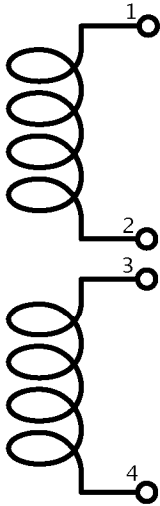


# Anatomy of a stepper motor

A "stepper motor" is a simple kind of electric motor common in electronic devices such as printers. A stepper is just a rotating magnet (connected to the shaft) inside a set of coils. Turn the shaft and AC electricity comes out. Some wind turbines essentially use large steppers as their generators – they don't need a gearbox like other types of generators.

Steppers are made with different configurations of coils with leads connected to different points. Here are three common configurations:

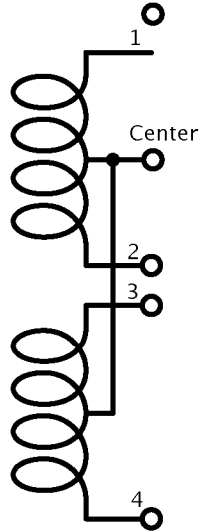
4 leads



Low resistance between wires that form ends of a coil (e.g. between 1 and 2).

No path (infinite resistance) between unconnected coils (e.g. between 2 and 3).

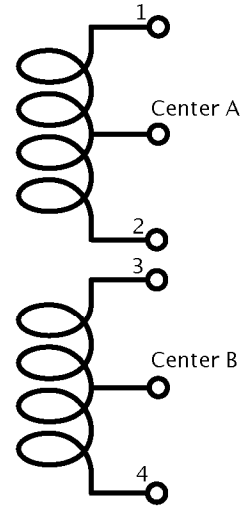
5 leads



A resistance of  $X$  between all non-center pairs (1-2, 1-3, 2-3, etc.).

A resistance of  $1/2 X$  between the Center and all other leads.

6 leads

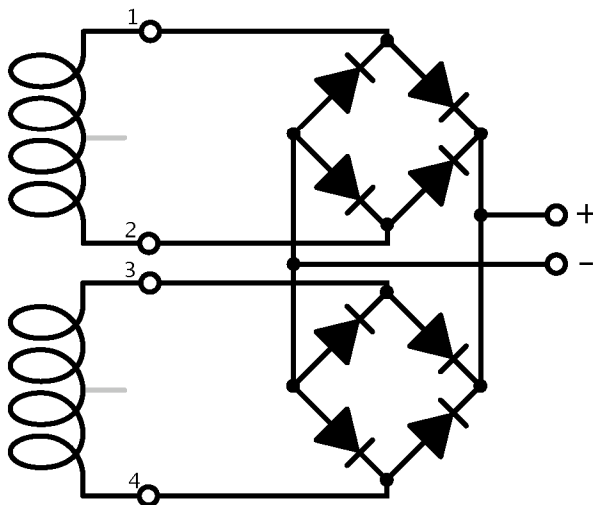


A resistance of  $X$  between connected coil ends (e.g. 1-2).

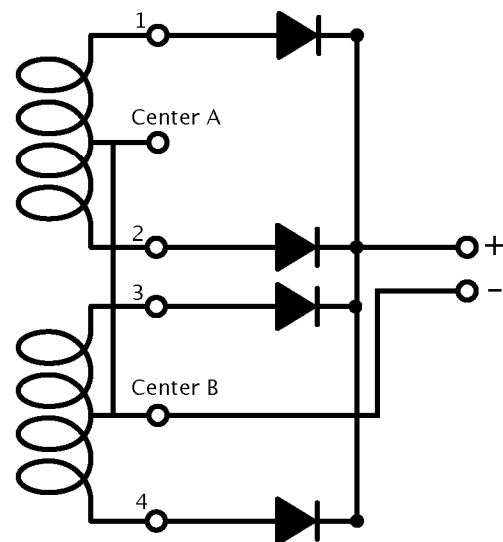
A resistance of  $1/2 X$  between the Center of a coil and either end (e.g. Center A to 1 or Center B to 3).

No path between coils (e.g. 2 to 3).

## Some ways to wire them:



Each coil connects to a bridge rectifier. If there are center leads (5 or 6-wire versions) they are left unconnected.



Four diodes connect the coil ends to the DC + output; Center leads are connected and are the DC - output.