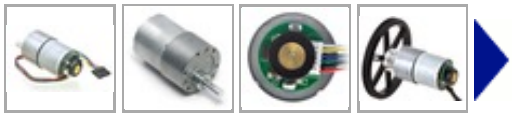
67:1 Metal Gearmotor 37Dx54L mm with 64 CPR Encoder



Pololu item #: 1445 **108** in stock

Price break	Unit price (US$)
1	**39.95**
10	35.96

Quantity: 1

backorders allowed

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This 2.62" × 1.45" × 1.45" gearmotor is a powerful 12V brushed DC motor with a **67.67:1** metal gearbox and an integrated quadrature encoder that provides a resolution of 64 counts per revolution of the motor shaft, which corresponds to **4331 counts per revolution** of the gearbox's output shaft. These units have a 0.61"-long, 6 mm-diameter D-shaped output shaft. This gearmotor is also available without an encoder.

Key specs at **12 V**: 150 RPM and 300 mA free-run, 200 oz-in (14 kg-cm) and 5 A stall.

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Gearmotor Options

This powerful brushed DC gearmotor is available in six different gear ratios and features an integrated quadrature encoder with 64 counts per revolution (CPR) of the motor shaft. A version without the encoder is also available.

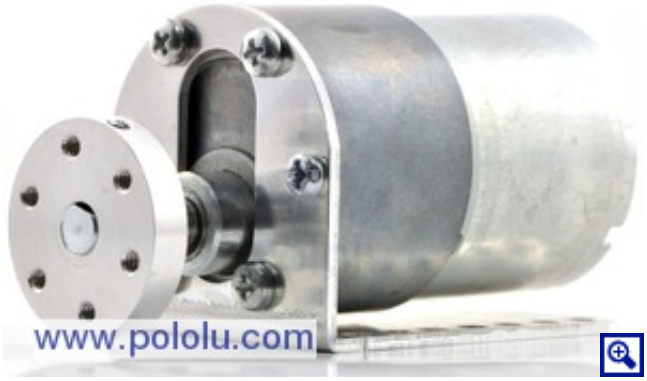
Gear Ratio	No-Load Speed @ 12 V	Stall Torque @ 12 V	Stall Current @ 12 V	With Encoder	Without Encoder
19:1	500 RPM	84 oz-in	5 A	37Dx52L mm	37Dx52L mm

29:1	350 RPM	110 oz-in	5 A	37Dx52L mm	37Dx52L mm
50:1	200 RPM	170 oz-in	5 A	37Dx54L mm	37Dx54L mm
67:1	150 RPM	200 oz-in	5 A	37Dx54L mm	37Dx54L mm
100:1	100 RPM	220 oz-in	5 A	37Dx57L mm	37Dx57L mm
131:1	80 RPM	250 oz-in	5 A	37Dx57L mm	37Dx57L mm

These motors are intended for use at 12 V, though the motor can begin rotating at voltages as low as 1 V.

Gearmotor Dimensions

The face plate has six mounting holes evenly spaced around the outer edge threaded for M3 screws. These mounting holes form a regular hexagon and the centers of neighboring holes are 15.5 mm apart. You can use our custom 37D mm metal gearmotor bracket(shown in the left picture below) to mount the gearmotor to your project via these mounting holes and the screws that come with the bracket.

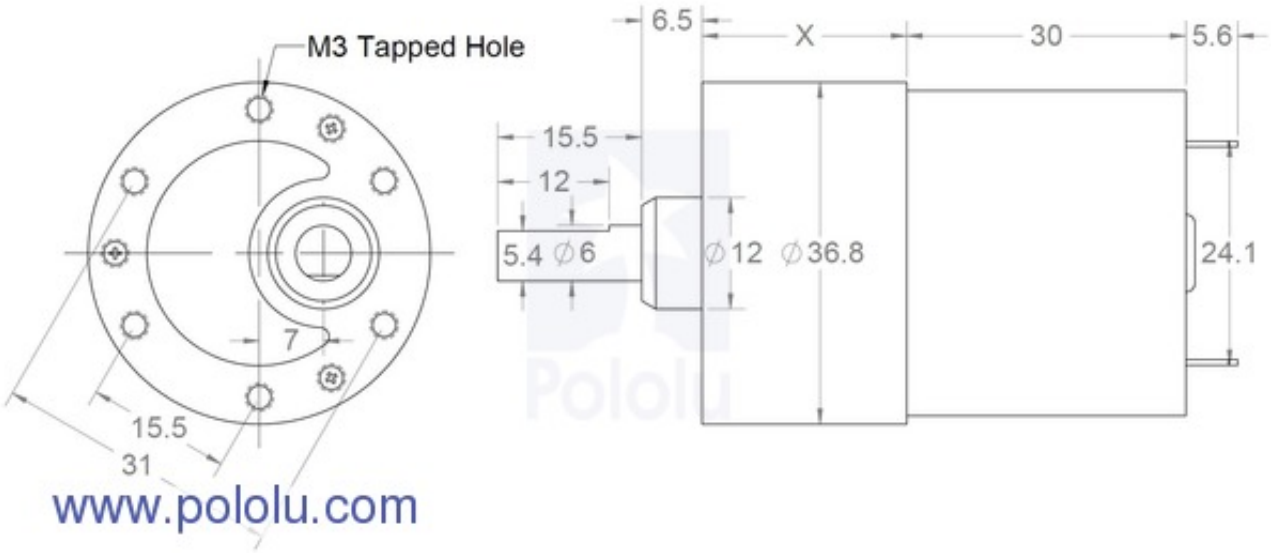


Gearmotor with bracket and hub.

37D mm metal gearmotor with 64 CPR encoder and Pololu 90×10mm wheel.

Please note that unlike our smaller metal gearmotors, these 37D mm gearmotors have output shafts with a diameter of 6 mm. The Pololu universal aluminum mounting hub for 6mm shafts can be used to mount our larger Pololu wheels (80mm- and 90mm-diameter) or custom wheels and mechanisms to the gearmotor's output shaft (see the right picture above).

The diagram below shows the dimensions (in mm) of the 37D mm line of gearmotors. The value of x is **22 mm** for the 19:1 37Dx52L mm and 29:1 37Dx52L mm versions, **24 mm**for the 50:1 37Dx54L mm and 67:1 37Dx54L mm versions, and **26.5 mm** for the 100:1 37Dx57L mm and 131:1 37Dx57L mm versions. Note that the encoder PCB and magnetic disc are not shown in this dimension diagram. The encoder assembly extends an additional 12.5 mm beyond the rear of the motor.

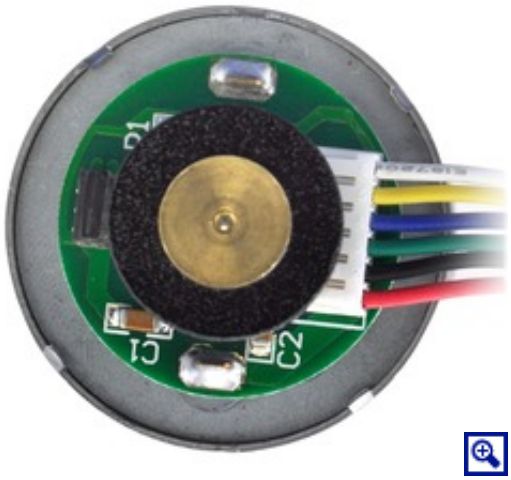


37D mm metal gearmotor dimensions (units in mm).

Warning: Do not screw too far into the mounting holes as the screws can hit the gears. We recommend screwing no further than 3mm (1/8") into the screw hole.

Using the Encoder

A two-channel Hall effect encoder is used to sense the rotation of a magnetic disk on a rear protrusion of the motor shaft. The quadrature encoder provides a resolution of 64 counts per revolution of the motor shaft. To compute the counts per revolution of the gearbox output, multiply the gear ratio by 64. The motor/encoder has six color-coded, 11" (28 cm) leads:



37D mm metal gearmotor with 64 CPR encoder.

Color	Function
Red	motor power (connects to one motor terminal)
Black	motor power (connects to the other motor terminal)
Green	encoder GND
Blue	encoder Vcc (3.5 – 20 V)
Yellow	encoder A output
White	encoder B output

The Hall sensor requires an input voltage, Vcc, between 3.5 and 20 V and draws a maximum of

10 mA. The A and B outputs are square waves from 0 V to Vcc approximately 90° out of phase. The frequency of the transitions tells you the speed of the motor, and the order of the transitions tells you the direction. The following oscilloscope capture shows the A and B (yellow and white) encoder outputs using a motor voltage of 12 V and a Hall sensor Vcc of 5 V:

Encoder A and B outputs for 37D mm metal gearmotor with 64 CPR encoder (motor running at 12 V).

By counting both the rising and falling edges of both the A and B outputs, it is possible to get 64 counts per revolution of the motor shaft. Using just a single edge of one channel results in 16 counts per revolution of the motor shaft, so the frequency of the A output in the above oscilloscope capture is 16 times the motor rotation frequency.

> As of July, 2012, we are shipping these gearmotors with leads terminated by a 1×6 0.1″ female header, as shown in the main product picture. If this header is not convenient for your application, you can pull the crimped wires out of the header or cut the header off. Previously, these gearmotors shipped with stripped, unterminated leads.