METROPOLITAN NY CHAPTER
Refrigeration Service Engineers Society

Continuing Education for the HVAC/R Industry

"Better Service Through Knowledge"

****

January 2015

WWW.METRONYRSES.ORG

Measuring Total System Superheat

Servicing and maintaining refrigeration equipment often requires technicians to measure the pressures and temperatures, and calculate the condition of the refrigerant at several different locations throughout a system.

One location that is sometimes overlooked is the superheat value of the refrigerant at the inlet of the compressor. This is commonly referred to as the system's *total superheat*. Most compressor manufacturers recommend this measurement be taken approximately 6" from the suction service valve. This can be an important measurement for reciprocating compressors, as it ensures that the returning refrigerant will not cause damage to the compressor. Reciprocating compressor manufacturers will normally state the accepted range of superheat values for the refrigerant returning to their compressors. Too low or too high of a superheat value may cause damage to a compressor.

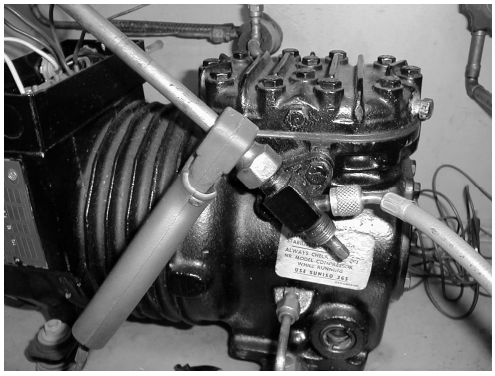
A refrigerant with a 0°F superheat value (saturated refrigerant) at this location indicates that some amount of liquid refrigerant is probably returning to the compressor. At this condition, the amount of liquid refrigerant returning is unknown; however any amount is too much. Liquid refrigerant returning to a compressor can damage a compressor in one of two ways:

1. Liquid refrigerant can mix with the compressor's lubricating oil. As the liquid refrigerant comes in contact with the bearing surfaces it will wash away the oil film causing wearing of the bearings. Depending on the percentage of liquid refrigerant to oil, the bearing wear could be mild to severe.
2. If a sufficient amount of refrigerant returns to the compressor, it may be possible for liquid to enter the cylinder(s) of the compressor and cause further damage to the compressor as it attempts to compress a liquid.

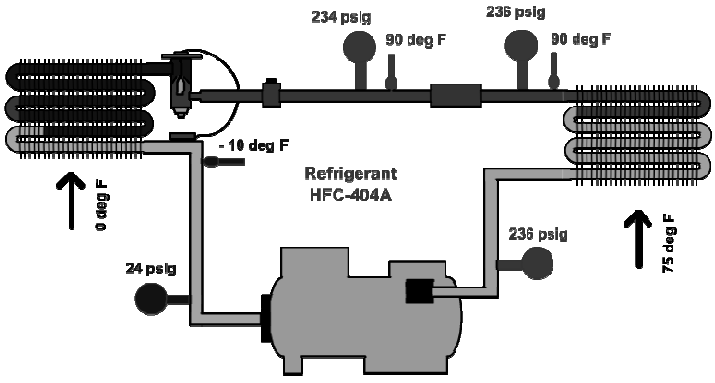
Too low of a superheat value is also a problem. Even though liquid refrigerant may not currently be returning to the compressor, it may be possible that during low load conditions the superheat value of the refrigerant will drop to 0°F and then some amount of liquid refrigerant could return to the compressor.

One popular compressor manufacturer recommends that the superheat value returning to their compressor be no less than 20°F.

Too high of a superheat value can also be problematic. If the superheat value is too high it will cause the heat of compression to increase, causing the temperature at the discharge valves to increase. If the temperature at this location increases beyond its safe operating temperature, it will cause damage to the compressor. For a reciprocating compressor to operate properly, the temperature of the discharge valves should never rise above 300°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 bearing wear.



While servicing and maintaining refrigeration systems, technicians should check the superheat value of the refrigerant returning to the compressor and compare it to the specifications provided by the compressor manufacturer. This is one way a technician can ensure the compressor is operating within safe operating conditions.



COMING TOPICS

Refrigeration Testing System Analyzer

What's up With New Refrigerants

High Velocity Air Conditioning

Low Temp Radiant Heat

System Capacity – A Comparison of Different Modulating and Staging Controls

If you have any suggestions or requests for Future programs, please let us know!

THIS SPACE AVAILABLE

Metro NY Chapter RSES HVAC Training Courses

The Metropolitan New York Chapter RSES will offer the RSES Technical Institute Courses – 1, 2 & 3 on Tuesday & Thursday evenings, starting January 13th, 2015 in Long Island City, New York

Dates*: For 11 weeks on Tuesdays & Thursdays

1/13 & 1/15	1/20 & 1/22	1/27 & 1/29
2/3 & 2/5	2/10 & 2/12	2/17 & 2/19
2/24 & 2/26	3/3 & 3/5	3/10 & 3/12
3/17 & 3/19	3/24 & 3/26	

Dates Tentative – Subject to Change

Time: 6:00 PM – 10:00 PM

Location: Long Island City High School
14-30 Broadway
Long Island City, NY 11106

Cost for Course *1, 2* or *3*:
$849.00 for RSES members
$949.00 non-RSES members (also includes 1 year membership in RSES)

Includes: Technical Institute course manual, course tuition, Certificate of Completion after passing final exam, 72 hours toward NATE Recertification, for those eligible.

Register by January 5th by calling, mailing or Emailing the form below

FOR ADDITIONAL INFORMATION VISIT:
http://www.metronyrses.org
or Email: school@metronyrses.org
or Phone Stan Hollander: 718 232-6679
by Mail: Metro NY Chapter RSES
Attn: Stan Hollander, 1837 61st Street, Brooklyn, NY 11204
–Checks and Charge Cards Welcome –
Please make checks payable to "Metro NY RSES"

TRAINING COURSE OVERVIEWS

TECHNICAL INSTITUTE COURSE *1*

This course begins with a comprehensive introduction to refrigeration and air conditioning. Topics covered include: basic physics, major system components including hermetic, semi-hermetic and open compressors, condensers, evaporators and refrigerant metering devices. It also covers the fundamental concepts of electricity and magnetism as they pertain to resistors, resistance, conductors, power supplies, circuit protection devices and transformers. Detailed information on lessons and content for Course 1 can be found at:
http://metronyrses.org/ti1.html

TECHNICAL INSTITUTE COURSE *2*

Beginning with tools-of-the-trade this course covers refrigeration system accessories, desiccants and driers, defrosting methods, refrigeration system controls and piping. It also includes instruction on compressor replacement and system evacuation, electric motors in refrigeration systems, motor capacitors and protectors, thermostats, relays, contactors and starters, test equipment and troubleshooting, pressure and enthalpy diagrams, psychrometrics, heat transfer and estimating heat loads, residential air conditioning, humidification and a review of safety codes. Detailed information on lessons and content for Course 2 can be found at:
http://metronyrses.org/ti2.html

TECHNICAL INSTITUTE COURSE *3*

Begins with comprehensive introduction to heat pump theory, including watersource heat pumps. Topics covered include computer-room environmental control, economizers, fans and blowers, air filtration and distribution evaporative condensers and cooling towers, water treatment, multiple-rack systems, hydronics, troubleshooting, controls and controls components, pneumatic relays, typical control applications, and control maintenance. Detailed information on lessons and content for Course 3 can be found at:
http://metronyrses.org/ti3.pdf

DETACH & RETURN THIS SECTION WITH PAYMENT – BE SURE TO KEEP COPY FOR YOUR RECORDS

REGISTRATION FORM

Name:_____ Company:_____
Address:_____ City: _____ State:____ Zip:_____
Email: _____ Phone: _____
Check / Credit Card Number: _____ Exp:_____
Name on Credit Card: _____
Which course are you registering for? Technical Institute Course *1, 2* or *3* Choose ONLY ONE ____
Are you a *current* RSES Member: If Yes, RSES Membership Number: _____

Please register by January 5th - space is limited.
Check or Credit Card Accepted for Payment
Make check to "Metro NY RSES" and mail w/ registration to: Metro NY RSES, Attn: Stan Hollander, 1837 61st Street, Brooklyn, NY 11204
To register by Email submit this form with Credit Card information to school@metronyrses.org

METROPOLITAN NEW YORK CHAPTER, RSES

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

SUCTION LINE TRAPS

Refrigeration systems require good piping practices to ensure reliability and efficiency.

One good practice is the installation of "P" traps in a suction riser of a system. This will normally be required when a compressor is located more than 3 to 4 feet *above* the location of the evaporator. The installation of suction line traps will aid in oil returning back to the compressor.

An initial "P" trap should be installed at the base of the vertical riser and additional traps installed every 20 feet of vertical rise, as necessary. Traps should be constructed with a minimum depth and the horizontal section should be as short as possible. This will avoid the accumulation of large quantities of oil in the trap.

In the unlikely event of cancellations, announcements will be posted on our web site

Wednesday January 14th, 2015 at 7:30pm

at

RICCARDO'S

21-01 24th Avenue, Astoria NY 11102

Refrigeration System Testing Analyzer

By

Jim Pritchard—Testo

PLACE LABEL HERE

EDUCATIONAL PROGRAM
Wednesday January 14th, 2015
at 7:30
SEE DETAILS—THIS PAGE

The HVACR Training Authority
Metropolitan New York Chapter
Refrigeration Service Engineers Society
241 Halsey Street
Brooklyn, NY 11216