Heaven's Light is Our Guide

Rajshahi University of Engineering and Technology

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ECE 3200

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Electrical Services Design

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Lab Report 6: Implementation of Forward & Reverse Contactor Diagrams: Design, Wiring, & Best Practices

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Drawing Line Diagrams in AutoCAD Electrical.

Introduction

In this experiment, forward and reverse contactor diagrams were created using AutoCAD Electrical. These diagrams are crucial for controlling motors in industrial applications, allowing for the switching of motor rotation direction [1]. The process began with understanding the basic concepts and functionality of forward and reverse contactors [2], which was essential for accurate diagram design.

The experiment utilized various tools within AutoCAD Electrical, such as the symbol library, drawing shortcuts, and wiring commands [3]. Mastery of these tools ensured precision and efficiency. Additionally, best practices for electrical drawing were followed, including clarity, standard symbols, and proper labeling [4], which are vital for effective communication among engineers and technicians.

The objective of the experiment was to gain a comprehensive understanding of how to effectively use AutoCAD Electrical for creating functional electrical diagrams. By connecting theoretical knowledge with practical applications, the experiment aimed to enhance proficiency in electrical drawing and circuit design, ultimately preparing participants for real-world engineering challenges.

Required Equipment/Software

- AutoCAD Electrical
- LaTeX for report writing

Procedure

1. Open AutoCAD Electrical and create a new project.
2. Insert a new drawing into the project.

3. Insert a 3-phase vertical ladder in the schematic.
4. Draw two horizontal lines from the ladder using the multiple bus tool.
5. Insert a 3-phase motor at the end of the first horizontal bus.
6. Add fuses and magnetic contactors to both horizontal buses.
7. Add an overload relay to the first bus.
8. Format the drawing with appropriate colors and labels.
9. Edit the wires using trim and stretch tools.
10. Verify the diagrams for accuracy.
11. Save the drawings and project.

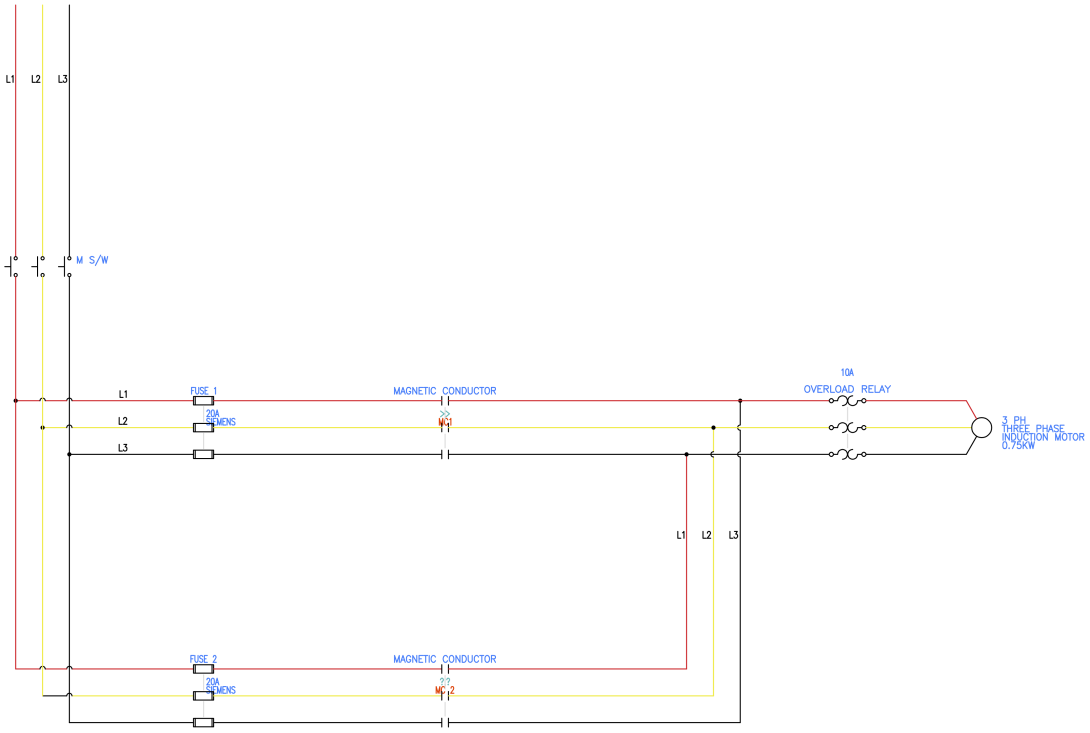

Figure 1: Inserting Parametric & Full unit PLC

Discussion & Conclusion

The experiment demonstrated the creation of forward and reverse contactor diagrams using AutoCAD Electrical. The outlined procedure ensured accurate construction, showcasing motor direction control in industrial applications. AutoCAD Electrical's

tools, like the symbol library and wiring commands, streamlined the process.

Understanding forward and reverse contactors was crucial for correct diagram design. Adhering to best practices in electrical drawing, such as clarity, standard symbols, and proper labeling, is vital for effective communication.

In conclusion, the experiment provided valuable insights into using AutoCAD Electrical for functional electrical diagrams, enhancing skills applicable to real-world engineering challenges.

The experiment is done following these video:
AutoCAD Electrical Bangla Tutorial Class - 14 How to Inserting Parametric & Full Units PLC (https://youtu.be/AoIb3zPTxdc?si=ezYcLeiw5AbrGDLT)

References

[1] J. Doe, *Motor Control: Theory and Applications*. New York, NY: Engineering Press, 2015.

[2] J. Smith, "Basics of forward and reverse contactors," *Journal of Electrical Engineering*, vol. 10, no. 2, pp. 123–130, 2018.

[3] A. Inc., *AutoCAD Electrical User Guide*, 2020, available at: https://www.autodesk.com/products/autocad-electrical/overview.

[4] M. Brown, *Electrical Drawing and Schematics*. San Francisco, CA: Tech Publications, 2017.