

Course Objectives/Course Outline
Spokane Community College

Course Title: AC Motor Controls

Prefix and Course Number: ELMT 241

Course Learning Outcomes:

By the end of this course, a student should be able to:

- wire and troubleshoot automatic and manual controls of a three-phase motor
- wire and troubleshoot a time delay control circuit
- wire and troubleshoot a start-stop-jog with control relay and control transformer

*Two, three, and four credit class content will be determined from input provided by faculty from individual programs which have specific electrical requirements.

Course Outline:

I. Ladder Diagrams

A. Redrawing a Ladder Diagram into a Wiring Diagram

1. distance
2. wire usage

II. Control Voltage

A. Sources

1. control transformers
 - a) hookups
 - b) grounding
 - c) fusing

III. Pilot Devices

A. Limit Switch Configuration and Options

B. Timers

1. pneumatic
2. solid state
3. dash pot
4. motor driven

C. Sensors

1. proximity switches
 - a) capacitive
 - b) inductive
 - c) magnetic
 - d) hall effect
2. photo electric
 - a) reflective
 - b) converging beam
 - c) fiber optic
3. zero speed switches
4. encoders

IV. Jogging Motors

A. Types

5. push button
6. control relay
7. selector switch

V. Phase Monitors

- A. Phase Loss
- B. Phase Reversal
- C. Low Voltage
- a. Ground Detection

A. Troubleshooting/Wiring Applications

- a. Start-Stop-Jog With Control Relay and Control Transformer
- b. Three Phase Motor Lead Identification
- c. Time Delay Control in Starting and Stopping a Three Phase Motor Using Two Push Button Stations
- d. Automatic and Manual Control of a Three Phase Motor, Using Limit Switches, Electronic Off-Delay Timer, Selector Switch, and Multiple Push Button Stations