ELECTROHYDRAULIC ACTUATOR

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ELECTROHYDROSTATIC ACTUATION

Emerging industry trends demand compact, accurate, electric actuation for turbine fuel and steam control. Electrohydrostatic actuation (EHA) provides these benefits for applications where high force requirements dictate the use of hydraulic power. Young & Franklin's patents-pending Electrohydrostatic Actuators and Electrohydrostatic Actuators with a Failsafe System combine the accuracy of electronic control with the high-force capability of hydraulics in a compact package.

The principle behind the technology consists of using a bi-directional pump with both ports connected to each side of a linear or rotary actuator. The pump positions the actuator when driven in either direction by a motor. The motor in turn is controlled by a servo controller. A position sensor located on the actuator provides the controller with the necessary feedback for position control.

EHA actuators do not use valves for control as typically found in electrohydraulic actuation (where a servo valve is located between the pump and the actuator). Instead, the pump is accurately rotated back and forth to position the actuator using the feedback and servo controller. The pump draws fluid from a pressurized reservoir, or accumulator via a set of valves.

The basic electrohydrostatic principle

Advantages of using EHA Technology
Several advantages to using EHA actuation instead of conventional hydraulic control are outlined below:

High force: Over 25,000 lbf obtainable
Low hysteresis (< 1%)
Reduced pressure losses (no control valves)
Efficiency: flow is controlled on demand and pressure can be controlled electronically
Less loss of heat (no relief valves)
Compact: pump, motor, actuator, sensors and controller in one small package
Enhanced reliability: fewer components
Integrated diagnostic capability
No hydraulic system requirement

Applications
Young & Franklin currently uses EHA technology for inlet guide vane actuation, bleed heat valve control and remote subsea actuation.

Our 8613 IGV actuator design incorporates a hydraulic accumulator for fail-safe operation in Class 1 Division 2 Groups B, C, D hazardous areas. A separate motor and pump provide and maintain the accumulator precharge pressure. This accumulator provides the hydraulic pressure necessary to quickly operate the IGV to a safe position during power loss or trip conditions.

This simple but effective EHA technology can be extended to other applications where remote electrical control of

hydraulic power is required to position linear or rotary actuators.