

创造传奇

Creating a Legend!

感谢您购买使用无刷电动船用推进器！

Thanks for your use of our brushless electric trolling motor!

NINGBO EMP DC MOTOR DYNAMICS CO.,LTD

领航员系列

Navigator Series

无刷电动船用推进器使用说明书

Brushless Electric Trolling Motor Owners Manual



Product Operation Data

Navigator 1.0 use 2X12V/100Ah batteries

Dinghies, sailboats up to 1.0 tons

	Speed (km/h)	Range (km)	Runtime (hours)
Slow speed	2.0 - 3.0	50.0 - 75.0	25:00
Half throttle	5.0 - 6.5	29.0 - 37.0	5:50
Full throttle	7.0 - 9.0	19.0 - 25.0	2:50

Navigator 1.5 use 2X12V/120Ah batteries or 4X12V/60Ah batteries

Dinghies, sailboats up to 1.5 tons

	Speed (km/h)	Range (km)	Runtime (hours)
Slow speed	2.0 - 3.0	60.0 - 90.0	30:00
Half throttle	5.5 - 7.0	28.0 - 36.0	5:10
Full throttle	7.5 - 9.5	17.0 - 22.0	2:20

Navigator 2.0 use 2X12V/180Ah batteries or 4X12V/90Ah batteries

Dinghies, sailboats up to 2.0 tons

	Speed (km/h)	Range (km)	Runtime (hours)
Slow speed	2.0 - 3.0	90.0 - 135.0	45:00
Half throttle	6.0 - 7.5	36.0 - 45.0	6:00
Full throttle	8.0 - 10.0	20.0 - 25.0	2:30

Navigator 2.5 use 2X12V/200Ah batteries or 4X12V/100Ah batteries

Dinghies, sailboats up to 2.5 tons

	Speed (km/h)	Range (km)	Runtime (hours)
Slow speed	2.0 - 3.0	100.0 - 150.0	50:00
Half throttle	7.0 - 8.5	28.0 - 34.0	4:00
Full throttle	9.0 - 11.0	18.0 - 22.0	2:00

Navigator 3.0 use 4X12V/150Ah batteries

Dinghies, sailboats up to 3.0 tons

	Speed (km/h)	Range (km)	Runtime (hours)
Slow speed	3.0 - 4.0	120.0 - 160.0	40:00
Half throttle	8.0 - 9.0	32.0 - 36.0	4:00
Full throttle	10.0 - 12.0	20.0 - 24.0	2:00

Note: Test data above for reference only, test result depends on ships size, shape, weight, wind speed and flow.

Electric Brushless Motor

NB EMP[®]



产品特点

1. 寿命长。采用无刷技术，产品寿命比有刷电机提高5倍以上。维护简单，成本较低。
2. 效率高，节能。产品使用直流无刷电机，产品效率为85%以上，比有刷电机综合节电率提高30%~60%，比汽油机综合节电率更提高100%~200%。
3. 噪音低。产品的噪音低于55分贝，一般汽油机的噪音在65分贝以上，所以本产品可以称为静音产品。
4. 重量轻。产品的重量比相同功率有刷电机轻20%以上，比汽油机轻50%~100%
5. 绿色环保产品。产品使用蓄电池直接供电，无汽油机的废气和废油污染。
6. 具有堵转保护功能。
7. 具有过热保护功能。
8. 具有低压保护功能。保护电瓶在低压时不会因为大电流输出降低使用寿命。
9. 具有启动保护功能。
10. 具有反接保护功能。
11. LED电压显示功能，电压误差±0.1V。
12. 无级调速，超低转速到最大速无缝过渡。
13. 可伸缩超大把手，更适合操控。
14. 耐高温、大电流电线。
15. 可靠的接插件。
16. 更加强壮、可靠的悬挂系统

Features

1. Long lifetime. The brushless technology extends the product lifetime by more than 5 times in comparison to brush motor. The maintenance is simple with low cost.
2. High efficiency, energy saving. Products use brushless DC motor, and the efficiency is over 85%. The efficiency is 30-60% higher and 100-200% higher when compared to the brush motor and gasoline engine, respectively.
3. Low noise. The noise produced by this motor is less than 55 dB and it has no noise pollution. In comparison, the general gasoline engines make noise at 65 dB.
4. Light weight. The weight of the product (at the same output power) is more than 20% lighter than the brush motors and 50%~100% lighter than

产品运行参数

领航员 1.0 使用2X12V/100Ah电瓶

橡皮船、玻璃钢船、帆船，最重可达1.0吨

	速度 (公里/小时)	航行距离 (公里)	航行时间 (小时)
低速	2.0 - 3.0	50.0 - 75.0	25:00
半油门	5.0 - 6.5	29.0 - 37.0	5:50
全油门	7.0 - 9.0	19.0 - 25.0	2:50

领航员 1.5 使用2X12V/120Ah电瓶或4X12V/60Ah电瓶

橡皮船、玻璃钢船、帆船，最重可达1.5吨

	速度 (公里/小时)	航行距离 (公里)	航行时间 (小时)
低速	2.0 - 3.0	60.0 - 90.0	30:00
半油门	5.5 - 7.0	28.0 - 36.0	5:10
全油门	7.5 - 9.5	17.0 - 22.0	2:20

领航员 2.0 使用2X12V/180Ah电瓶或4X12V/90Ah电瓶

橡皮船、玻璃钢船、帆船，最重可达2.0吨

	速度 (公里/小时)	航行距离 (公里)	航行时间 (小时)
低速	2.0 - 3.0	90.0 - 135.0	45:00
半油门	6.0 - 7.5	36.0 - 45.0	6:00
全油门	8.0 - 10.0	20.0 - 25.0	2:30

领航员 2.5 使用2X12V/200Ah电瓶或4X12V/100Ah电瓶

橡皮船、玻璃钢船、帆船，最重可达2.5吨

	速度 (公里/小时)	航行距离 (公里)	航行时间 (小时)
低速	2.0 - 3.0	100.0 - 150.0	50:00
半油门	7.0 - 8.5	28.0 - 34.0	4:00
全油门	9.0 - 11.0	18.0 - 22.0	2:00

领航员 3.0 使用4X12V/150Ah电瓶

橡皮船、玻璃钢船、帆船，最重可达3.0吨

	速度 (公里/小时)	航行距离 (公里)	航行时间 (小时)
低速	3.0 - 4.0	120.0 - 160.0	40:00
半油门	8.0 - 9.0	32.0 - 36.0	4:00
全油门	10.0 - 12.0	20.0 - 24.0	2:00

备注：船的大小、形状、重量和风速、水流速度会影响测试结果，所以以上参数仅做参考。

Product Technical Data

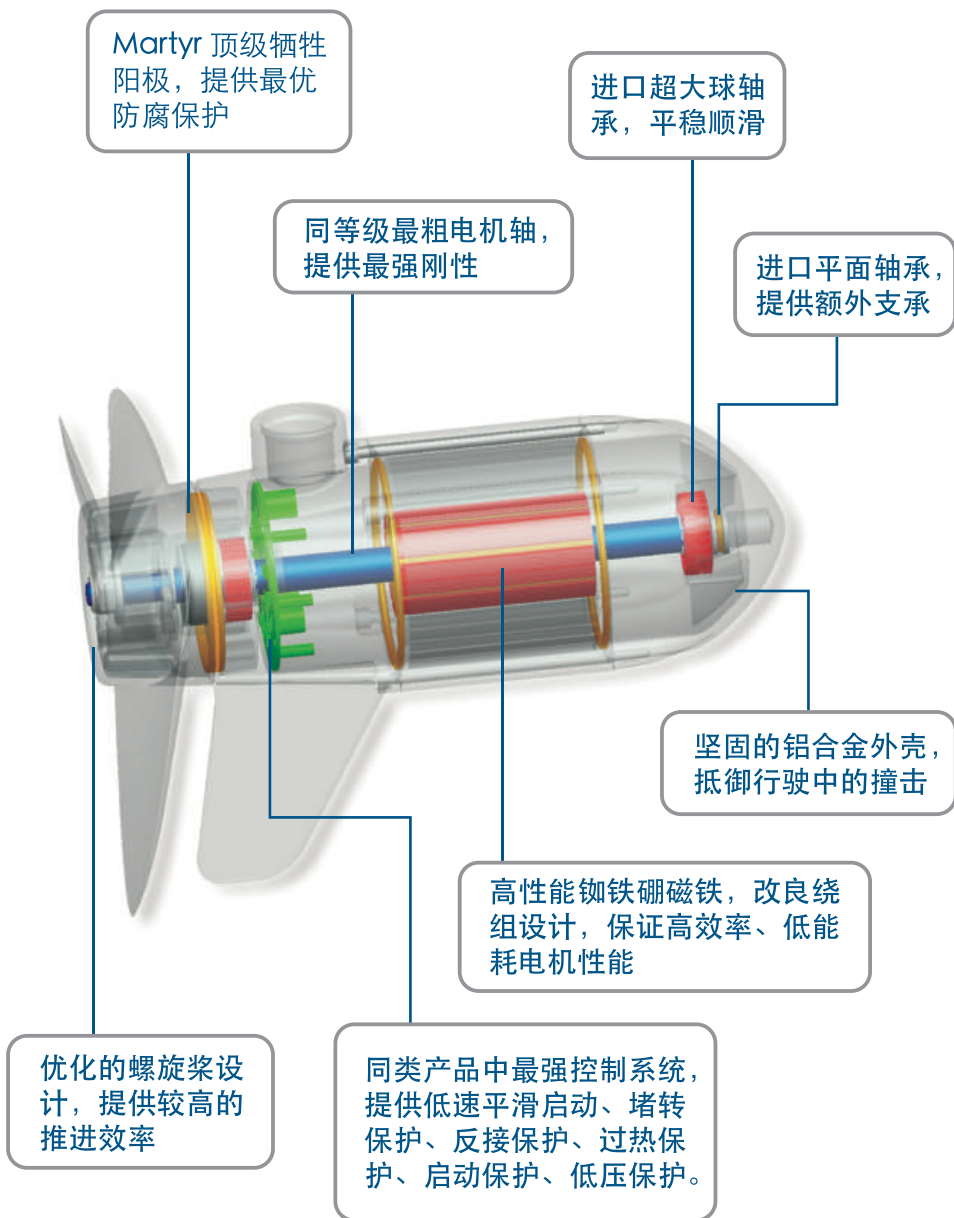
Model	Navigator 1.0		Navigator 1.5		Navigator 2.0		Navigator 2.5		Navigator 3.0
Input power in watts	735		1100		1470		2100		2700
Propulsion power in watts	480		715		1000		1365		1700
Comparable petrol outboards (propulsive power)	2HP		3HP		4HP		6HP		8HP
Comparable petrol outboards (thrust)	3HP		4HP		5HP		7HP		9HP
Efficiency at maximum power in %	65		65		68		65		63
Maximum efficiency in %	≥83		≥83		≥85		≥83		≥80
Static thrust in lbs	80		100		120		140		160
Voltage in volt	12	24	24	48	24	48	24	48	48
Maximum current in amp	60	30	45	22.5	60	30	87.5	43	56
Maximum propeller speed in rpm	1100		1200		1350		1450		1600
Speeds(FWD/REV)	Variable								
Total weight in kg	8.0		9.0		10.0		11.0		12.0
Shaft length in cm	100/Customizable								
Control	Tilt/Extendable Tiller								
Battery gauge	Yes								
Overheat protection	Yes								
Low-voltage protection	Yes								
Stall protection	Yes								
Start protection	Yes								
Reverse connection protection	Yes								

Features

- the gasoline engines respectively.
- Green product. The product uses the battery as its power supply and there is no pollution from the gasoline burn.
 - With "stall protection" function.
 - With "overheat protection" function.
 - With "low voltage protection" function. This protection protects the battery from being compromised due to the high current output due to the low voltage.
 - With "start protection" function.
 - With "Reverse connection protection" function.
 - LED voltage display, voltage accuracy of $\pm 0.1V$.
 - Stepless speed variation, seamless transition from super low speed to the maximum speed.
 - Large handle with adjustable length, more comfortable to control.
 - Current wires with high temperature resistance.
 - Reliable connector.
 - More robust, reliable Mounting system.

无刷电机结构图

产品技术参数



型号	领航员 1.0		领航员 1.5		领航员 2.0		领航员 2.5		领航员 3.0
输入功率 (W)	735		1100		1470		2100		2700
输出功率 (W)	480		715		1000		1365		1700
比较汽油船外机 (推进力)	2HP		3HP		4HP		6HP		8HP
比较汽油船外机 (推力)	3HP		4HP		5HP		7HP		9HP
最大功率时效率 (%)	65		65		68		65		63
最大效率 (%)	≥83		≥83		≥85		≥83		≥80
静推力 (lbs)	80		100		120		160		180
额定电压 (V)	12	24	24	48	24	48	24	48	48
最大电流 (A)	60	30	45	22.5	60	30	87.5	43	56
最大功率时转速 (rpm)	1100		1200		1350		1450		1600
调速 (正转/反转)	无级调速								
总重 (kg)	8.0		9.0		10.0		11.0		12.0
杆长度 (cm)	100/可定制								
控制	可伸缩把手								
电压测量	有								
过热保护	有								
低压保护	有								
堵转保护	有								
启动保护	有								
反接保护	有								

Use, maintenance attention points and tips

17. Adjust the depth of the motor in depth adjustment collar to avoid impact with hard objects such as shallow river bed and stone. In the fast running of the machine, the impact of the hard object can easily cause the shaft of the motor to be bent, the propeller is damaged, and even the motor is burnt.
- Note:** In case of this incident, it is not covered by the warranty.

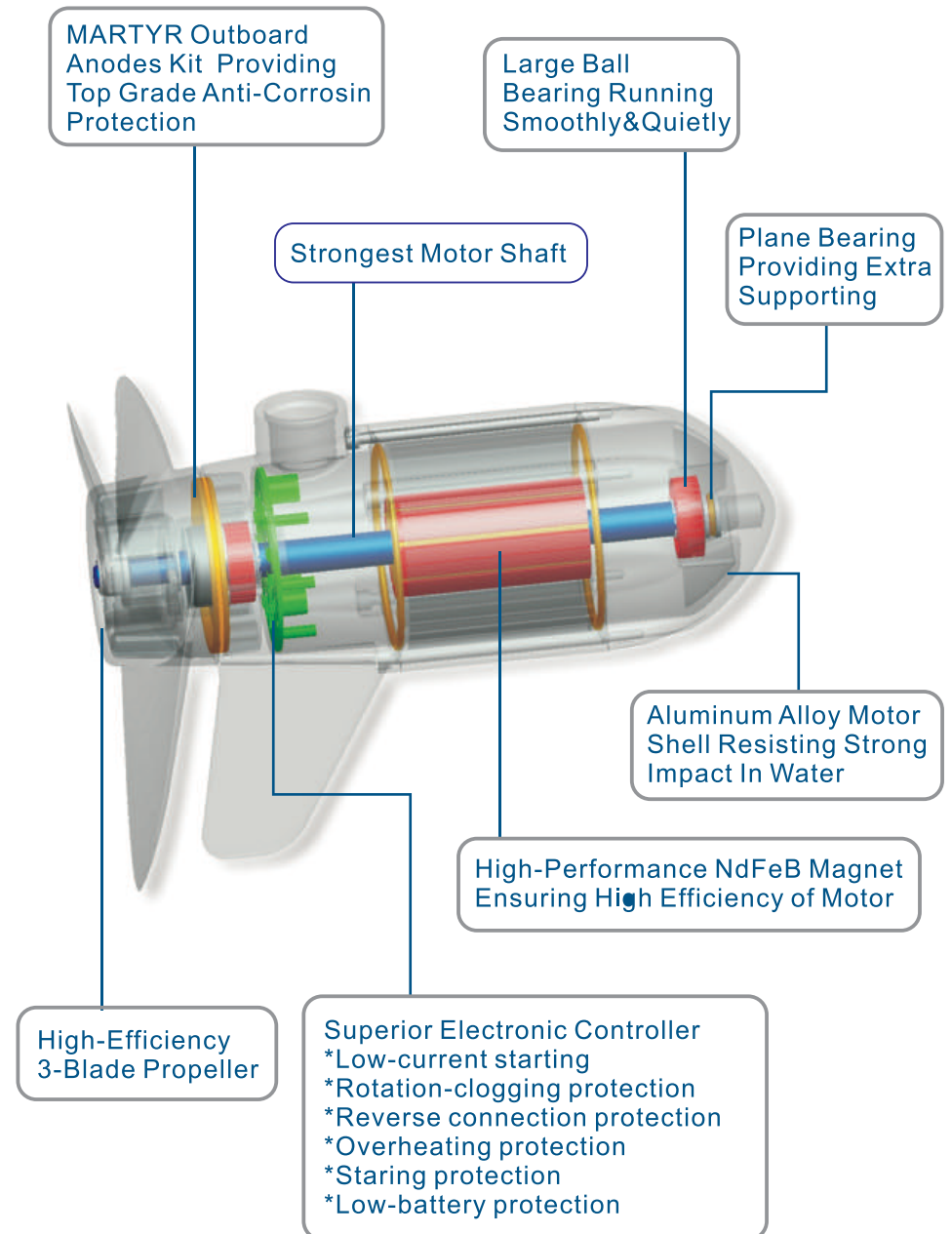
保修条款

1. 本公司提供自购买日起壹年的保修时间。（购买日以发票的日期为准）
2. 本保修不包括易磨损零件（螺旋桨组件、电源线接插件等）。
3. 本公司仅对正当使用范围内所出现的产品质量问题负责保修，对任何人为过失操作、事故及不正确的修理和对产品改装等不在本保修范围之内，本公司保留收费维修及拒绝保修的权利。

Warranty

1. The company offers one years warranty from the date of purchase(valid only with your purchase receipt) .
2. This warranty does not cover the wearing parts , e.g. props and connectors.
3. The company warranty applies to the original products with proper use only. Operation with any human error , accident and improper repairs and product modifications , etc. are not within the scope of this warranty. The company could keep the rights to charge the repairs and services or refuse to do any repairs and services.

Optimized Brushless Motor Design



安装

1. 将推进器安装在船尾，拧紧悬挂架上的两个螺栓。（图A）
2. 调整推进器的角度：一手抓住管子，一手轻按扳手，调整到理想角度后松开扳手使之复位。检查推进器是否固定牢固。（图B）

警告：当调整推进器角度时，不能把手放在管子和船体之间，谨防受伤！在安装和卸下推进器时必须断开电源。



3. 调整电机的水下深度：一手抓住管子，另一手旋松深度调节环螺栓，将电机调整至需要的深度，再拧紧螺栓。（图C）
4. 调整掌舵阻力：旋松或拧紧悬挂架阻力螺栓。（图D）



Use, maintenance attention points and tips

1. Check the wiring before connecting the battery and power cords .
2. Add grease to the screws in the moving parts every month.
3. Wash with water after each use throughout the motor, especially after using PH or salt water .
4. Clean the connectors, check for loose connectors , wire rust or scratches and so on. Lacking of maintenance may cause the connection to overheat, or even burn.
5. Using the current control at half the maximum current can protect the battery and extend the sailing mileage.
6. Mount angle can be adjusted to increase efficiency of motor.
7. Low-Voltage Protection: When the voltage is displayed low , the controller will enter the low voltage protection mode : power output will be reduced down to 50% , in order to protect the battery.
8. Overheat protection: when the propeller is entangled by articles which are not cuttable, the motor could overheat. When the temperature of motor reaches 110℃ ,the controller will go to the temperature protection mode: power output will be reduced down to 50%, in order to protect the motor and battery.
9. Stall protection: When the motor stalls , the controller will enter the stall protection mode : the power output will be only 6A, to protect the motor.
10. Start protection: if the handle speed scale is in the zero position in the first beginning, when connecting to the power, the program will start properly when accompanying with a "dido" sound. otherwise, the motor will not start. This protection function to protects the user from being injured due to the sudden start.
11. Reverse connection protection: when the wire connection is reversed, the motor will not start in order to protect the user .
12. Select the appropriate model of the motor for the highest energy efficiency based on the size of the boats..
13. When the pin breaks , remove the propeller and (Fig. K) replace the pin.
14. Reverse when using, try not to full speed should be at half speed position, can effectively protect the motor.
15. When used, it can be heard that the bearing voice is louder or different, the bearing should be replaced immediately and the sealing parts should be replaced at the same time. Can effectively extend the service life of the product.
16. When adjusting speed, please turn the handle slowly, and the machine can respond quickly. If you turn your handle quickly, it is easy to damage the speed control switch.

1. 接电瓶和电源线时先检查线路后再连接。
2. 每月定时给螺丝活动件处添加润滑油。
3. 每次使用后用清水清洗整个推进器，特别是在盐碱水中使用后。
4. 每月清洁连接器，检查连接器是否有松动、生锈或电线刮伤等现象。若缺少此项维护，可能会造成连接处过热，损耗变大甚至烧毁。
5. 使用时电流控制在最大电流的一半有利于电瓶的保护和延长航行距离。
6. 适当调整悬挂架角度能增加航行效率。
7. 低压保护功能：电压过低时，控制器就会进入低压保护程序：动力输出减到50%，以保护电瓶。
8. 过热保护功能：电机如果遇到螺旋桨不能切断的物品缠绕时阻力变大发热，发热达到110℃时，控制器就会进入过热保护程序：动力输出减到50%，以保护推进器和电瓶。
9. 堵转保护功能：电机堵转时，控制器就会进入堵转保护程序：动力输出只有6A左右，以保护推进器。
10. 启动保护功能：把手应先到零位，连接上电源后听到“嘀嘟”的声音后程序才能正常启动。如果把手不在零位，连接上电源时电机不会启动。此项保护功能以保护使用者不会因电机突然启动而受到伤害。

11. 反接保护功能：电线连接相反时，电机不会启动，以保护使用者。
注：各项保护功能开启后必须重新复位后才能恢复正常运行。（图F，复位：插头拔开然后再插上，听到“嘀嘟”的声音）

12. 根据船型大小选择合适的推进器能提高使用效率。

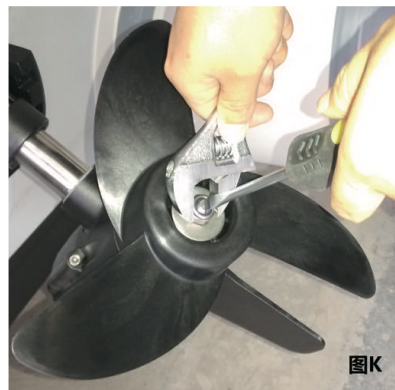
13. 不锈钢销子断时，请按（图K）方法取出螺旋桨更换销子。

14. 倒档使用时尽量不要全速，应在半速位置，能有效保护电机。

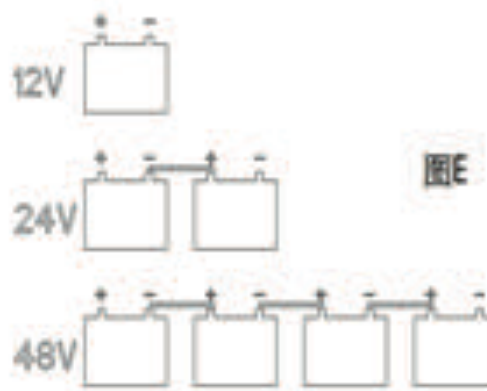
15. 使用时听到轴承声音变大或有异响，应立即更换轴承并同时更换密封件。能有效延长产品使用寿命。

16. 调速时，请慢速转动把手，机器也能快速反应。如快速转动把手，很容易造成调速开关损坏。

17. 适当调整电机在水下的深度，避免与浅滩河床、石头等硬物碰撞。机器在快速运行中与硬物碰撞很容易造成电机轴撞弯、螺旋桨损坏、甚至电机烧毁。请注意：发生此项事故时，产品不在保修之内。



5. 连接蓄电池：12V使用单个蓄电池接主电源线，正极（+）接电源线红线，负极（-）接电源线黑线。24V使用2个蓄电池串联，48V使用4个蓄电池串联。（图E）
6. 连接电源线快速插头：连接电源线前先检查接线是否正确。（图F）



7. 确保手柄速度刻度在零位。在零位时，连接上电源时会听到“嘀嘟”的声音，这表示电机控制程序正常，可以正常启动了。如果不在零位，连接上电源时电机不会启动以保护使用者的安全。（图G）
8. 调速。本产品为无级调速。手柄可伸缩，最长可延伸14cm。F方向是正转，R方向是反转，O是零位。（图G，图H）



9. 螺旋桨安装：注意查看螺旋桨槽和不锈钢销子是否正确配合，否则螺旋桨不能正常使用。（图I）依次装入螺旋桨，不锈钢垫圈，弹性垫圈，防松螺母。（图I-2）（图I-3）安装时需用一只手抓住螺旋桨以固定轴，另一只手用扳手或专用工具拧紧防松螺母。（图J）

安装

警告： a. 安装螺旋桨时必须断开电源。 b. 抓住螺旋桨时注意边缘锋利，谨防受伤！



Assembly

1. Attach the motor to the stern of the boat. Make sure you tighten the two bolts securely. (Fig.A)
2. Adjusting the angle of the trolling motor: hold the shaft in one hand and the tap wrench in the other hand, adjust to the desired angle and then release the wrench to its original position. Make sure the motor is affixed to the stern. (Fig.B)

Assembly

WARNING! When adjust the angle of the trolling motor, please don't put your hands between the shaft and the hull of the boat—**you might be injured!** When mounting or detaching the trolling motor, make sure that the battery is disconnected.

3. Adjusting the depth: hold grasp the shaft with one hand and unscrew depth adjustment bolt using the other hand, adjust the motor to the desired depth , and then tighten the bolt. (Fig.C)
4. Adjust the steering force: Loosen or tighten the bolt. (Fig.D)
5. Connect the battery: Connect the two 12V batteries in series and then connect them to the main power lines, with the red battery cable to the positive battery terminal(+), and the black battery cable to the negative battery terminal (-), respectively. (Fig.E)
6. Connect the power cord plugs: before connecting the power cords, check if wiring is correct. (Fig.F)
7. Make sure the handle speed scale in the zero position. In the zero position, you will hear the "dido" sound when connected to a power source, which means that the motor control program is working correctly, and it can be started properly. If it is not in the zero position, when connecting the motor will not start, which is purposely designed to protect the users. (Fig.G)
8. Adjust the speed. This product has a stepless speed variation. Telescopic handle, can be extended up to 14cm. F represents the forward direction, R represents the reverse direction, O means the original position. (Fig.G, Fig.H)
9. Propeller Installation: Make sure trough and propeller pin is correctly matched , otherwise the propeller cannot be-properly used. (Fig.I) Locate the propeller, washer ,spring washer, locknut in sequence. (Fig.I-2, Fig.I-3) Hold the propeller with one hand, and use a wrench or a special tool to tighten the locknut using the other hand.

WARNING! a). Must disconnect the power when installing propeller. b). Watch out the sharp edges of the propeller during installation. —**you might be injured!**