

METROPOLITAN NY CHAPTER Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry

“Better Service Through Knowledge”

September 2013

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Testing Your Tools

Accurately troubleshooting and repairing refrigeration systems requires technicians to use many specialty instruments. They base many of their diagnoses on what is read from these instruments. Relying on them to be consistently accurate day in and day out is a must. If these tools are inaccurate, more than likely their diagnoses will be inaccurate. This is not good for the technician nor their customers.

Technicians should regularly check these specialty tools for their accuracy. They should prove their instruments are functioning correctly. For example, the basic tool used by all technicians is the refrigerant pressure gauge. Technicians should regularly verify that their gauges are reading the correct pressure. Checking the accuracy of refrigerant pressure gauges is relatively simple. Most technicians will apply a known pressure to the gauge that will cause a mid-span deflection. If the gauge reads the correct pressure it is accurate. If the gauge reads a different value from the known pressure, try adjusting the gauge to match the known pressure. Then remove the pressure from the gauge, the reading should drop to relatively close to zero.



A thermometer can be easily checked by placing it in a solution of crushed ice and water. Fill a jar with crushed ice, add water (preferably distilled) and cover. It is best to have a solution which has much more ice than water. Let the temperature of the solution stabilize—it should stabilize at 32°F. Once the temperature of the solution has stabilized, place the thermometer in the ice/water solution. Let the temperature measured on the thermometer stabilize and observe its reading—while agitating. If the thermometer measures a temperature of 32°F, then the thermometer is relatively accurate. If not, the thermometer needs to be adjusted, repaired or discarded.

Vacuum pumps and micron gauges should also be checked. Simply connect your micron gauge directly to the vacuum pump using a vacuum rated hose, then turn on the

micron gauge and vacuum pump. In a relatively short time you should see the pressure drop on your micron gauge. You should be able to pull at least 500 microns or less; if not then you probably have a problem with one of these tools.

Refrigerant scales also need to be checked occasionally. An inaccurate scale can cause you to either over or under charge a system, if using it to weigh in the refrigerant. The best way to test your scale is to find a known weight and measure its weight using your scale.

Another tool which should be checked is your electronic leak detector. Occasionally, when removing your gauges from a system, have your leak detector ready to sniff the "de minimus" release of refrigerant. You can use this to verify if the leak detector senses the small amount of refrigerant being released. Avoid spraying refrigerant directly onto the leak detector's sensor. Have the sensor just close enough to sense the release.

Yes, even multimeters should be checked. Once, a technician was working on an ice cream freezer and measured 380 volts applied to a 208/230 volt system. So, being a good technician, he went to the circuit breaker panel serving the equipment and measured the voltage entering the load center. Again he read 380 volts. So he told the customer the problem was a voltage supply issue and the electric company needs to correct it. The customer called the electric company and they sent a technician over to investigate the problem. As he explained the problem, the technician from the electrical company shook his head and went to get his voltmeter to test the incoming voltage. Guess what? He measured 228 volts at the load center. The refrigeration technician could not believe it. He took out his meter again and measured voltage 380 volts. Then the electrical technician said, "If the voltage was truly high wouldn't all the equipment have issues?" and, of course, all the equipment was not having issues. So he looked at the obviously defective multimeter and said, "Looks like it's time for a new meter". Guess he was right.

Get into the habit of testing all your test instruments and verify they are operating correctly. Do not wait until you are on the job and have to guess if your instruments are accurate. That is a waste of time for you and your customer.

Election of Officers

At the January meeting we will have Election of Officers and Board Members. If any member in good standing wishes to hold an office or position on the Board of Directors and/or would like to nominate another member for any of these important positions, please advise any current officer.

TEST YOUR KNOWLEDGE

(Refrigeration - Thermostatic Expansion Valves)

1. To achieve maximum evaporator performance, where should you install the TXV?
 - a. as far from the evaporator as possible
 - b. as close to the evaporator as possible
 - c. does not matter
 - d. none of these
2. How can the presence of vapor in the liquid line be overcome?
 - a. by superheating the vapor refrigerant
 - b. by superheating the liquid refrigerant
 - c. by subcooling the liquid refrigerant
 - d. by subcooling the vapor refrigerant
3. Where should a remote bulb never be located?
 - a. where the suction line is trapped
 - b. on the outlet of the evaporator
 - c. on a vertical section of the suction line at the outlet of the evaporator
 - d. none of these
4. What is one essential function of the TXV?
 - a. to control the case temperature
 - b. to control the evaporator temperature
 - c. to control the amount of liquid in the receiver
 - d. to control the amount of superheat at the outlet of the evaporator
5. An equalizing line must be installed:
 - a. upstream of the sensing bulb
 - b. downstream of the sensing bulb
 - c. at the inlet of the compressor
 - d. at the outlet of the compressor
6. What is the normal superheat of an air conditioning application?
 - a. 10°F to 15°F
 - b. 5°F to 7°F
 - c. 8°F to 10°F
 - d. 1°F to 5°F
7. When suction pressure decreases, the compressor discharge temperature _____.
 - a. remains the same
 - b. increases
 - c. decreases
 - d. doubles

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Signs Seen Around the World

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HAVE CHILDREN IN THE BAR

Budapest zoo:
PLEASE DO NOT FEED THE ANIMALS.
IF YOU HAVE ANY SUITABLE FOOD,
GIVE IT TO THE GUARD ON DUTY.

Doctor's office, Rome:
SPECIALIST IN WOMEN AND OTHER DISEASES

Hotel, Acapulco:
THE MANAGER HAS PERSONALLY PASSED
ALL THE WATER SERVED HERE.

Restaurant, Nairobi
CUSTOMERS WHO FIND OUR WAITRESSES RUDE OUGHT TO
SEE THE MANAGER.

On an Athi River Highway:
TAKE NOTICE: WHEN THIS SIGN IS UNDER WATER, THIS
ROAD IS IMPASSABLE.

Answers to Test Your Knowledge:

1) b; 2) c; 3) a; 4) d; 5) b; 6) a; 7) b



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DON'T FORGET—We have a ***WEBSITE***—www.metronyrses.org. Regularly scheduled Educational Programs and Seminars are posted here.

Any changes to our scheduling (cancellations due to inclement weather or other unexpected emergencies or unforeseen situations, etc.) will be immediately posted on the home page.

On our website you will also find: past & current Newsletters, Educational Seminars, proposed School Training Courses, Membership Information & Chapter Contacts.

Please familiarize yourself with our Website.

**Wednesday September 11th, 2013
at 7:30pm**

at

**RICCARDO'S
21-01 24th Avenue, Astoria NY 11102**

A/C Line-Set Contamination & Cleaning:

How line sets become contaminated, Compressor burn out, Refrigerant change out, R22 to R410a conversion, Equipment changes, Immiscibility of Mineral Oil and POE Oil, How to flush a line set.

by

Robert Renshaw, Rectorseal, Inc.

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EDUCATIONAL PROGRAM
Wednesday September 11th, 2013
at 7:30pm
SEE DETAILS — THIS PAGE

