battery.

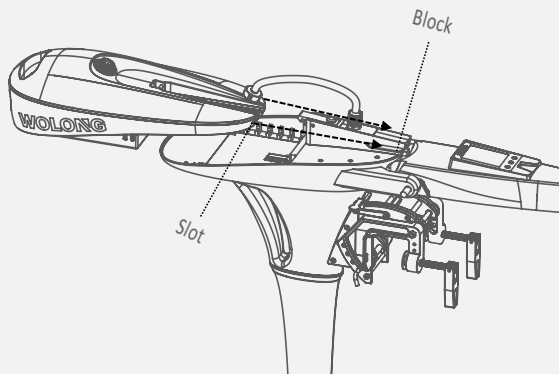


Figure 3-6

Step4: Plug the power cable connector in the power port and tighten the connector. The connector is metal, and its own needs to be figure tight $\frac{1}{2}$ of a turn clockwise.

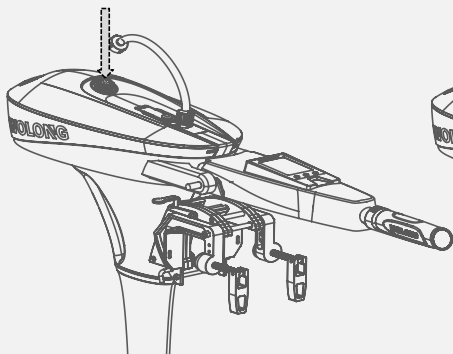


Figure 3-7

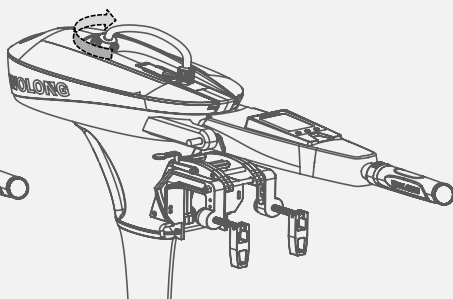


Figure 3-8



Make sure the power cable connector and socket are dry before connecting to avoid short-circuit.





Please spray and clean the connectors about every 3 months with contact spray.

4. Operation

4.1 Checklist before Start

1. Check and ensure the battery has enough power.
2. Ensure the electric outboard motor is correctly and firmly installed on the boat.
3. Ensure the propeller is correctly and firmly installed on the electric outboard motor.
4. Ensure the battery is correctly and firmly installed on the electric outboard motor.
5. Before start, check and ensure the throttle is in zero position.
6. Ensure the throttle can travel smoothly.
7. Check the connections before each trip, ensure the connections are correct and secure, no disconnection or worn or aging connections.
8. Check and ensure the power port is dry to avoid short-circuit.

 Only start the outboard when the propeller is under water.

 If the cable has been immersed in water, please dry the cable thoroughly before connection or turning on power.

4.2 Starting

Step1: Put the security key on the proper position of tiller/remote control, and attach the other end of the security key to your wrist or life vest.

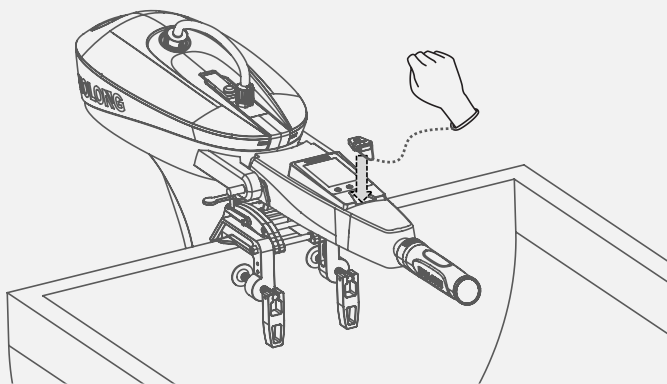


Figure 4-1

Precautions!

- For safety consideration, please use the security key in the package, and always attach the lanyard of security key to your wrist or life vest, so that the outboard will be stopped in the emergency situation of falling.
- The security key has magnetic field, keep it 50cm/20inch away from pacemakers and other medical implants.
- The magnetic field of security key may interfere with some electronic instruments, keep it away from these electronic instruments.
- Keep the security key 50cm/20inch away from magnetic cards (e.g. Credit cards) and other magnetic media.

Step2: Press and hold (≥ 2 secs) the “POWER” button to power on the system.

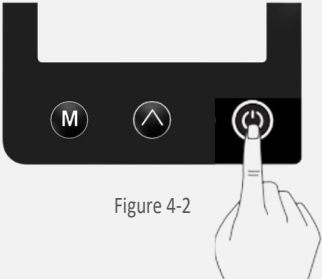


Figure 4-2

Step3: Turn the throttle from zero position to a desired direction to start the electric outboard motor. Change the heading direction of the boat by turning the tiller on horizontal level.

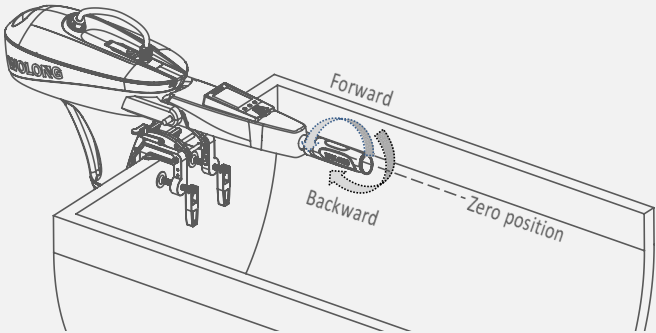
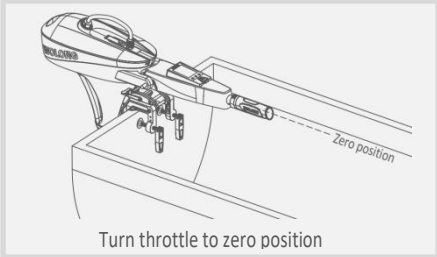


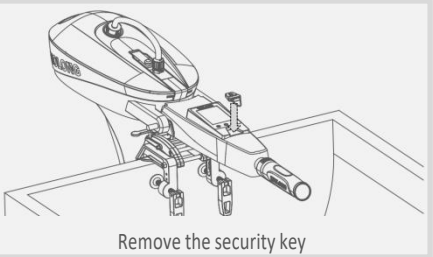
Figure 4-3

4.3 Stopping

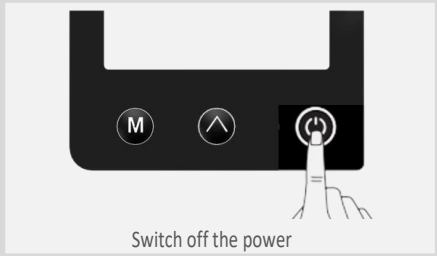
The outboard can be stopped in one of the following four ways.



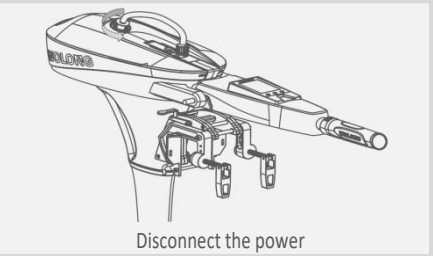
Turn throttle to zero position



Remove the security key



Switch off the power



Disconnect the power

Figure 4-4

In normal operating procedure, it's recommended to stop the outboard as following steps.

1. Rotate/Pull the throttle to zero position.
2. Wait until the electric outboard motor stops, then remove the security key from tiller/remote control.
3. Press and hold (≥ 2 secs) the "POWER" button to power off the system.
4. Tilt the electric outboard motor out of water and uninstall it from boat according to your requirement.

In abnormal situations like a fall over emergency, it's recommended to stop the electric outboard motor by removing the security key from the tiller.

In malfunction situations, the electric outboard motor will stop immediately for protection. It 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 security key is removed.
4. The connection between tiller and battery is cut.
5. The battery is empty.
6. The outboard goes malfunctions (e.g. motor is blocked or the battery voltage drops below 33V dc).



It's recommended to tilt up it out of water when the electric outboard motor is not running.

4.4 Tiller Adjustment

The Flowstar series tiller is adjustable in both horizontal and vertical directions.

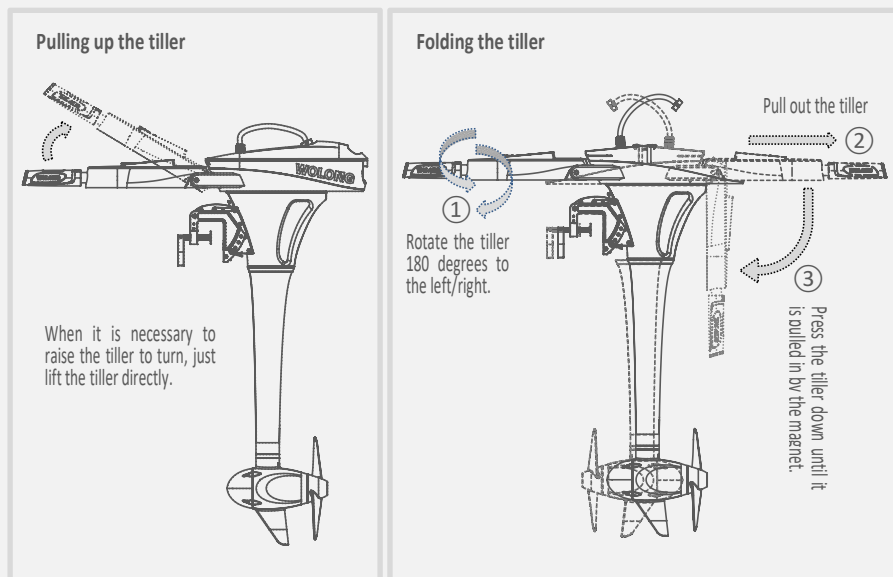


Figure 4-5



Put down the tiller can be convenient for transportation and storage.

4.5 Tilting up the Outboard Motor

Toggle up the Trim Operation Lever once, then take the battery handle to tilt up the outboard motor to a maximum height. When the tilt positioning pin "clicks" into the groove, release the battery handle and the outboard will stay at a position of 75° trim angle.

Hold the battery handle and toggle up the Trim Operation Lever once again, users can lay down the outboard gently to the original position in water.

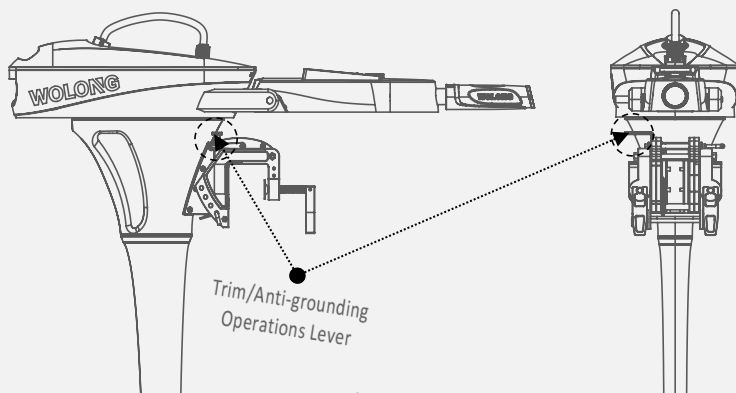


Figure 4-5

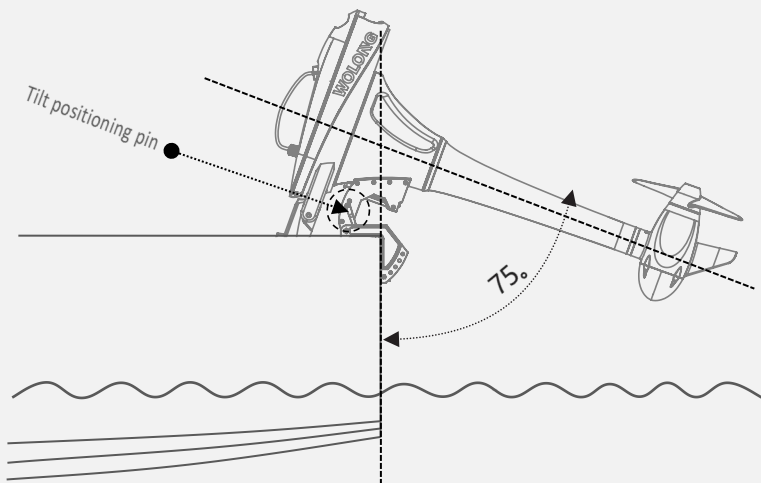


Figure 4-6



Never toggle the Trim Operation Lever when the propeller is rotating.



Slight and gentle operations are recommended when tilting up and down.

4.6 Fixing the Steering Direction

Before attaching the battery, inserting the Steering Lock Pin into the hole indicated in Figure 4-7 can fix the steering direction, and the rotation of tiller on horizontal level will be disabled. Use the pin if necessary.

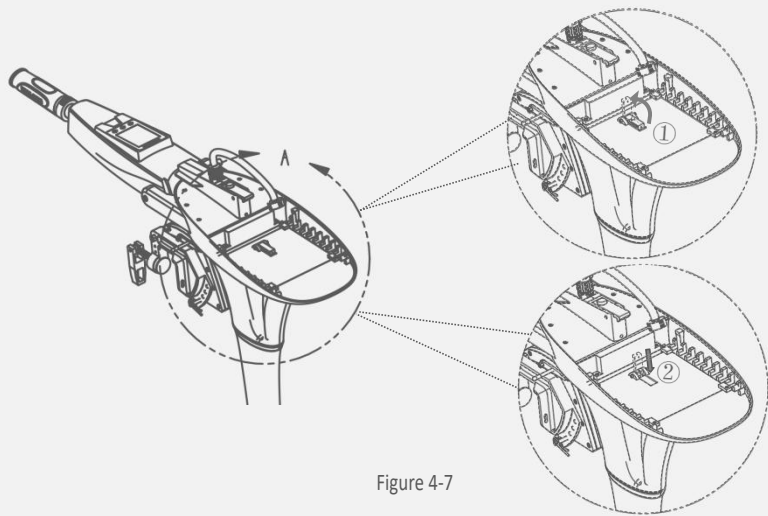


Figure 4-7

4.7 Fixing for Easy Carrying

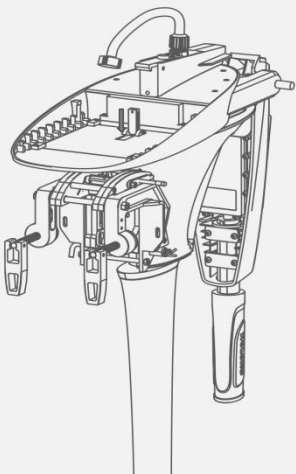


Figure 4-8

Rotate the tiller by 180° and fold to the position as indicated in Figure 5-12. Then put the lock pin into the hole to fix the folded tiller for easy carrying, storage or transportation.。

5. Control System

Flowstar series control system is used for starting and stopping the electric outboard motor, adjusting the speed of the motor, configuring the battery parameters, displaying the system information and messages, etc. the Tiller can only wirely communicate with the electric outboard motor. The Tiller itself owns the steering capability.

5.1 Display Panel

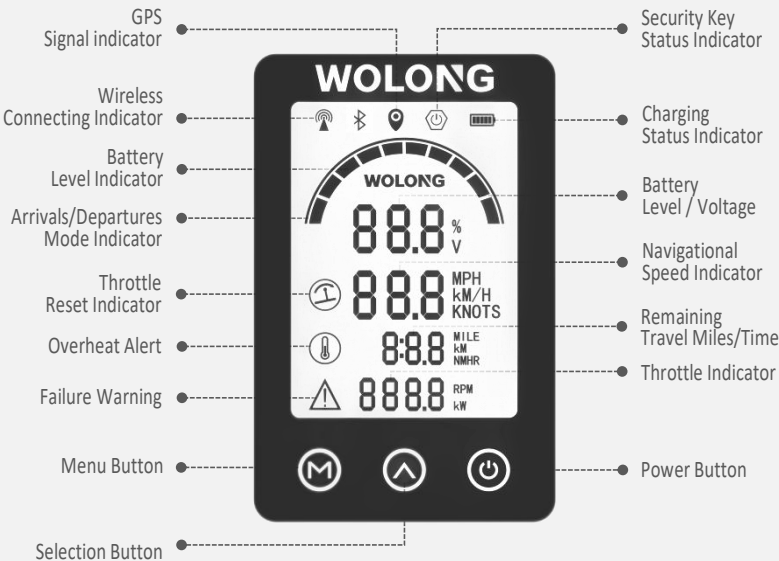









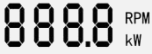
Figure 5-1

Button	Function
 "Power"	1. In power-off state, press and hold the "power" button 3S to power on the control system. 2. In power-on state, press and hold the "power" button 3S to power off the control system. 3. On the Settings state, press the Power button to save the current settings.
 "Selection"	1. On any setting state, press the "Selection" button to view options for current setting. 2. In power-on state, when home page displays, press "Selection" button and hold 5S to enter the throttle calibration page.
 "Menu"	1. In power-off state, press and hold the "Menu" button about 3S to activate the Arrivals / Departures mode. 2. In the Arrivals / Departures mode, press and hold the "Menu" button about 3S to exit it. 3. On any setting state, press the " Menu" button to enter the preferences setting page.







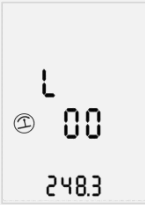



If users enter the page without setting any parameters, the current parameters displayed on the page will be saved as user parameters by default.


Icon	Function	
	Charging Status Indicator	Hidden : normal mode. Blink : Battery charging.
	Security key Status Indicator	Blink : the Security key is detached. Shown constantly : the Security key is present and is working well.
	GPS Signal indicator	Hidden : $\geq 5S$ No signal received. Blink : $\geq 2S$ No signal received. Shown constantly : $< 2S$ No signal received.
	Wireless Connecting Indicator	Hidden : There is no wireless signal connection. Shown constantly : The wireless signal has been connected.
	Arrivals/Departures Mode Indicator	Blink : the Arrivals / Departures mode has been activated. Shown constantly : normal mode. At this time, the motor speed range is reduced from normal mode to $0^{\circ} \pm 500rpm$.
	Battery Level Indicator	Indicating approximate battery level. 1. The solid blocks stand for remaining battery. 2. Each blocks represents 10% of the power. 3. All the 10 blocks will blink when the remaining battery is less than 20%. Steer your boat to shore or wharf as soon as possible, and fully charge the battery on time.
	Battery Level / Voltage	Indicating accurate battery level percentage / voltage. ※ it is configurable in preference setting page. 39% : indicates current battery level. 46.9 _v : indicates current battery voltage.
	Throttle Reset Indicator	Blink : It means the throttle needs reset to neutral.
	Navigational Speed Indicator	Displaying the real time cruise speed. ※ Units can be set on the preferences page (MPH, km/H, KNOTS).
	Overheat Alert	Hidden : The system temperature is in the normal range. Blink : It means the battery Overheat. Shown constantly : The system Overheat and stop working.
	Remaining Travel Miles/Time	Displaying real time remaining Travel Miles/Time. ※ Units can be set on the preferences page (MILE, km, NMHR).

Icon	Function	
	Failure Warning	 Hidden : Hide when without a fault.  Blink : Blink during the battery level 1 alarm.  Shown constantly : bright during system level 2 alarm.
	Throttle Indicator	Displaying the real time input power or input rpm of the outboard motor system.

5.2 Calibration

 If user first time uses the product, should calibrate the throttle strictly as below steps.

Calibration Process	LCD Displaying
<p>Step1:</p> <p>① Pull the throttle to the middle (zero) position where you can hear a click sound, Long press  button for 5s until "C 03" appears.</p> <p>② Wait for 3S until "C 00" appears, it means that the middle (zero) position calibration is completed.</p>	
<p>Step2:</p> <p>① Push the throttle to the maximum forward power position, press of the  button. You will see "L 03" appears.</p> <p>② Wait for 3S until "L 00" appears, it means that the maximum forward position calibration is completed.</p>	
<p>Step3:</p> <p>① Push the throttle to the maximum backward power position, press of the  button. You will see "A 03" appears.</p> <p>② Wait for 3S until "A 00" appears, means that the maximum backward position calibration is completed.</p>	
<p>Step4:</p> <p>Press of the  button again. It will return to the main page Automatically.</p>	

 Before calibration, please detach the Security Key from the control system.

5.3 Warning Messages

When the outboard motor is running in abnormal conditions or out of order, a warning message with an error code will display on the LCD panel. At the same time, the buzzer will emit a continuous beeping sound. Figure 5-2 is an example. Please find more error codes and corresponding solutions in the below table.

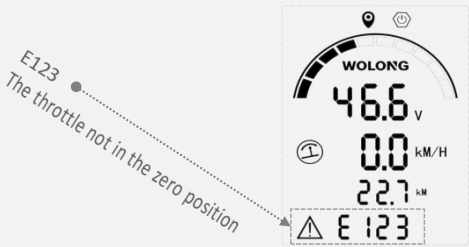


Figure 5-2

Code	Cause	Solution
E100	The security key is detached	Please attach the security key back.
E108	Motor over-current	Reduce throttle, and drive slowly.
E109	Motor / Propeller Blocked	Turn off the main switch, and then clean up the items wrapped around the propeller. Test if the propeller can be rotated by hand. If so, continue operating the electric outboard motor.
E116	Main Control Unit (MCU) over-voltage	Power off and check the battery voltage and replace the battery according to the recommended operating specifications.
E119	Inverter over-voltage	
E118	MCU and Tiller communication failure	Check whether the communication cable between modules is connected normally, and restart if it is normal. If there is still an abnormality, please contact the dealer.
E206	BMS communication failure	
E121	Failure of throttle position sensor	Refer to Section 5.2 Calibration for recalibration.
E123	The throttle not in the zero position	Turn the throttle back to zero position.
E124	Battery over-current	Reduce throttle, and drive slowly.
E125	Battery short-circuit	Stop and check the short circuit point.
E126	Battery Overheat	Stop running the outboard motor and wait until the temperature drops to normal operating temperature range.
E127	Battery over discharge	Timely charge the battery.
E200	Inverter under-voltage	Power off and check the battery voltage. Even the warning message disappears automatically, outboard motor may still operates at low power. Please charge the battery as soon as possible.
E204	MCU bus under-voltage	

Code	Cause	Solution
E201	Motor 1 Overheat	Stop running the electrical outboard motor and wait until the temperature drops to normal operating temperature range.
E202	Motor 2 Overheat	
E203	Inverter board Overheat	
E205	MCU board over temperature	



If the problem persists, please consult your Wolong Marine authorized dealer for assistance.

6. Battery Charging

Charge the battery when the state of battery level is low or empty. It's recommended to charge the battery after detaching it from the outboard though it's allowed to operate and charge the electric outboard motor simultaneously.

Step 1 :

Power off the electric outboard motor first. Then as shown in ① disconnect the power cable and detach from the power port.

Step 2 :

One hand presses the battery lock down as shown in ②, other hand holds the battery handle as shown in ③ Horizontal pull out to detach the battery.

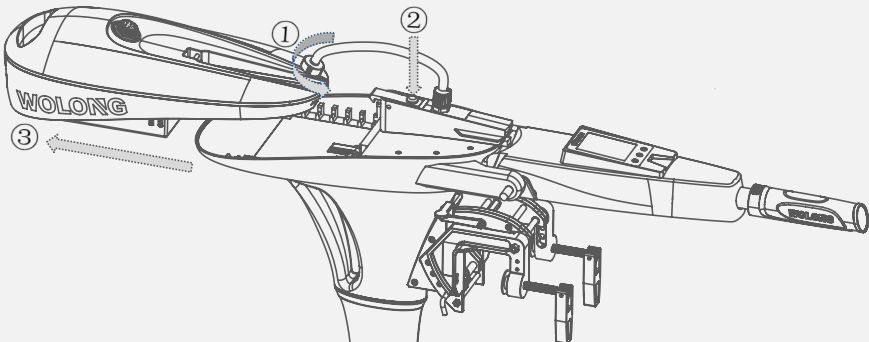


Figure 6-1

Step 3 :

Connect the output cable of battery charger to the battery, then connect the AC power plug of the charger to the 100V~240V wall outlet.

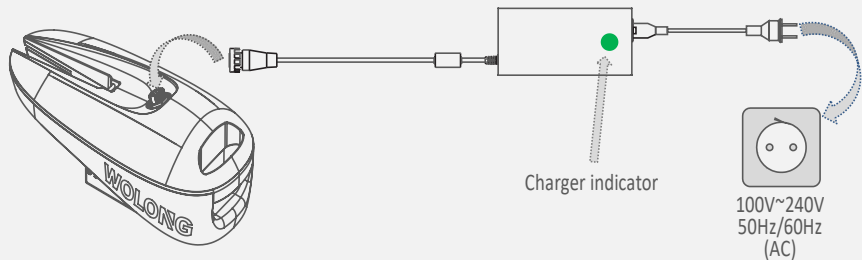


Figure 6-2

Indicator	Normal Status	Description
Charger indicator	Solid red light	The charger has been plugged into the charging port of the battery and it works well.
	Solid green light	The charger works well but has not been plugged into the charging port of the battery, or the battery has been fully charged.

Indicator	Normal Status	Description
Charger indicator	Light out	<ol style="list-style-type: none"> 1. Make sure the AC socket has power output. 2. Disconnect the battery with charger, If at this time : <ol style="list-style-type: none"> a) the charger indicator becomes solid green, there may be a fault in battery. b) the charger indicator is still off, there may be a fault in charger. <p>Please contact your Wolong Marine authorized dealer to change the battery/charger.</p>

Step 4 :

Plug the battery charger out of the wall socket after the battery has been fully charged, then disconnect the battery charger port and charger.



If other batteries are used, please refer to the relevant instructions or operation manual for charging.

7. Trim Angle Adjusting

Flowstar series has four trim angle options including 21°, 14°, 7° and 0°. The trim angle should be adjusted according to the boat type and the running speed to achieve higher efficiency. It is recommended to try different trim angles at your desired running speed to achieve the best performance.

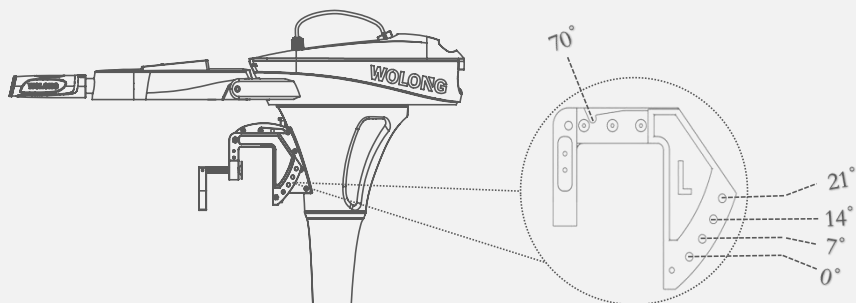


Figure 7-1



Only adjust the trim angle when the outboard is stopped, please operate slowly.



Never toggle the Trim Operation Lever if the propeller is rotating.

To adjust trim angle

Step 1 : Pull the trim operation lever up and tilt up the outboard to the 75° position. (Users can refer to the section 4.5 Tilting up the Outboard Motor.)

Step 2 : Remove the pull B-pin on the trim pin and then pull the trim pin out.

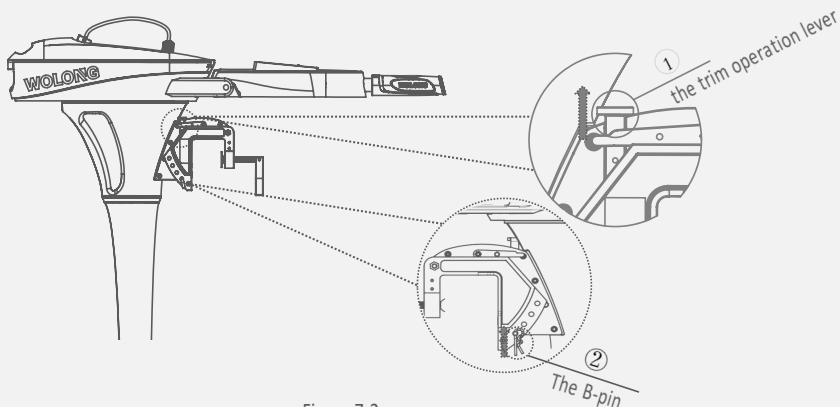


Figure 7-2

Step 3 : Select a desired trim angle and insert the trim pin into the corresponding position, attach the pull B-pin to fix the trim pin.

Step 4 : Lay down the outboard motor slowly, press the trim operation lever down and confirm it lock the trim pin, the outboard motor can stay at the desired trim angle.

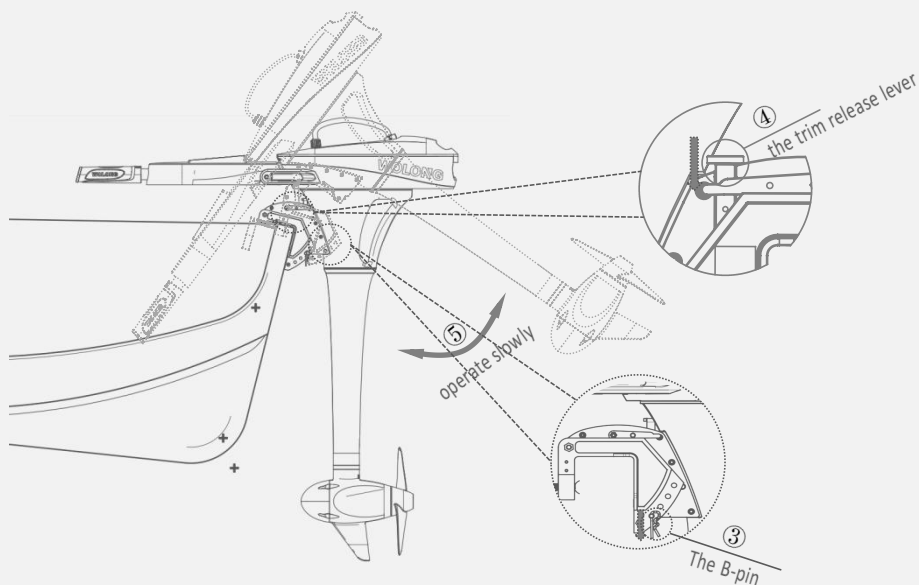


Figure 7-3

Step 5 : Try to tilt up the outboard and test if the angle is successfully fixed. It is recommended to try different trim angles to help find the best working trim angle for the boat and operating conditions.



Please increase the speed gradually during test, watch out for water cavity and other instability problems, if the problem gets serious, stop the outboard immediately and try to reduce the trim angle

8. Anti-grounding Mode

When the boat runs in shallow water or in complicated underwater conditions, it may meet grounding dangers or entanglement with plants in the water, setting the outboard to anti-grounding mode will protect the outboard motor from damage if the outboard hits submerged reefs or rocks. In anti-grounding mode, the underwater part of the outboard is flexible in tilting direction and the motor will automatically tilt up if it hits something underwater.



Never turn the throttle backward when the outboard is in anti-grounding mode.

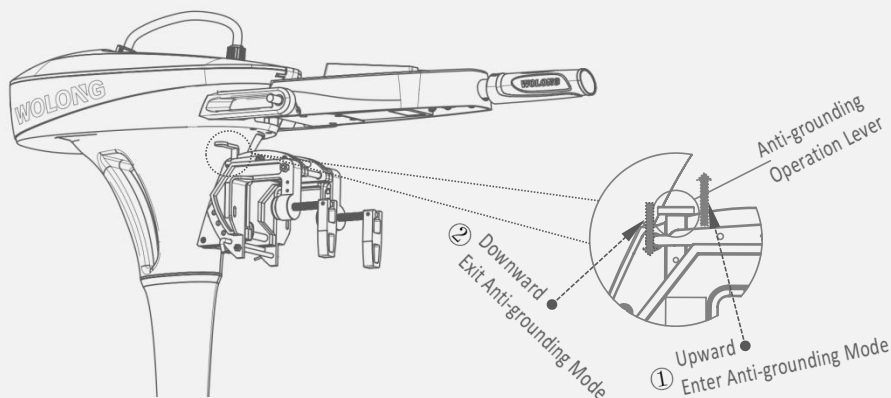


Figure 8-1

To set the outboard in anti-grounding mode:

As shown in Figure 8-1 ① above, lift the anti-grounding operation lever up to the maximum position to complete the setting.

To inactivate the anti-grounding mode

As shown in Figure 8-1 ② above, press the trim operation lever down and confirm it lock the trim pin, the anti-grounding protection will be disabled and the outboard will work in normal state.



Never activate the anti-grounding mode when the propeller is rotating.



Only use the anti-grounding mode in necessary conditions, such as in shallow water, near the shore or unknown underwater conditions.

9. Maintenance

9.1 Notes

Regular maintenance is beneficial to keep your electric outboard motor working in optimal condition.

Do not start the outboard in shallow or unknown water conditions. Only use the outboard in deep water area.

In order to clean and reduce corrosion, use fresh water to wash the whole outboard after use in salt water.



Disconnect the battery from outboard before maintenance.



Conduct the maintenance under instructions of professional experts or your dealer.



Only use Wolong Marine official original components for replacement and maintenance.



Regularly check whether the propeller is damaged, whether there is a fishing line entangled. The motor is out of warranty due to the fishing line causing water to enter the motor.

9.2 Propeller Maintenance



Ensure the battery is disconnected before each check, as a rotating propeller is dangerous.



Gloves are recommended to wear, in order to protect your hand from the sharp propeller edges.

Check the propeller based on the following tips, then refer to the figure 9-1 to replace a new propeller if necessary.

1. Check the propeller blades for wear broken, corrosion and other damage.
2. Check the pin for wear broken, corrosion and damage.
3. Check for water plants, fishing net or line twine around the propeller.

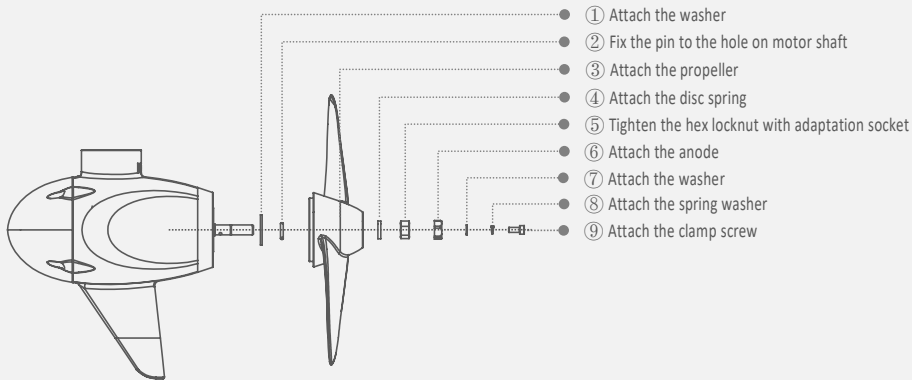


Figure 9-1

9.3 Replacing the Anode

Please refer to the figure 9-2 & figure 9-3 below to replace a new anode if necessary.

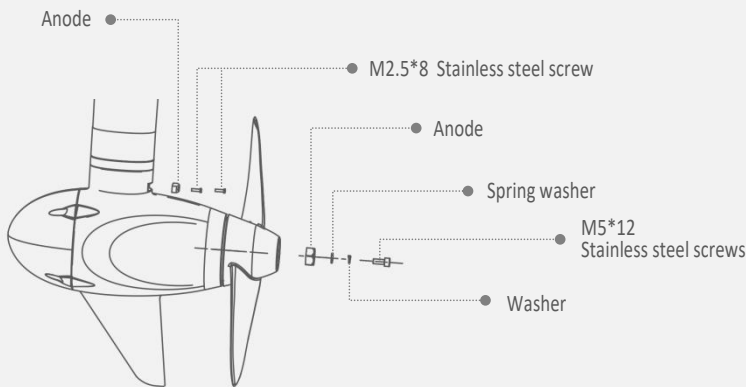


Figure 9-2

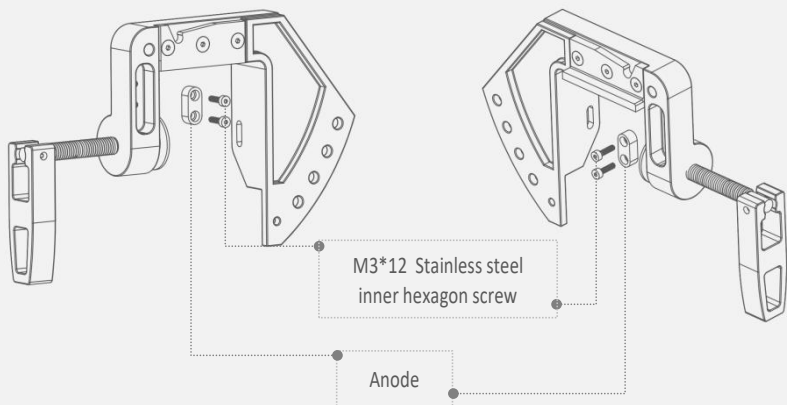


Figure 9-3

9.4 Maintenance of Electrical Contacts

Clean all electrical contacts with electrical contacts cleaner every two months, and clean immediately once there is rusty show up.

9.5 Maintenance Time Table

Regularly maintained in proper manner and used in normal condition, the outboard can work at its optimal state. The following table shows a general maintenance frequency, which however may vary according to operating conditions.

Item	Operations	Initial	Every	
		50 hours (3 months)	100 hours (6 months)	200 hours (12 months)
Anode	Check/Replace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Greasing points	Greasing	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Propeller and pin	Check/Replace	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

“☐” Indicates checks may be carried out by users.
“☒” Indicates work to be carried out by your dealer.

Greasing Map

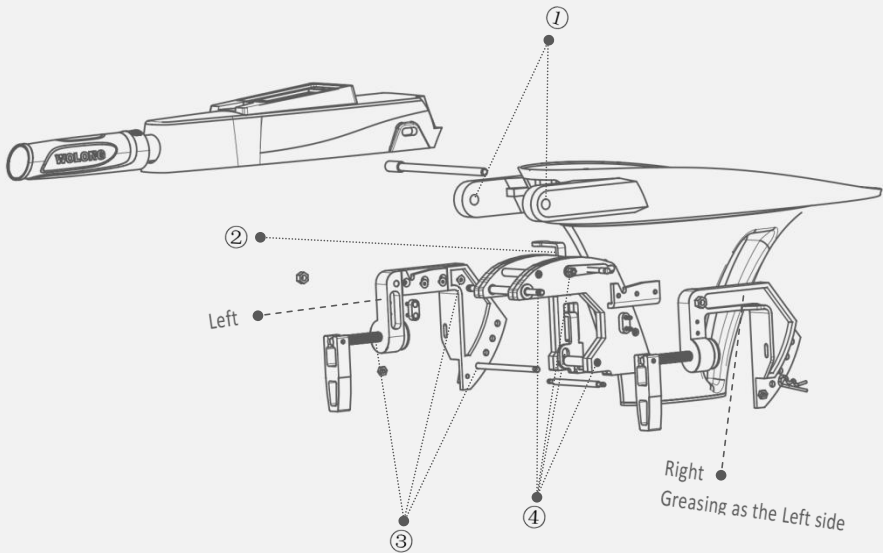


Figure 9-4

10. Transportation and Storage

10.1 Transportation

For long distance transport, please use the Wolong Marine original package to pack the electric outboard motor before transportation.

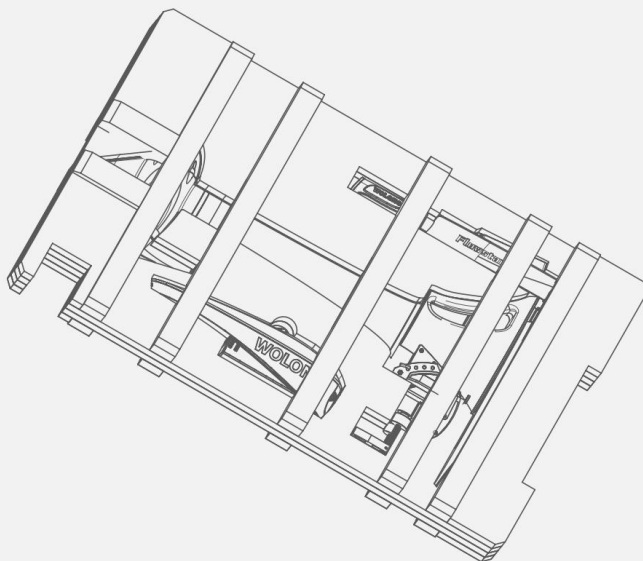


Figure 10-1



The Li-ion batteries higher than 100Wh are not allowed in the aircraft. The Li-ion batteries are classified under Class 9 (dangerous goods - see Lithium Battery Guidance Document IATA 2015 Revision 1—[I-Site www.iata.org](http://www.iata.org)).



Never ship a damaged or broken battery.

10.2 Placement

When placing the outboard on the ground, ensure the ground is flat and clean. It's better to put some damping cotton or cushion under the outboard to prevent damage.

10.3 Storage

If your electric outboard motor is going to be stored for more than 2 months, it's advised to have the outboard cleaned, checked prior to storage. It's recommended to pack the outboard with Wolong Marine original package for storage.



Take adequate damping-absorber for protection before transport and storage. And ensure the propeller receives no pressure if the propeller is installed on the propeller shaft.



Store the outboard in a dry, well ventilated place without direct sun exposure.

11. Emergency Situations

11.1 Impact Damage

If the outboard strikes some object in the water, please follow the procedures below.

- ① Stop the electric outboard motor immediately.
- ② Check the propeller and other components before you start the motor again.
- ③ Return to the nearest harbor or beach, carefully and slowly.
- ④ If the motor is damaged, find your dealer or Wolong Marine service center for help.

11.2 Overboard

If the electric outboard motor accidentally overboard or submerged during use, Please take the following actions.

- ① Stop it immediately and disconnect the battery.
- ② Please contact your Wolong Marine authorized dealer for more information and Maintenance, confirm the outboard is thoroughly inspected before re-operation.

11.3 Low Battery Level

When the battery voltage is lower than a set threshold, the outboard will stop automatically to prevent battery from over-discharging. If this happens when the outboard is far away from the shore, and no new battery can be replaced, it's recommended to wait until the battery voltage recovers, and you can restart the outboard to return with throttle power under 100W.








12. Warranty terms

The Wolong Marine warranty is provided for the first end purchaser of an Wolong Marine product. Consumers are entitled to a free repair or replacement of defective parts or parts which do not conform with the sales contract. This warranty operates in addition to your statutory rights under your local consumer law.

12.1 Warranty Policies

Wolong Marine warrants its products to be free of defects in material and workmanship for a limited period since the date of purchase. Once a fault is discovered, the user has the right to make a warranty claim under the Wolong Marine warranty policies.


Product	Warranty Expiry Date
Flowstar series (Main body)	Two years after the date of purchase (uncommercial).
Components have been repaired or replaced	Three months since the date of maintenance. Note: 1. If the three-month period overlaps with the original warranty period, the warranty against these replaced or repaired parts still expires two years after the date of purchase. 2. If the three-month period exceeds the original warranty period, the repaired or replaced parts continue applying to warranty during the extended period.

-  In order to validate the warranty, users are required to fill in the Warranty Card in the package in advance.
-  Keep the product label in intact state and record the serial number on the label. Never tear the label off the product. An Wolong Marine product without the original product label will not be applicable to warranty services provided by Wolong Marine.
-  The warranty is valid only when the information is correct and complete.
-  Free warranty is only validated upon the presentation of legal serial number, Warranty Card, and evidence of purchase from an authorized Wolong Marine authorized dealer.
-  Valid date of purchase should be established by the first-hand purchaser with original sales slip.
-  Free warranty is not transferable and will not be reissued.
-  Within the limits of the applicable laws, the warranty policies of Wolong Marine may update without prior notice. The latest version is available at our website www.wolong-electric.com.

12.2 Out of Warranty

Make sure the product is properly packed during delivery, the original Wolong Marine package is recommended. If the product got further damaged due to improper packing during delivery, the furtherly damaged part will be deemed as out of warranty coverage.

In addition, faults or damages caused by the following reasons are also excluded from warranty scope within the covered period:

- Any improper operation contradicts the user manual.
 - Accident, misuse, wishful abuse, physical damage overcharging, liquid damage or unauthorized repair.
 - Dropping, improper care or storage.
-  Minor defects, such as normal wear and tear that does not affect the intended function of the product, are also not covered by the warranty.



Consumables are not covered by the warranty.



Other compensation or economic losses caused by the use of the product are exempt from liability.



Products purchased through non-Wolong Marine's official authorized sales channels, used for commercial purposes, and failed to submit all materials required for warranty as required will be exempt from warranty obligations in the event of any of the above.

12.3 Warranty Claim Procedures

If you find your product defective, you can make a claim to your dealer following below procedures:

1. Fill in the Warranty Card correctly and completely in advance. Then make your warranty claim by sending it to your authorized Wolong Marine service partner together with valid proof of purchase. Usually these documents are required when making a warranty claim: the Warranty Card, ex-factory serial number, and evidence of purchase.
2. Send the defective product to your authorized Wolong Marine service point after getting the confirmation. Note that the label should be kept intact. You can also deliver the product to your authorized Wolong Marine dealer after getting confirmation.
3. The defective components or parts will be either repaired or replaced according to the diagnosis made by the Wolong Marine authorized service partner.
4. If your warranty claim is accepted, the equipment will be repaired or replaced free of charge. Note that any delivery cost incurred in the process is at your charge.
5. After careful examination and confirmation by Wolong Marine authorized dealer, the defective or faulty components will be repaired or replaced with brand new ones against the actual condition.
6. In case your warranty claim be rejected, an estimated repair charge with round trip delivery cost will be sent for confirmation. Wolong Marine authorized service point will conduct maintenance accordingly only after your confirmation.



If warranty expires, you can still enjoy maintenance services from authorized Wolong Marine service partners with minimum maintenance charge.

Wolong Marine Warranty Card

(* Ensure the validity of the warranty, please fill in the Warranty Card correctly and completely in advance and read the warranty terms)

「Consumer Information」

Name			
Address			
Telephone Number		E-Mail	

「Dealer Information」

Company Name			
Address			
Telephone Number		E-Mail	

「Product Information」

Date of Purchase (M/D/Y)		
Serial Number	Electric outboard motor (Main body)	
	Batteries (if applicable)	
	Control system(if applicable)	

WOLONG 卧龙

Power your future

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

Wolong (Zhejiang) Marine Technology Co., LTD

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E-Mail : marine-service@wolong.com