

# TECHNICALLY SPEAKING

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## ECM MOTOR TESTERS

**With the increased emphasis on energy conservation**, more manufacturers are employing ECM Motors as standard equipment in their systems. The New UGRM furnace, 16 & 18 SEER condensing units, Mod 90 furnace and new air handlers all utilize some type of ECM motor. It is our responsibility to empower our customers with the knowledge and tools necessary to effectively troubleshoot system problems. This also provides us the opportunity for additional sales!

**GE, who manufactures a large share of the ECM motors** on the market reports that 41% of the motors returned to their factory actually have *"no problem found"*. That means someone made an expensive misdiagnosis; it also means the real problem has not been corrected by replacing the motor.

**Many technicians have some apprehension** about ECM Motors and Systems operation. With as many as **21 wires** going to these new motors, limited published material as to what those wires do, and these motors controlled by some type of circuit board it's no wonder why. No longer can a technician get away with using only a voltmeter to diagnosis motor problems. In order for a technician to effectively troubleshoot ECM motors or circuit board problems he needs to have the proper tools. Remember: any mistake in diagnosing a system will cost our customer much more money than the cost of these tools.

**Below I have listed 2 types of testers** available from PROTECH to aide the technician in troubleshooting ECM motors. First is the GE TechMate Pro ECM Motor tester and the second is the Zebra Variable Speed ECM Motor Analyzer.

**Both devices test the Electronic Module of the ECM motor** to tell the technician if the module is good or bad. The TechMate Pro is a simple and inexpensive one button tester used on GE 2.3 and 3.0 (when used with the 3.0 adapter) Motors. The Zebra Analyzer is more expensive, it has more features and gives the user more information and capabilities. With the appropriate adapters it can be used to diagnose all manufacturers ECM blower motors and condenser fan motors except for the Carrier Infinity Series.

### The GE ECMTM TECMate PRO

(Protech Part: # 510009)

Is designed to assist field service technicians by troubleshooting GE ECMTM 2.3 motors independently of the HVAC system. The TECMate PRO is designed to isolate a motor failure from other HVAC system controller failures. GE ECMTM motors are used in one of two modes: Thermostat Mode and Variable Speed Mode. In either mode, the TECMate PRO is capable of identifying a motor failure versus other HVAC controller failure.



## The Zebra VZ-7 Analyzer

(Protech Part # VZ-7)

Is a microprocessor-controlled diagnostic tool that performs sophisticated testing with only 4 switches. With it, a technician will be able to:

- Visually monitor signal calls from the furnace/air handler circuit boards.
- Interrupt those signals and send the motor any signals you desire, to observe motor operation
- Get a visual display of motor **RPM** and the calculated **CFM** (on most systems)
- Get a visual readout of all 4 system "taps". These selections help set up a system correctly
- Get a direct readout of the control voltage in the motor (low voltage here causes erratic operation)
- And finally, IF a problem is traced to the motor, one switch press starts an automatic analysis to clearly indicate if the problem is in the motor's electronics, or one of 7 possible winding problems.

Two DVDs are included: one that teaches Variable Speed System Theory, the second instructs the tech



how to use the VZ-7 to troubleshoot these systems.

### Accessories Protech #:

**VZH03:** X-13 Motor Adapter

**VZH04:** Colman/York Adapter

**VZH06:** ECM Condenser Fan Motor Adapter

**In conclusion** - remember when selling a unit with an ECM Motor, make your customer aware of the tools available to help them effectively troubleshoot and diagnose system problems. Depending on skill level and budget there are various ECM Motor Testers available to meet their needs. This will not only benefit your customer but it is an opportunity to show them that we are looking out for their best interests.

If you have any questions, please contact:

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