

12V DC 300RPM

This motor belongs to the class of DC Geared Motors, specifically the JGA25-370 series, known for providing a necessary trade-off between speed and torque for robotics and automation applications. It is designed to be highly compatible with popular microcontroller platforms such as Arduino, Raspberry Pi, and STM32, utilizing common DC motor driver modules

- **Model Name and Type:** JGA25-370 DC Gear Motor. The name implies a 25mm gearbox diameter attached to a 370 series motor
- **Operating Voltage:** The nominal operating voltage is 12V DC
- **Output Speed (No-load):** It provides an output speed of 210RPM (Revolutions Per Minute) under no-load conditions
- **Torque Capability:** The motor delivers up to 12Kg • cm of torque. This makes it suitable for medium-load mechanical motion control projects
- **Gearbox Material:** It features a durable all-metal gearbox for enhanced strength and long service life, ensuring stable and reliable continuous operation
- **Output Shaft:** The typical output shaft diameter is 6mm.
- **Typical Applications:** This motor is ideal for building robots, conveyor systems, smart vehicles, and other DIY projects requiring controlled motion

- **Stall Current:** The internal motor (before the gearbox) can draw a Stall Current (maximum current draw when the shaft is blocked) of approximately 2.2 Amps at 12V
- **Motor Driver Requirement:** This means the chosen motor driver (the module linking the motor to the Raspberry Pi) must have a continuous current rating exceeding 2.2 Amps per channel to safely operate the motor, especially when the car is starting or pushing against an obstacle

2.3.2) Encoder:

The motor comes integrated with an encoder to provide closed-loop control of speed and position, which is essential for precise robotic applications

1) Encoder Type and Output Signal:

- The integrated encoder uses Hall Sensor technology.
- It provides two square wave outputs, designated as Channel A and Channel B
- The signals are approximately 90° out of phase. This phase difference is crucial for determining the direction of rotation (quadrature encoding)
- The voltage output of the Hall sensor signals ranges from 0V to V_{dc} (the encoder's supply voltage)

2) Wiring and Physical Characteristics:

- **Leads:** The encoder assembly is terminated by 6 color-coded leads
- **Connector:** These leads are typically terminated into a 6 female header with a 0.1"pitch (standard spacing)

- Length: The lead length is approximately 15cm
- Mounting: The motor faceplate includes 2 mounting holes for M3 screws. The distance between these mounting holes is 18mm apart

3) Wire Function (Based on common JGA25-370 Encoders):

- The 6 wires generally correspond to:

Two Wires (Motor): For the 12V motor power (e.g., Red/White or Red/Black)

Four Wires (Encoder): VCC (Encoder Power, usually 5V or 3.3V), GND, and the two signal lines (Channel A and Channel B)