

Terminology

The following information is intended as an aide to understanding the terms used when discussing stepping motor applications.

Detent or residual torque:

The torque required to rotate the motor's output shaft with no current applied to the windings.

Drives:

A term depicting the external electrical components to run a Stepper Motor System. This will include power supplies, logic sequencers, switching components and usually a variable frequency pulse source to determine the step rate.

Dynamic torque:

The torque generated by the motor at a given step rate. Dynamic torque can be represented by PULL IN torque or PULL OUT torque.

Holding torque:

The torque required to rotate the motor's output shaft while the windings are energized with a steady state D.C. current.

Inertia:

The measure of a body's resistance to acceleration or deceleration.

Typically used in reference to the inertia of the load to be moved by a motor or the inertia of a motor's rotor.

Linear step increment:

The linear travel movement generated by the lead-screw with each single step of the rotor.

Maximum temperature rise:

Determined by the resistance rise method, motor un-mounted in free air and energized with a steady state D.C. current.

Pull in torque:

The load a motor can move without missing steps when started at a constant pulse rate.

Pull out torque:

The load a motor can move when at operating speed. This is normally substantially greater than the Pull in torque.

Pulse rate:

The number of pulses per second (pps) applied to the windings of the motor. The pulse rate is equivalent to the motor step rate.

Pulses per second (PPS):

The number of steps that the motor takes in one second (sometimes called "steps per second"). This is determined by the frequency of pulses produced by the motor drive.

Ramping:

A drive technique to accelerate a given load from a low step rate, to a given maximum step rate and then to decelerate to the initial step rate without the loss of steps.

Single step response:

The time required for the motor to make one complete step.

**Step:**

The angular rotation produced by the rotor each time the motor receives a pulse. For linear actuators a step translates to a specific linear distance.

Step angle:

The rotation of the rotor caused by each step, measured in degrees.

Steps per revolution:

The total number of steps required for the rotor to rotate 360°.

Torque to inertia ratio:

Holding torque divided by rotor inertia.