METROPOLITAN NY CHAPTER
Refrigeration Service Engineers Society

Continued Education for the HVAC/R Industry

"Better Service Through Knowledge"

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December 2013

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RSES® The HVACR Training Authority Metropolitan New York Chapter

EMPIRE KEYSTONE ASSOCIATION BETTER SERVICE THROUGH KNOWLEDGE

Choosing the Right Multi-Meter

When it comes to choosing a multi-meter for servicing HVAC/R systems, there are a lot of choices on the market. Careful planning should go into selecting the right meter.

This is an essential tool for troubleshooting so you want to select the right tool for the job. You should select a high quality tool that will stand up against the daily abuse of servicing and troubleshooting HVAC/R systems. Your meter should have most of the functions you typically use -- ideally it would have them all. This would eliminate having to carry multiple meters onto a job. As technicians we carry enough tools onto a jobsite so it is always nice to consolidate when possible.

One of the choices you have when selecting a multi-meter is whether to select a true RMS or non-RMS multi-meter. To understand the difference we first need to understand what RMS represents.

The Root-Mean-Square (RMS) value of any AC voltage or current is its effective or power producing value. An AC waveform is in a constant state of change. It is constantly changing its value from 0 to a positive peak value, back to zero, and then to a negative peak value and back to zero. On a 60 hertz power supply, this happens 60 times per second. For example, every 1/60 of a second a standard 120 volt AC waveform will go from zero to 170 volts, back to zero, then to 170 volts and then back to zero. However its RMS value or effective value is 120 volts.

Non-RMS meters calculate the RMS value of an AC waveform using a shortcut method. They are designed to be "average responding RMS indicating" meters. These meters capture the rectified average of an AC waveform and scale the number by 1.1 to calculate the RMS value. It is not the true RMS value but rather a calculated value based on an assumption about the waveform.

As long as the waveform of an AC signal is sinusoidal (not distorted) these meters will yield accurate results. They work well with linear loads such as induction motors, resistance heaters, incandescent lights, and similar linear loads.

However when an AC waveform becomes distorted (as is the case with nonlinear loads such as adjustable speed drives or any circuits which contain semiconductors, rectifiers, SCRs and similar devices), these meters cannot yield accurate results. A true-RMS meter must be used to accurately measure the RMS value of the AC signal. These meters have a specialized circuit within the meter to read the true RMS value of a non-linear (distorted) AC signal.

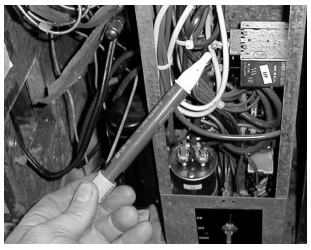
So, when does a technician need to use a true-RMS meter? Basically any time the AC supply being measured is distorted by nonlinear loads (such as adjustable speed drives) or any circuits which contain semiconductors, rectifiers, SCRs and similar devices. Using a non-RMS meter on these loads can cause you to read a lower than true value, up to 40% lower in some cases.

So the next time you need to purchase a multi-meter, spend some time looking at your options and select the right tool for your job.

Electrical Safety

When replacing or repairing any electrical components, always verify that the voltage source is truly disconnected from the circuit.

Test the circuit for the presence of voltage with some type of voltmeter or voltage indicator.



Do not solely rely on the electrical disconnect to ensure the voltage is disengaged.

Always verify this yourself.
It is possible that the disconnect may be defective or may have been bypassed by others.

t is also possible that there may be another voltage source supplying the circuit not controlled by the disconnect shut down.

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 be on the Board of Directors and/or would like to nominate another member for any of these important positions, please advise any current officer.
The Nominating committee is recommending the following slate:

Officers
President: Drew Garda
Vice President: Vacant
Treasurer: Steven Aiello
Secretary: Nito Mehra
Sergeant-at-Arms: Kurt Eggert

Members-Board of Directors
Howard DaCosta
Herb Meyer
Stan Hollander, CMS
Rich Bruno

Appointed Positions
Educational Director: Stan Hollander, CMS
Newsletter Editors:
Stan Hollander, CMS & Herb Meyer
Publicity: Available

Things you didn't need to know . . .

- Some lions mate over 50 times a day.
- The average chocolate bar has 8 insects' legs in it.
- Marilyn Monroe had six toes.
- A rhinoceros horn is made of compacted

Air Conditioning Formulas

1 BTU = amount of heat required to raise (or lower) temperature of one pound of water one degree F
1 Watt = 3.412 Btu/h
1 horsepower = 2545 Btu/h
1 lb. = 7000 grains
1 ft (head) = 0.433 psi
1 squared foot EDR (equiv. direct radiation) = 240 Btu
1 boiler horse power = 33,479 Btu/h
Sensible heat = $(1.08)*(Q)*(t_1-t_2)$

Using superheat to check the refrigerant charge of an air conditioning system with a fixed orifice metering device

1. Operate unit a minimum of 15 minutes before checking charge.
2. Measure suction pressure by attaching a gage to suction service port.
3. Measure suction line temperature by attaching a thermometer to unit suction line near suction valve. Insulate thermometer for accurate reading.
4. Measure outdoor coil inlet air dry-bulb temperature.
5. Measure indoor coil inlet air wet-bulb temperature with a sling psychrometer.
6. Refer to table. Find air temperature entering outdoor coil and wet-bulb temperature entering the indoor coil. At this intersection note the superheat.
7. If unit has a higher superheat than charted, add refrigerant until charted superheat is reached.
8. If unit has a lower superheat than charted, remove refrigerant until charted superheat is reached.

Outdoor Temp.	INDOOR COIL ENTERING AIR TEMPERATURE WB											
	50	52	54	56	58	60	62	64	66	68	70	72
55	9	12	14	17	20	23	26	29	32	35	37	40
60	7	10	12	15	18	21	24	27	39	33	35	38
65	—	6	10	13	16	19	21	24	27	30	33	36
70	—-	—-	7	10	13	16	19	21	24	27	30	33
75	—-	—-	—-	6	9	12	15	18	21	24	28	31
80	—-	—-	—-	—-	5	8	12	15	18	21	25	28
85	—-	—	—-	—-	—-	—-	8	11	15	19	22	26
90	—-	—-	—-	—-	—-	—-	5	9	13	16	20	24
95	—-	—-	—-	—-	—-	—-	—-	6	10	14	18	22
100	—-	—-	—-	—-	—-	—-	—	—	8	12	15	20
105	—-	—-	—-	—-	—-	—-	—-	—-	5	9	13	17

THIS SPACE AVAILABLE

COMING EVENTS

New Technology Boilers

Intelligent Motors

Daikin Mini-Split Systems

Ice Machine Servicing and Troubleshooting

Identifying and Fans & Blowers

Soldering & Brazing Safety & Techniques

Servicing Scroll & Screw Compressors

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

THIS SPACE AVAILABLE

METROPOLITAN NEW YORK CHAPTER, RSES

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

Annual Holiday Dinner (December Meeting)

Starting at 6:30pm

Join us for our Holiday Buffet. Bring nothing but yourselves and your appetites. Riccardo's puts out a great table for us to enjoy. Did I say "bring nothing but"? You can certainly bring a friend or colleague. They can enjoy a fine meal with us, and then partake of the educational opportunities which we have to offer, as well as our friendship and camaraderie. Who knows? They may even want to become a part of this great organization of ours.

The Officers of The Metropolitan NY Chapter RSES wish all our members, friends & their families a very

******Happy, Healthy, and Safe Holiday & Holiday Season******

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

HOLIDAY BUFFET— 6:30 pm

Wednesday December 11th, 2013 at 6:30pm

at

RICCARDO'S

21-01 24th Avenue, Astoria NY 11102

EverGreen Motors: One Motor = 600-1200 RPM.
These motors determine the proper rotation - automatically. Fascinating new Technology. Come and Learn about them

By
Greg Palaski of Regal Beloit, Inc.

PLACE LABEL HERE

EDUCATIONAL PROGRAM
Wednesday December 11th, 2013
at 6:30pm
SEE DETAILS — THIS PAGE

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