APPLICATION NOTE

# HOW TO IDENTIFY AND REPLACE A FAILING AC CAPACITOR

One of the most common causes for an air conditioner (AC) system malfunction is a failing capacitor. Capacitors are an integral component of an AC system, releasing energy to the compressor, blower and outside fan. As a contractor, there are many signs you can look for to identify the cause of an AC issue, and switch the capacitor out if needed before it becomes a bigger problem.

While a failing capacitor is fairly easy to identify visually, an air conditioner will express certain symptoms as the capacitor degrades. If the client's AC system has demonstrated the following symptoms, it's important the capacitor is switched out right away before the compressor or fan is damaged or stops working.

## Application Symptoms

Relays are electrically controlled devices that open or close electrical contacts to affect the operation of other devices in the same or different circuits. A relay's most basic components are its coil, armature, and contacts. When the relay is put into a given circuit, the current from that circuit induces a magnetic field in the relay coil. The magnetic field then affects the armature in such a fashion that it causes the contacts to make or break the part of the circuit that is attached to the relay output.

## Visual Symptoms

As a capacitor degrades it will have a bulged appearance, with the normally flat top becoming domed. This is a sure sign the capacitor needs to be replaced. If an oily substance has seeped through the top as well, leaving behind a sticky residue, the capacitor has reached or is nearing the end of its life.suppress the arc during the contact break operation and increase the overall life of the relay.

Bulged capacitor

Good capacitor

## Necessary Safety Precautions

Many HVAC capacitors are designed to provide high voltages when fully charged, so improper handling can cause electrical shock. When replacing a capacitor there are several safety rules you should follow:

- Never ever touch capacitor terminals
- Never short the terminals with a metal object. (This can create heavy sparking that can cause a fire under the right conditions)
- Discharging should be through a resistance load by a specialist

## Steps for Replacing a Capacitor

As their name suggests, general purpose transformers are typically used for general lighting and other low voltage applications. These transformers include any VA rating along with primary and secondary voltage ratings up to 600 V ac. Typically no fusing is required, but internal fusing is an option.

## Control Transformer

A type of isolation transformer, control transformers are designed to provide rated output voltage at full Va. As the load decreases, the output voltage will go up. Conversely, if the load increases it will result in lower output voltages. Providing excellent voltage regulation, control transformers are commonly used in industrial applications.

For more information on transformers visit HartlandControls.com

Disclaimer Notice—Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at **www.littelfuse.com/product-disclaimer.**



© 2021 Littelfuse, Inc.