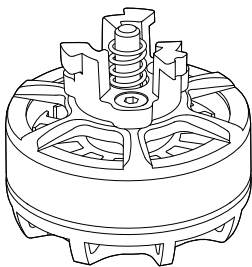


# DJI Snail Racing Propulsion System

## DJI Snail 竞速多旋翼动力系统

User Manual  
用户手册

V1.0 2016.09



## Disclaimer and Warning

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This disclaimer is produced in various languages. In the event of divergence among different versions, the Chinese version shall prevail when the Product in question is purchased in China, and English version shall prevail when the Product in question is purchased in any other region.

## Legend



Important



Hints and Tips



Reference

## Warning

When powered on, the motors and propellers will rotate very quickly and can cause serious damage or injuries. Always be vigilant and make safety your top priority.

1. Always attempt to fly your aircraft in areas free of people, animals, power lines, and other obstacles.
2. DO NOT approach or touch the motors or propellers when the unit is powered on.
3. Ensure that there are no open circuits or short circuits when soldering the ESC cables.
4. Before takeoff, ensure that the propellers and motors are installed correctly.
5. Ensure that all parts of the aircraft are in good condition. DO NOT fly with worn or damaged parts.

6. Only use compatible, authorized DJI parts.
7. Ensure that all parts are firmly in place and all screws are tight before each flight.
8. The input throttle signal mode (regular or OneShot125) cannot be changed while the product is in use. Set the input throttle signal mode on your flight controller. Restart the electronic speed controller to apply the new mode.
9. Do not connect the electronic speed controller to a DC regulated power supply, or the power system and the electronic speed controller will be damaged when the product captures energy produced during deceleration as this product has Active Braking Function by default.
10. Ensure that the motors rotate smoothly before takeoff.



Active Braking Function: The motor actively reverses torque when decelerating, recovering some of the rotational energy. Normal braking relies mainly on air resistance.

## Introduction

The Snail Racing Propulsion System is a multirotor propulsion system designed for racing multirotor aircraft with a max thrust of 1.32kg/rotor. Based on the operation environment of racing multirotor aircraft, impact analysis and drop tests are performed on the Snail 2305 Racing Motor to guarantee its rugged structure.

The Snail 430-R Racing ESC uses a 32 bit motor driver chip with a maximum main frequency of 100MHz. Its advanced algorithms allow a responsive motor drive with precise control and its small power supply ripple ensures normal performance of other power supply units when motors reach maximum current output. Like most DJI products, the ESC firmware can be updated, ensuring that the Snail is constantly refined.

## Features

**Active Braking Function**

**3D Mode\***

**Two Throttle Signal Modes**

- Regular throttle signal: 30Hz to 500Hz PWM signal
- OneShot125 signal: 30Hz to 1000Hz

**High Rotational Speed Motors**

- 46,000rpm (7 pole pairs)
- 322,000rpm (1 pole pair)

Maximum Continuous Current: 30A

DJI Assistant 2 Software

Complete Electromagnetic Compatibility Test

- Radiated Emission
- Electrostatic Discharge Immunity
- Radiated RF Electromagnetic Field Immunity

Typical Applications: Racing multirotor aircrafts

\* Get 6048-3D Propellers and update the ESC firmware via DJI Assistant 2 to activate the 3D mode of the 430-R Racing ESC (Refer to Connecting the ESCs for more information).

## In the Box

### Standard Package



2305 Motor (CCW) × 2



2305 Motor (CW) × 2



430-R ESC × 4



Heat-shrink Cover × 4



Screws (M3 × 5, M3 × 6)

### Optional Package



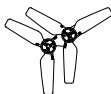
5024S



6030S



7027S

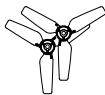


5048S Tri-Blade

Quick-Release Propeller Pairs



6048-3D  
Propeller Pair



5048 Tri-blade  
Propeller Pair



ESC Programmer



A DJI Snail Propeller Adaptor is required for mounting 6048-3D Propellers and 5048 Tri-Blade Propellers on the motors.

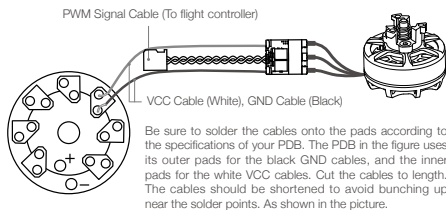


5048S Tri-Blade Quick-Release Propellers are recommended for use with the Snail Racing Propulsion System. Y-shaped and aerodynamic designed blades enable them to provide racing multirotor aircraft with sufficient strength and stiffness.

## Connecting the ESCs

Tool Required: Power distribution board (PDB), electric soldering iron and soldering tin.

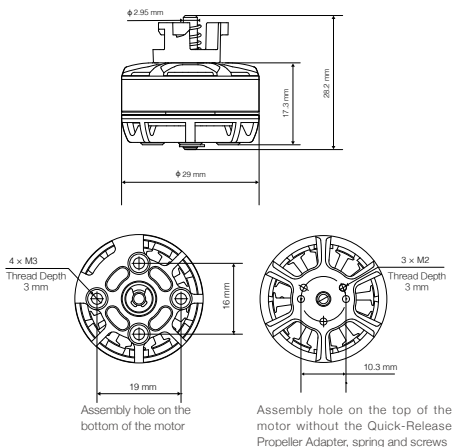
1. Solder the ESC's black GND cable and white VCC cable to the pads on the PDB as shown.
2. Connect the signal cable to your flight controller. The signal cable's white wire transmits the control signal; the black wire is for GND.
3. Connect the motor to the ESC. Test the motors and ensure that the rotation direction of each motor is correct. You can reverse the rotation direction by swapping the positions of any two cables. See below the ESC Configuration for more information on how to reverse the motor rotation direction.
4. A PWM signal cable is also used to connect PC to update firmware.



Ensure that there are no open circuits or short circuits when soldering the ESC cables.

## Mounting the Motors

The dimensions and thread sizes of the motor are illustrated below. Ensure they are compatible with your frame arms before mounting the motors.



- Use a suitable Propeller Adapter and airframe that can withstand the large thrust delivered by the Snail Racing Propulsion System.
- Choose an appropriate screw length and screw size according to the depth of the assembly hole and thickness of the motor mounting plate. Using screws that are too long or too large may not be able to secure the motor.
- When mounting or removing the motors, be careful to prevent foreign articles from entering the motors.

## Assembling the Propellers

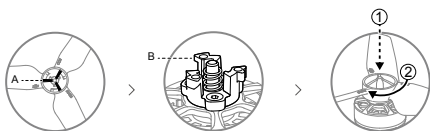
### Quick-Release Propellers

This example uses the 5048S propellers. Instructions also apply to the installation of 5024S, 6030S and 7027S.

1. Pair the propellers marked CW with the clockwise rotating motors; pair the unmarked propellers (white ring on the

bottom of the propellers) with the counterclockwise rotating motors (with white dots).

2. Align gap A inside the propeller nut with fin B on the Propeller Adapter. Press the propeller down onto the adapter firmly and, while holding the propeller pressed down, rotate the propeller in the lock direction (propellers marked CW rotate counterclockwise; propellers without markings rotate clockwise) until you feel it secure in place.
3. To remove the propeller, press the propeller down firmly and, while holding the propeller pressed down, rotate the propeller in the unlock direction until it can be removed easily.

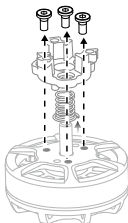


### Other Propellers

This example uses the 6048-3D propellers. Instructions also apply to the installation of 5048 Tri-Blade Propellers.

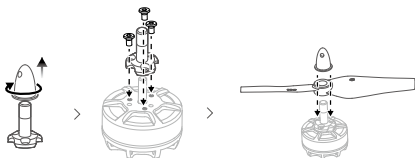
Tools Required: M2 hex key and Snail Propeller Adapter.

1. Remove the screws securing the Quick-Release Propeller Adapter on the 2305 Racing Motors, and then remove the Quick-Release Propeller Adapter.



2. Remove the cap on the Snail Propeller Adapter.
3. Align the holes of the black Propeller Adapter with the holes on the CW motors. Insert the M2×4 screws and tighten to secure. Align the holes of the red Propeller Adapter with the holes on the CCW motors. Insert the M2×4 screws and tighten to secure.

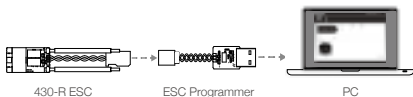
4. Install the unmarked propellers onto the red Propeller Adapter, and install the propellers marked with CW onto the black Propeller Adapter.
5. Secure the propellers by rotating the red cap onto the axes of the red Propeller Adapter and black cap onto the axes of the black Propeller Adapter.



- Stand clear of the motors and DO NOT touch the propellers when they are spinning.
- Use only DJI approved propellers.
- Use appropriate propellers for your needs, as they can wear out.
- Pay attention to screws properly during installation and removal.
- Before mounting 6048-3D Propellers, select 3D Mode in DJI Assistant 2 and update the corresponding firmware. (Refer to Using DJI Assistant 2 for details)

## Using DJI Assistant 2

DJI Assistant 2 is used to update and configure the ESC. Remove propellers before connecting to DJI Assistant 2.



Unplug any other serial devices connected to your PC before updating. Then follow the instructions below.

1. Download and install DJI Assistant 2 from the Official DJI website. (<http://www.dji.com/snail/info#downloads>)
2. Connect the ESC Programmer to the ESC with the PWM signal cable and to your computer using the USB cable on the programmer.
3. Connect a battery (3-4S LiPo) to supply power to the ESC. Do not disconnect the ESC from your computer or the power supply until configuration is complete.



4. Launch DJI Assistant 2. When a connection is established, the software will display the connected devices. Use your DJI account to log in.
5. Click Settings to set parameters.
6. Click the firmware update and select the version you would like to update. DJI Assistant 2 will automatically download and update the firmware. Restart your ESC after the update is complete.



- Ensure that your computer is connected to the Internet during update.
  - Ensure that the battery level is adequate for the update.
  - DO NOT unplug the USB cable during the update.
  - Retry to update if DJI Assistant 2 displays an update failure prompt.
  - If the ESC is not recognized by the DJI ESC Assistant, check if there is more than one FTDI device connected such as another DJI Updater or programmer, an FTDI USB adapter or development board (e.g. a BeagleBone, Raspberry or Arduino board). Unplug the other FTDI devices. Restart the DJI Assistant 2 and the ESC, and try again.
- 

## ESC Configuration

Calibrate the throttle range and switch the motor rotation direction using the remote controller.

1. Power on the remote controller and receiver. Ensure a good communication between them. Push the throttle stick all the way up. The motor start a slow double beep, a single beep sequence.
2. Then the warning sound will alternate between a quick single beep and a quick double beep. Pull the throttle stick all the way down after hearing a single beep to calibrate the throttle. Pull the throttle stick all the way down after hearing a double beep to reverse the motor rotation direction. By rotating the desired motor quickly in any direction, this motor's rotation direction will be changed.
3. The warning sound becomes a chime when completed.
4. Restart the ESC after reversing its rotation direction.

## System Status Beep Codes

The motors will beep when the Snail is in use. The table below contains more information about the warning sound.

Alarm	Description
Chime	Ready to work
Rapid Beeping	Minimum throttle signal not reached. Check the flight controller, remote controller or remote controller receiver.
Slow Beeping	No throttle signal.
Alternating Single and Double Beeps	Using the remote controller for configuration and set motor rotation direction.

## Specifications

Max Thrust	1.32kg/rotor (16.8V, Sea Level)
Recommended Battery	4S LiPo
Recommended Takeoff Weight	125–250g/rotor (Sea Level)
Operating Environment	-10° to 50°C
<b>ESC</b>	
Max Allowable Voltage	17.4V
Max Allowable Current* (Continuous)	30A
Max Peak Current*(3 sec)	45A
Supported Throttle Signal Modes	Regular/OneShot125
Max OneShot125 Signal Frequency	1000Hz
Max Regular Signal Frequency	500Hz
Default PWM Output Signal Frequency	16kHz
Weight (Without Cables)	2.8g
Supported Battery	3S–4SLiPo
<b>Motor</b>	
Stator Size	23×5mm
KV	2400rpm/V
Weight (Without Cables)	27.8g

\* Tested at the temperature of 25°C, well ventilated

Propellers	Diameter×Thread Pitch	Weight (single one)
5048S propellers	5×4.8inch (12.70×12.19cm)	5.50g
5024S propellers	5×2.4inch (12.70×6.10cm)	3.45g
6030S propellers	6×3.0inch (15.24×7.62cm)	3.20g
6048-3D propellers	6×4.8inch (15.24×12.19cm)	4.10g

5048 propellers	5×4.8inch (12.70×12.19cm)	5.68g
7027S propellers	7×2.7inch (17.78×6.86cm)	4.32g

## Performance and Parameters

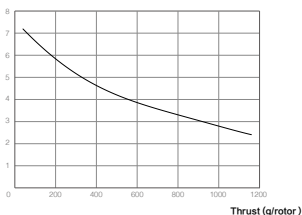
The following data was generated using 5048s tri-blade Quick-Release propellers. Use this data to facilitate the proper use of the propulsion system.



- A payload of 120g to 300g per rotor is recommended for optimal performance.
- DO NOT overload the system. A payload more than 400g per rotor will severely compromise safety and performance.
- It is recommended to pair with racing aircraft weighing less than 650g (including battery).

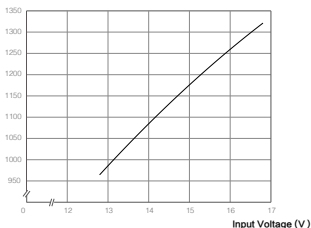
### Snail Racing Propulsion System Performance

Power Loading (g/W)

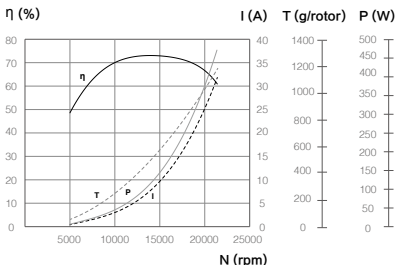


The data above was measured with an input voltage of 14.8 V, at a temperature of 25°C and sea level. The thrust was adjusted by the throttle.

Max Thrust (g/rotor)



The data above was measured at full throttle, at a temperature of 25°C and sea level.

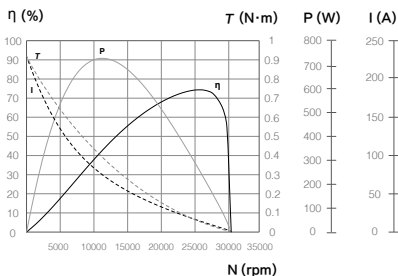


η – Electrical Efficiency, T – Thrust, I – Current, P – Input Power, N – Rotational Speed

The data above was measured with an input voltage of 14.8V, at a temperature of 25°C and sea level. The rotational speed was adjusted by the throttle. Electrical efficiency is the product efficiency of the system including the ESC and motor.

## 2305 Racing Motor Performance

### Performance Diagram



T – Torque, I – Current, P – Output Power, η – Efficiency, N – Rotational Speed

The data above contain theoretical values measured with an input voltage of 14.8V, for reference only. When operating at a temperature of 25°C with no additional cooling devices, the motor cannot operate with a current more than 50A. It can support short term operation (about 1 to 10 sec) with a current between 25A and 50A, and continuous operation with a current under 25A. The motor run time should depend on the actual environmental temperature and cooling conditions.

### Characteristic Parameters

Speed Constant	2400rpm/V
Back Electromotive Force Constant	0.0056364 v·s/rad
Mechanical Time Constant	200ms
Motor Rotor Inertia	1.84kg·mm <sup>2</sup>

Total Rotor Inertia (5048S Propeller Included)	6.62kg·mm <sup>2</sup>
Torque Constant	0.0054267N·m/A
Line-to-Line Inductance	14μH
Line-to-Line Resistance	61mΩ
Thermal Time Constant	100s

## Compliance Information

### FCC Compliance

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.

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

### EU Compliance Statement

SZ DJI TECHNOLOGY CO., LTD. hereby declares that this device is in compliance with the essential requirements and other relevant provisions of the EMC Directive.

A copy of the EU Declaration of Conformity is available online at [www.dji.com/euro-compliance](http://www.dji.com/euro-compliance)



EU contact address: DJI GmbH, Industrie Strasse. 12, 97618, Niederlauer, Germany

This content is subject to change.

**Download the latest version from**  
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## 符号说明



重要注意事项操作



使用提示



词汇解释

## 产品使用注意事项

高速旋转的螺旋桨可能会对人身财产造成一定程度的伤害和破坏，因此在使用 Snail 竞速多旋翼动力系统时，请务必注意安全。

1. 使用时请远离不安全因素，如障碍物、人群、高压线等。
2. 切勿贴近或接触旋转中的电机或螺旋桨，避免被旋转中的螺旋桨割伤。
3. 确保电调焊接正确，电路无短路、无开路。
4. 使用前请检查螺旋桨和电机是否安装正确。
5. 使用前请检查各零部件是否完好。如有部件老化或损坏，请更换新部件。
6. 请使用 DJI 提供的配件。
7. 每次飞行前，请检查飞行器各部分结构及螺丝是否松动。
8. 输入油门信号模式（普通油门信号或 OneShot125）在电调运行过程中不可更改。如需切换，请在飞控中更改输入油门信号模式，然后重新给电调上电。电调在重新上电后会自动检测当前模式。
9. 由于电调默认带主动刹车功能，请勿使用直流稳压电源连接电调进行测试，否则将会导致电调以及电源损坏。
10. 起飞前请检查电机是否可以流畅旋转。



主动刹车：电机主动提供反向力矩来使螺旋桨减速。若关闭主动刹车功能，螺旋桨减速将主要通过桨叶的空气阻力实现。

## 简介

Snail 竞速多旋翼动力系统是一款单轴最大拉力为 1.32kg 的多旋翼动力系统，适合竞速多旋翼飞行器。Snail 2305 竞速电机根据竞速多旋翼飞行器的使用场景，进行了力学的冲击仿真以及科学的跌落测试，保证结构的强度，增加耐摔性。Snail 430-R 竞速电子调速器专为竞速多旋翼飞行器设计，采用了主频高达 100MHz 的 32 位定制电机驱动芯片；搭载先进的控制算法，实现急速精准稳定的电机驱动控制；供电纹波小，保证大电流输出的情况下不会对其他设备的供电造成影响。固件支持用户自行升级，方便用户享受未来的新功能。

## 产品特性

支持主动刹车功能

支持 3D 模式 \*

支持两种油门信号

- 普通油门信号：30 - 500Hz 的 PWM（脉宽调制）信号
- OneShot125 信号：30-1000Hz

支持最高转速电机

- 46000 rpm（7 对极电机）
- 322000 rpm（1 对极电机）

最高 30A 持续电流

支持 DJI Assistant 2 PC 调参

完整的电磁兼容性测试

- 辐射骚扰测试
- 静电抗扰度测试
- 射频电磁场辐射抗扰度测试

典型应用：竞速多旋翼飞行器

\* 如需使用 3D 模式，需配合 6048-3D 螺旋桨并通过 DJI Assistant 2 调参软件对电调进行固件升级（详见第 19 页使用 DJI Assistant 2 调参软件）。

## 物品清单

标准配件



逆时针旋转 2305 电机 × 2



顺时针旋转 2305 电机 × 2



430-R 电调 × 4



备用热缩套 × 4



M3×5 螺丝；M3×6 螺丝



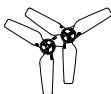
5024S 快拆桨



6030S 快拆桨



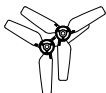
7027S 快拆桨



5048S 快拆三叶桨



6048-3D 桨



5048 三叶桨



电调编程器



若选用 6048-3D 桨及 5048 三叶桨，需另外购买 Snail 普通桨转接件配合安装。



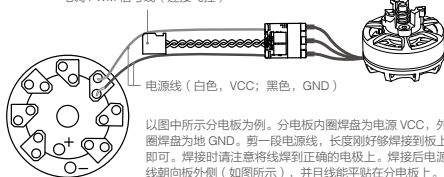
推荐搭配 Snail 5048S 快拆三叶桨使用。Snail 5048S 采用新一代翼型和优秀的气动设计，并针对竞速多旋翼飞行器快速飞行做了特殊的优化处理，提供充足的结构强度和刚度。

## 安装电调

工具和材料（自备）：分电板、电烙铁和焊锡。

1. 将电调电源线焊到分电板上，注意焊点牢固并且不会出现短路。电源线白色为电源 VCC，黑色为地 GND。
2. 将电调 PWM 信号线连接至飞控。其中白色线为控制信号线，黑色线为地线。
3. 将电机的三根线分别连到电调上。调试使电机按照需求方向旋转。如果不一致，交换该电机的任意两根连线。更多设置电机正反转方法，详见使用遥控接收系统设置参数部分内容。
4. 电调 PWM 信号线同时用于固件升级。

电调 PWM 信号线（连接飞控）

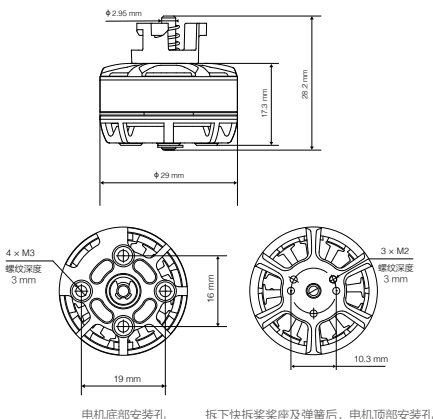


请确保电路中没有短路或开路。



## 安装电机

参考电机尺寸将电机安装到合适的力臂上。



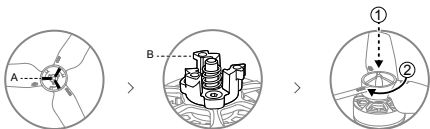
- Snail 穿越机动力系统的拉力较大，务必确保您所选用的电机固定座及机架的结构强度与动力系统提供的拉力匹配。
- 请注意螺纹孔尺寸和螺纹深度。安装电机时，请根据螺纹深度和您使用的电机固定座厚度，选择合适的螺丝。若使用过长的螺丝，拧入后可能导致电机无法固定。
- 安装及拆卸电机时，切勿使异物进入电机。

## 安装螺旋桨

### 快拆式螺旋桨

包括 5048S 快拆三叶桨、5024S 快拆桨、6030S 快拆桨及 7027S 快拆桨，此处安装说明以 5048S 快拆三叶桨为例。

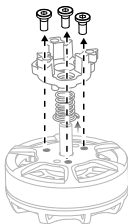
1. 带 CW 标志的螺旋桨对应顺时针旋转电机，未带 CW 标志的螺旋桨（底部印有白圈）对应逆时针旋转电机（桨座带有白点）。
2. 将桨帽内的缺口 A 对准电机上的凸出部分 B。用力下压桨帽到底后沿锁紧方向旋转螺旋桨（CW 沿逆时针，未带 CW 则沿顺时针），直至螺旋桨可以被弹簧弹起到锁止位置。
3. 如需拆卸，用力下压桨帽到底，然后沿解锁方向旋转螺旋桨，直至其可以被自由取下。



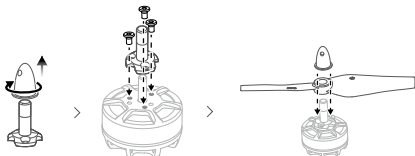
### 普通螺旋桨

包括 6048-3D 桨及 5048 三叶桨，此处安装说明以 6048-3D 桨为例。安装时请自备适用于固定螺丝（M2×4）的内六角扳手及 Snail 普通桨转接件。

1. 拧开 2305 竞速电机上用于固定快拆桨桨座的螺丝，并取下原桨座和弹簧。



2. 取下普通桨转接件上的旋帽。
3. 将红色普通桨转接件与 CCW 电机上的安装孔对齐，黑色普通桨转接件与 CW 电机上的安装孔对齐，拧紧螺丝进行固定。
4. 安装未带 CW 标志的螺旋桨到装有红色普通桨转接件的电机上，带 CW 标志的螺旋桨到黑色普通桨转接件的电机上。
5. 将原旋帽安装回普通桨转接件的轴上，并顺时针方向旋转红色旋帽，逆时针方向旋转黑色旋帽，直至完全固定。

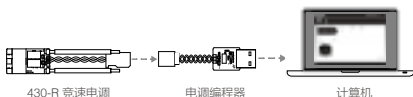




- 由于桨叶较薄，请小心操作以防意外划伤。
- 请使用 DJI 提供的螺旋桨，不可混用不同型号的螺旋桨。
- 螺旋桨为易损耗品，如有需要，请另行购买。
- 拆装过程中请注意妥善保管螺丝配件。
- 使用 6048-3D 桨需在 DJI Assistant 2 调参软件中选择“3D 模式”并进行固件升级。（详见使用 DJI Assistant 2 调参软件）

## 使用 DJI Assistant 2 调参软件

DJI Assistant 2 调参软件主要用于电调固件升级、系统配置等。连接 DJI Assistant 2 调参软件前，请务必确保螺旋桨已拆下。



使用电调编程器前，请移除计算机上其他的串口设备，然后按照以下步骤操作：

1. 从 DJI 官方网站下载并运行 DJI Assistant 2 调参软件安装程序，按照提示完成安装。（<http://www.dji.com/cn/snail/info#downloads>）
2. 将电调的 PWM 信号线接入电调编程器，电调编程器通过 USB 接口连接计算机。
3. 连接 3-4S LiPo 电池为电调供电，设置完成前请勿切断电源或断开连接。
4. 运行 DJI Assistant 2 调参软件并等待电调与软件连接，使用 DJI 账号登录进入主界面。
5. 用户可运用 DJI Assistant 2 调参软件的设置界面进行基本参数的设置。
6. 选择固件升级按钮进行相应的固件版本升级，DJI Assistant 2 调参软件将自行下载并升级固件，升级完成后，请重启电调。



- 确保升级过程中电脑能够访问互联网。
- 确保电池电量充足。
- 升级中请勿插拔电调编程器的 USB 接口。
- 若 DJI Assistant 2 调参软件提示升级失败请尝试重新升级。
- 若 DJI Assistant 2 调参软件无法识别电调，请检查计算机是否接有多个电调编程器或升级器、FTDI USB 适配器或其他可能使用到 FTDI 芯片组的开发工具（包括但不限于：BeagleBone、Raspberry、Arduino 等）。如果是，请断开其他 FTDI 设备，仅保留一个 Snail 电调编程器，然后重启 DJI Assistant 2 调参软件，重新为电调供电，即可恢复正常。

## 使用遥控接收系统设置参数

用户可以通过遥控接收系统进行油门校准及电机转向切换。

1. 打开遥控接收系统且遥控器和接收器通讯正常后，将遥控器油门杆推至最高，此时电机进入编程模式，电机鸣音为 B---B-B---B。
2. 紧接着电机鸣音方式变为 B-BB-B-BB 循环，在 B 一声后将遥控器油门杆下拉至最底可进行油门校准；在 BB 两声后将遥控器油门杆下拉至最底可进行电机正反向切换，此刻以任意方向快速旋转需要改变转向的电机，完成正反向切换。
3. 设置成功后，电机鸣音为正常开机音。
4. 如进行的是电机正反向切换，切换成功后需重启电调。

## 提示音描述

使用时，请根据电机鸣音判断产品是否正常工作。如果出现异常状态鸣音，请排查故障。

正常状态鸣音	描述
开机音	系统就绪
异常状态鸣音	描述
BBBBB……	油门输入不在最小值，请检查飞控、接收器或遥控器设置
B--B--B……	无油门输入
B---B-B---B	通过遥控接收系统设置参数（油门校准以及正反向切换）

## 产品规格

最大拉力	1.32 千克 / 轴（16.8 V，海平面）
推荐电池	4S LiPo
推荐起飞重量	125 - 250 克 / 轴（海平面）
使用环境温度	-10 至 50 °C
电调	
最大允许电压	17.4 V
最大允许电流 *（持续）	30 A
最大允许峰值电流 *（3 秒）	45 A

\*25°C 通风良好情况测得数据

支持输入油门信号模式	普通信号及 OneShot125 信号
最大兼容 OneShot125 信号频率	1000 Hz
最大兼容普通信号频率	500 Hz
默认输出 PWM 频率	16 kHz
重量（不含线）	2.8 g
支持电池	3S - 4S LiPo
<b>电机</b>	
定子尺寸	23 × 5 mm
KV 值	2400 rpm/V
重量（不含线）	27.8 g

螺旋桨	直径 × 螺距	重量（单桨）
5048S 螺旋桨	5 × 4.8 inch (12.70 × 12.19 cm)	5.50 g
5024S 螺旋桨	5 × 2.4 inch (12.70 × 6.10 cm)	3.45 g
6030S 螺旋桨	6 × 3.0 inch (15.24 × 7.62 cm)	3.20 g
7027S 螺旋桨	7 × 2.7 inch (17.78 × 6.86 cm)	4.32 g
6048-3D 螺旋桨	6 × 4.8 inch (15.24 × 12.19 cm)	4.10 g
5048 螺旋桨	5 × 4.8 inch (12.70 × 12.19 cm)	5.68 g

## 性能参数

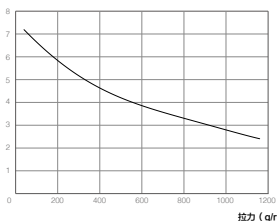
以下数据，为搭配 5048S 三叶螺旋桨测得。请根据性能参数合理使用动力系统。



- 建议单轴拉力在 120g-300g 之间，以获得最佳性能。
- 请勿超重飞行，单轴拉力超过 400g 将会严重影响性能以及安全性。
- 根据竞速无人机的飞行实际工况，建议飞行器（含电池）总重不宜超过 650 克。

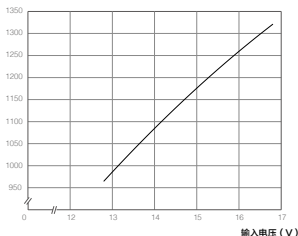
## Snail 竞速多旋翼动力系统性能

力效 (g/w)



以上数据为电调输入电压 14.8 V、室温 25℃、海平面高度的环境下，变化油门输入调节拉力测得。

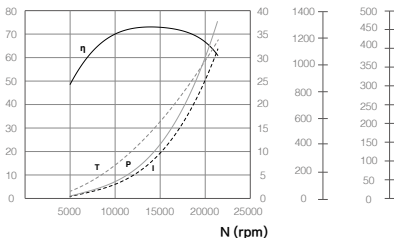
最大拉力 (g/rotor)



以上数据为室温 25℃、海平面高度的环境下，电调满油门，调节电调输入电压测得。

$\eta$  (%)

$I$  (A)  $T$  (g/rotor)  $P$  (W)

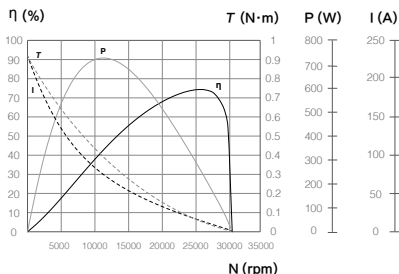


$\eta$  - 电效率, T- 拉力, P- 输入功率, I- 电流, N- 转速

以上数据均为电调输入电压 14.8 V、室温 25℃、海平面高度的环境下, 变化油门输入调节转速测得。其中, 电效率是电机和电调的效率乘积。

## 2305 电机性能

### 性能曲线



$\eta$  - 电机效率, T- 扭矩, P- 输出功率, I- 电流, N- 转速

以上数据均为输入电压 14.8 V 时的理论值, 仅供参考。在室温 25℃、无额外冷却装置的情况下, 电流超过 50 A 为不可工作区域, 25 - 50A 为短时 (约 1 - 10s) 工作区域, 25 A 以下为可持续工作区域。实际使用时, 请根据工作环境温度和散热条件控制电机运行时间。

### 特征参数

速度常数	2400 rpm/V	扭矩常数	0.0054267 N·m/A
反电动势常数	0.0056364 v · s/rad	线电感	14 $\mu$ H
机械时间常数	200 ms	线电阻	61 m $\Omega$
电机转子惯量	1.84 kg · mm <sup>2</sup>	热时间常数	100 s
转子总惯量 *	6.62 kg · mm <sup>2</sup>		

\* 含 5048S 螺旋桨

内容如有更新, 恕不另行通知。

您可以在 DJI 官方网站查询最新版本  
<http://www.dji.com/snail>

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