

Industrial Electrical Controls Fundamentals

OEM: Rockwell Automation • Duration: 4 Days (32 hrs) • Code: MFG-213

COURSE MODULES & TOPICS

Objectives

- Define the safety considerations that must be observed when installing, checking or locking out electrical equipment
- Define uses and functions of input and output devices, relays, and motors
- Demonstrate the reading of schematic diagrams and logic
- Define an open and short condition and perform voltage and current measurements
- Demonstrate the proper use of the following test equipment in lab to measure voltage, current, resistance and continuity: VOM, DVM, Multi-meters, continuity tester and amp probe
- Approximate secondary voltage, secondary current and primary current of a transformer when given its turns ratio, primary voltage and secondary load
- Identify the proper wiring configurations of a control transformer's primary current for 240V and 480V operation
- Approximate a transformer's maximum primary current for 480V operation, using the nameplate information

Prerequisites

- Familiar with basic electricity

Student Materials

- Student Manual includes the key concepts, definitions, examples, and activities presented in this course

Course Agenda

Day 1

- Electrical Safety
- Electrical Fundamentals Fundamental concepts and terms
- Sources of electricity
- Transformers
- Wiring Devices
- Wiring Standards
- Hands-on lab

Day 2

- Input Devices Push Buttons
- Limit, Proximity, Toggle, Rotary Switches
- Relays
- Output Devices Motors
- Heaters
- Panel Meters
- Light Indicators
- Disconnect Devices Fuses
- Circuit Breakers
- Overloads
- Contactors
- Use of Multimeter
- Hands-on lab

Day 3

- Logic Devices Timers
- Counters
- Hands-on Lab
- Schematic Diagrams BOM
- Title blocks
- Basic Schematic Symbols
- Wire identification
- Logic Diagrams Switches
- Timers
- Relays
- Truth Tables
- Ladder Diagrams Rung Identification
- Power Rail Identification
- Hands-on lab

Day 4

- Basic Machine Control Systems
- Distribution Three-Phase Devices
- Hands-on lab
- Build Circuits
- Circuit Troubleshooting
- Grounded and Ungrounded Control Circuits
- Hands-on lab