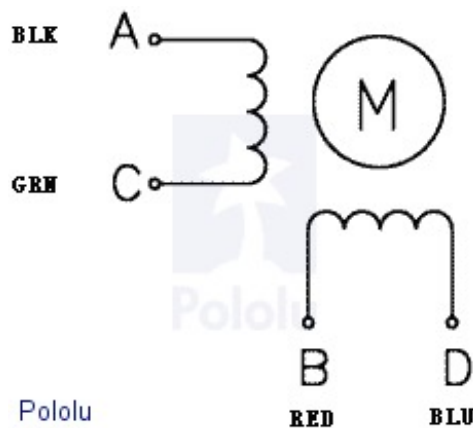


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Bipolar stepper motor wires are terminated with bare leads.



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Bipolar stepper motor wiring diagram.

## Overview

This small hybrid bipolar stepping motor has a  $1.8^\circ$  step angle (200 steps/revolution). Each phase draws 600 mA at 3.9 V, allowing for a holding torque of 180 g-cm (2.5 oz-in). The motor has four color-coded wires terminated with bare leads: black and green connect to one coil; red and blue connect to the other. It can be controlled by a pair of suitable H-bridges (one for each coil), but we recommend using a bipolar stepper motor driver.

Our 4 mm universal mounting hub can be used to mount objects on the stepper motor's 4 mm-diameter output shaft.

## Specifications

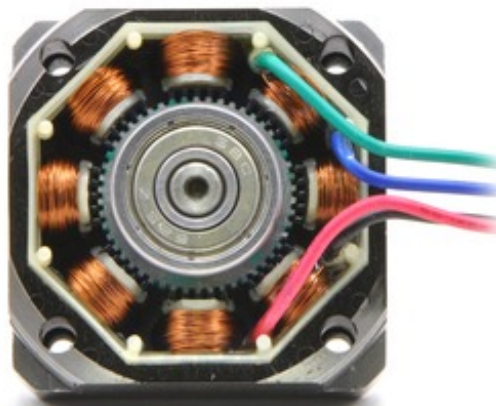
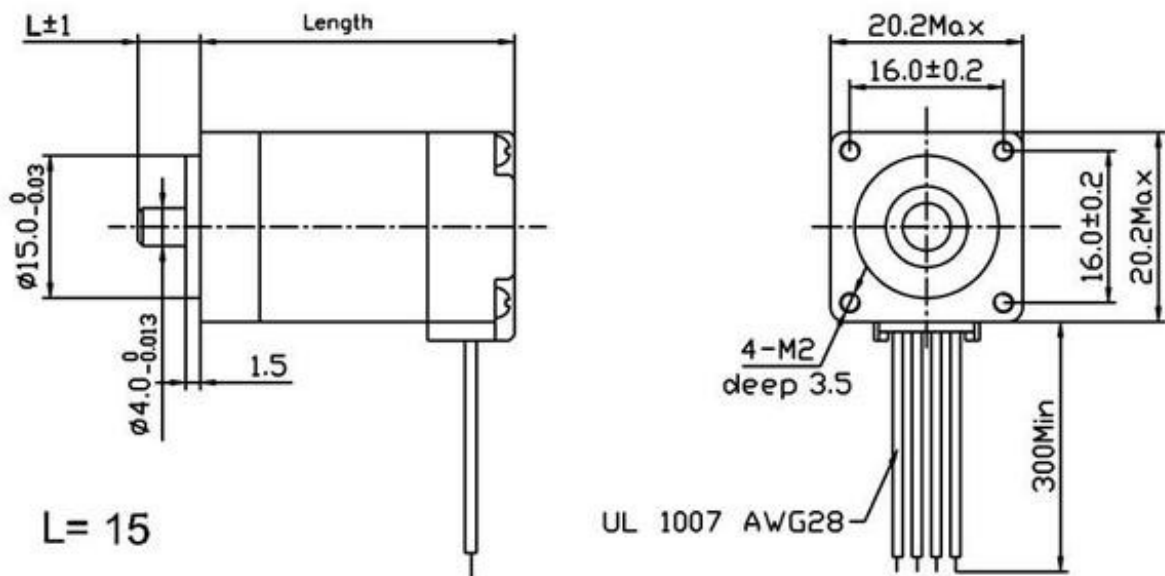
- **Size:** 20 mm square × 30 mm, not including the shaft (NEMA 8)
- **Weight:** 60 g (2 oz)
- **Shaft diameter:** 4 mm “D”
- **Steps per revolution:** 200
- **Current rating:** 600 mA per coil
- **Voltage rating:** 3.9 V
- **Resistance:** 6.5  $\Omega$  per coil

- **Holding torque:** 180 g-cm (2.5 oz-in)
- **Inductance:** 1.7 mH per coil
- **Lead length:** 30 cm (12")

More specifications are available in the datasheet (51k pdf).

### Dimensions

The following diagram shows the stepper motor dimensions in mm. The dimension labeled "Length" is 30 mm. The output D-shaft has a length of 15 mm and a 4 mm diameter with a section that is flattened by 0.5 mm. This shaft works with our 4 mm universal mounting hub.



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The inside of a bipolar stepper motor.

### Stepper Motor Applications

Stepper motors are generally used in a variety of applications where precise position control is desirable and the cost or complexity of a feedback control system is unwarranted. Here are a few applications where stepper motors are often found:

- **Printers**
- **CNC machines**
- **3D printer/prototyping machines**
- **Laser cutters**

- Pick and place machines
- Linear actuators
- Hard drives



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Pololu's assortment of stepper motors.



Note: This stepper motor is SOYO part number SY20STH30-0604A.

[Documentation on producer website.](#)