AMPUSHWORKS ENTERPRISES PRIVATE LIMITED

Technical Training Programmes 2026–27

SYLLABUS

Electrical Control Panels and Motor Automation

Course information	
Programme	8. Electrical Control Panels and Motor Automation
Duration	One month
Total hours	102 hours (theory 32, practical 64, examinations 6)
Course fee	₹3,000 per candidate
Batch size	Minimum 10 candidates; batches scheduled after sufficient registrations
Eligibility	B.Tech, Diploma, ITI, B.Sc and BCA students, engineering graduates, working professionals and college faculty
Prerequisites	Basic knowledge of electricity. Suitable for ITI, diploma and engineering students.

1. Course Introduction

Control panels and motor starters are at the heart of pumps, machines and industrial equipment. This course teaches safe wiring, protection and testing of control panels, and introduces the automation of motors.

2. Course Objectives

On completing this course, candidates will be able to:

- Apply electrical safety practices
- Identify and select panel components
- Read and follow control wiring diagrams
- Wire and test DOL and star-delta starters
- Apply motor protection and basic automation

3. Hours Distribution

Component	Hours
Theory classes (8 units × 4 hours)	32
Practical sessions (14 labs × 4 hours)	56
Mini project (practical)	8
Theory examination	2
Practical examination	4
Total programme hours	**102**

Practical sessions including the mini project total 64 hours (56 + 8). The examinations (6 hours) are held after completion of the training.

4. Theory Syllabus (32 hours)

Unit	Topics covered	Hours
Unit 1	ELECTRICAL SAFETY • Hazards of electricity • Safe working practices and PPE • Earthing and isolation	4
Unit 2	PANEL COMPONENTS • Contactors and relays • MCBs, MCCBs and fuses • Overload relays, push buttons and indicators	4
Unit 3	MEASURING INSTRUMENTS • Multimeter and clamp meter • Voltmeters, ammeters and energy meters • Insulation testing basics	4
Unit 4	CONTROL WIRING DIAGRAMS • Symbols and conventions • Power and control circuits • Reading and drawing diagrams	4
Unit 5	DOL STARTERS • Working principle • Wiring and interlocking • Applications and limits	4
Unit 6	STAR-DELTA STARTERS • Need for reduced-voltage starting • Timer-based changeover • Wiring and testing	4
Unit 7	MOTOR PROTECTION • Overload, single-phasing and phase failure • Under/over-voltage and dry-run protection • Protection relays	4
Unit 8	PANEL AUTOMATION AND TESTING • Timers and level-based control • Panel layout, ferrules and wiring standards • Testing and commissioning a panel	4

5. Practical Sessions (64 hours)

Lab	Practical assignment	Hours
1	Safety briefing and tool handling	4
2	Identify panel components	4
3	Use multimeter and clamp meter	4
4	Wire a contactor with push buttons	4
5	Holding (latching) circuit	4
6	Wire a DOL starter	4
7	Overload relay setting and test	4
8	Forward–reverse control with interlock	4

Lab	Practical assignment	Hours
9	Wire a star-delta starter	4
10	Timer setting and changeover test	4
11	Phase-failure protection wiring	4
12	Level-based automatic motor control	4
13	Panel layout, ferrules and dressing	4
14	Fault-finding in a starter panel	4
MP	Mini project: Build and commission a motor control panel with DOL or star-delta starter, protection and automatic level control.	8
	Total practical hours	**64**

6. Mini Project

Project: Build and commission a motor control panel with DOL or star-delta starter, protection and automatic level control.

Each candidate (or small group) plans, builds, tests and documents the project during the final practical sessions, and presents it during the practical examination.

7. Hardware, Tools and Software

- Contactors, relays, MCBs, overload relays and timers
- Push buttons, indicators and panel enclosures
- Multimeters, clamp meters and insulation testers
- Test motors and level switches

8. Learning Outcomes

By the end of the course, candidates will be able to:

- Work safely on low-voltage control panels
- Read and wire control diagrams
- Wire, test and commission DOL and star-delta starters
- Apply motor protection and simple automation

9. Assessment and Certification

Examination	What is assessed	Duration
Theory examination	Understanding of concepts, components and principles covered in the 8 units	2 hours
Practical examination	Ability to build, wire, program, test and fault-find; presentation of the mini project	4 hours

Practical assignments completed during the course are also reviewed as part of the practical assessment.

A **training completion certificate** will be issued subject to successful completion of the programme and assessment requirements.

10. Enrolment and Contact

To enrol, send your name, mobile number, college or organisation, course and year, and the name of this programme to Ampushworks. You will be informed when your batch is scheduled.

Contact	Details
Address	Priyadarshi Nagar, Bhagwat Nagar, Patna, Bihar – 800026
Website	https://ampushworks.com
Registration form	https://www.ampushworks.com/training.html#register
Email	support@ampushworks.com
Phone	+91 94702 13936
WhatsApp	+91 94702 13937

Note: This syllabus may be updated by Ampushworks to reflect new technology and equipment. The syllabus issued at the start of a batch applies to that batch.