

Print Date: 9/4/13
Course Objectives/Course Outline
Spokane Community College

Course Title: Machine Controls

Prefix and Course Number: FLPT 123 – Revised fall 2013

Learning/Performance Outcomes:

By the end of this course, a student should:

- read and draw relay logic electrical control schematics for fluid powered machines
- write a sequence of operation (including operator functions) for an automated machine
- identify all electrical components commonly used in machine control (found in control panel)
- write simple machine control program for Mini PLC (Allen Bradley)
- have command of an adequate electrical vocabulary for industry

Course Outline

- I. Industrial Plant Electrical Power
 - A. Type available
 1. Power voltages used
 2. Machine control voltages used
- II. Schematic differences--hydraulic and electrical
 - A. Ladder type electrical schematic
 - B. Electrical wiring diagram
- III. Solenoid Operated Directional Valve
 - A. Electrical requirements
 1. Coil voltage
 2. Type electrical signal required
 - a. momentary
 - b. sustained
 3. Two position valve
 - a. single solenoid
 - b. double solenoid
 - 1) electrical interlock
 4. Three position valve
- IV. Automated Machine
 - A. Identified
 - B. Frame
 - C. Moveable mechanical parts
 1. Linear
 2. Rotary
 - D. Actuators
 1. Location on machine
 2. Mounting type (style)
 - E. Valves used
 1. Mechanically operated
 2. Electrically operated
 3. Location on machine
 - F. Power unit
 1. Electrical motor
 2. Control panel (motor starter)
 3. Location

- G. Electrical control
 - 1. Limit switches
 - a. location
 - b. function
 - 2. Push buttons
 - a. location
 - b. function
 - c. push button panel
 - 3. Control panel
 - a. relays
 - b. timers
 - c. location
- H. Fluid line
 - 1. Routing on machine frame
- I. Electrical conduit
 - 1. Types used
- V. Typical Control Panel
 - A. Relay Logic
 - 1. Components used
 - a. function
 - b. voltage
 - 2. Location
 - a. machine
 - b. building
 - B. Programmable Controller
- VI. Electrical Components
 - A. Identify
 - B. Electrical Specifications
 - C. Application
 - D. Schematic Symbol & Terminology
- VII. Electrical Schematic
 - A. Rules for drawing
 - B. Reading and interfacing with hydraulics
 - C. Study basic circuits
 - D. Convert to PLC program
- VIII. Vocabulary