

Corporate Office  
7042 Fairfield Business Dr.  
Fairfield, OH 45014-5480  
(513) 874-3225  
(513) 874-3229 Fax



THE FPDA  MOTION & CONTROL NETWORK

## ElectroHydraulics Proportional & Servo Valves

**Course Description:** Modern hydraulic systems can involve sophisticated closed loop feedback controls for timely and precise equipment operation. Proportional valves, servo valves, and their associated electric and electronic power and signal arrangements require a good understanding by maintenance and engineering personnel to assure peak performance.

This course begins with a review of electrical principles and covers amplifier theory and control concepts. Both proportional and servo valve theory are extensively reviewed. Participants will wire up control cards and drive electro-hydraulic valve cut-a-ways. They will learn how to adjust and fine tune an application, set gains, make feedback adjustments, and troubleshoot. ISO cleanliness requirements and means to achieve them are also covered since precise controls require extra clean fluid.

**Prerequisites:** Some maintenance experience in hydraulics and Level 1 Industrial Hydraulics knowledge. Exposure to electronic controls is helpful.

### **Textbooks:**

### **Learning Objectives:**

- State hydraulic and electrical fundamentals
- Describe proportional and servo principles of operation
- Associate solenoid types and electronic controls
- Describe pressure and flow controls
- Explain load compensation
- Describe directional valves
- Troubleshoot valves
- Explain single stage and two-stage servo spool types
- Discuss flapper-nozzle, jet pipe, and high performance type servo valves
- Explain mechanical and electronic feedback
- Explain dither, zero-lap and dead band
- Discuss hysteresis and linearity
- Evaluate ISO cleanliness requirements
- Setup circuits and troubleshoot