PT ATMI BizDEC

TRAINING PROGRAM SYLLABUS

Electrical Drawing & Troubleshooting for Industrial Maintenance
(Program Gambar Kelistrikan dan Troubleshooting untuk Maintenance Industri)

1. General Information

Program Name : Electrical Drawing & Troubleshooting for Industrial Maintenance
Program Code : PM042.01
Duration : 32 Learning Hours (JP)
Learning Method : Blended (Theory + Practice + Project-Based Learning)
Target Participants

- Electrical technicians
- Maintenance technicians

Participant Requirements

- A background in electrical work, maintenance, or engineering
- A focus on industrial machine maintenance and troubleshooting

2. Program Description

Electrical Drawing & Troubleshooting Program equips electrical, maintenance, and engineering technicians at PT Ultrajaya with the ability to read electrical drawings for industrial machine maintenance and troubleshooting. The material covers electrical symbols, wiring and schematic diagrams, power and control circuits, motor circuits, and sensor–PLC–actuator systems.

The program focuses on tracing electrical circuits from the power source to the actuator, determining measurement points, identifying faults, and using drawings to troubleshoot conveyors, pumps, solenoid valves, and motors in the food and beverage industry.

3. Learning Objectives

After completing this program, participants are expected to be able to:

- Understand the functions and types of electrical engineering drawings.
- Read electrical and control symbols.
- Read wiring and schematic diagrams.
- Understand the relationship between power and control circuits.
- Read motor circuits and sensor–PLC–actuator systems.

- Use electrical drawings for circuit tracing and troubleshooting.

4. Impact-Oriented Outcomes

Participants will be able to:

- Identify symbols, components, terminals, and wires from electrical drawings.
- Trace power and control paths and determine measurement points.
- Read the relationships between PLC inputs and outputs, sensors, and actuators.
- Trace circuits from the electrical power source to the actuator.
- Locate faults in conveyor, pump, solenoid, or motor systems.
- Develop recommendations for corrective action based on troubleshooting results.

5. Training Material Structure

No.	Module	Sub-Material	Duration	Method
1	Electrical Drawing Fundamentals	Drawing types; IEC symbols; reference designations; terminal and wire numbers.	8 JP	Component identification
2	Power & Control Circuits	Power and control circuits; protection; DOL; forward–reverse; star–delta.	8 JP	Conveyor motor circuit tracing
3	Industrial Machine Control Drawings	Sensors; PLC I/O; 24 VDC; relays; solenoids; VFDs; actuators; interlocks.	8 JP	Sensor–PLC–actuator circuit tracing
4	Electrical Drawings for Troubleshooting	Electrical circuit tracing; fault finding; measurements; fault analysis.	8 JP	Troubleshooting case studies

6. Learning Methodology

- Instructor-led training (focused theory sessions)
- Demonstration of software use
- Hands-on practice (electrical design)
- Case studies of industrial electrical systems
- Project-based learning
- Coaching and design review

7. Learning Media & Facilities

- Training modules
- Examples of industrial electrical diagrams
- References for electrical symbol standards

8. Evaluation & Assessment

- Pre-test and post-test (conceptual understanding)
- Practical assessment: identification of components and power/control circuits

- Practical assessment of terminals, voltage paths, and measurement points
- Final assessment: troubleshooting case studies using electrical drawings

9. Training Output / Key Deliverables

Participants will produce:

- Component identification results based on electrical drawings
- Power and control circuit tracing results
- Sensor–PLC–actuator circuit tracing results
- Fault location findings and recommended corrective actions

10. Certification

- Training Certificate (Completion Certificate)
- Competency Certificate (optional, through a competency assessment according to participant needs)

11. Instructor

- The instructor is an **experienced practitioner** and/or trainer in **industrial electrical systems, electrical panel design, and engineering design.**

Syllabus Approval Page

Electrical Drawing & Troubleshooting for Industrial Maintenance
Program Code : PM-042.01

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