

# Industrial Electrical Control Panel Design Training Course

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Geneva

AGILE LEADERS
Training Center

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## Overview

Industrial Electrical Control Panel Design Training Course is a one-week course for engineers and technical reviewers who need a verified Control Panel Design Package. Participants develop industrial control panel design requirements, power and control schematics, component sizing, enclosure layouts, wiring plans, and verification evidence. The course solves fragmented design decisions by connecting load data, protection, thermal management, automation interfaces, and documentation through a controlled review sequence. Agile Leaders Training Center delivers this course on industrial electrical control panel design.

## Who Should Attend

- Functions responsible for electrical design bases, load lists, and panel specifications
- Teams responsible for automation interfaces, PLC I/O, and motor-control requirements
- Personnel responsible for maintenance access, commissioning readiness, and technical acceptance
- Groups responsible for design reviews, drawing control, and vendor-document evaluation
- Engineers responsible for low-voltage protection, enclosure selection, and wiring design

The course assumes participants already read electrical drawings and evaluate industrial equipment, and it leaves out beginner electrical theory, live construction authorization, vendor certification, and medium-voltage switchgear design.

## Departments and Industries

The course supports control-panel design decisions across manufacturing, utilities, process industries, infrastructure, and building services.

- Electrical engineering and design departments
- Automation, instrumentation, and controls functions
- Maintenance, reliability, and asset-management teams
- Commissioning, quality, and technical-assurance groups
- Manufacturing, water, energy, chemicals, and transport facilities
- Engineering contractors and panel-building organizations

## Learning Objectives

By the end of this course, participants will be able to:

- Build a panel design basis from load and interface data
- Apply component sizing and circuit-protection methods
- Analyze power, control, VFD, and PLC interface schematics
- Evaluate enclosure layout, segregation, and thermal constraints
- Use wiring, terminal, grounding, and labeling plans
- Create a reviewable Control Panel Design Package

## Course Agenda

### Day 1: Establish the Design Basis

- Panel Requirement and Design Input Register
- Load List and Duty Classification Method
- Control Philosophy and Operating Sequence Map
- IEC 61439 Assembly Requirement Framework
- IEC 60204-1 Machine Interface Checklist

### Day 2: Engineer Power and Control Circuits

- Single-Line and Power Schematic Development Method
- Control Circuit and Interlocking Logic Diagram
- Feeder and Branch-Circuit Sizing Worksheet
- Protection Coordination and Short-Circuit Evidence Log
- Control Power Supply Selection Matrix

### Day 3: Select Components and Interfaces

- Contactor, Relay, and Motor Starter Selection Schedule
- VFD Application and Bypass Interface Diagram
- PLC I/O and Field Interface Allocation Sheet
- Terminal Block and Cable Connection Plan
- Component Rating and Derating Decision Record

### Day 4: Integrate the Physical Design

- IEC 62208 Enclosure Environment Selection Matrix
- Internal Segregation and Clearance Layout Method
- Panel Heat-Load and Thermal Management Worksheet
- Protective Bonding and Grounding Layout Plan
- Wire Routing, Identification, and Labeling Standard

## Day 5: Control Panel Design Practice

- Suggested Exercise: Validate a Panel Design Input Register
- Suggested Exercise: Review Power and Control Schematics
- Suggested Exercise: Test Layout and Thermal Decisions
- Suggested Exercise: Compile BOM and Drawing Register Evidence
- Capstone Exercise: Produce a Control Panel Design Package

## Practical Exercises

The course uses suggested activities to convert industrial requirements into traceable panel design evidence.

- Suggested activity: reconcile a load list, control philosophy, and interface register for a process skid
- Suggested activity: size representative feeders and components while documenting protection and short-circuit assumptions
- Suggested activity: review an enclosure layout for access, segregation, heat, wiring, grounding, and identification
- Suggested activity: present a design package with open issues, review comments, and verification actions

## FAQs

### Who suits industrial electrical control panel design training and what does it assume?

Industrial electrical control panel design training suits professionals who already read electrical drawings and contribute to equipment design, automation, maintenance, commissioning, or technical review. It assumes practical electrical experience and does not teach basic wiring theory.

### How does industrial control panel design differ from PLC programming training?

Industrial control panel design connects load requirements, power circuits, protection, component ratings, physical layout, wiring, documentation, and verification. PLC programming training concentrates on control software and logic execution rather than the complete panel engineering package.

### What evidence supports control panel component sizing?

Control panel component sizing uses load duty, supply characteristics, operating conditions, manufacturer ratings, derating factors, protection assumptions, conductor capacity, and interface requirements recorded in a traceable design decision log.

## How are thermal constraints managed in industrial control panel design?

Thermal constraints are managed by estimating internal losses, checking enclosure conditions, arranging heat-producing components, preserving airflow paths, applying derating, and documenting cooling or ventilation choices for review.

## Conclusion

Participants take back a Control Panel Design Package containing design inputs, schematics, sizing records, layout decisions, connection plans, a BOM, and verification actions. The package makes engineering assumptions and review status visible. It supports consistent handoff from requirements to drawing review, panel build, inspection, and commissioning preparation.