

# Chapter 2

## Understanding Electrical Drawings

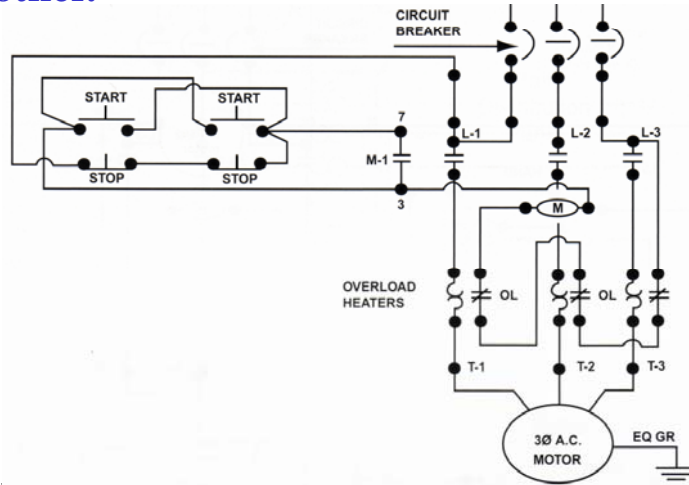
### PART 2 Wiring—Single Line—Block Diagrams

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# WIRING DIAGRAMS

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Wiring diagrams are used to show the point-to-point wiring between components of an electric system and sometimes their physical relation to each other.

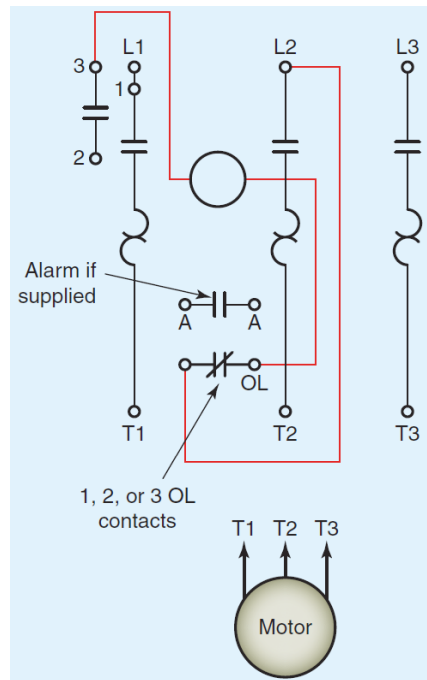


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Wiring diagrams are helpful in wiring up systems, because connections can be made exactly as they are shown on the diagram.



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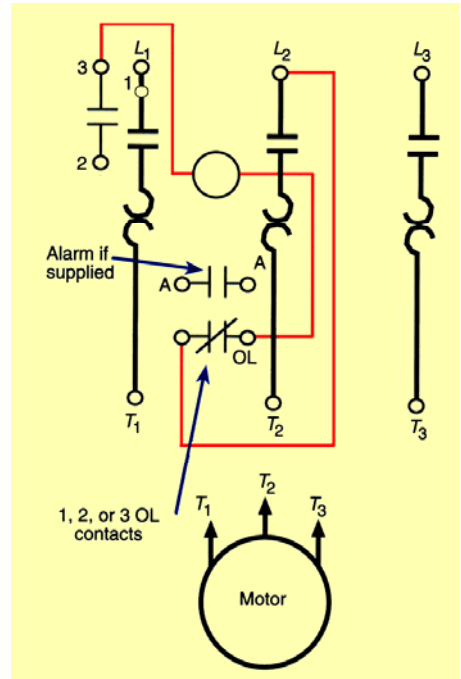


The open terminals (marked by an open circle) and arrows represent connections made by the user.

The bold lines denote the power circuit, and thin lines are used to show the control circuit.

By convention, in most AC magnetic starters, black wires are used in power circuits, and red wires are used in control circuits.

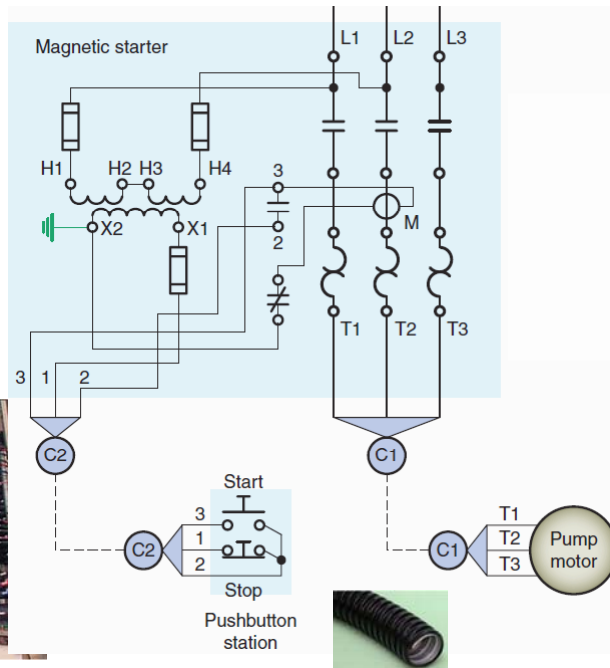
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The routing of wires in cables and conduits is an important part of a wiring diagram.



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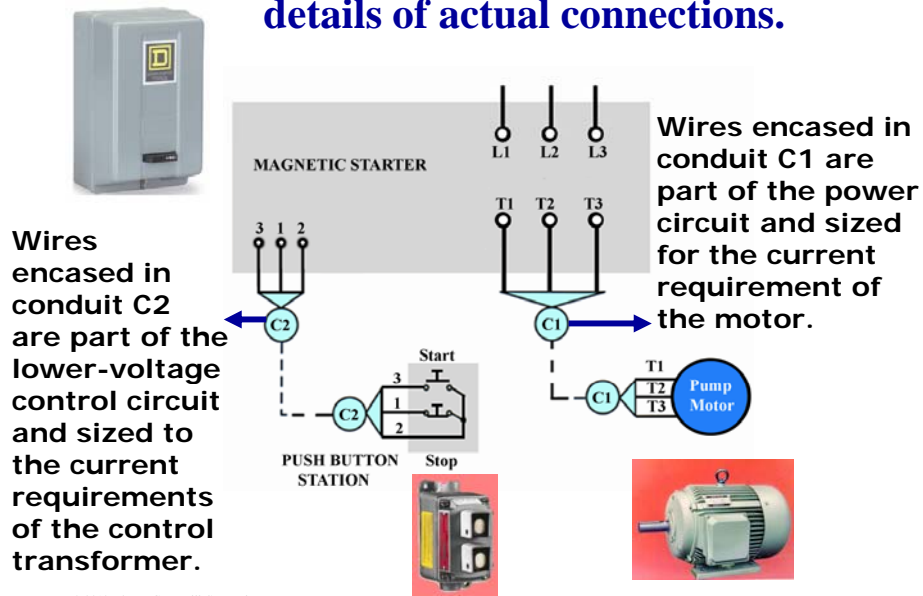


## Typical Conduit Layout

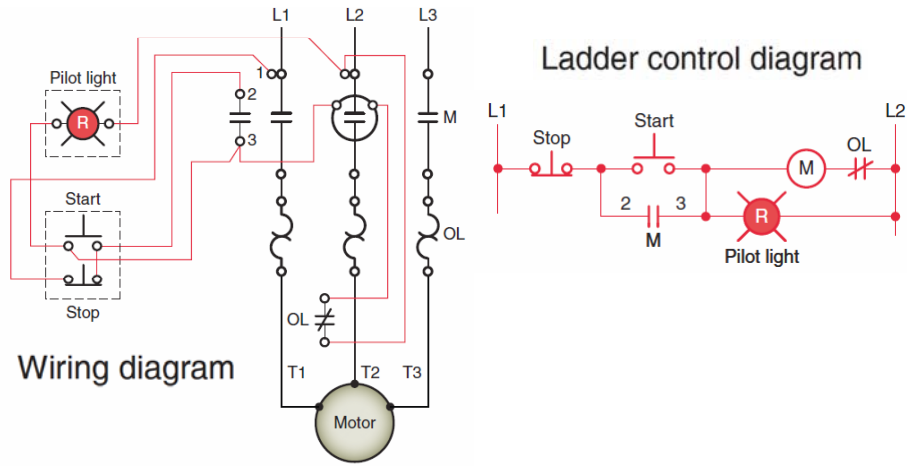


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## Wiring diagrams show the details of actual connections.



**Wiring diagrams are often used in conjunction with ladder diagrams to simplify understanding of the control process.**

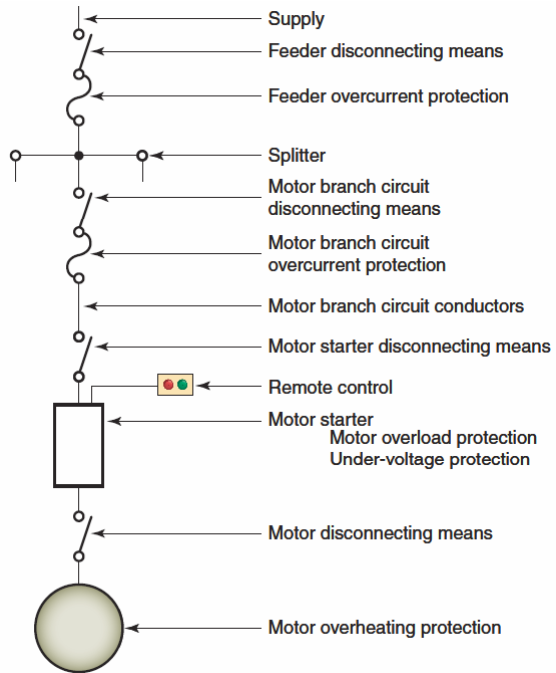


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# SINGLE-LINE DIAGRAMS

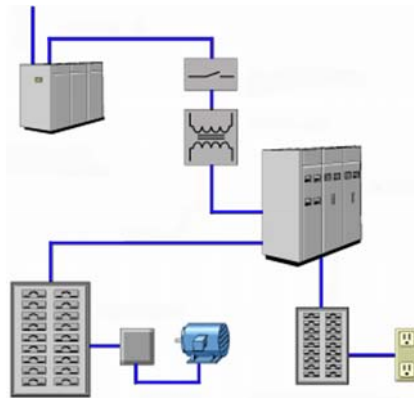
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**A single-line diagram uses symbols along with a single line to show all major components of an electric circuit.**



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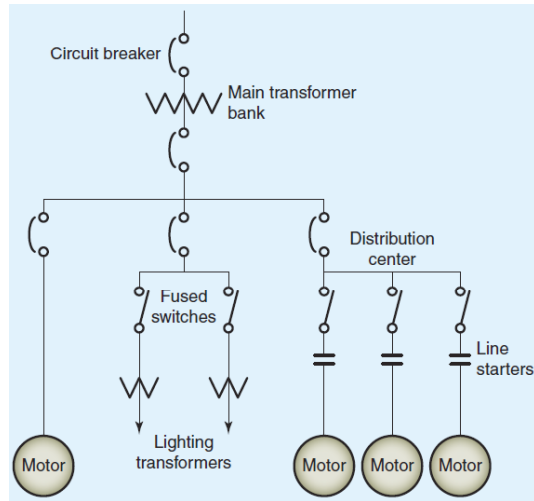
**Power systems are extremely complicated electrical networks that may be geographically spread over very large areas.**



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The use of a single-line diagram is a concise way of communicating the basic arrangement of the power system's component.

These types of diagrams are also called “power riser” diagrams.



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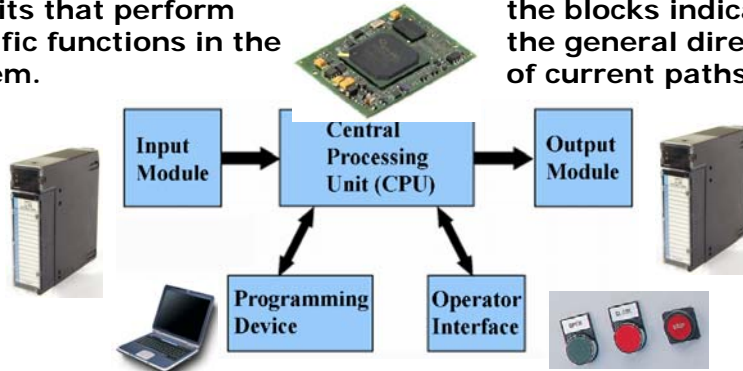
## BLOCK DIAGRAMS

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**A block diagram represents the major functional parts of complex electrical/electronic systems by blocks rather than symbols.**

Each block represents circuits that perform specific functions in the system.

Arrows connecting the blocks indicate the general direction of current paths.

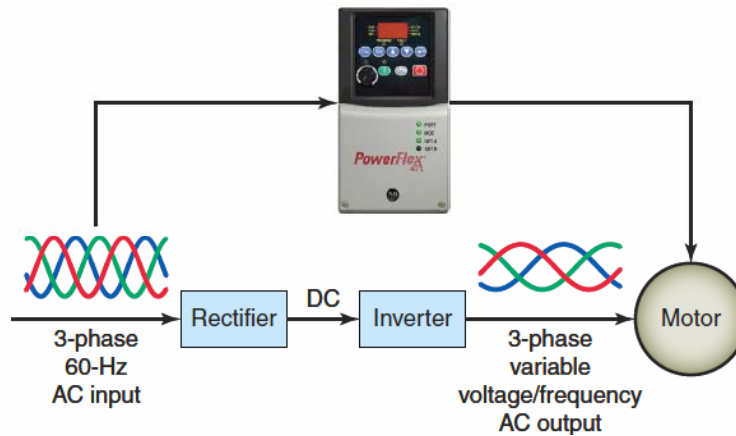


**Programmable Logic Controller (PLC) System**

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**AC motor drive block diagram.**

A variable-frequency drive controls the speed of an AC motor by varying the voltage/frequency supplied to the motor.



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