



## Data Specs

### Nema17 Planetary Geared Stepper Motor

This high precision NEMA 17 Stepper motor has an integrated Planetary Gearbox with a 1:5.18 gear ratio, the resolution can reach 0.35° step angle. It's a good solution in applications that need very low rotation speeds and/or lots of torque. Suitable for 3-D printer filament extruder application.



### Electrical Data:

- Manufacturer Part Number: 42BYGP40P160S.
- Motor Type: Bipolar Stepper.
- Gearbox Type: Planetary
- Gear ratio: 1:5.18
- Step Angle: 0.35°.
- Phase resistance:  $1.6\Omega \pm 10\%$ .
- Phase Voltage: 2.55V.
- Phase inductance:  $3.0\text{mH} \pm 20\%$
- Braking torque: 2.2N.cm
- Rotor inertia: 57g.cm<sup>2</sup>
- Insulation resistance: 100M ohm Mini(500V DC)
- Insulation Class: Class B
- Number of leads: 4
- Motor weight: 450g

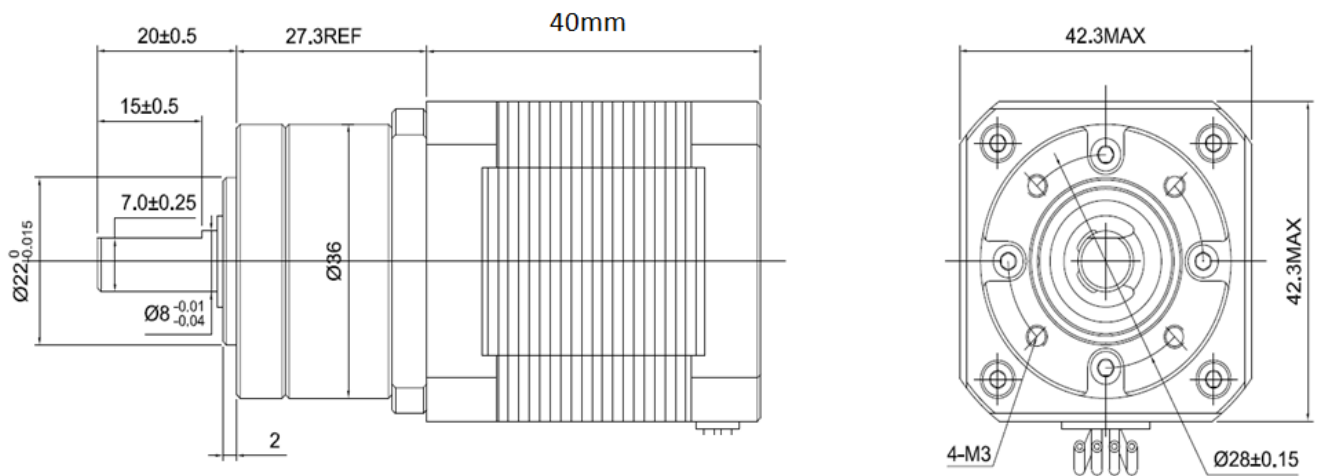
## Gearbox Specifications

- Gearbox Type: Planetary.
- Gear Ratio: 1:5.18.
- Efficiency: 90%.
- Backlash at No-load:  $\leq 1^\circ$ .
- Max. Permissible Torque: 2Nm (283oz-in).
- Moment Permissible Torque: 4Nm (566oz-in).
- Shaft Maximum Axial Load: 50N.
- Shaft Maximum Radial Load: 100N.

## Physical Specifications

- Frame Size: 42 x 42mm.
- Motor Length: 40mm.
- Gearbox Length: 27.3mm.
- Shaft Diameter:  $\Phi 8$ mm.
- Shaft Length: 20mm.
- D-cut Length: 15mm.

## Dimension Drawing (mm):



## How to choose a geared stepper motor?

- Selecting a geared stepper motor will result in increasing the output torque and decreasing the speed. Simply, the Gearbox Output Speed is:

$$\text{Output Speed} = \frac{\text{Motor Speed}}{\text{Gear Ratio}}$$

- The gearbox output torque will depending on many factors, it can be calculated by:

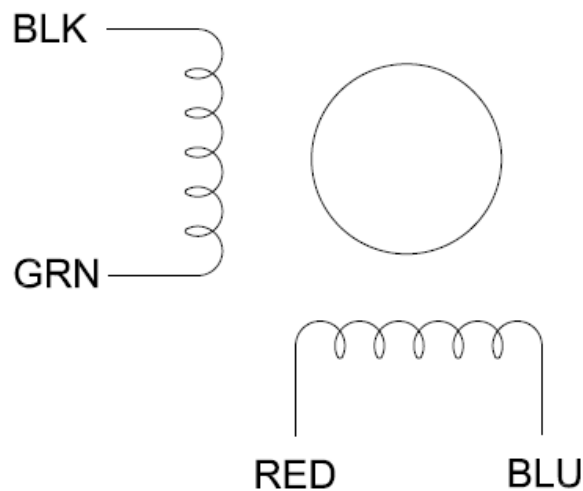
$$\text{Output Torque} = \text{Motor Output Torque} \times \text{Gear Ratio} \times \text{Gearbox Efficiency}$$

- The Gearbox Step Angle can be determined by:

$$\text{Gearbox Step Angle} = \frac{\text{Motor Step Angle}}{\text{Gear Ratio}}$$

- When choosing a stepper motor with a gearbox, keep in mind that the gearbox Max Permissible Torque, beyond which the gearbox could become damaged.

## Connection Diagram:



Wire Color	Black	Green	Red	Blue
Board Connector	A	C	B	D