

57STH56 NEMA-23 Bipolar Stepper with 77:1 Gearbox



This NEMA-23 motor has an integrated Planetary gearbox with a

$76 \frac{49}{64} : 1$ ratio. It comes with the rear shaft exposed, so you can mount an encoder or shaft coupler. See the ["Compatible Products"](#) tab for a complete list of attachments.

When connected to a 1067 – PhidgetStepper Bipolar HC, the 3334 has a maximum speed of 25 RPM. At the output of the gearbox, the step angle approximately $0.023B^{\circ}$. When using the step angle in calculations, you should derive the exact step angle by dividing $1.8B^{\circ}$ by the gearbox reduction ratio. See the ["Compatible Products"](#) tab for wiring details.

At 2.8 Amps, this stepper motor can produce a maximum torque of 960 kg-cm. However, the gearbox is only rated for 240 kg-cm of continuous torque. Loading this gearbox stepper beyond the torque rating of the gearbox will shorten its useful life.

Connection

This motor must be controlled by a constant current or chopper drive controller. You can find a list of suitable controllers on the **Compatible Products** tab. There you will also find compatible attachments such as encoders, mounting hardware, and transmission hardware.

Warning

Connecting the motor directly to a power supply will destroy the motor and void the warranty. If you want to check your motor make sure it is connected to a constant current / chopper drive controller.

Product Specifications

Motor Properties

Motor Type	Bipolar Stepper
Manufacturer Part Number	57STH56-2804B / 56JXS300K77
Step Angle	0.023B°
Step Accuracy	B± 5 %
Holding Torque	240 kgB·cm
Rated Torque	240 kgB·cm
Maximum Speed (w/1067 Motor Controller)	25 RPM
Acceleration at Max Speed (w/1067 Motor Controller)	1E+06 1/16 steps/secBI

Electrical Properties

Recommended Voltage	12 V DC
Rated Current	2.8 A
Coil Resistance	900 m0©
Phase Inductance	2.5 mH

Physical Properties

Shaft Diameter	12 mm
Rear Shaft Diameter	3.9 mm
Mounting Plate Size	NEMA – 23
Weight	1.5 kg
Number of Leads	4
Wire Length	300 mm

Gearbox Properties

Gearbox Type	Planetary
Gear Ratio	76 ⁴⁹ □ ₆₄ : 1
Backlash Error	1 ¹ □ ₂ B°
Maximum Strength of Gears	240 kgB·cm
Shaft Maximum Axial Load	100 N
Shaft Maximum Radial Load	250 N

Documents

- Stepper Motor and Controller Primer
- Mechanical Drawings

Projects

- Motor Music: Play MIDI Files using Phidget Stepper Motors (June 1, 2015)
- How To Avoid Resonance Issues in Stepper Motors (July 28, 2014)
- Steppers with Encoders: When Open-loop Control Is Not Enough (May 13, 2014)

Motor Controllers

This motor must be controlled by a stepper motor controller. This diagram shows how to connect the motor wires to the controller to produce a clockwise rotation in the stepper motor when increasing position. To wire for counter-clockwise rotation when increasing position, reverse the red and blue wires.

Note: Make sure to unplug the power cord from the motor controller before switching wires around.

The following stepper controllers can be used to drive this motor:

Controller Properties				
Part Number	Motor Position Resolution	Stepper Velocity Resolution	Stepper Velocity Max	Available Current per Coil Max
1067_0B	¹ / ₁₆ Step (40-Bit Signed)	1 ¹ / ₁₆ steps/sec	250000 ¹ / ₁₆ steps/sec	4 A
STC1000_0	¹ / ₁₆ Step (40-Bit Signed)	1 ¹ / ₁₆ steps/sec	115000 ¹ / ₁₆ steps/sec	4 A