



Advanced Electrical II

A motor or control circuit failure can mean unplanned equipment shutdowns, a loss of production and expensive downtime and repair costs. Understanding the operation of motor control circuit equipment and developing effective troubleshooting skills will significantly reduce the length of an outage. This class presents an advance understanding of safe work practices when working on motors and other electrical systems. Resources for predicting the likelihood of equipment failure will be provided, and a basic program for clearly identifying problems. Common electrical devices and their operational requirements will be discussed. Diagram analysis for troubleshooting will be practiced. The proper use of safety equipment, knowledge of electrical hazards, and knowledge of how to respond in the event of an electrical disaster are absolutely essential for all electrical personnel. Anyone who works on or near power generation, transmission, or distribution systems should attend this course. Additionally, supervisors, managers, safety personnel, and those responsible for ensuring a safe work environment should attend this course.

Duration: 8 Hour Program

Electrical Fundamentals

Solve for the total and the individual voltage and current in a Series, Parallel, and Series-Parallel Combination Circuits
(Resistance, Capacitance, & Inductance)
Use Ohm's Law and Kirchoff's Law
Connect a given circuit
Take Voltage and Current measurements

Motor Fundamentals

Identify 1 Φ /3 Φ motors
Identify Shaded-Pole motors
Identify Capacitor Start and CSCR
Solve for Synchronous Speed
Demonstrate Schematic Diagrams tracing, reading, interpretation, & understanding
(Site-specific Controllers/Buckets)
Perform Motor Leads Taping and Termination
Connection Box
Connect motor leads in Wye/Delta
Single Speed/Voltage
Dual Speed (high/low speed)
Dual Voltage (high/low voltage)
Reversing rotation (1 Φ /3 Φ motors)

Motor Fundamentals (Cont)

Perform Continuity test/check,
Insulation Resistance test
Resistance test and measurements
Polarization Index Test (PI)
Dielectric Absorption Ratio Test (DAR)

PPE and Safe work Practices

Identify Double Insulated and Regular Portable Hand Tools
Conduct Lockout/Tag Out Procedures and De-energize Equipment
Don /don of PPE
Working On or Near Energized Equipment
Set Proper Boundaries (shock/arc flash)
Discuss Conductive Materials and Install Personal Grounding
Conduct Live-Dead-Live test
6-point checks
Discuss Opening Circuits Under Load
Demonstrate Proper Switching Position

Circuit breakers

Identify Parts of an Air Circuit Breaker and Molded-type Circuit Breaker