September 5th @ Johnstone Supply Corporate offices

ECM Motors

The September 5th ORACCA meeting is scheduled to be held at the Johnstone Supply Corporate Office 11632 NE Ainsworth Cir, Portland, OR 97220. Lunch and the and the meeting facility is being provided by Johnstone Supply, so bring your appetite and join your fellow HVAC contractors to network and hear about this exciting program.

Presenting will be Darryl, with Regal Beloit, makers of the Genteq brand, such as the Evergreen EM motor line.

Regal is one of the world’s largest motor producers with technology and manufacturing centers spanning the globe. Regal motor designs include HVAC, fractional, and integral and medium voltage AC and DC motors in IEC and NEMA enclosures. Innovative motors include axial and radial flux designs with integrated controls for optimum performance. Regal builds “Mission Critical” motors for many unique industry applications like HVAC, pumping, fans and blowers, compressors, and industrial machinery.

What is an ECM Motor?

ECM stands for an “electronically commutated motor” which basically means a motor that uses electronic controls to vary its speed. There are three types of ECM motors: constant cfm, constant rpm, and constant torque. Since cfm, rpm and torque are all related, the basic principles are the same. But for ease of discussion, I’m going focus on a Constant Torque ECM motor.

A Constant Torque ECM is made up of two parts, the motor and ECM Microprocessor, that are both housed in one shell. The microprocessor is the “brains” of the motor. It holds the logic that controls the motor. The logic is a math equation or algorithm that figures out the ideal airflow for each specific piece of HVAC equipment out there and uses a formula to maintain that airflow using a calculation of the precise relationship between motor speed and torque.

It should be noted that the ECM motor programming is specific to each model of HVAC equipment, so programming is ONLY done at the factory, not in the field. When ordering a replacement ECM motor, techs must know the specs of the model in which the motor will be installed for it to work properly.

How does an ECM Motor work?

Once the settings are programmed into microprocessor in the factory and the control board dip switches are set in the field, the motor torque and airflow (CFM) should remain steady*. What WILL change is the speed of the motor (RPM). Depending on system conditions, the motor will need to spin faster or slower in order to keep a steady torque and airflow. This was where me and the folks in my office really got stuck. We couldn’t figure out what could
initiate a change in torque? It turns out it's static pressure in the system.

When the load or demand on the system increases (like it’s really hot outside, for example), a higher static pressure is present. Higher cooling demand increases condensation on the evaporator coil, reducing air flow (hence higher static pressure). Resistance to air flow can also be caused by a clogged filter or dirty coil, which will also increase static pressure. This higher pressure increases the torque on the motor. An increased torque basically means that it requires more “muscle” to turn a motor. Higher pressure essentially creates additional resistance on the blades of the fan motor, which is why it needs more “muscle” or torque to turn the motor.

When the microprocessor senses increased torque, it automatically increases the speed of the motor. A faster motor creates more airflow to make sure that CFM stays steady despite the resistance in the system from conditions like clogged filter or a hard-working evaporator. More airflow also reduces static pressure, which reduces torque. At the same time, increased airflow also provides the additional oomph of airflow that the system needs to provide additional cooling or heating capacity during high demand times for the system.

* Ideal airflow will be different in heating and cooling modes. The control board dipswitch settings (usually set in the field) need to be set up properly for proper seasonal operation.

How does an ECM Motor save energy?

The energy savings come into play when demand and static pressure decreases. When it is not needed at full speed, the motor can slow down, which uses far less energy. A motor running at full speed uses nearly 8 times the energy of a motor running at half speed. So any time you can slow it down, even a little, saves you big bucks. And since you don’t NEED the motor to run at full speed all the time, it’s a no-brainer energy savings technique!

Want to know more about these motors, join us at Johnstone Supply Corporate Office, September 5th at 11:30am.

2019 Calendar

On the back page of this newsletter is the 2019 calendar of events for ORACCA. Please take a moment to review these dates and post them to your personal calendars, so you will not miss out on some very important and informative meetings in 2019.
### TRAINING/ TESTING

On-Demand Training /Testing. This means the tests are scheduled with both your availability and that of the Proctor in mind. Once you feel comfortable to take the test, a date and place are set up through the ORACCA office. Call 360-824-3805 for information. These on demand training/testing sessions include the following:

- **EPA 608 CFC Training/Test - Now Available!**
- NATE Training/Test Core, Gas Heat and Heat Pump Brazing Certification Test,

**October 18, 2019, PCC @ Swan Island Facility**

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**Not a member? We’d love to serve you, too.**
For additional information visit www.oracca.org or call 360-834-3805. Email dick@oracca.org

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Planning Ahead ....

MEETING DATES 2019

January 17 - Codes Update @NW Natural, Sherwood - NATE CEU (1.0), CCB CE (1.0)
February 7 - Utility Update @ PGE Wilsonville - NATE CEU (1.0), CCB CE (1.0)
March 7 - All Day Tech Training @ Airefco, Vancouver, WA - NATE CEU (8.0), CCB CE (1.0)
March 22nd - Brazing Test, 8:00AM PCC, Swan Island 2019
April 18 - Codes Update, Gas Pipe Sizing Presentation @ Interstate Roofing, Tigard.
       NATE CEU (1.0), CCB CE (2.0)
May 2 - VRV Ductless Systems & Honeywell @ Mar-Hy. - NATE CEU (1.0) CCB CE (1.0)
June 14 - Brazing Test, 8:00AM PCC, Swan Island 2019
June 15 - Shoot Out - Canby Rod & Gun Club
June 20 - Codes Update@Mfg. Reps Presentation, Rinnai @ NW Natural, Sherwood-
       NATE CEU (1.0), CCB CE (2.0)
July 15 - Golf Tournament - Oregon City Golf Course
August - No Meeting
Sept. 5 - ECM Motor Presentation Johnstone Supply @ Johnstone Corp - NATE CEU (1.0),
       Codes Update@NW Natural, Sherwood - NATE CEU (1.0) & CCB CE 2.0
October 17 - Minor Label Review, Codes Update@NW Natural, Sherwood -
       NATE CEU (1.0) & CCB CE (1.0)
October 18 - Brazing Test, 8:00AM PCC, Swan Island 2019
Nov. 7 - H/R Recruiting BDR @ Platt Electric, Beaverton - NATE CEU (1.0), CCB CE (1.0)
Dec. 4 - Xmas Party @ Lennox
Dec. 13 - Brazing Test, 8:00AM PCC, Swan Island 2019

Visit our Website for information on the association’s activities.
www.oracca.org