Reading Electrical Schematics

These basic tutorials start with electrical symbols and schematic design and proceed to include the specific schematics for the production machines you use in your plant. They are designed to help you use an electrical schematic to work your way through any problem that may occur during the manufacturing process.

Being able to read and understand an electrical schematic is the fastest way to solve an electrical problem. We suggest that you start with the tutorial named **What is an Electrical Schematic**, to help you understand what some of the electrical symbols represent and how the electrical schematics work. The tutorials will run automatically in *Windows® Media Player*.

You can pause, go forward, or go backward during the presentation. When finished, just close *Media Player*. Each module takes about ½ hour to complete.
Reading Electrical Schematics
3 Phase 480 VAC

CB1 30A

120 VAC

480 VAC

XFR

CB2 10A

X2

2 pole circuit breaker

Motor starter
With overload attached

GRD

Reading Electrical Schematics
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- **3 Phase 480 VAC**
- CB1 30A
- CB2 10A
- CB3 10A
- 480 VAC
- 120 VAC

**Terminal**

- Terminal on that device
- (#) (A#)

**E-Stop Start**

**WIRING**

- Terminal on that device
- (#) (A#)
Reading Electrical Schematics

- Terminal on that device (#) (A#)

3 Phase 480 VAC

- CB1 30A
- CB2 10A
- CB3 10A

Screw terminals 95 and 96 on the overload relay NC means normally closed

Overload relay

Screw terminals for the coil on the motor starter
Running the circuit

3 Phase 480 VAC

CB1 30A

CB2 10A

CB3 10A

L1 L2 L3

Motor

OL T1

OL T2

OL T3

M Aux

CR1

U SOL.

PB1 PB2

XFR

GRD

1 2 3 4

(1) (2) (3) (4)

E-Stop Start

Hydraulic cylinder

CB3 10A

X1

1 3 4

(1) (2) (3) (4)

Start PB2

Wiring Terminal

Terminal on that device

(#) (A#)
Test the circuit
Reading Electrical Schematics
Reading Electrical Schematics

Abbreviations are frequently used in control circuits. The following list identifies a few commonly used abbreviations:

- **D** Down
- **U** Up
- **M** Motor Starter
- **CB** Circuit Breaker
- **CR** Control Relay
- **OL** Overload
- **XFR** Transformer
- **PB** Pushbutton
- **SOL** Solenoid
- **GRD** Ground

**Symbols**

- M: Motor
- CR: Control Relay
- GRD: Ground
- NO: Normally Open
- NC: Normally Closed
- M Aux: Motor Auxiliary
- PB: Pushbutton
- OL: Overload
- Terminal on that device (#)

**Wiring Terminal**

Terminal on that device (#)

**Ground**

Terminal on that device (#)