JUPITER PRIME
Consulting • Training • Advisory
جوبيتر برايم للاستشارات والتدريب

COURSE BROCHURE

Industrial Control Panel Design and Testing Training Course

19 – 23 April 2027
Munich

Industrial Control Panel Design and Testing Training Course

Ref: 3024_114696 **Date:** 19 – 23 April 2027 **Location:** Munich **Fees:** 6200 GBP

Industrial control panel design and testing is a 1-week training course for electrical design engineers and panel builders who specify components, draw wiring diagrams, size enclosures and prove panels before shipment, ending with a control panel design and test dossier. As plants add automation, variable speed equipment and remote monitoring, panels pack more heat and more circuits into less space. Jupiter Prime Training presents industrial control panel design and testing here.

Why Industrial Control Panel Design and Testing Matters Now

Three groups shape panel work today. Plant owners want more automation in the same floor space, suppliers deliver drives that dissipate heat and emit noise, and commissioning crews expect panels that arrive tested and labelled. A panel that is sized, segregated and verified with care starts up on schedule; one assembled from habit brings nuisance trips, overheated terminals and lengthy rework on site. The course rests on established practice for low voltage assemblies, enclosure protection ratings and temperature rise verification, described in general terms.

Who Gains Most from Industrial Control Panel Design and Testing

- Design engineers who prepare schematics, layouts and bills of materials
- Panel builders who assemble, wire and inspect enclosures
- Control engineers who define input, output and network connections
- Project engineers who witness factory tests and accept panels
- Maintenance engineers who specify replacements and modifications

Engineering contractors and machine builders gain most when designers and assembly staff attend together.

Industrial Control Panel Design and Testing Capabilities

Participants turn a functional description into a panel that can be built and signed off.

- Select contactors, overload relays and breakers for each load — bill of materials approval
- Design schematic, terminal and layout drawings buildable without queries — panel builder
- Calculate heat dissipation and choose enclosure cooling — reliability in hot plant rooms
- Specify segregation between power, control and signal wiring — noise immunity and safe maintenance
- Apply labelling and wire numbering conventions — site commissioning crews
- Test assembled panels against a written factory acceptance procedure — client witness and shipment release

Key Industrial Control Panel Design and Testing Terms

- Enclosure protection rating — a code stating how well an enclosure keeps out solid objects, dust and water.
- Temperature rise — the increase of air temperature inside a panel above the surrounding air at full load.
- Form of segregation — the degree to which barriers inside an assembly separate busbars, functional units and terminals.
- Short-circuit current rating — the highest prospective fault current a panel can withstand safely at its supply terminals.
- Terminal schedule — a table listing every terminal, its wire number, destination and signal type.
- Factory acceptance test — documented checks performed at the builder's premises before a panel is shipped.

Industrial Control Panel Design and Testing Day by Day

Day 1: Panel Function and Specification

- Functional Description and Input Output List — Defining Panel Scope
- Panel Types for Motor Control, Process and Machinery — Choosing the Arrangement
- Supply Conditions and Prospective Fault Current — Setting Panel Ratings
- Environmental Conditions and Enclosure Protection Ratings — Dust, Water and Corrosion
- Specification and Data Sheet Preparation — Client Requirements and Supplier Quotation

Day 2: Component Selection

- Contactors, Overload Relays and Motor Starters — Utilisation Categories and Coordination
- Circuit Breakers and Fuses for Control Circuits — Discrimination and Cable Protection
- Control Power Supplies and Transformers — Voltage Levels and Backup Arrangements
- Relays, Timers and Safety Relays — Control Logic and Emergency Stop Circuits
- Terminals, Wire Sizes and Ferrules — Current Capacity and Connection Reliability

Day 3: Drawings, Layout and Segregation

- Schematic Diagram Conventions and Cross-Referencing — Readable Drawing Sets
- Panel Layout and Mounting Plate Arrangement — Access, Spacing and Future Space
- Segregation of Power, Control and Signal Wiring — Electrical Noise and Maintenance Safety
- Cable Entry, Glanding and Earthing Bars — Enclosure Integrity and Bonding
- Wire Numbering and Labelling Schemes — Traceability From Drawing to Hardware

Day 4: Thermal Design and Build Quality

- Heat Loss Estimation per Component — Total Dissipation Inside the Enclosure
- Natural Ventilation, Fans and Panel Air Conditioners — Choosing the Cooling Method
- Enclosure Sizing Against Temperature Rise Limits — Component Derating Decisions
- Assembly Wiring Practice and Torque Checks — Build Quality Inspection Points
- Drive and Power Electronics Installation — Filters, Screened Cables and Clearances

Day 5: Practising the Control Panel Design and Test Dossier

- Component Schedule for a Pump Station Panel Case — Applying Day 2 Selection
- Drawing and Segregation Check for a Packaging Line Panel — Applying Day 3 Methods
- Thermal Calculation for a Drive Panel — Applying Day 4 Cooling Choices
- Factory Acceptance Test Procedure and Punch List — Witness Checks Before Shipment
- Control Panel Design and Test Dossier — Drawings, Calculations and Test Records

Applying Industrial Control Panel Design and Testing After the Course

- Lead a heat dissipation recalculation for one panel that runs hot and propose a cooling or layout change
- Draft a factory acceptance test procedure for the next panel order and agree it with the client before build

Industrial Control Panel Design and Testing Questions FAQ

What is industrial control panel design and testing, and why does it matter now?

Industrial control panel design and testing is the selection of components, preparation of drawings, thermal sizing and factory verification of control enclosures. It matters now because automation puts more heat into each panel.

Which roles gain most from industrial control panel design and testing?

Electrical design engineers, panel builders, control engineers and project engineers who accept panels gain most.

How does industrial control panel design and testing differ from a switchboard design course?

Industrial control panel design and testing deals with control circuits, motor starters, wiring and cooling inside control enclosures. A switchboard course covers power distribution assemblies and busbars at higher currents.

What do you bring back from industrial control panel design and testing training?

You bring back a worked set of drawings, component schedule, heat calculation and factory acceptance procedure for a case panel to adapt for your next order.

Industrial Control Panel Design and Testing: The Way Forward

The control panel design and test dossier first informs whether a supplier's panel is ready to ship. Designers use it to fix drawing standards, panel builders to plan assembly checks, and project engineers to run witness tests. After first use, revisit the heat loss allowances and spare space margins, since plant modifications fill panels quickly.