

STEP MOTORS

Operational control

The rotation angle and the rotation speed are controlled by the following equations.

Rotation angle (degree) = the unit step angle (degree) × the number of pulses

$$\text{Rotation speed (r/min)} = \frac{\text{the unit step angle (degree)}}{360^\circ} \times \text{pulse speed (Hz)} \times 60(\text{s})$$

•(r/min): the number of rotation per minute • (Hz): pulse generation frequency •(s): second

We can obtain the rotation speed by substituting the values below into the above equation.

◇Unit step angle: 0.72°, pulse generation frequency: 100 Hz → Rotation speed = 12(r/min)

◇Unit step angle: 0.72°, pulse generation frequency: 1000 Hz → Rotation speed = 120(r/min)

For the same step motor, motor speed is changed by changing pulse generation frequency.

Difference between step motors and servomotors

Item	Step motor	Servomotor
Control method	Open loop	Closed loop
Stopping accuracy	Low	High
Practical rotation speed	Not practical at high speed	Practical at high speed
Torque characteristics	Torque is small at high rotation speed range	Torque is not influenced by rotation speed. Torque more than rated torque is available momentarily
Influence by drive mechanism	Not so much influenced	Much influenced
Price	Low	High

Torque characteristics

