


[About LEE](#)
[Products](#)
[Contact Us](#)
[What's New](#)
[Engineering](#)
[Search](#)

Stepper Motors


[Electro-Fluidic Systems](#)
[Micro Dispensing](#)
[Control Valves](#)
[Scientific Products](#)
[Pumps](#)
[MINSTAC](#)
[Manifold Services](#)
[Other Products](#)
[Drawings](#)
[ASK LEE](#)

Stepper Motor Description

A stepper motor is a device whose normal shaft motion consists of discrete, angular movements when driven from a sequentially switched DC power supply. Used for precise positioning stepper motors are controlled by digital pulses. They also enable simple accurate control of speed and are ideal for driving a pump piston.

Stepper motors operate by rotating an armature in fixed increments through magnetic poles positioned at many points around the diameter. These magnetic poles are positioned such that by turning on one or more of the windings in a particular sequence, the rotating armature can progress to the next pole in finite steps. Construction characteristics of the stepper motor determines the angle of the rotation. Lee LPV pumps use stepper motors that usually rotate 7.5° or 15°. One digital pulse causes the motor drive to increment one precise angle of rotation.

Bipolar Motor

As can be seen in the schematic below, the current can be driven in both directions, necessitating only two windings, rather than the four required for the unipolar design. By utilizing both sections at the same time, we can obtain a 40% increase in amp turns for the same power dissipation in the motor. When controlled effectively, we feel the bipolar drive type is more appropriate for use with Lee LPV pumps. In our opinion, the advantage of increased performance capability outweighs the requirement for more complex circuitry. The complexity does not become such an issue if the modular drives are used.

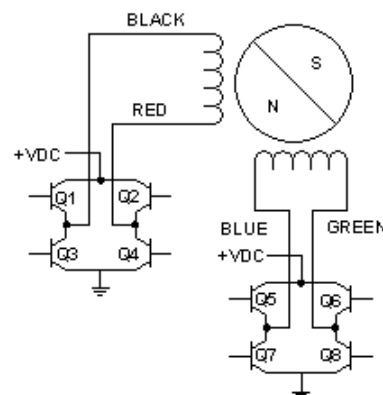
STEPPING SEQUENCE

STEP	Q2-Q3	Q1-Q4	Q6-Q7	Q5-Q8
1	ON	OFF	ON	OFF
2	OFF	ON	ON	OFF
3	OFF	ON	OFF	ON
4	ON	OFF	OFF	ON
1	ON	OFF	ON	OFF

DISPENSE

ASPIRATE

WIRING DIAGRAM



AWE0009S

The electrical energy to the windings above can be controlled several different ways. The most common ways are described in the [following section](#).

For more information, please send us your application information via our [ASK LEE](#) service. Or contact our application engineers in the [USA](#) at 1-800-LEE-PLUG or our representatives [around the world](#).

Copyright 06/2002 by The Lee Company, USA

-- [Trademark](#) information --

[LEE Homepage](#)