

SPIRIT 1.0 Plus USER MANUAL



rubberboot
EXPERT.NL

Acknowledgement

Thanks for choosing ePropulsion products, your trust and support in our company are sincerely appreciated. We are dedicated to providing high-performance electric outboards, as well as thrusters, 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 this product, please read this reference manual thoroughly to understand the correct and safe operations. By using this product, you hereby agree that you have fully read and understood all the 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 right of final interpretation of this manual.

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

Symbols

The following symbols will help to acquire some key information.



Important instructions or warnings



Useful information or tips

Product Identification

Below figure indicates the position of the product label on which the serial number locates. Please record the serial number for access to maintenance or other after-sale services.

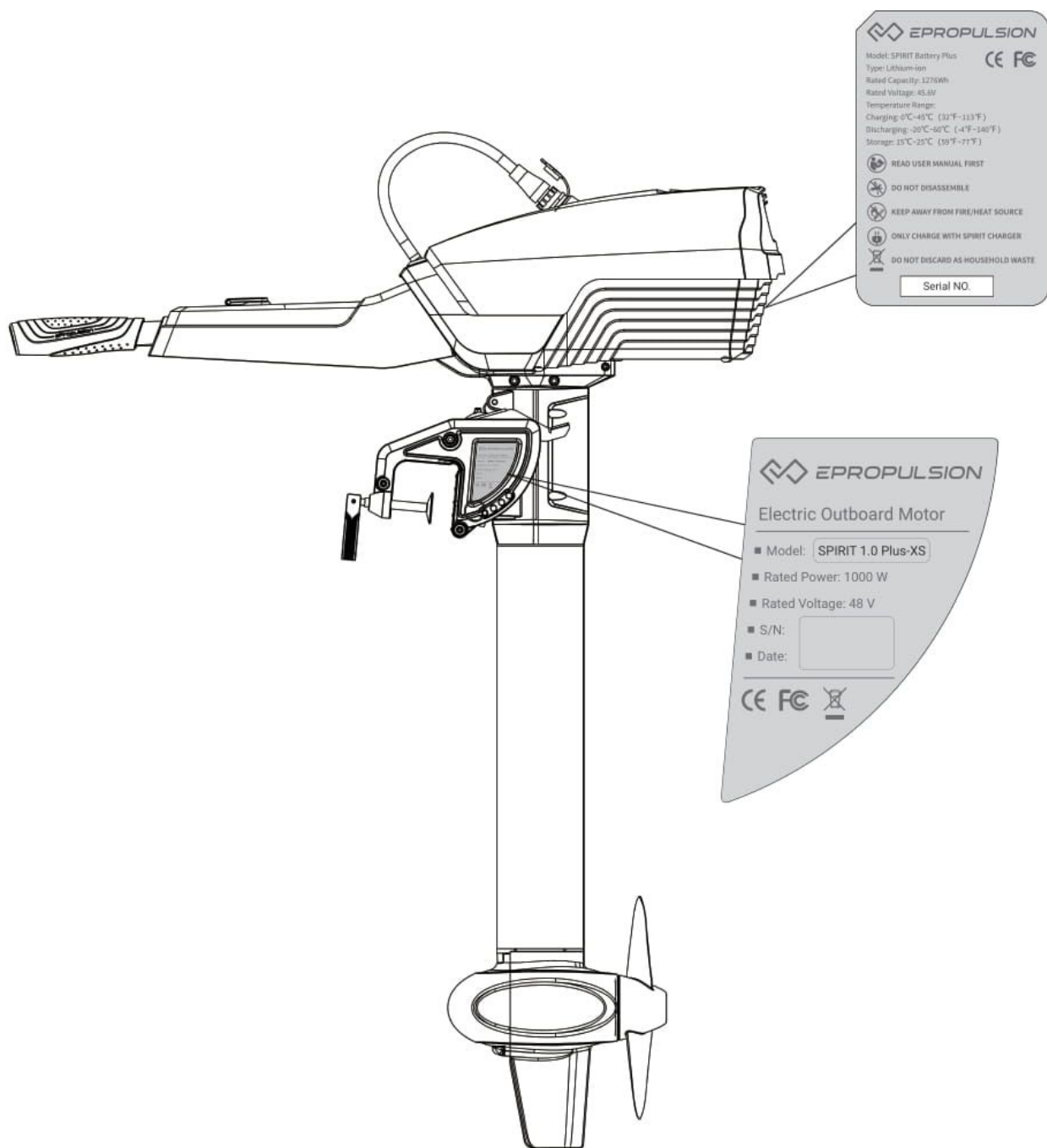


Figure 0-1

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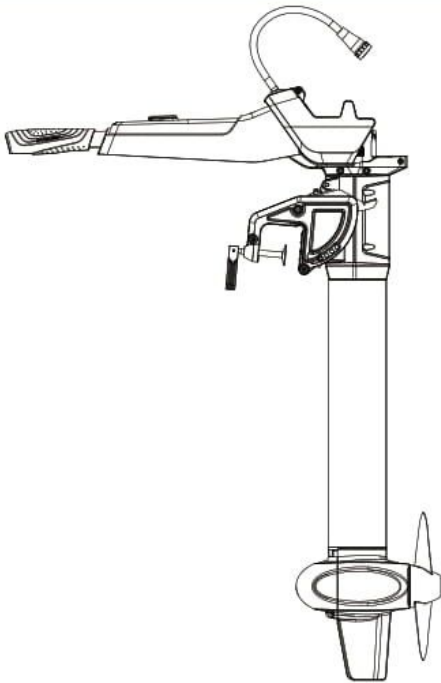
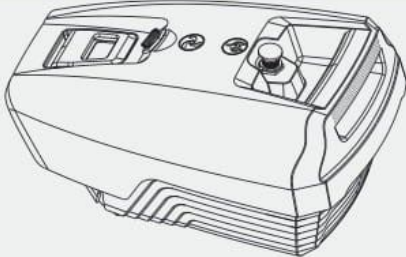
1 Product Overview





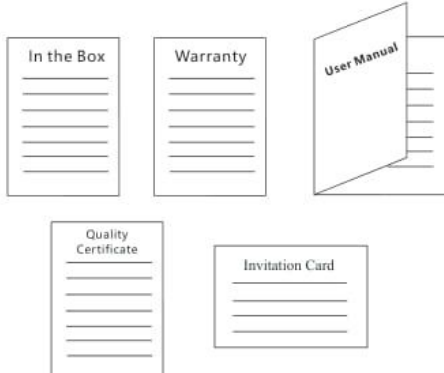
SPIRIT 1.0 Plus is designed to be an integrated electric outboard with high overall efficiency and long cruising duration. The power of SPIRIT 1.0 Plus is equivalent to a 3hp petrol outboard but works quieter. With foldable tiller, it's easy to carry and store. All these high-performance features make SPIRIT 1.0 Plus an ideal option for tenders, dinghies and sailboats.




The SPIRIT 1.0 Plus includes three models, SPIRIT 1.0 Plus-L, SPIRIT 1.0 Plus-S and SPIRIT 1.0 Plus-XS, which have different shaft lengths for adaptation of different transom heights.

1.1 In the Package

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

Items	Qty./Unit	Figure
Outboard (Main part)	1 set	
Battery (Purchase Separately)	1 set	

Items	Qty./Unit	Figure
Battery Charger	1 set	
Spirit External Battery Cable (Purchase Separately)	1 set	
Kill Switch	2 sets	
Steering Lock Pin	2 pcs	
In the Box, User Manual, Warranty Card, Quality Certificate & Invitation Card	1 set	

-  Save the ePropulsion original package for the outboard storage.
-  Other accessories mentioned in this user manual need to be purchased by users from ePropulsion authorized dealers.
-  There are currently four types of official chargers for SPIRIT Battery Plus. The one included in the package is Standard Charger. The other three are Fast Charger, Solar Charger and DC Charger, which need to be purchased separately by users from ePropulsion authorized dealers.

1.2 Parts and Diagram

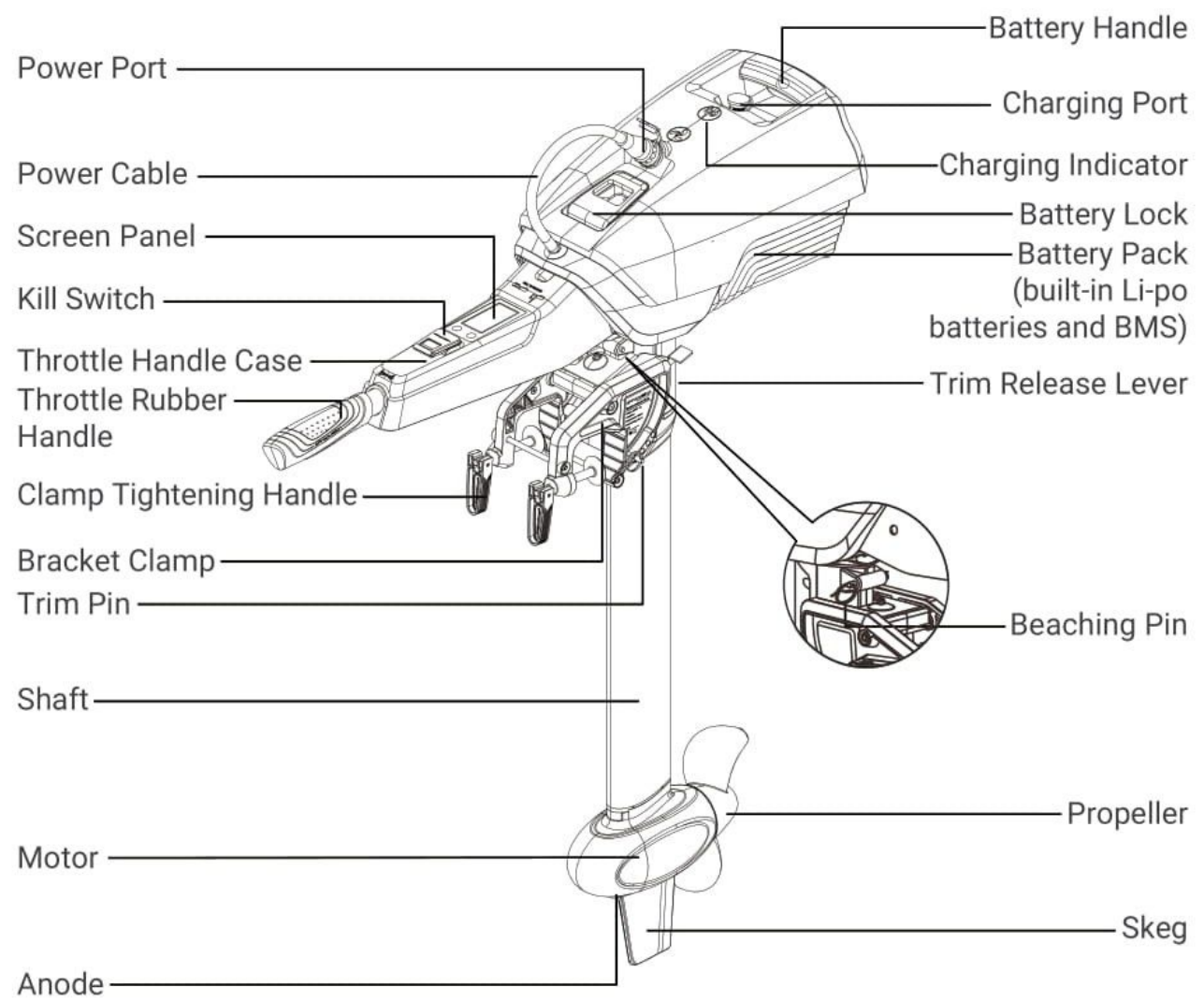


Figure 1-1

1.3 Specifications

SPIRIT 1.0 Plus-L/ SPIRIT 1.0 Plus-S / SPIRIT 1.0 Plus-XS	
Type	Electric
Rated Input Power	1 kW
Rated Current	20.8 A
Comparable Petrol Outboard	3 hp
Maximum Overall Efficiency	55%
Maximum Rotation Speed	1200 rpm
Steering	Tiller control
Weight (without battery)	10.4 kg / 22.9 lbs. (XS) 10.6 kg / 23.4 lbs. (S) 10.8 kg / 23.8 lbs. (L)
Dimension (L×W×H)	884 mm × 275 mm × 942 mm (XS) / 1042 mm (S) / 1167 mm (L) 34.8" × 10.8" × 37.1" (XS) / 41" (S) / 45.9" (L)
Shaft Length	525 mm / 20.7" (XS) 625 mm / 24.6" (S) 750 mm / 29.5" (L)
Trim Angle	0°, 7°, 14°, 21°, 70°
Propeller (Diameter / Pitch)	280 mm / 5.8"


SPIRIT Battery Plus


Type	Lithium-Polymer
Rated Capacity	1276 Wh
Rated Voltage	45.6 V
Cut-off Voltage	33.6 V
Full Charged Voltage	52.2 V
Charging Time	~8 hrs
Cycle Life	≥500 cycles (80% of Rated Capacity)
Temperature Range	Charging: 0°C ~ 45°C (32°F ~ 113°F) Discharging: -20°C ~ 60°C (-4°F ~ 140°F)
Dimension (L×W×H)	416 mm × 275 mm × 202 mm
Weight	8.8 kg / 19.4 lbs.

External Battery Requirement

Type	Lead-acid Battery or Lithium Battery
Rated Voltage	48 V
Minimum Voltage	39 V
Maximum Voltage	60 V
Minimum Continuous Discharge Current	28 A
Internal Resistance	<100 mΩ

SPIRIT 1.0 Plus Charger	
Output Power	180 W
Output Voltage	52.2 V DC
Output Current	3.5 A
Cut-off Current	0.4 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 ~ 264 V AC
Output Frequency	50 Hz / 60 Hz
Input Current (Max)	2 A @ 220 V
Efficiency	≤87%

 It is forbidden to charge other batteries with SPIRIT charger. It is strictly forbidden to charge SPIRIT battery with non-official standard charger.

 SPIRIT battery plus, SPIRIT 1.0 Plus machine and SPIRIT 1.0 Plus charger should be used together. It is forbidden to use SPIRIT battery plus and SPIRIT 1.0 Plus charger for SPIRIT 1.0 Plus machine, and it is forbidden to use SPIRIT battery for SPIRIT 1.0 Plus machine. Otherwise, the consequences of mixed use is at your charge.

1.4 Declaration of Conformity

Object of the Declaration:

Product: Electric Outboard Motor
Model: SPIRIT 1.0 Plus, SPIRIT 1.0 Plus-S, SPIRIT 1.0 Plus-L, SPIRIT 1.0 Plus-XS, SPIRIT 1.0 Plus-C

Company Name: Guangdong ePropulsion Technology Limited

Address: Room 201, Bldg.17A, 4th XinZhu Road, SongShan Lake District, Dongguan City, Guangdong Province, China

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

EMC Directives	2014/30/EU
MD Directives	2006/42/EC

Applied Standards:

EN 55014-1:2006+A1:2006+A2:2011	EN 55014-2:2015
EN 61000-3-2:2014	EN 61000-3-3:2013
EN 60204-1: 2016	EN ISO 12100:2010

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: 陶师正

Shizheng Tao, Chief Executive Officer & Cofounder of Guangdong ePropulsion Technology Limited

2 Important Notes before Start

The SPIRIT 1.0 Plus 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 Outboard

WARNING

- Only allow adults who have thorough understanding of this manual to operate this product.
- **Always have a paddle on board especially if the electric outboard motor is the only propulsion system.**
- Familiarize yourself with all the outboard operations, including start/stop, steering and tilting.
- Check the status of the outboard and battery level before each trip.
- Follow the boat manufacturer's instructions on the maximum allowed outboard power of your boat, do not overload the boat or the outboard.
- Take serious of battery safety. Follow battery instructions, avoid short-circuit, overheat, overcharge and over-discharge.
- Only run the outboard while the propeller is under water.
- Stop the outboard immediately if someone falls overboard.
- Do not leave the outboard in the water while the boat speed reach 35km/h.
- Tilt up the outboard above water after use.
- Wash the outboard with fresh water after operating in salt water.
- Do not leave the outboard in the water if the boat is driven by other forms of power such as sailing or rowing.
- If an error code displays and the outboard malfunctions, please reset the throttle to zero position and cut the power off, then refer to *6.2 Error Codes and Solutions* to acquire the solution to the error.
- For protection considerations, the motor will stop immediately if the

battery voltage drops below the critical level during operation or when running.

- To keep electric connectors in good condition, please spray the connectors about every 3 months with contact spray.
- To store the outboard motor, put the machine in original ePropulsion package and keep it in a dry and ventilated place without direct sun exposure.

2.2 Battery

The SPIRIT Battery Plus specially designed for SPIRIT 1.0 Plus can only be charged with an ePropulsion 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.

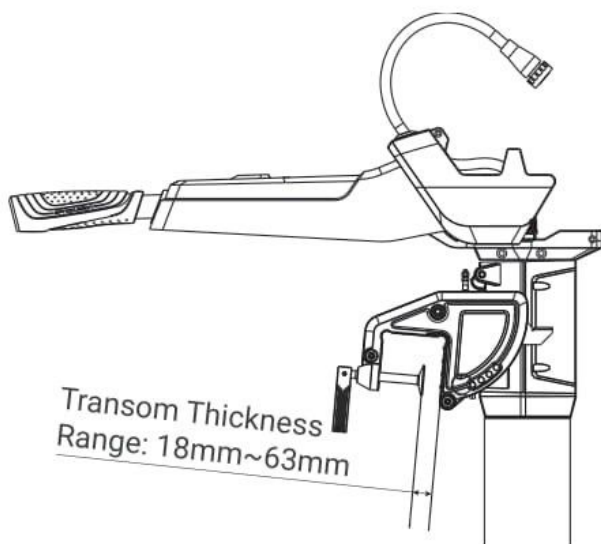
WARNING

- 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 ePropulsion service.
- Never charge a broken or damaged battery.
- Only charge the battery with an ePropulsion 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.
- 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 dry environment.
- Charge the battery immediately after full discharge.
- Before long time storage, ensure the battery charge level is 60% around, store the battery in 15°C ~ 25°C (59°F ~ 77°F) 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.
- 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.
- After long time storage, 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.
- 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 motor on the transom on the motor holder and tighten the two clamp handles.



Transom Thickness
Range: 18mm~63mm

Figure 3-1

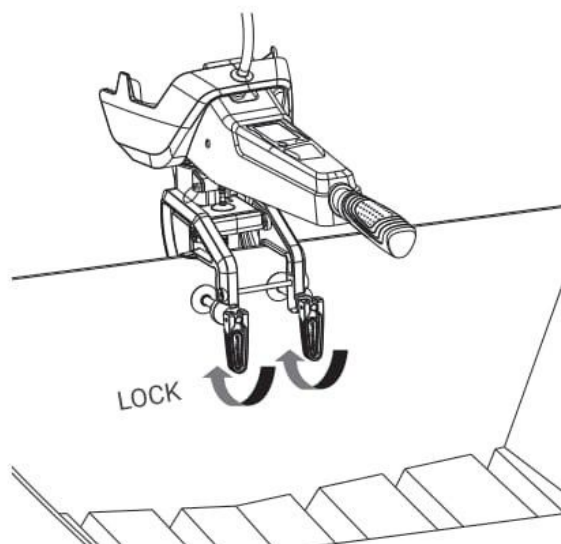

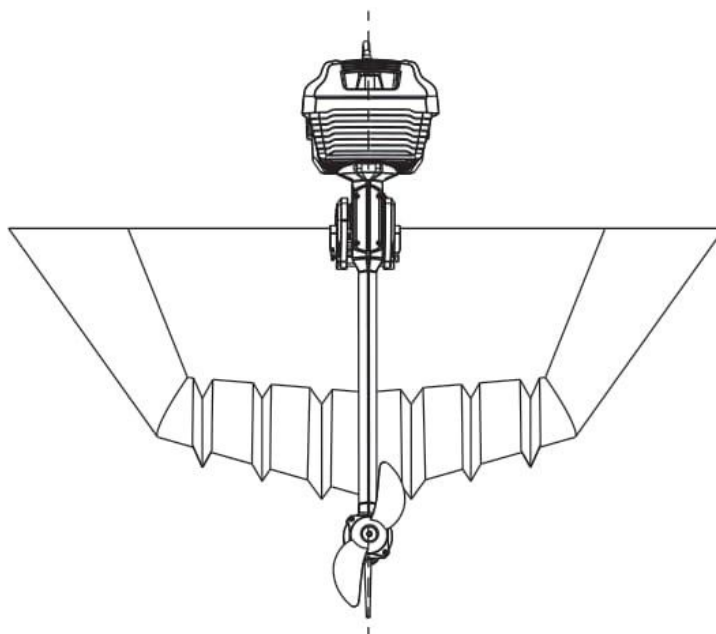


Figure 3-2

 Ensure to mount the outboard on the centerline of your boat. If the boat shape is asymmetric, please consult your dealer to get proper solution.



Center line

Figure 3-3

The mounting height of the outboard 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.

Transom Height	Recommended Model
Higher than 500mm	SPIRIT 1.0 Plus-L
400mm~500mm	SPIRIT 1.0 Plus-S
300mm~400mm	SPIRIT 1.0 Plus-XS

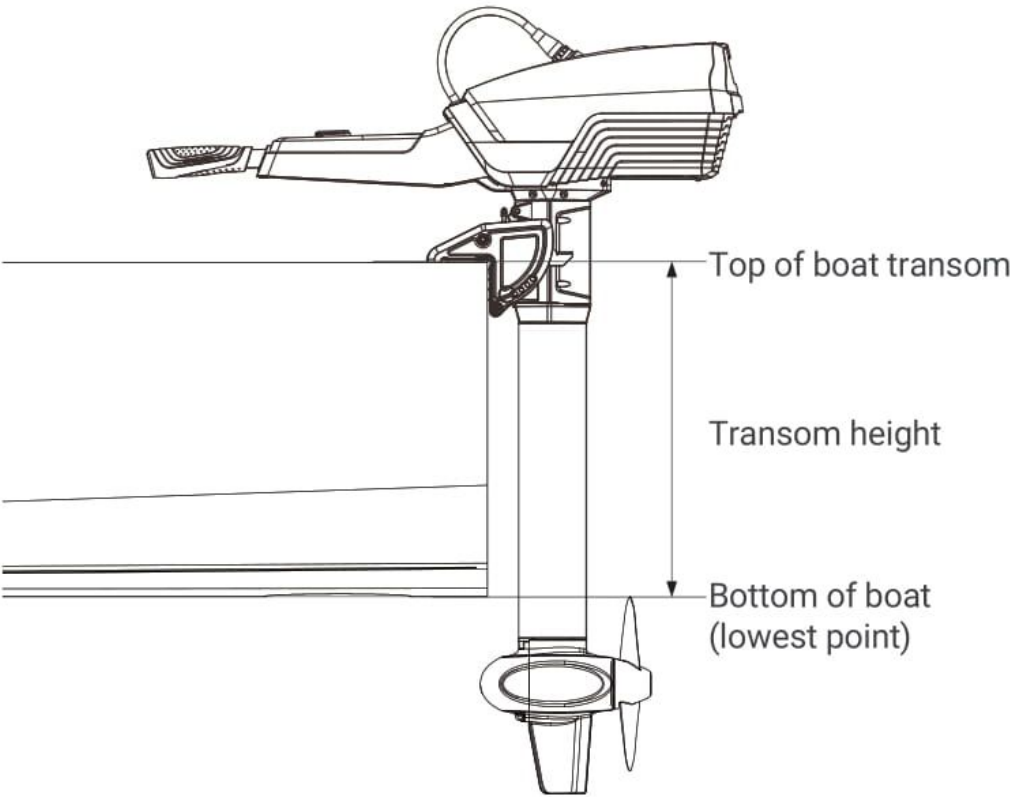


Figure 3-4

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: Lift the battery by gripping the handle and pull up the battery lock. Align the two slots on the battery bottom to the blocks on the bracket and put down the battery. Release the battery lock and lock the battery on the bracket.

- 💡 Ensure to hold the battery handle before detaching or mounting the battery.

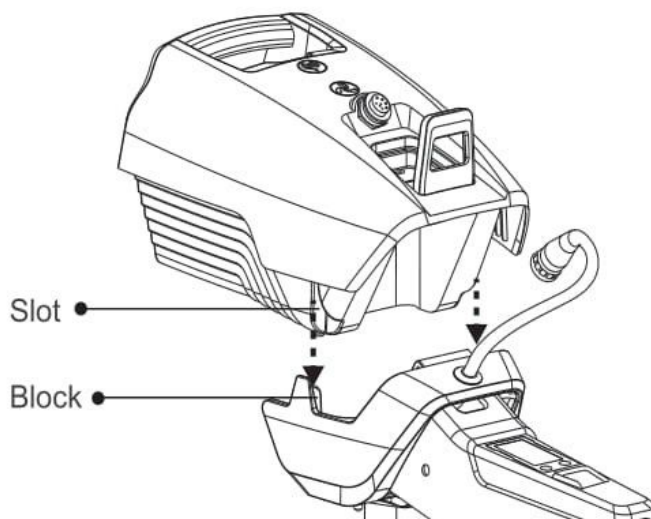


Figure 3-5

Step3: Plug the power cable in the power port and tighten the connector. The connector is metal, and it own needs to be figure tight $\frac{1}{2}$ of a turn clockwise.

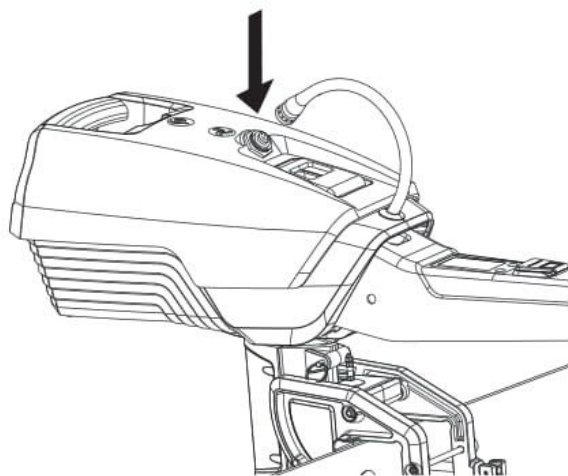


Figure 3-6

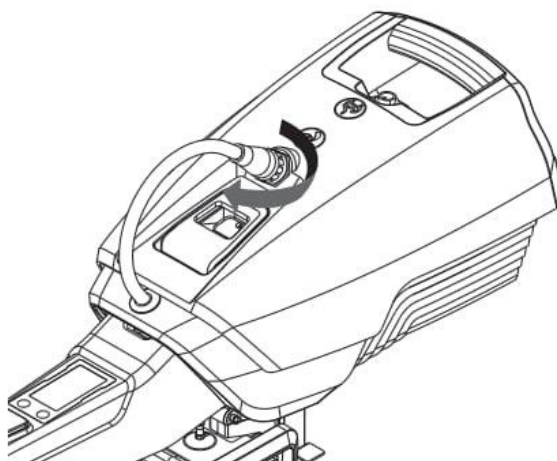


Figure 3-7

- 💡 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 Connecting a 48V Battery

When using a battery, make sure the power switch is off before connection.

1. First connect the external battery cable to the battery.
2. Connect the external battery cable with the power cables from the outboard.

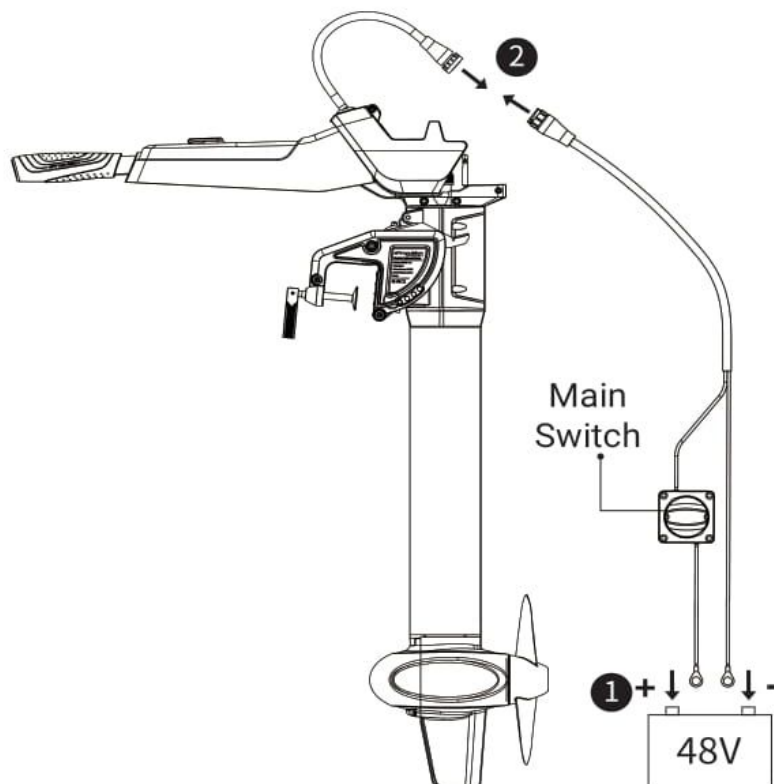


Figure 4-1

- ⚠️ Avoid battery short-circuit during connection.
- ⚠️ Do not short-circuit the main switch with other power supplies. The main switch should be mounted on the boat, and the back plate of the main switch should not be removed.
- ⚠️ Outboard motor will stop working once the power cable disconnects.
- 💡 Counterclockwisely turn the reset button on the power switch until it is stuck to power on the battery before use.
- 💡 Users can also enlarge the battery capacity by connecting multiple batteries in parallel.
- 💡 During use, if a poor contact is found, it is recommended to check the tightening of each terminal connection.

5 Operation

5.1 Checklist before Start

1. Check and ensure the battery has enough power.
2. Ensure the outboard is correctly and firmly installed on the boat.
3. Ensure the propeller is correctly and firmly installed on the outboard.
4. Ensure the battery is correctly and firmly installed on the outboard.
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.

5.2 Starting

Step1: Put the kill switch on the pointed position of tiller.

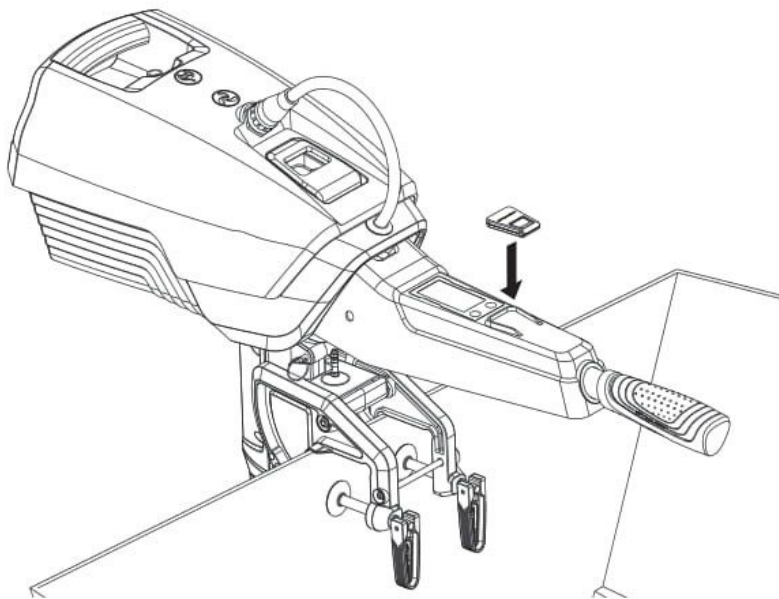


Figure 5-1

Step2: Attach the other end of the kill switch to your wrist or life vest.

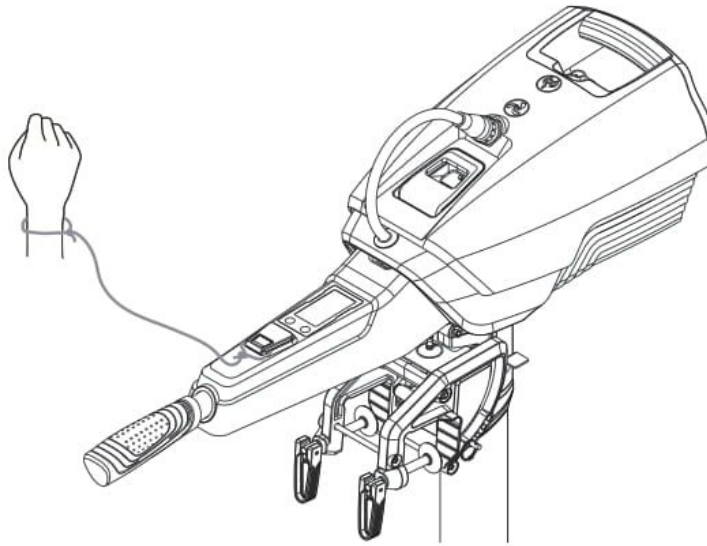


Figure 5-2

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

Step3: Press and hold (≥ 2 secs) the "POWER" button to power on the system.

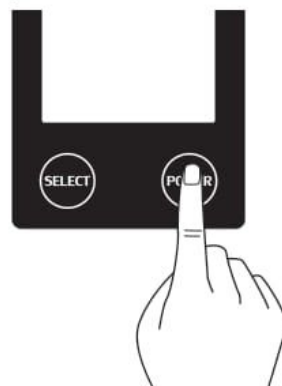


Figure 5-3

Step4: Turn the throttle from neutral position to a desired direction to start the outboard motor. Change the heading direction of the boat by turning the tiller on horizontal level.