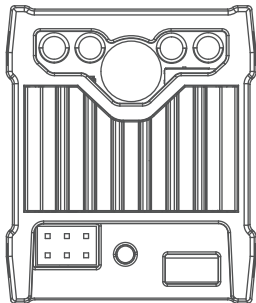


TYROTE

Rumble 60

使用说明书
User Manual



CAYOTE TEAM

Warnings

This product is a high-performance brushed electronic speed controller (ESC) designed for RC model vehicles. Improper installation or operation may cause personal injury or equipment damage. Please read this manual carefully before use and always disconnect the battery after operation.

Disclaimer

Thank you for choosing this product. Please read this manual carefully before installation and operation. The manufacturer is not responsible for any damage or loss caused by improper use, incorrect installation, or failure to follow this manual. Any damage resulting from unauthorized disassembly or modification is not covered.

Product design, specifications, and instructions may change without prior notice.

Safety Notes

Ensure all wires and connectors are properly insulated before connecting the ESC.
Confirm all components are connected correctly and securely.
Use properly matched motor and battery specifications to avoid system overload.
Ensure adequate cooling during operation. ESC temperature should not exceed 90°C / 194°F.
Disconnect the battery from the ESC after use to prevent battery over-discharge.

警告

本产品为RC模型车的高性能有刷电子调速器（ESC）。
错误的安装或操作可能造成人身伤害或设备损坏。
使用前请仔细阅读本说明书，并在使用后断开电池连接。

免责声明

感谢您选择本产品。安装及使用前请仔细阅读本说明书。
对于因不当使用、错误安装或未按照说明书操作所造成的损失或损坏，本公司不承担责任。用户自行拆解或改装产品所导致的问题亦不在责任范围内。
本公司保留在不另行通知的情况下，对产品设计、规格及说明进行更新或调整的权利。

注意事项

连接电调前，请确保所有电线和接头绝缘良好，避免短路。
请确认所有设备连接正确且牢固。
使用前请确保电机与电池规格匹配，避免系统过载。
使用过程中保持良好散热，电调温度勿超过 90°C / 194°F。
使用结束后请断开电池与电调连接，避免电池过度放电。

Contents

01-Product features - - - - -	-06
02-Specifications - - - - -	-07
03-Connections - - - - -	-08
04-Setting up the ESC - - - - -	-10
04-1.Calibration - - - - -	-10
04-2.Instructions for switch on and off and beeping - - - - -	-12
05-Parameter Setting and Programming - - - - -	-13
06-LED indicator guide - - - - -	-15
07-Protection Function - - - - -	-16
08-Troubleshoot guide - - - - -	-17

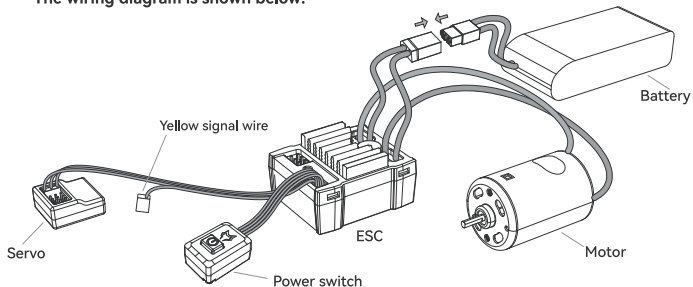
目录

01-产品特色	-19
02-产品规格	-20
03-连接电子调速器	-21
04-设置电子调速器	-22
04-1.设定油门行程	-23
04-2.开关机及鸣音说明	-24
05-参数设定方法及编程项目说明	-25
06-电调状态指示灯(LED)说明	-27
07-保护功能说明	-28
08-故障快速处理	-29

- Fully waterproof design, suitable for all weather conditions; (Note: After use in water, please clean and dry the electronic speed controller as soon as possible to prevent oxidation of the connectors);
- Equipped with an advanced, safe electronic switch that completely eliminates issues common with traditional mechanical switches in harsh environments such as dusty or humid conditions—including frequently jammed reed switches, corroded contacts, and accidental shutdowns caused by violent impacts;
- Multiple protection features: low battery protection, over-temperature protection, and throttle runaway protection;
- Features an automatic shutdown function after 30 minutes of inactivity to effectively protect the battery.

Model	TYROTE Rumble 60
Fwd. Cont. /Peak Current	60A / 360A
Rev. Cont. /Peak Current	30A / 180A
Recommended Vehicle	1/10 Scale RC Cars/Off-Road Vehicles/Trucks/Rock Crawlers
Battery Cells	2-3S LiPo or 6-9 Cell NiMH
Supported Motor Types	Brushed Motors (540/550-size motors)
Supported Motor	2S LiPo: $\geq 12T$ 3S LiPo: $\geq 18T$ 540/550-size motors
BEC Output	3A/6V (Switching Regulator Mode)
Dimensions/Weight	39.3*33*21.3mm/54.5 $\pm$ 3g

The wiring diagram is shown below:



1. Connecting the Motor

There is no specific wiring order for connecting the ESC to the motor. The two output wires from the ESC can be connected to either of the two motor wires. If the rotation direction is incorrect, simply swap the positions of the two motor wires.

2. Connecting the Receiver

Plug the ESC's throttle control wires (white, red, and black) into the receiver's throttle channel (TH channel). The ESC's throttle control wires also supply 6V power to the receiver and servos; therefore, do not provide additional power to the receiver, as this may damage the ESC. If additional power is required, disconnect the red wire from the ESC's throttle wires. Single yellow wire: This wire is used for software upgrades or updates.

3. Connecting the Battery

The ESC's input wires are polarized. When connecting the battery, ensure that the ESC's (+) terminal is connected to the battery's (+) terminal, and the (-) terminal is connected to the (-) terminal. If the ESC is connected with reversed polarity, it will be damaged. Damage to the ESC caused by reversed polarity is not covered by the warranty.

04

Setting up the ESC

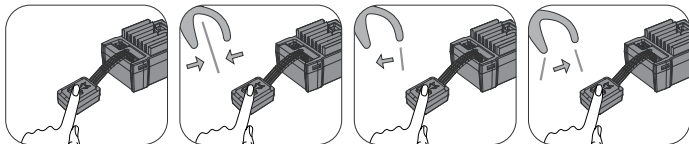


1. This ESC does not have reverse polarity protection. If the power is connected in reverse, it may cause instantaneous and irreversible damage to the ESC and battery. Please pay close attention to battery polarity when using this product. We recommend using battery connectors with polarity-reversal protection.
2. If the motor is spinning in the wrong direction, swap the two motor wires.

1 Calibration

The throttle travel must be reset the first time the ESC is used or after the remote controller's throttle parameters (such as D/R, EPA, or ATL) have been changed; otherwise, it may result in malfunction or unintended operation. Additionally, we recommend enabling the remote controller's loss-of-control protection feature. Set the remote controller's throttle channel "F/S" (No Signal Protection) function to "Off" or configure the protection threshold to the throttle's neutral position. This ensures that the motor will stop running if the receiver loses the signal from the remote controller.

The throttle calibration procedure is as follows:



Step 1: Turn on the remote control and set the parameters for the throttle channel—such as “D/R,” “EPA,” and “ATL”—to 100% (i.e., turn the corresponding knobs to the maximum position). Set the “TRIM” for the throttle channel to 0 (i.e., turn the corresponding knob to the middle position). If the remote control is in its default settings, proceed directly to Step 2.

Step 2: With the ESC powered off, press and hold the ON/OFF button without releasing it, as shown in Figure 1. The red LED on the ESC will flash slowly three times, then flash rapidly for three seconds. Release the button immediately (if you do not release the button within 3 seconds, the ESC will enter parameter setting mode, and you will need to start over from Step 2). After releasing the button, the motor will beep; the beep may be faint, so please observe the LED status instead.

Step 3: You now need to set three points: throttle midpoint, forward maximum, and reverse maximum. Keep the throttle trigger in the midpoint position and press the SET button once (as shown in Figure 2). The red light will flash once, and the motor will beep once, indicating that the midpoint position has been saved; Move the throttle trigger to the forward maximum position, press the SET button once as shown in Figure 3. The red light will flash twice, and the motor will beep “beep-beep-” twice, indicating that the forward maximum throttle position has been saved; Move the throttle trigger to the full reverse position, then press the SET button once as shown in Figure 4. The red light will flash three times, and the motor will beep “beep-beep-beep” three times, indicating that the full reverse position has been saved.

Step 4: Throttle calibration is complete. After three seconds, the motor will operate normally.

2 Instructions for switch on and off and beeping

1) Power On/Off Instructions:

To turn on the device when it is off, briefly press the ON/OFF button; to turn off the device when it is on, press and hold the ON/OFF button.

2) Power-On Beep Instructions:

When turning on the device normally (briefly pressing the ON/OFF button): If the battery type is set to LiPo, the motor will emit several “beep” sounds to indicate the number of cells.

For example: “Beep-beep” indicates 2 cells, and “Beep-beep-beep” indicates 3 cells. After detecting the number of cells, the motor will beep once more to confirm that it is ready for operation. If the battery type is set to NiMH, the motor will beep once to indicate NiMH mode, and then beep once more to confirm that it is ready for operation.

1. Parameter Setting

1) This ESC uses jumper caps for parameter setting; parameters are configured by inserting or removing the jumper caps to change their positions.

2) This ESC has two adjustable parameters: operating mode and battery type. As shown in the figure below:

When the jumper cap corresponding to “Batt” is inserted into the left two-pin header, it indicates LiPo battery mode; when inserted into the right two-pin header, it indicates NiMH mode; and when no jumper cap is inserted, it indicates lithium battery mode.

When the jumper cap corresponding to “Mode” is inserted into the left two-pin header, it indicates F/B/R mode; when inserted into the right two-pin header, it indicates F/B mode.

2. Programming

1) Operating Modes

F/B/R stands for Forward/Brake/Reverse. This mode uses a double-click reverse mechanism: when the throttle trigger is first pushed into the reverse zone, the motor only applies the brake and does not initiate reverse motion. When the throttle trigger returns to the center zone and is pushed into the reverse zone a second time (the so-called “double-click”), if the motor has stopped, reverse motion begins; if the motor has not stopped, reverse motion does not occur, and the motor remains in braking mode. This is designed

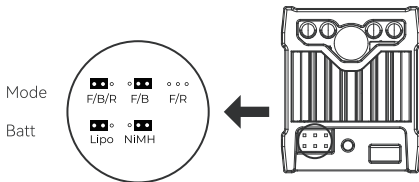
to prevent accidental reversing caused by repeated light braking while the vehicle is in motion. In this mode, forward power is 100%, reverse power is 50%, and braking power is 100%.

F/B stands for Forward/Brake, meaning forward motion with braking. In this mode, the vehicle can only move forward and brake; it cannot reverse. This mode is typically used for racing. In this mode, forward power is 100%, and braking power is 100%.

F/R stands for Forward/Reverse. In this mode, the vehicle can move forward or reverse. In this mode, forward power is set to 100% and braking power is set to 100%.

2) Battery Type

There are two options: "Lipo" and "NiMH." Different battery types result in different ESC low-voltage protection thresholds. Please set this according to the battery you are actually using; do not set it incorrectly.



- When the throttle trigger is in the center position, the red LED is off.
- While moving forward, the red LED flashes; when the throttle is at maximum forward (100% throttle), the red LED remains steady.
- When braking, the red LED flashes; when the throttle is at maximum reverse and the maximum braking force is set to 100%, the red LED remains steady.
- When reversing, the red LED flashes; when the throttle is at maximum reverse and the maximum reverse force is set to 100%, the red LED remains steady.

1) Low Voltage Protection

LiPo Mode: When the battery voltage remains below 3.2V per cell for 2 seconds (e.g., $3.2 \times 2 = 6.4\text{V}$ for a 2S battery, or $3.2 \times 3 = 9.6\text{V}$ for a 3S battery), the ESC will reduce its output power; when the battery voltage drops below 2.6V per cell, the ESC will shut off the output. Once low-voltage protection is triggered, the ESC's red LED will flash continuously when the throttle is in the center position.

NiMH Mode: When the battery voltage remains below 5.0V (total battery voltage) for 2 seconds, the ESC will reduce output power; when the battery voltage drops below 4.4V, the ESC will cut off output. Once low-voltage protection is triggered, the ESC's red LED will flash continuously when the throttle is in the center position.

2) Overheat Protection

When the internal temperature of the ESC exceeds 105°C , it will reduce output power, and the ESC's red light will flash continuously when the throttle is in the center position. Full power output will automatically resume once the temperature drops below 60°C .

3) Throttle Signal Loss Protection

If the ESC detects no throttle signal for 0.25 seconds, it will shut down the output. Once the signal is restored, simply return the throttle to the center position to resume normal operation. It is recommended to set the remote control's "F/S" loss-of-control protection to the output shutdown mode, or to set the protection threshold to the center position.

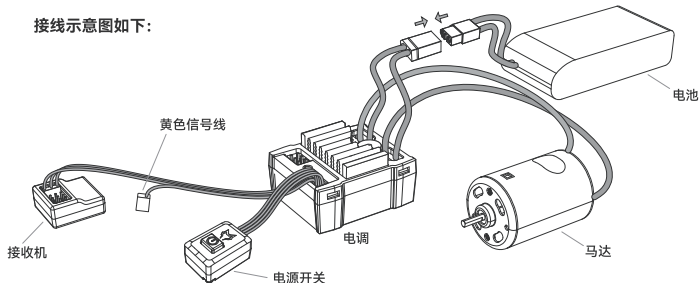
Problem	Possible cause	Recommended Solution
No indicator light after power-on, and the motor does not run	1. No power is reaching the ESC; 2. The power switch is damaged.	1. Check whether the battery and power connectors are securely connected, then reconnect if necessary; 2. Replace the power switch if it is faulty.
Red LED flashes after power-on, and the motor cannot start	The throttle cable is connected to the wrong receiver channel, or the throttle trim is not centered.	Connect the ESC signal cable to the receiver's TH / CH2 (Throttle) channel correctly, then reset the transmitter throttle trim to the neutral position.
Vehicle slowly moves forward or backward when the throttle is at neutral	Throttle neutral point calibration is inaccurate.	Recalibrate the throttle range, or use the transmitter throttle trim to fine-tune the neutral position until the car remains stationary.
Pushing the throttle forward causes the vehicle to reverse	1. Motor wires are connected in the wrong order;	1. Swap any two motor wires connected to the ESC;

	2. The throttle direction on the transmitter is reversed.	2. Change the transmitter throttle direction setting from NOR → REV or REV → NOR; 3. Check the motor direction setting in the ESC programming menu.
Motor suddenly stops or power drops significantly during operation	1. Receiver signal interference; 2. Low-voltage protection activated; 3. Over-temperature protection activated.	1. Check for radio interference and make sure transmitter/receiver batteries are fully charged; 2. Continuous red LED flashing indicates low-voltage protection — recharge or replace the battery; 3. Double red LED flashing indicates overheat protection — stop use and allow the ESC to cool down before restarting.
Forward works normally, but reverse does not respond	The throttle neutral point is shifted into the brake range.	Recalibrate the throttle neutral point. Ensure the throttle trigger is in the neutral position and set throttle trim to "0".
Throttle range calibration cannot be completed	1. ESC signal wire is plugged into the wrong receiver channel or connected backwards; 2. Receiver or transmitter malfunction.	1. Verify that the ESC signal cable is connected correctly to the receiver; 2. If the motor can still run, try another receiver channel for testing, or replace the radio system to confirm whether the issue comes from the transmitter/receiver.

- 全防水设计，适应各种气候环境；（注：浸水工作后尽快将电调洗净吹干，防止插头氧化）；
- 配备先进安全的电子开关，彻底解决了传统机械式开关在多尘、潮湿等恶劣环境下频发的簧片卡死、触点锈蚀、以及因剧烈撞击而导致机械开关意外关闭等问题；
- 多重保护功能：电池低压保护、过温保护、油门失控保护；
- 具备30分钟无操作自动关机功能，有效保护电池。

型号	TYROTE Rumble 60
正向：持续/峰值电流	60A / 360A
反向：持续/峰值电流	30A / 180A
主要适用车型	1/10 房车/越野车/卡车/攀爬车
电池节数	2-3S Lipo 或 6-9 Cell NiMH
支持电机类型	有刷电机（540/550级电机）
支持电机T数	2S LiPo: $\geq 12T$ 3S LiPo: $\geq 18T$ 540/550尺寸电机
BEC输出	3A/6V（开关稳压模式）
尺寸/重量	39.3*33*21.3mm/54.5 $\pm$ 3g

接线示意图如下：



1. 连接马达

电调与电机相连无顺序要求，电调的两根输出线与电机的两根线可以随意对接，若出现转向相反，将两条电机线互换位置即可。

2. 连接接收机

把电调的油门控制线（白红黑三色线）插入接收机的油门通道（即TH通道）。电调油门控制线亦输出6V的电压给接收机及舵机，故请勿给接收机额外供电，否则可能损坏电调，若需要额外供电，请断开电调油门线中的红色线。单根黄色线：此线用于升级或迭代软件。

3. 连接电池

电调的输入线有极性之分，插入电池时，请确保电调的(+)极与电池的(+)相连，(-)极与(-)相连。如果电调接反电，电调将会损坏。因电源接反而导致电调损坏是不享有保修服务的。

04

设置电子调速器



警告!

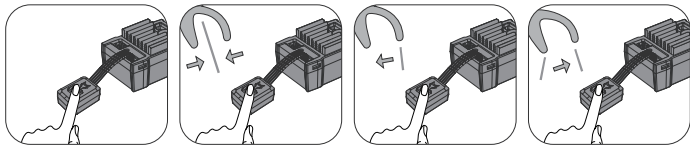
1. 此电调不具备电源反接保护功能。如果电源反接，瞬间将可能对电调及电池造成不可恢复的损坏，请使用时特别注意电池极性。建议使用具有防呆功能的电池插头。

2. 若电机转向不对，请将电机两条线互换。

1 设定油门行程

电调第一次使用或遥控器更改过油门D/R、EPA、ATL等参数后，均需重设油门行程，不然可能会导致无法使用或误动作。另外我们建议同时开启遥控器的失控保护功能，将遥控器油门通道的无信号保护（“F/S”）功能设置为关闭输出方式或将保护值设置为油门中立点位置，使得当接收机无法收到遥控器信号后，马达能够停止运转。

油门校调步骤如下图所示：



步骤一：打开遥控器，将油门通道的“D/R”、“EPA”、“ATL”等参数调整为100%（即对应旋钮调整至最大位置），油门通道的“TRIM”调整为0（即对应旋钮调整至中间位置）。若遥控器为默认设置，直接从步骤二开始。

步骤二：电调关机状态，持续按住ON/OFF键不松开如图一，电调上红色灯会慢闪三次然后快闪三秒，立即松开按键（如果未在3秒内及时松开按键，电调将进入参数设定模式，此时需从步骤二重新开始操作），松开后马达鸣叫，马达鸣叫声可能较小，请观察LED灯状态即可。

步骤三：此时需要设定三个点：油门中点、正向最高点和反向最高点。油门扳机留在中点位置，按一下SET键如图二，红灯闪烁1次，马达鸣叫“啐-”1声，表示已存储中点位置；油门扳机打到正向最高点，按一下SET键如图三，红灯闪烁2次，马达鸣叫“啐-啐-”2声，表示已存储油门正向最高点；油门扳机打到反向最高点，按一下SET键如图四，红灯闪烁3次，马达鸣叫“啐-啐-啐-”3声，表示已存储油门反向最高点。

步骤四：油门行程校调完毕，三秒钟后，电机即可正常操作。

2 开关机及鸣音说明

1) 开关机说明：

关机状态下短按ON/OFF键开机；开机状态下长按ON/OFF键关机。

2) 开机鸣音说明：

在正常情况下开机（即短按ON/OFF键的情况下开机）：若电池类型设置为锂电时，电机发出几声“滴”鸣音表示锂电节数。

例如：“滴滴”表示2节锂电池，“滴滴滴”表示3节锂电，检测完锂电节数后电机再鸣叫一声表示确认OK可以运行了；若电池类型设置为镍氢时，电机鸣叫一次，表示镍氢模式，然后再鸣叫一次表示确认OK可以运行了。

1. 参数设定方法

1) 采用跳线帽设定方式，通过拔插跳线帽来改变其位置从而达到设定参数的目的。

2) 该电调有两项参数可调，即运行模式和电池类型。如下图：

“Batt”对应的跳线帽插入左侧两 Pin 排针时表示锂电模式，插入右侧两 Pin 排针时表示镍氢模式，不插跳线帽时表示锂电模式。

“Mode”对应的跳线帽插入左侧两 Pin 排针时表示 F/B/R 模式，插入右侧两 Pin 排针时表示 F/B 模式。

2. 编程项目说明

1) 运行模式

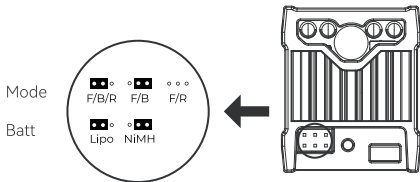
F/B/R 表示 Forward/Brake/Reverse，即前进后退带刹车。此模式采用双击式倒车方式，即油门扳机第一次推至反向区域时，电机只是刹车，不会产生倒车动作，当油门扳机回到中点区域并第二次推至反向区域时（即所谓的“双击”），如果此时电机已停止，则产生倒车动作，如果电机未停止，则不会倒车，仍是刹车。这样做的目的是防止车辆行驶过程中因多次点刹而造成误倒车。该模式下，前进力度为 100%，倒车力度为 50%，刹车力度为 100%。

F/B 表示 Forward/Brake，即前进带刹车。此模式下，车辆仅能前进和刹车，不能倒车，该模式通常用于竞赛。该模式下，前进力度为 100%，刹车力度为 100%。

F/R 表示 Forward/Reverse，即前进 or 后退。此模式下，车辆该模式下，前进力度为 100%，刹车力度为 100%。

2) 电池类型

有“锂电 (Lipo)”和“镍氢 (NiMH)”两种可调。不同的电池类型将导致电调低压保护值不同，请根据实际使用电池来设定，不可设置错误。



- 油门扳机处于中点区域，红色LED熄灭。
- 前进时，红色LED闪烁；当油门处于正向最大（100%油门）时，红色LED变成恒亮。
- 刹车时，红色LED闪烁；当油门处于反向最大且最大刹车力度设为100%时，红色LED变成恒亮。
- 倒车时，红色LED闪烁；当油门处于反向最大且最大倒车力度设为100%时，红色LED变成恒亮。

1) 低压保护

锂电模式下, 当电池电压低于 3.2V/ 节持续 2 秒后 (如使用 2S, 则电池总电压为 $3.2 \times 2 = 6.4\text{V}$, 使用 3S 时则为 $3.2 \times 3 = 9.6\text{V}$), 电调将降低输出功率; 当电池电压低于 2.6V/ 节时, 电调将关闭输出。触发低压保护后, 油门处于中点位置时电调红灯持续闪灯。

镍氢模式下, 当电池电压低于 5.0V (电池总电压) 持续 2 秒后, 电调将降低输出功率 当电池电压低于 4.4V 时, 电调将关闭输出。触发低压保护后, 油门处于中点位置时电调红灯持续闪灯。

2) 过热保护

当电调内部温度高于 105°C 时将会降低输出功率, 油门处于中点位置时电调红灯持续闪烁, 待温度低于 60 度后可自动恢复全功率输出。

3) 油门信号丢失保护

当电调连续 0.25 秒没有检测到油门信号将会关闭输出, 信号恢复后, 油门回到中位可正常运行。建议将遥控器的失控保护“F/S”设置为关闭输出方式或将保护值设置为中点位置。

故障现象	可能原因	解决方法
上电后指示灯不亮，电机无法启动。	1、电池电压没有输入到电调； 2、电调开关损坏。	1、检查电源输入通路是否有焊接不良情况，并重新焊好； 2、更换开关。
上电后红色LED闪烁，电机无法启动。	电调油门线插反或通道插错或油门不在中点。	将电调的油门排线按正确方向插到接收机的“油门（TH）”通道（Throttle，通常为CH2），或者重新设置油门行程。
油门处于中点位置时车子缓慢前进或后退。	油门行程没校准好。	重新设置油门行程或使用控的油门微调校准中点。
遥控器正向加大油门，车子反而倒退。	1、电调输出线和电机线连接的线序错误； 2、遥控器油门通道方向设置错误。	1、将电调输出两根线互换位置； 2、将遥控器油门通道反向，从原“NOR”换为“REV”或从原“REV”换为“NOR”； 3、检查是否通过遥控第三通道设置了电机转向。

电机转动过程中，突然停转或功率输出显著降低。

- 1、接收机遇到干扰；
- 2、电调进入电池低压保护状态；
- 3、电调进入过温保护状态。

- 1、检查接收机出现干扰的原因，检查发射机器电池电量；
- 2、红灯持续闪烁为电压保护，请更换电池；
- 3、红灯两下循环闪烁为温度保护，请等电调温度降低后继续使用。

前进正常，但无法倒车。

遥控器油门通道中点偏离到刹车区域。

重新校调油门通道中点，使遥控器油门扳机置于中位时，电调上的指示灯不亮。

无法完成油门行程校准。

- 1、电调油门线接错接收机通道或插反；
- 2、接收机或遥控器故障。

- 1、检查电调油门线与接收机的连接是否正确；
- 2、若舵机可以工作，可以将电调油门线接到接收机的舵机通道进行测试确认，或直接更换遥控系统测试。

TYROTE
Rumble 60

CAYOTE TEAM