SERVO DRIVES

Servo Drives

Servo Drive is a special electronic amplifier used to power electric servomechanisms. A servo drive monitors the feedback signal from the servomechanism and continually adjusts for deviation from expected behavior.

Function

A servo drive receives a command signal from a control system, amplifies the signal, and transmits electric current to a servo motor in order to produce motion proportional to the command signal. Typically the command signal represents a desired velocity, but can also represent a desired torque or position. A sensor attached to the servo motor reports the motor's actual status back to the servo drive. The servo drive then compares the actual motor status with the commanded motor status. It then alters the voltage frequency or pulse width to the motor so as to correct for any deviation from the commanded status.

In a properly configured speed control system, the servo motor rotates at a velocity that very closely approximates the velocity signal being received by the servo drive from the control system. Several parameters, such as stiffness also known as proportional gain, damping also known as derivative gain, and feedback gain, can be adjusted to achieve this desired performance. The process of adjusting these parameters is called performance tuning. Although many servo motors require a drive specific to that particular motor brand or model, many drives are now available that are compatible with a wide variety of motors.

Use in Industry

Servo systems can be used in CNC machining, factory automation, and robotics, among other uses. Their main advantage over traditional DC or AC motors is the addition of motor feedback. This feedback can be used to detect unwanted motion, or to ensure the accuracy of the commanded motion. The feedback is generally provided by an encoder of some sort. Servos, in constant speed changing use, have a better life cycle than typical AC wound motors. Servo motors can also act as a brake by shunting off generated electricity from the motor itself.