

## GA12-N20

# GA12-N20 DC Mini Gear Motor User Manual

MODEL: GA12-N20 (3V-6V, 35-500 RPM)

## 1. Introduction and Overview

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This manual provides essential information for the safe and effective use of your GA12-N20 DC Mini Gear Motor. This compact, all-metal gear motor is designed for various applications requiring slow speed and high torque, operating within a 3V to 6V DC range and offering versatile speed options from 35 RPM to 500 RPM.

Key features include a durable permanent magnet construction, an explosion-proof design for reliable performance, and a lightweight, compact form factor suitable for space-constrained projects.

## 2. Setup

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Follow these steps to set up your GA12-N20 DC Mini Gear Motor:

- Unpacking:** Carefully remove the motor from its packaging. Inspect for any visible damage.
- Power Supply:** Connect the motor to a DC power supply within the specified voltage range of 3V to 6V. Ensure correct polarity (red wire typically positive, black wire negative) to control rotation direction.
- Mounting:** Secure the motor using appropriate mounting hardware (not included) to ensure stable operation. The motor features a 3mm flat output shaft for easy integration into your project.
- Shaft Connection:** Attach your desired component (e.g., wheel, gear) to the motor's output shaft. Ensure a secure fit to prevent slippage during operation.



Figure 2.1: GA12-N20 DC Mini Gear Motor with black plastic gear housing.

### 3. Operating Instructions

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The GA12-N20 motor is designed for straightforward operation. Once properly set up, apply power to begin operation.

- **Voltage Input:** The motor operates optimally between 3V and 6V DC. Applying voltage outside this range may damage the motor or result in suboptimal performance.
- **Speed Control:** The motor's speed (RPM) is directly proportional to the input voltage within its operating range. Higher voltage results in higher RPM. Available speed variants include 35RPM, 70RPM, 100RPM, 200RPM, and 500RPM at rated voltage.
- **Direction of Rotation:** Reverse the polarity of the DC input voltage to change the direction of the motor's rotation.
- **Load:** Avoid exceeding the motor's rated torque capacity to prevent stalling or damage.



Figure 3.1: Side view of the GA12-N20 DC Mini Gear Motor, showing the brass gear housing.



Figure 3.2: Top view of the GA12-N20 DC Mini Gear Motor, highlighting the wiring and gear assembly.

## 4. Maintenance

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The GA12-N20 motor is designed for durability and requires minimal maintenance. Adhering to these guidelines will help ensure its longevity:

- **Cleaning:** Keep the motor free from dust and debris. Use a soft, dry cloth to gently wipe the exterior. Avoid using liquids or solvents.
- **Lubrication:** The internal gears are pre-lubricated. Additional lubrication is generally not required under normal operating conditions. If the motor is exposed to harsh environments, consult a specialist.
- **Environmental Conditions:** Operate the motor in a dry environment, away from excessive heat, moisture, and corrosive substances.
- **Inspection:** Periodically check the wiring for any signs of wear or damage. Ensure all connections are secure.

## 5. Troubleshooting

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If you encounter issues with your GA12-N20 motor, refer to the following troubleshooting guide:

Problem	Possible Cause	Solution
Motor does not run	No power, incorrect voltage, loose connections, motor stalled by excessive load.	Check power supply and voltage (3V-6V DC). Verify all wiring connections. Reduce load on the motor shaft.
Motor runs slowly or inconsistently	Low voltage, excessive load, internal friction.	Increase input voltage within the 3V-6V range. Reduce load. Ensure motor is clean and free of obstructions.
Motor makes unusual noise	Misalignment, worn gears, foreign object.	Check for proper alignment of connected components. Inspect for any foreign objects. If noise persists, motor may require replacement.
Motor overheats	Excessive load, continuous operation at maximum capacity, insufficient ventilation.	Reduce load. Allow motor to cool down. Ensure adequate airflow around the motor.

If the problem persists after attempting these solutions, contact the seller for further assistance.

## 6. Specifications

Feature	Description
Model	GA12-N20 (N20 Gear Motor)
Operating Voltage	3V - 6V DC
Rated RPM Range	35RPM, 70RPM, 100RPM, 200RPM, 500RPM (depending on variant)
Construction	All Metal Gear Wheel, Permanent Magnet
Output Shaft	3mm Flat Output Shaft
Protection Feature	Explosion-proof
Commutation	Brush
Efficiency	IE 1
Weight	Approximately 10g
Certifications	ROHS

## 7. Warranty Information

Specific warranty details for this GA12-N20 DC Mini Gear Motor are not provided in the product information. For warranty-related inquiries, please refer to the terms and conditions provided by your point of purchase or contact the seller directly.

## 8. Support

If you require technical assistance or have questions not covered in this manual, please contact the seller or distributor from whom you purchased the GA12-N20 DC Mini Gear Motor. Please have your purchase

details readily available when contacting support.