Tips on Condenser Fan Head Pressure Control

An A/C system's metering device requires a pressure drop for proper operation. If the headpressure falls too low (due to low ambient temperatures), the pressure drop across the metering device may not be large enough. This will result in the A/C system failing to operate properly and may cause evaporator freeze ups, compressor slugging and capacity loss. Therefore, it is important to prevent the head pressure from falling too low.

Adjustable Pressure Switch

Fan cycling or head pressure control is the easiest and most cost-effective way to maintain a minimum head pressure. A close-on rise pressure control can be used to successfully cycle the condenser fan on or off to maintain head pressure.

Fan cycling controls can be adjustable or non-adjustable. The non-adjustable fan cycling controls are selected by the pressure settings required for installation. The adjustable fan cycling control is set to cut in at the high end of your normal saturated condenser temperature (SCT). This may typically be between 120 and 130 degrees SCT. The cut out is adjusted for the lowest end of normal operating SCT. This will likely be 90 to 100 degrees SCT.

Some of the disadvantages of fan cycling include wear and tear of the fan motor from starting and stopping, as well as wear and tear of the compressor from the continuous head pressure fluctuations.

A fan speed controller is an alternative option and is easy to install. Instead of slamming the condenser fan on and off, the fan speed control will slow the fan down. The controller utilizes

Condensing Unit

a liquid line temperature sensor or a high-pressure transducer to control the fan speed. As the condenser pressure or liquid line temperature starts to fall, the fan motor will slow down. As the temperature or pressure begins to rise, the fan motor will speed up.

Consistent head pressure can be maintained by modulating the fan speed. This allows better low ambient performance, while limiting wear and tear on the compressor and fan motor. Fan speed controls are available for use with both ball and sleeve bearing motors and are adjustable with minimum speed settings and full speed start options.

Using a condenser fan, cycling pressure control is a good option for better low ambient temperature operation. The control also helps with efficiency of the equipment and can lower operating costs due to the fan not needing to run at 100% continuously or at 100% speed when cooling is required.

Pressure Switch

To ensure the switches and fans are operating properly, maintenance of the fan head pressure control should be included in the quarterly maintenance plan.

For more information/tips, contact Steve Leister at stevel@jacco.com.

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