

Super Precision Gyroscope

What's included:

- 1 x gyroscope
- 1 x electric motor and battery pack
- 2 x screws to attach motor to the gyroscope
- 1 x length of string to balance gyroscope on
- 1 x 'Alan'/hex key for above screws
- 2 x extensions for demonstrations
- 2 x 'ball' ends
- 1 x slot end
- 1 x screw for the battery box

4 AA batteries are required for the battery pack



IMPORTANT:

The gyroscope rotates at high speed and hence care should be taken to ensure that you do not touch the spinning disk/shaft when it is spinning. Do not drop or knock the gyroscope as this may damage or break the gyroscope (shaft or bearings). Ensure clothing such as ties, along with hair is kept away from the gyroscope when it is spinning. Keep the gyroscope away from young children and make sure older children are supervised.

About the gyroscope

The Super Precision Gyroscope has been designed for practical demonstrations in the work place, schools, colleges and universities. Due to the fascinating behavior it may also be appealing as an executive toy. Its size makes it small enough to be carried around with ease.

The provided electric motor and battery pack is used to start the gyroscope. This rotates the gyroscope at much higher speeds compared to a pull string method used on most 'toy' gyroscopes. It also means that less stress is placed on the bearings when the gyroscope is started. This gyroscope cannot be started with string.

The electric motor can be permanently connected to the gyroscope using the two screws supplied or can be placed against the gyroscope while it is getting up to speed. The motor can then be taken away and turned off, leaving you to do experiments with the high speed spinning gyroscope.

Three ways to get the gyroscope spinning

1 Electric motor (temporary)

- Firstly ensure that a good set of batteries are in the battery pack.
- Hold the gyroscope frame (silver coloured) in one hand.
- While the motor is OFF push the motor onto the axle of the gyroscope.
- Holding the motor and gyroscope firmly together turn the motor on (switch is on battery box)
- Wait until the gyroscope gets to the required speed and pull motor away from the gyroscope
- Turn off the motor (You are now free to conduct experiments with the gyroscope)

2 Electric motor (permanently attached)

- This option leaves the motor to the gyroscope (can be removed later)
- To attach the motor permanently push the motor onto the axle of the gyroscope.
- Insert the two screws using the provided 'Alan' key.
- Ensure that a good set of batteries are in the battery pack
- Turn on the electric motor (switch is on the battery box).
- Wait until the gyroscope is up to full speed
- You can either choose to leave the motor on or switch it off (the gyroscope will slow down and come to a rest over a number of minutes).

Demonstrating Gyroscopic Forces

Suspended by string

Screw one of 'ball' ends into the opposite side of the gyroscope that you connect the electric drill . Start the gyroscope spinning. Hold both ends of the string and put the 'ball' end into the loop of string. Raise the gyroscope. The gyroscope will roughly maintain its angle to the horizon.

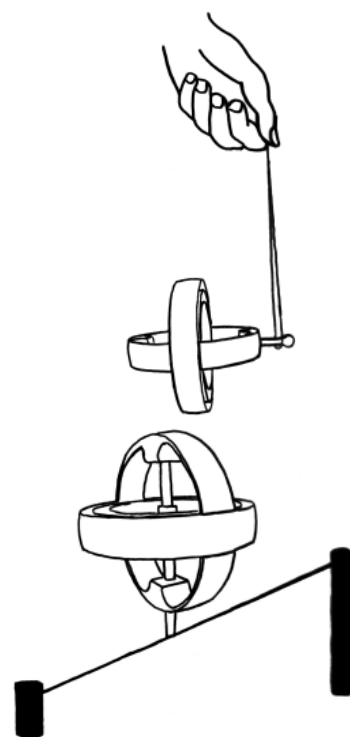
Important: Be ready to catch the gyroscope when it slows down.

High Wire

Screw the 'slot end' into the opposite side of the gyroscope that you connect the electric drill. Place the gyroscope onto taut string or wire (note the slot on the bottom). The gyroscope will remain on the wire until it slows down.

Other demonstrations

There are 7 places on the frame of gyroscope that the attachments can be screwed into. This allows you try out the attachments in different places and to explore the results.



Gyroscope Specification

RPM	12,000rpm+
Weight	
Total Weight :	345g / 12.16oz
Gyroscope weight without motor :	145.3g / 5.12oz
Brass disk (without shaft) :	111.2g / 3.92oz
Aluminium casing, bearings and shaft weigh :	34.1g / 1.2oz
Shaft (includes bearing washers) :	4.7g / 0.16oz
Bearings :	0.6g / 0.02oz
Aluminium casing :	26.1g / 0.92oz
Screws (hold case together) :	2.7g / 0.10oz
Electrical	
Motor Amps :	2.5 amps / 14.5~ Watts (start up), 0.5 amps / 2.9~ Watts(at full RPM)
Motor Voltage with standard batteries :	5.8 volts
Batteries :	Four 'AA' (LR6) batteries
Sizes	
Outer casing diameter :	62.5mm / 2.46in
Brass disk diameter :	53mm / 2.08in
Brass disk thickness :	12mm / 0.47in
Brass disk cut-out depth :	5.25mm / 0.21in
Brass disk cut-out diameter :	40.9mm / 1.61in approx
Shaft Diameter (largest point) :	3.98mm / 0.15 in
Motor length :	58.2mm approx
Motor diameter (at largest point) :	28.1mm approx