

METROPOLITAN NY CHAPTER Refrigeration Service Engineers Society

Continuing Education for the HVAC/R Industry

“Better Service Through Knowledge”

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Compressor Overheating

A common cause of premature reciprocating compressor failure is overheating. A reciprocating compressor that is running too hot will surely fail before it's time. A service technician should always look for this potential problem while servicing any refrigeration system.

The hottest location in any refrigeration system is at the discharge port of the valve plate inside the compressor head. It is difficult for a technician to measure the exact temperature at this location. However, measuring the temperature of the discharge line approximately 6 inches from the outlet of the compressor will give a good indication of the temperature at the discharge port. There will be approximately a 50°F to 75°F drop in temperature between the discharge port and 6 inches out on the discharge line. If a temperature of 175°F were measured on the discharge line, it would indicate an approximate temperature at the compressor discharge port of between 225°F and 250°F.

For a reciprocating compressor to operate properly, the temperature of the discharge port should never rise above 300°F. This means the discharge line temperature should never exceed 225°F (300°F - 75°F). At temperatures between 300°F and 320°F inside the compressor, the refrigeration oil will start to lose its ability to lubricate. This will cause premature wear of the compressor's cylinders and piston rings. At temperatures above 350°F the oil will start to break down, causing accelerated wear and introducing contaminants. Once this occurs, compressor failure will soon follow.

There are several reasons for a compressor to run too hot, including:

- High compression ratio
- High return gas temperatures
- Lack of external cooling

High compression ratios are the result of either lower than normal suction pressures or higher than normal discharge pressures. Changes in suction pressure will affect the compression ratio more rapidly than changes in the discharge pressure. For this reason, it is important to keep the suction pressure at its highest possible value.

Causes of low suction pressure can include:

- Incorrect sizing of components
- Misadjusted or defective metering device (TXV)
- Loss of refrigerant charge
- Plugged driers or strainers
- Excessive suction line pressure drop

Although not as sensitive to change as the suction pressure, the discharge pressure can still greatly affect the compression ratio. Keeping the discharge pressure within normal operating conditions is still important.

Several causes of high discharge pressure can include:

- Dirty condenser coils
- Undersized discharge line
- A blockage or re-circulation of condenser air
- Erratic condenser fan operation
- Overcharge of refrigerant
- Non-condensables in the system
- Undersized condenser

Many larger refrigeration systems with electronic controllers will automatically monitor the temperature of the discharge line. They also will send out an alarm if the temperature exceeds 225°F or less to alert the owner or service contractor of a potential problem. Regardless of how the discharge line temperature is monitored, it should always be checked as part of any service to a refrigeration system.





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For Information Call: Stan Hollander, CMS (718) 232-6679

**In the unlikely event of meeting cancellations,
announcement will be posted on our web site**

Wednesday February 14th, 2018
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PRESIDENT'S MESSAGE

WE'RE ON FACEBOOK

Your RSES Chapter is devoted to educating the technicians. Sometimes, that includes helping technicians solve problems. Have you ever run into a problem and you just can't figure out the solution? In an effort to provide a means of communicating among technicians, Rich Bruno has set up a Facebook page for our chapter at Metro NY RSES. It is our hope that technicians will post their problem or observations onto this page to benefit all members, as well as other technicians, and would respond with solutions and suggestions.

Rich is our Facebook administrator and will only approve technicians. Feel free to post your problems, solutions or just observations. Do not "bash" Contractors, Manufacturers and Wholesalers, or post any pricing information. We want this to be a helpful and informative and unbiased site.