

T238 BL480

T238 BL-480 Brushless Motor User Manual

Model: 2980KV/33000RPM Long

1. INTRODUCTION

This manual provides essential instructions for the installation, operation, and maintenance of your T238 BL-480 Brushless Motor. This high-performance motor is designed for use in Airsoft Electric Guns (AEG) and gel blasters, offering enhanced efficiency and durability. Please read this manual thoroughly before installation and use to ensure proper function and safety.



Image 1.1: The T238 BL-480 Brushless Motor. This image displays the main component of the product, highlighting its compact design and metallic finish.

2. SAFETY INFORMATION

Adherence to the following safety guidelines is crucial for preventing damage to the motor and connected equipment, as well as ensuring user safety:

- **Battery Compatibility:** This motor supports 2S/3S LiPo batteries. Ensure your battery's voltage and discharge rate are compatible with the motor and your AEG/gel blaster's specifications. Use XT60 or T-Dean connectors.
- **Professional Installation:** If you are unfamiliar with AEG/gel blaster internal components, seek professional assistance for installation to avoid damage.
- **Power Disconnection:** Always disconnect the battery before performing any installation, adjustment, or maintenance on the motor or gearbox.
- **Overcurrent/Overheat Protection:** The motor features built-in undervoltage, overcurrent, overheat, and stall protection. However, operating outside recommended parameters can still lead to damage.
- **Pinion Gear:** The included 1.3mm hex driver is for pinion gear removal only. Do not use it on the motor cap or RPM adjustment screw.

Advanced Safety & Protection



Undervoltage



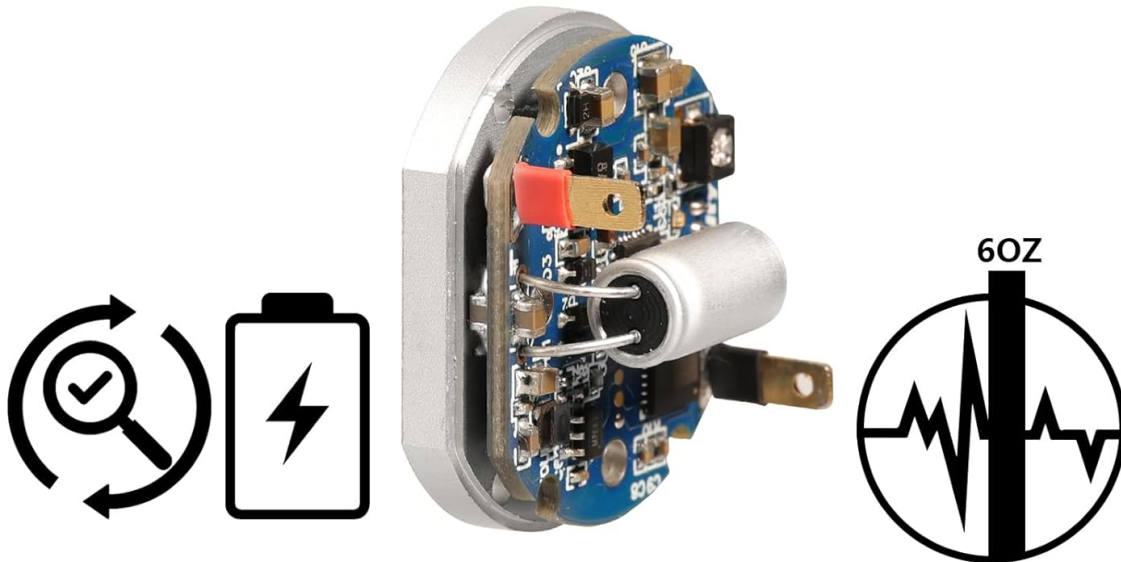
Overcurrent



Overheat



Stall protection



Auto-detection of battery cell count
(Prevents LiPo damage)

6-layer 2oz copper PCB
(Superior current handling
& EMI resistance)

Image 2.1: Diagram illustrating the advanced safety and protection features of the T238 BL-480 motor, including undervoltage, overcurrent, overheat, and stall protection, along with battery cell count auto-detection and a 6-layer PCB.

3. PACKAGE CONTENTS

Verify that all items are present in the package:

- 1 x T238 BL-480 Brushless Motor
- 1 x 1.3mm Hex Key (for pinion gear removal only)
- 1 x Motor Connectors Pack

Package Includes:

- ◎ T238 BL-480 brushless motor ×1
- ◎ 1.3mm hex key ×1
- ◎ Motor connectors pack ×1



Image 3.1: The contents of the T238 BL-480 Brushless Motor package, including the motor, a 1.3mm hex key, and a bag of motor connectors.

4. FEATURES

The T238 BL-480 Brushless Motor offers several key advantages:

- **High Performance:** Provides instant trigger response, high efficiency, and superior durability for competitive AEG and gel blaster setups.
- **Adjustable RPM:** A built-in potentiometer allows for fine-tuning of motor speed from 50% to 100% RPM.
- **Direct Replacement:** Designed to easily replace standard 480 brushed motors.
- **DTU Compatibility:** Seamlessly integrates with T238 DTU series units without requiring active braking to be disabled.
- **Maintenance-Free Design:** Brushless technology eliminates wear and heat issues associated with traditional brushed motors, leading to consistent performance.



Image 4.1: This graphic highlights the core benefits of the T238 brushless motor, emphasizing its high thermal efficiency, high torque, and speed capabilities.

5. SETUP AND INSTALLATION

5.1. Compatibility Check

The T238 BL-480 motor is fully compatible with V2/V3 gearboxes. Ensure you select the correct shaft length (Long or Short) for your specific gearbox. This manual pertains to the **Long** version.



Image 5.1: Comparison of different T238 BL-480 motor variants, showing both long and short shaft options with varying KV/RPM ratings. This manual focuses on the 2980KV (33,000 RPM) Long version.

5.2. Installation Steps

1. **Disassemble:** Carefully disassemble your AEG/gel blaster to access the motor housing and gearbox.
2. **Remove Old Motor:** Disconnect the wiring and remove the existing 480 brushed motor.
3. **Install New Motor:** Insert the T238 BL-480 Brushless Motor into the motor housing. Ensure the pinion gear properly engages with the gearbox bevel gear.
4. **Connect Wiring:** Connect the motor wires to your AEG/gel blaster's wiring harness. Ensure correct polarity.
5. **Reassemble:** Carefully reassemble your AEG/gel blaster.

Drop-in replacement for standard 480 brushed motors



Image 5.2: This image demonstrates the T238 BL-480 motor as a direct drop-in replacement for standard 480 brushed motors in an AEG/gel blaster grip.

5.3. DTU Integration

The T238 BL-480 motor is designed for seamless integration with T238 DTU series units. There is no need to disable active braking when using this motor with a T238 DTU.



Image 5.3: An illustration showing the T238 BL-480 motor's compatibility with the T238 DTU series, indicating that active braking does not need to be disabled.

6. OPERATING INSTRUCTIONS

6.1. Adjusting Motor Speed (RPM)

The T238 BL-480 motor features a built-in potentiometer for adjusting the motor's RPM from 50% to 100% of its maximum speed. This allows for fine-tuning performance to match different play styles or gearbox setups.

1. **Locate Adjustment Screw:** Identify the small adjustment screw on the motor's end cap.
2. **Use Appropriate Tool:** Use a small, non-metallic adjustment tool (not the hex key) to turn the potentiometer.
3. **Adjust RPM:** Turn the screw clockwise to increase RPM and counter-clockwise to decrease RPM. Make small adjustments and test the motor's performance.

Built-in speed adjustment (50%~100% RPM tuning)

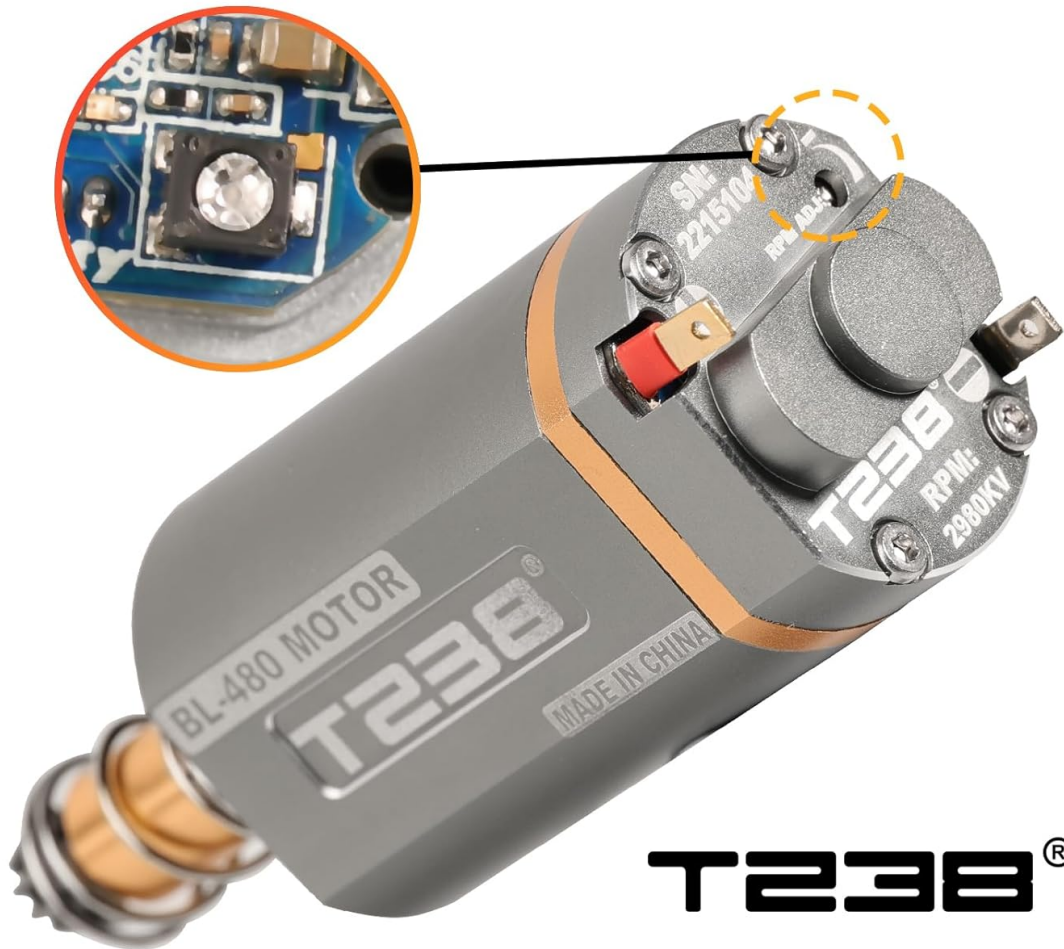


Image 6.1: A close-up view of the T238 BL-480 motor's end cap, highlighting the built-in potentiometer for speed adjustment (50% to 100% RPM tuning).

7. MAINTENANCE

One of the primary benefits of a brushless motor is its reduced maintenance requirements compared to brushed motors. The absence of brushes eliminates wear and tear from friction, leading to a longer lifespan and consistent performance.

- **Regular Inspection:** Periodically inspect the motor for any visible damage, loose connections, or debris.
- **Cleanliness:** Keep the motor free from dust, dirt, and moisture. Use a soft, dry cloth for cleaning.
- **Pinion Gear:** The pinion gear may require occasional inspection for wear. Use the provided 1.3mm hex key for removal if replacement is necessary. Do not attempt to open the motor casing for internal cleaning or lubrication, as this is generally not required for brushless motors and may void any potential warranty.

8. TROUBLESHOOTING

8.1. Common Issues

- **Motor Not Responding:**
 - Check battery charge and connection.
 - Verify all wiring connections are secure and correctly polarized.
 - Ensure the motor is properly seated in the gearbox and not binding.
- **Reduced Performance/Weak Trigger Response:**
 - Check battery health and charge level.
 - Ensure the RPM adjustment is set appropriately (not too low).
 - Inspect gearbox components for excessive friction or damage.
- **Unusual Noise (e.g., Ticking):**
 - A ticking noise could indicate an issue with internal components, potentially a faulty capacitor. If this occurs, discontinue use and consider professional inspection or contact support.
 - Ensure the motor's pinion gear is correctly meshed with the gearbox bevel gear. Improper shimming can cause grinding noises.

9. SPECIFICATIONS

Specification	Detail
Model Name	T238-BL480
Item Model Number	BL480
KV Rating	2980KV
RPM	33000RPM
Type	Brushless
Shaft Length	Long
Input Voltage	6~12.6V (2S/3S LiPo compatible)
Material	Aluminum
Product Dimensions	4.92 x 3.15 x 1.18 inches (approx. 12.5 x 8 x 3 cm)
Item Weight	8.15 ounces (approx. 0.23 kg)
Max Spring (18:1 ratio)	M180

Includes 1.3mm hex key for pinion gear removal/maintenance



**Dimensions: 87×25×29.5mm (Long)/
72×25×29.5mm (Short)**

Weight: 127g (Long)/120g(Short)

Input: 6~12.6V

Max Spring: M180(@18:1 ratio)

Image 9.1: This image provides a visual representation of the motor's dimensions for both long and short versions, along with the included 1.3mm hex key for pinion gear maintenance.

10. WARRANTY AND SUPPORT

Specific warranty details are not provided within the product information. For warranty inquiries, technical support, or service, please contact the manufacturer, T238, directly through their official channels or the retailer from whom the product was purchased.





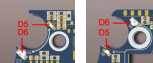

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