



Electrical Drawings and Control Circuits  
Training Course





# Electrical Drawings and Control Circuits Training Course

## Introduction

This electrical control circuits and drawings course begins with developing relevant drawings and symbols representing devices critical to all electrical installations to ensure continuity and efficient operations. Understanding and interpreting electrical drawings and ladder diagrams are the primary and fundamental tools for troubleshooting and maintaining an electrical installation.

Electrical symbols, schematics, and wiring diagrams support the operations of electrical installation equipment. This electrical control circuits and drawings program covers all electrical blueprint reading and circuit tracing aspects.

Participants in the electrical control circuits and drawings course will be familiarised with various standards and practices, learn to understand power flow, and identify equipment installed. As-fitted and ladder diagrams will be presented to correlate with the installed electrical equipment. Tracing electrical circuits with the corresponding wiring diagrams will be demonstrated to ensure proper troubleshooting methods.

## Understanding Electrical Control Circuits

Electrical control circuits are integral to operational efficiency. This electrical control circuits and drawings course module delves deep into the essence of electrical control circuits, elucidating the basics of control circuit arrays through schematic training, wiring design, and controller applications. Understanding the intricacies of electrical energy control ensures that engineers and technicians can oversee the smooth functioning and management of sophisticated electrical systems.

Participants will be trained in interpreting and constructing basic electrical control circuits using best practices in drawing and designing electric field simulations. The electrical schematic training will enhance the ability to draw and read complex electrical engineering drawings that form the backbone of modern electrical systems. By grasping the nuances of electrical schematic drawings, professionals can significantly improve their capacity for meticulous electrical drawing and troubleshooting.

## Drawing and Interpreting Electrical Schematics and Control Circuits

Focused training on electrical schematic drawing ensures that all aspects of schematics, including reading electrical drawings and creating electrical schematics, and the electrical control circuits and drawings course are covered comprehensively, preparing participants to tackle real-world challenges in electrical diagram analysis and system troubleshooting. This vital competency not only aids in understanding electrical drawings but also is a powerful tool for effective communication and documentation of electrical systems design.

## Targeted Groups

- Electrical Engineers.
- Electrical Supervisors.
- Maintenance Technicians.
- Managers in charge of electrical installations.
- Project Engineers.

## Course Objectives

Participants in the electrical control circuits and drawings course will be able to:

- Describe the various types of electrical drawings.
- Appreciate the importance of single-line diagrams.
- Analyze various electrical ladder drawings.
- Explain the operation of electrical equipment using wiring and schematic diagrams.
- Recognize the symbols in electrical drawings.

## Targeted Competencies

At the end of this electrical control circuits and drawings course, the target competencies will be able to:

- Interpretation and understanding of standard electrical symbols.
- Characteristics of single-line diagrams.
- Importance of ladder diagrams.
- Using diagrams for circuit tracing.
- Troubleshooting electrical systems using diagrams.

## Course Content

### Unit 1: Types of Drawings and Symbols

- Importance and relevance of drawings.
- Categories of electrical drawing and their characteristics.
- Different types of electrical drawings serve the purpose.
- International electrical symbols and drawings.
- Applications and functions of numerical relays.
- Importance of CTs and VTs information in electrical drawings.

### Unit 2: Interpretation and Significance of Single-Line Diagrams

- Onset of a single-line diagram.
- Importance of single-line diagrams.
- Standardized drawing symbols.
- Protective device coordination in single-line diagrams.
- Fault current calculations with information from the single-line diagram.
- Troubleshooting and electrical installations with the relevant diagrams.

### **Unit 3: Ladder Diagrams Interpretation**

- Types of ladder diagrams.
- Generic electrical equipment ladder diagrams.
- Designing control circuits.
- Interlock control circuits.
- Protective relays and timers ladder diagrams.
- Fail-safe designs.

### **Unit 4: Schematic and Control Circuits and its Merits**

- VFD schematics and its operation related to controlling circuits.
- UPS power supply schematic diagram components functionalities.
- Reading and tracing AC input diagrams and their significance.
- Identify components in the receiver, inverter, and AC outputs. schematic diagrams.
- Types of protection relays schematics, wiring, operation, and functional diagrams.
- Motor installation and control circuits.

### **Unit 5: Logic Circuits Applications and Troubleshooting Strategies**

- Logic gates and characteristics.
- Digital logic functions.
- Programmable logic controllers.
- Process and instrument diagrams.
- Troubleshooting strategies.