



## ECM TECHNOLOGY

Ken Jung

Just about all HVAC equipment (furnaces, air handlers, etc.), regardless of manufacturer, has a product that offers a variable speed motor (ECM technology).

General Electric first introduced ECM technology to the residential HVAC industry back in 1987. Originally, Armstrong Air went a different route. Based on quality and performance, Armstrong Air chose to use a variable speed motor that was manufactured by A. O. Smith Motor Division rather than the GE version. Later, A.O. Smith discontinued production of this variable speed motor and Armstrong Air adopted a GE ECM replacement motor package to be used for those earlier model furnaces and air handlers.

In 2004, the Regal Beloit Corporation bought out General Electric's Commercial and Residential HVACR motor and capacitor business, but maintained the GE branding until 2009. So any motor purchased during that time would have been labeled GE ECM by Regal Beloit. After 2009, Regal Beloit re-branded these products under the GENTEQ name, which is still used today.

Even if you are not familiar with the name Regal Beloit, you probably have heard of other brands they own, such as Marathon, Lincoln, Leeson and Fasco. One other trivial fact - Regal Beloit has its world headquarters right here in Beloit, Wisconsin.

The first production of ECM was the 1.0 version. This was the motor with the big square or rectangular box attached to the back of the motor housing and was followed by version 2.0, which had the big cast aluminum motor control attached to the motor housing. The 1.0 and 2.0 versions are no longer in production.

Currently there are three versions of ECM's on the market: the 2.3, 2.5 and most recently the 3.0 version.

In the event that the rating label is missing, the easiest way to identify the 2.3 or 2.5 versions is from the amount of wires connected to the motor. The 2.3 version would have 10 or more wires in the 16 pin connector and is the most widely used motor in the industry. The 2.5 version

would have 5 or less wires in the 16 pin connector and is the OEM motor for Carrier/Bryant products.

Even though the motors may seem similar, each motor is programmed differently to meet the performance requirements set by the manufacturer. Motors should not be interchanged between products produced by different manufacturers.

### Trouble Shooting: Version 2.0, 2.3 & 3.0

*(Version 2.5 must use OEM service instructions)*

First, verify that all pin and plug connections are tight and secure. Next, measure and verify that the high voltage plug (at the motor) has proper high voltage and proper ground connection. Remember that proper high voltage could be 240vac depending on the equipment the ECM is located in. On 120vac systems there will be a factory jumper between terminals 1 and 2. There is no jumper on a 240vac motor. Supply voltage must be within +/- 10% of name plate rating.

To test the motor portion (motor bearing unit), first turn off power and wait approximately 5 minutes to insure that any stored electrical charge in the motor capacitor bank has fully discharged. Disconnect both power and communication pin plugs.

After this time period, once the motor assembly has been removed, remove the two hex-head screws from the back of the motor control and separate the sections.

- **Winding test:** Carefully unplug the 3-pin connector from inside the motor control. With an ohm meter set to highest scale, measure the resistance between each of the motor leads to the unpainted part of the motor case. Readings greater than 100Ω pass this part of the test. ( $R > 100 \Omega$ )
- **Phase to Phase test:** Set ohm meter to lowest ohm scale and measure phase to phase, or motor lead to motor lead. (Lead 1 to lead 2; lead 1 to lead 3; lead 2 to lead 3) Resistance values should be less than 20Ω and each of the values should be the same.

# MONROE EQUIPMENT INTRODUCES GEOSYSTEMS

*Matt Schneider*

It is fair to say that Monroe Equipment has been late to the party, so to speak, with regards to geothermal heat pump product. The management and sales team has spent countless hours being educated on the features and benefits of each individual unit. The only consistent thing that we found, was that most of the popular geothermal brands are either made by the same manufacturer and private labeled or their feature and benefit sets were almost identical. In typical Monroe Equipment fashion, our desire was to represent a unit that was “different”.

This past May, Matt Kobleska and I attended the Bluehawk HVAC Distributor Cooperative Meeting in New Orleans, LA. There we happened to have a chance meeting with a representative from Research Products who sought us out with regards to their new Geothermal Heat Pump Product. The end result of this meeting is that Monroe Equipment was able to find that “different” product. We are pleased to announce that we have been selected as the exclusive distributor of GeoSystems Geothermal Heat Pumps for the State of Wisconsin.



GeoSystems is the parent company of two very distinct acquisitions by Research Products. They were initially looking for a product line to enter the very competitive Central and Southern U.S. geothermal market. The goal was to have a product with similar features and benefit sets to the ClimateMaster, GeoComfort and WaterFurnace brands. They achieved this goal with their acquisition of Hydro-Heat. This product line has since been outfitted with some new, self-diagnosing controls from Honeywell and is sold under the GeoSource label. This product will compete directly with the afore mentioned products, but will represent only a small segment of our market.

The “different” product that was discussed earlier is the flagship of the GeoSystems offering. Research Products was able to acquire the Econar Cold Climate Series Geothermal Units. Econar was a small, regional manufacturer of geothermal products out of Minnesota. Econar has developed and patented a geothermal unit specifically for the upper Midwest and Canada by providing heating capacities 15% - 40% higher than the industry’s most popu-

lar units. The Econar design philosophy is that the geothermal heat pump should be capable of meeting 100% of the required heating capacity of the home, without oversizing the air conditioning and installing additional loops or using additional fossil fuel heat sources, conserving energy and making your installation more competitive.



*GeoSource Heat Pump Products*

We apologize for being late to the party, but we are confident that we have found the right product for this market.

In addition to the right product, the manufacturer is highly accommodating and supportive. They are located in Maple Grove, MN, and have focused all of their marketing and support initiatives to Iowa, Minnesota, Michigan, North Dakota, South Dakota and Wisconsin. We are all well aware that support is often as important as product and Monroe Equipment and GeoSystems are dedicated to your success.



*Econar Heat Pump*

## GETTING TO KNOW YOU

*Donna Inman*

Let me introduce you to Carolyn Dulka, Monroe's newest co-worker. Carolyn and I have at least a couple of things in common – we both love our jobs and spending time with our families. Carolyn goes further and says that she loves her customers and enjoys working with each and every one of them. She lives by the following: Live like there is no tomorrow, because this life is not a dress rehearsal.

Carolyn says her wonderful husband, Brian, of 28 years has been through thick and thin with her! They were in the military for 23 years and Brian is now retired from the service. Carolyn's family also consists of two beautiful daughters; Elizabeth, 22, who is pursuing a career in nursing, and Victoria, just turned 21, who is a make-up artist in the Green Bay area. The four legged family members include Diamond, a 12 year old chocolate lab, an English short hair who is 11 as well as two perfect felines, Skunk and his sister Bear.

Having been in the industry for over 10 years, Carolyn has had the opportunity to travel throughout the United States to work with contractors who were passionate

about working on their businesses to grow revenue and loyal employees. Much like being a Territory Manager here at Monroe, Carolyn had the opportunity to work with contractors in that capacity. In addition, she was employed inside a contractor's company working to help with customer service, the service department and marketing, as well as flat rate pricing. Now do you see why we are so fortunate to have Carolyn and her abilities "working" for us?!



*Carolyn Dulka, Northeast WI Territory Manager*

Carolyn's hobbies include camping, boating, fishing and reading. From what I have observed, the fish better be biting! Carolyn's time is always productive!

*ECM Technology Continued from page 1*

- If the motor passes both of these tests, the motor is ok and the problem is most likely in the control portion. If the motor fails, it is strongly recommended to replace both the motor and the control sections.
- I have also heard that you can check the magnets of the motor by placing a jumper wire across the two outer terminals of the pin connector. This will "align" the motor magnets and make the shaft of the motor somewhat difficult to turn. I have tried this multiple times and have found that it is not reliable nor does it work on every version of ECM. The factory does not recommend or stand behind this test method.



*TECMate PRO*

Lastly, and probably the easiest and most reliable method of testing the 2.0, 2.3 and 3.0 version of ECM is to use a GENTEQ "TECMate Pro" motor tester. This inexpensive test device can save time and remove any doubt or question as to whether the motor has truly failed. Simple pin connections to the motor and two lead connections to the 24vac transformer is all that is needed to use this test device. Complete detailed instructions come with each TECMate Pro. If the motor operates with the use of the TECHMate motor tester, both the control module and motor portion are ok. The motor may operate at a reduced speed during the test, this is normal.

If the motor operates during the above test, the problem most likely will be associated to the wiring harness and/or other circuit board/controls used within the furnace or air handler.

Call for your TECMate Pro today! Mention this article and receive a 10% discount on this test device.

## REKLAIM PROGRAM

Larry Bellman

**D**ue to regulatory mandates and the HCFC production cut-backs, HVACR contractors and technicians need a convenient place to dispose of used and unwanted refrigerants in a safe and environmentally responsible manner.

In response, Monroe Equipment is offering ReKlaim, a trademarked program that takes a simple, systematic approach to help expand your business. The ReKlaim program is a comprehensive refrigerant reclamation service and is an easy resource for returning your used refrigerant gases and managing cylinder assets.



As a ReKlaim Collection Center, Monroe offers free Monroe truck pick-up on all return cylinders, including all shipping tags, documents and labels, the use of certified DOT approved cylinders on an exchange basis and personalized service throughout the process. We coordinate all logistics to make this a simple and efficient process.

If you have any questions about the program, please give me a call at 262-782-8190.



### Up Coming Events

JULY 4, 2012

*Monroe Equipment CLOSED*

SEPTEMBER 1, 2012

*Monroe Equipment Parts CLOSED*

SEPTEMBER 3, 2012

*Monroe Equipment CLOSED*

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