Capacitor Testing and Troubleshooting

The use of a capacitor analyzer or multi-meter has become very common when troubleshooting single phase motors. When troubleshooting capacitors, the three main faults to test for are open, shorted, or grounded capacitors.

**Functional capacitors** will have an infinite reading between any of the terminals to the shell of the capacitor and will have a measured microfarad reading between terminals that is within the percentage rating on the capacitor data label.

![Capacitor Diagram](image)

**Figure 7-16 - Example Good Capacitor Readings**

The technician can identify if the capacitor is charging and discharging with a standard ohm meter but, to read microfarads, a capacitor analyzer should be used. Some multi-meters have this capability. If the readings are outside of the rating on the capacitor data plate, the capacitor should be replaced. Figure 7-16 is an example of a potentially good capacitor.
Open capacitors will have an infinite reading between the terminals on the capacitor when using an ohm meter to troubleshoot the capacitor. This is represented by an infinite reading or O.L. on the multi-meter as indicated in Figure 7-17. If a capacitor analyzer is used the instructions with the meter should be followed.

![Figure 7-17 - Example of Open Capacitor](image)

Shorted capacitors will have a reading of Zero ohms of resistance between the terminals of the capacitor as indicated in Figure 7-18. If a capacitor is shorted, the readings between terminals will not fluctuate. Instead the readings between the terminals will stay steady and in most situations will read less than 1 ohm of resistance. The technician should verify the readings by reversing the meter leads to the capacitor terminals. If the resistance begins to increase or decrease, the capacitor is not shorted.

![Figure 7-18 - Example of Shorted Capacitor](image)
Grounded capacitors will have a measurable resistance from any of the capacitor terminals to the shell as shown in Figure 7-19.

Figure 7-19 - Example of Grounded Capacitor