C

Servo Motors

Overview of Servo Motors

Servo motor are specialized for high response, high precision positioning. As a motor capable of accurate rotation angle and speed control, it can be used for a variety of equipment.

Features

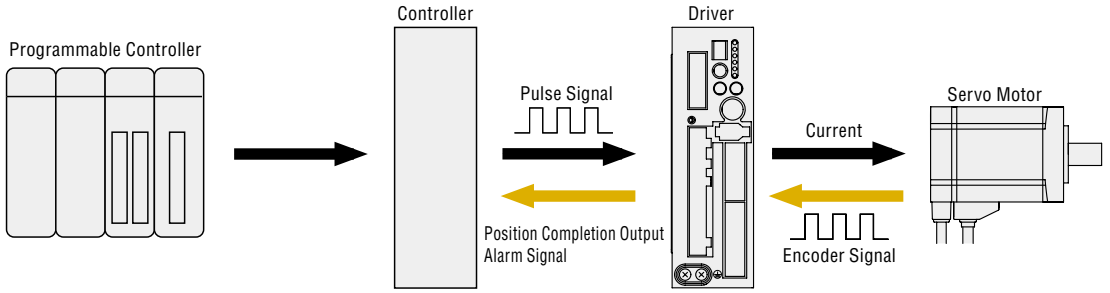
●Closed Loop Control: Motor Operation Follows at Command

A rotation detector (encoder) is mounted on the motor and feeds the rotation position/speed of the motor shaft back to the driver.
The driver calculates the error of the pulse signal or analog voltage (position command/speed command) from the controller and the feedback signal (current position/speed) and controls the motor rotation so the error becomes zero.
The closed loop control method is achieved with a driver, motor and encoder, so the motor can carry out highly accurate positioning operations.

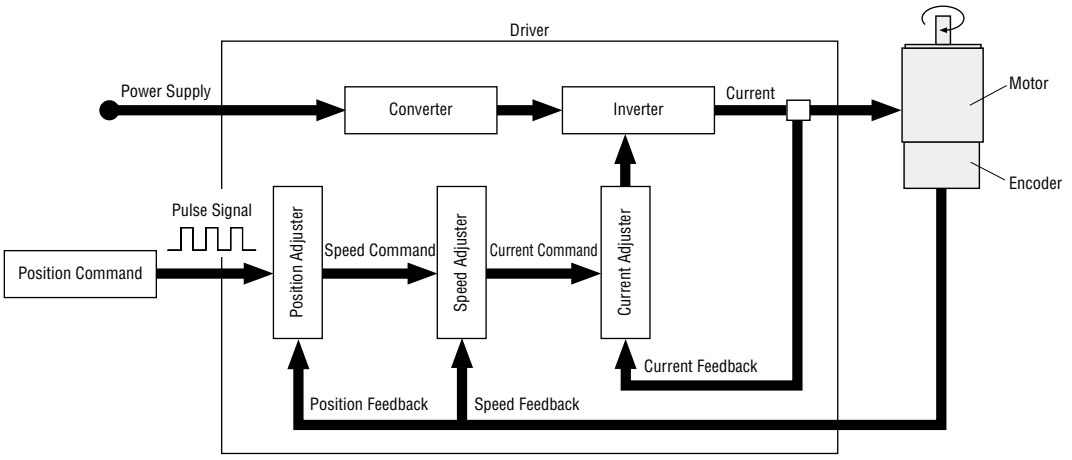
- An END signal communicates the completion of the positioning operation.
- An alarm can be output if there is an abnormality such as an overload, making it possible to communicate equipment abnormalities.

◇Position Control Using a Pulse Signal

The controller inputs the pulse signal. The stop position and speed are then controlled according to the pulse number and frequency.

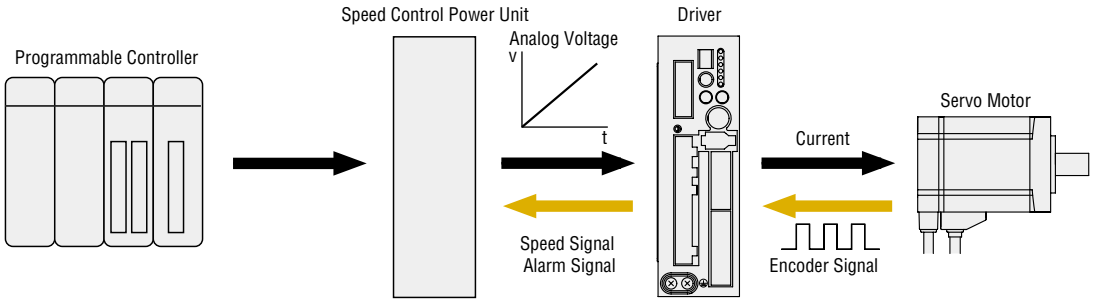


• Position Control Diagram

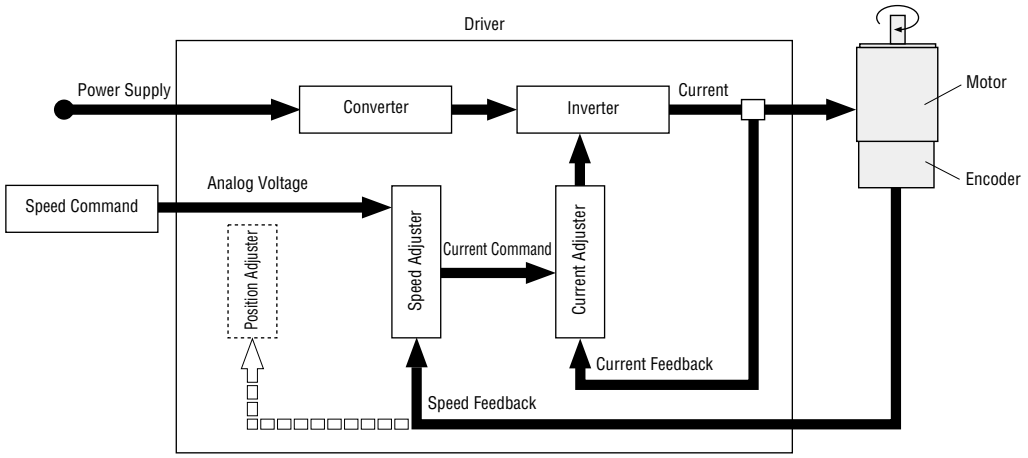


◇Speed Control by Analog Voltage

The analog voltage is input to control the speed.

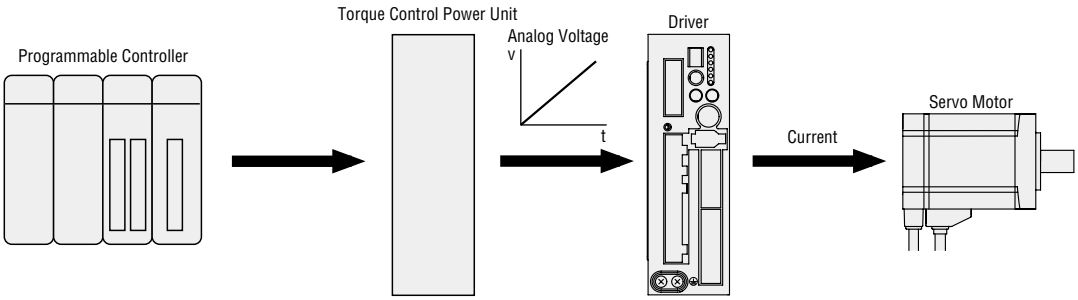


• Speed Control Diagram

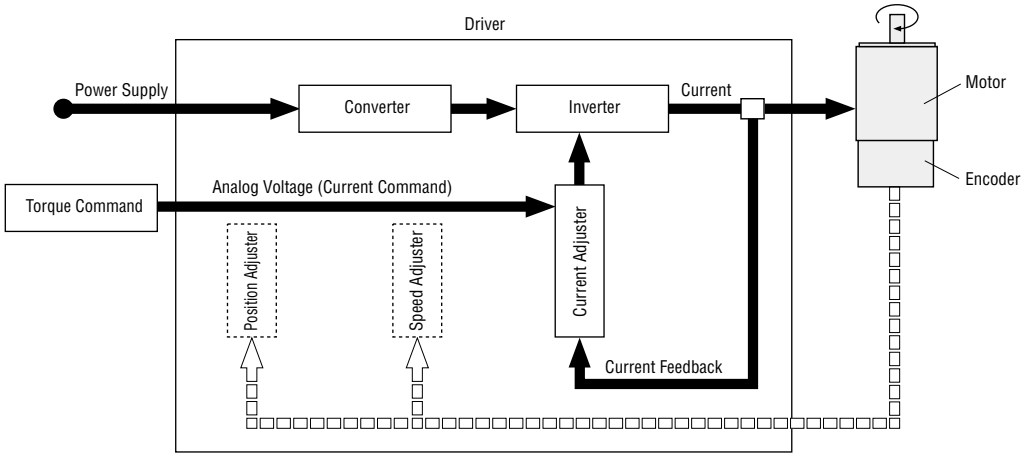


◇Torque Control by Analog Voltage

The analog voltage is input to control the torque.



• Torque Control Diagram

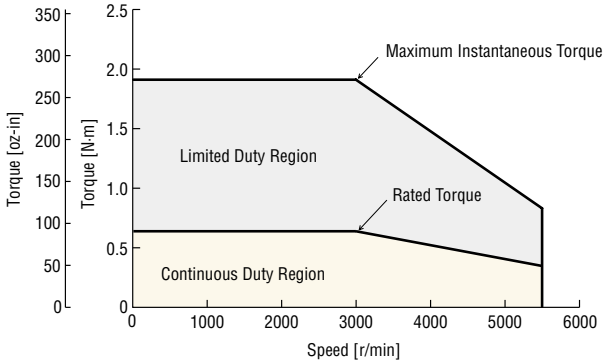


●Compact and High Power

The servo motor is compact and lightweight and outputs high power.

◇Speed – Torque Characteristics

Rated Output Power: 200 W (1/4 HP)
Motor Frame Size: 60 mm (2.36 in.)

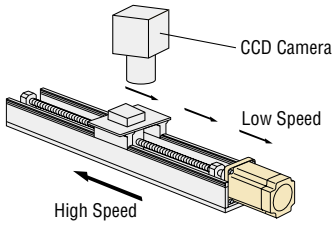


• Continuous Duty Region and Limited Duty Region

A servo motor controls the current according to the state of the load. Because of the efficiency and low heat generation of the motor, continuous operation is possible within the rated torque.
Also, during acceleration and deceleration, the limited duty region is used to obtain a large torque, making it possible to decrease the positioning time.

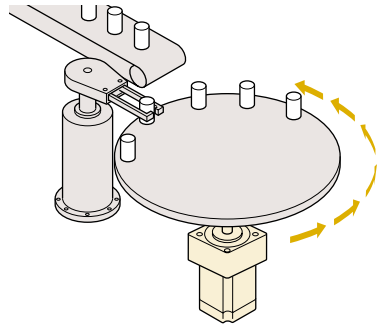
●A Wide Variable Speed Range

A flat, stable torque is generated from low to high-speed range, so that long-stroke positioning can be carried out quickly.
The machine cycle is improved in testing equipment by quickly returning at high speed after slowly transporting the workpiece at low speed.



●Geared Type also Compatible with Large Inertial Loads

The servo motor has restrictions on the permissible load inertia, but the geared type can be used to greatly increase the load that can be driven.



Motor Types

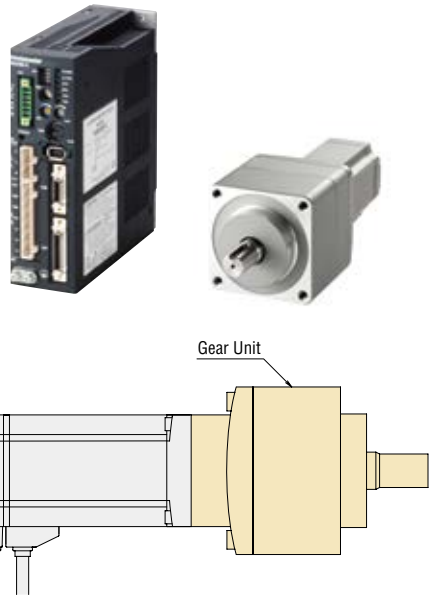
A wide range of servo motors is available, such as the electromagnetic brake type and geared type in addition to the standard type. Such a wide selection means that you can choose the optimal type according to the function and performance required in your specific application.

Standard Type

This is the basic round shaft type motor.
Motors are available in a variety of sizes.

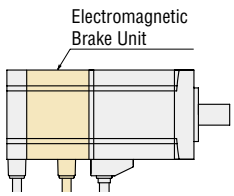
Geared Type

These motors incorporate a gearhead with reduced backlash to make the most of the high controllability of the motors.
The gearhead ensures highly accurate, smooth operation even in applications where a large load torque is received. The inertia of the load converted to the motor shaft is reduced by the square of the gear ratio, improving the start and stop responsiveness.



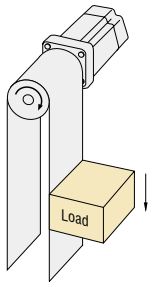
Electromagnetic Brake Type

These motors incorporate a non-excitation type electromagnetic brake. When the power is accidentally cut off due to a power outage or another unexpected event, the electromagnetic brake holds the load in position to prevent it from dropping or moving.
Electromagnetic brake motors are available in a round shaft type or geared type.



● Regeneration Operation
When suddenly starting or stopping a vertical drive (gravitational operation) or big inertia, the motor goes into regeneration operation, working as a generator. For regeneration operation with the **NX** Series, use the regeneration unit, sold separately.

NX Series Regeneration Unit



Gravitational Operation

Product Line of the NX Series

NX Series servo motors are capable of highly accurate control with easy operation, similar to stepper motors. Choose between the standard type and the geared type.

		Tuning-Free **NX** Series
Series		
Reference Page		▶ Page C-8
Key Features		● High speed and high response ● 4 control modes: position, speed, torque, tension ● Damping control suppresses vibration during stopping
Built-in Encoder Sensor		20-bit absolute encoder (Optical encoder)
Resolution		100 P/R～100000 P/R
Rated Speed		3000 r/min
Max. Speed		5500 r/min
Absolute-Compatible		●
Output	50 W (1/15 HP) [□42/60 mm (1.65/2.36 in.)]	●
	100 W (1/8 HP) [□42/60 mm (1.65/2.36 in.)]	●
	200 W (1/4 HP) [□60/90 mm (2.36/3.54 in.)]	●
	400 W (1/2 HP) [□60/90 mm (2.36/3.54 in.)]	●
	750 W (1 HP) [□85 mm (3.35 in.)]	●
Additional Function	Electromagnetic Brake	●
Regeneration Operation		●*
Geared Types	**PS** (Planetary gear mechanism)	●
Power-Supply Input		Single-Phase 100-115 VAC Single-Phase 200-230 VAC Three-Phase 200-230 VAC
Safety Standards		cULus CE

*A separately-sold regeneration unit is required.