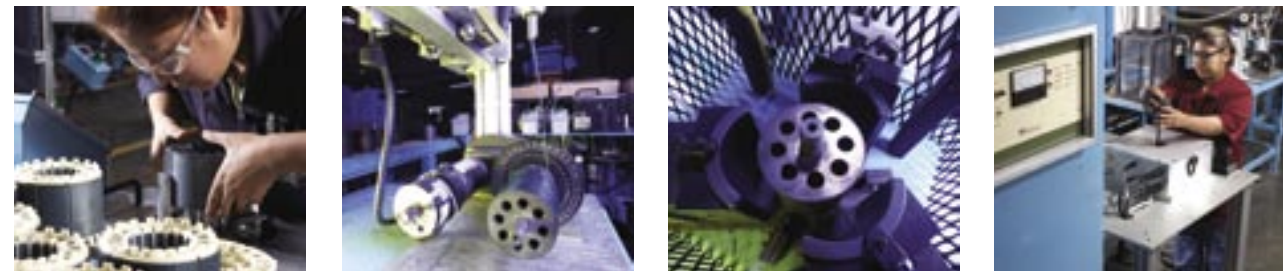


## A. O. Smith ECM CoolBLUE Solutions...

### Production AOS ECM Motors for High Efficiency, Comfort-Conditioning Furnaces!



## A. O. SMITH ELECTRICAL PRODUCTS COMPANY One Source...Many Powerful Solutions in Electric Motors

	<p><b>Hermetic Motors</b> Precision rotor and stator kits ranging in size from 139-395 mm frame sizes, in outputs from 1-1/2 to 500 horsepower.</p>
	<p><b>Fractional Horsepower Motors</b> Split-phase, permanent split capacitor, capacitor-start, shaded pole, and polyphase motors ranging in output from 1/100th to 5 horsepower. 3.3-inch, 4.0-inch, 42-frame, 48-frame, and 56-frame sizes.</p>
	<p><b>Subfractional Horsepower Motors</b> Single-coil, two-pole, shaded pole C-frame motors, and brushless DC C-frame motors.</p>
	<p><b>Integral Horsepower Motors</b> Open, closed, and custom-designed motors in two-pole, four-pole, six-pole, and eight-pole configurations. Sizes range from 143 to 440 frame in outputs from 1 to 400 horsepower.</p>
	<p><b>Blower Packages</b> 50-1200 CFM blowers for furnaces, water heaters and ventilation, powered by shaded pole, PSC and BLDC motors.</p>

## A.O.SMITH ELECTRICAL PRODUCTS COMPANY

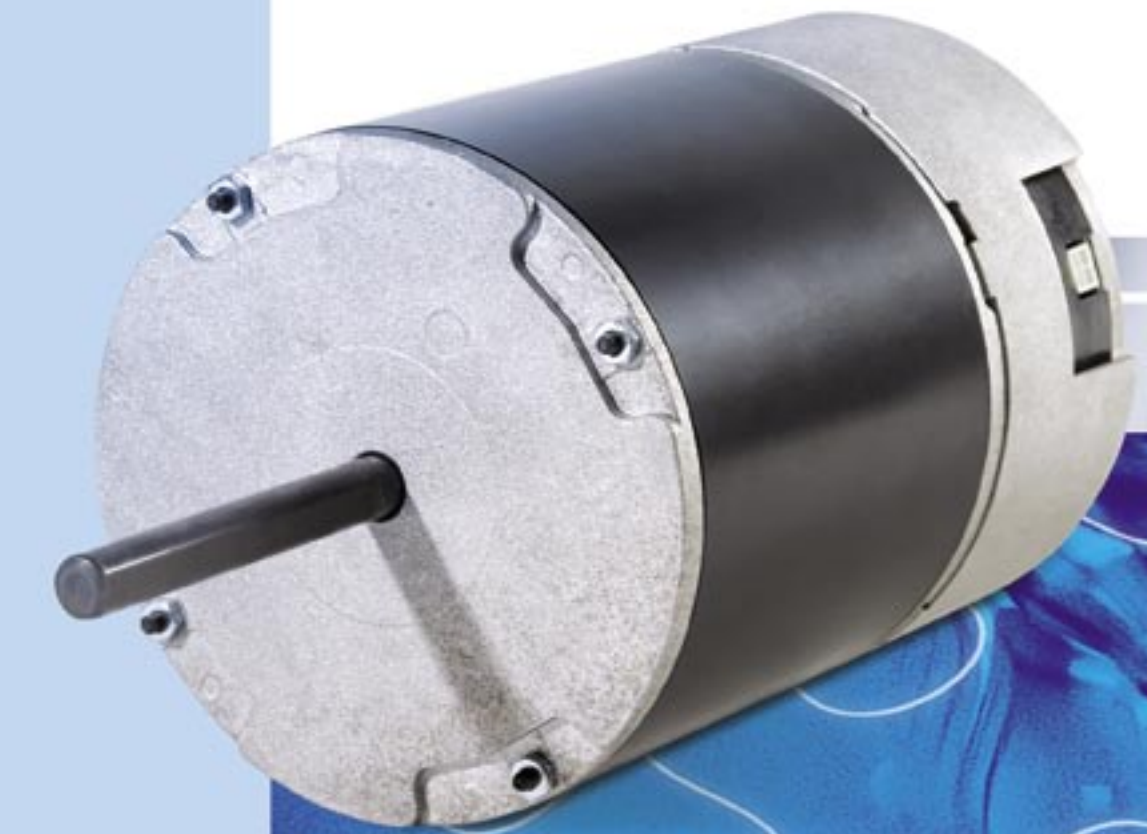
Universal Electric Motors  
6200 Dixie Road, Unit 1  
Mississauga, ON., L5T2E1  
Tel: 1-877-670-3380  
Fax: 905-670-7637  
www.uem.ca

Copyright © 2006  
A. O. Smith Corporation  
All rights reserved

Bulletin #7850

## A.O.SMITH ELECTRICAL PRODUCTS COMPANY

### AOS ECM Variable Speed Technology



Part of *CoolBLUE Solutions*

## A. O. Smith ECM Variable Speed Fan Motors

### Add Comfort to the Home

And High Efficiency to Comfort-Conditioning Furnaces!

	ENCLOSURE	ELECTRONICS	APPLICATION
AOS ECM	TEAO or Open	Full featured	Indoor Furnace/ Air Handler
Comfort Select	TEAO or Open	De-featured	Indoor Furnace/ Air Handler Outdoor Condensing Unit
Open Select	Open	De-featured	Indoor Furnace
PSC Standard Induction Motor		No electronics	Indoor Furnace/ Air Handler Outdoor Condensing Unit

#### Equipment Design Flexibility

AOS ECM allows the original equipment designer to use features that go beyond typical permanent split capacitor motors. The motor can be designed for constant torque, constant CFM, or constant speed. System performance in heating, cooling and refrigeration equipment can be improved by utilizing speed control at various operating conditions designed for constant airflow, lower noise levels, better humidity control and improved air quality. AOS ECM motors are agency approved.

#### Motor Control Programmability

Since each horsepower rating has some "stretch" in output, fewer motors are needed in an equipment product line. To match the various fan system needs, the motor can be programmed for direction of rotation, ramp-up/down rates, speed matching to static pressure and communication to other devices among many other functions.

#### Airflow Control

The AOS ECM algorithms deliver constant airflow over a wide static pressure range. The motor can be applied to difficult duct configurations, changing filter conditions, or adjusted vent dampers. The intelligent control logic allows the motor controller to provide for the adjustments needed. Programming choices by A. O. Smith engineers allow for constant airflow, if desired, for the maximum comfort and energy performance.

#### Robust Design and Testing

Design and reliability testing assures that the motor electronics can withstand many types of electrical transient conditions. Additional stress testing includes salt spray testing to ASTM-B117, as well as elevated heat ambient testing. These tests ensure a robust, mechanical, electrical and moisture-resistant design. The choice of materials allows the motor to meet the new RoHS compliant standards.

In addition, unit performance testing in dozens of applications ensures the motor and the heating/cooling system perform as expected.



#### Applications

The 48 frame AOS ECM is focused on the indoor air handler of furnaces, heat pumps and air conditioners. Single and variable-capacity gas and electric furnaces, energy recovery equipment and commercial fans for comfort conditioning are natural applications. Other models are available for the outdoor fan application.

#### Simple Installation and Servicing

Original equipment manufacturers will appreciate the ease of programming. The motor physically installs as easy as a PSC motor. The software settings can be pre-programmed or line programmed with a laptop computer. Existing load characteristics can easily be downloaded in the field. Should the electronics need servicing, the control module can be easily replaced by a HVAC/R field service technician.

#### Configuration Options

The motor and control are designed to function together. The typical configuration consists of an integrated motor and control with the electronics mounted opposite the shaft end in a covered canopy. The electronics can also be mounted off-motor in the HVAC/R equipment. A full line of 1/3 to 1.25 horsepower in 115, 230, 277 volts are available.

#### Electromagnetic Interference Specifications

The unit passes all requirements for Electromagnetic Compatibility in these types of applications and passes FCC Part 15, Class B requirements for conducted and radiated EMI.

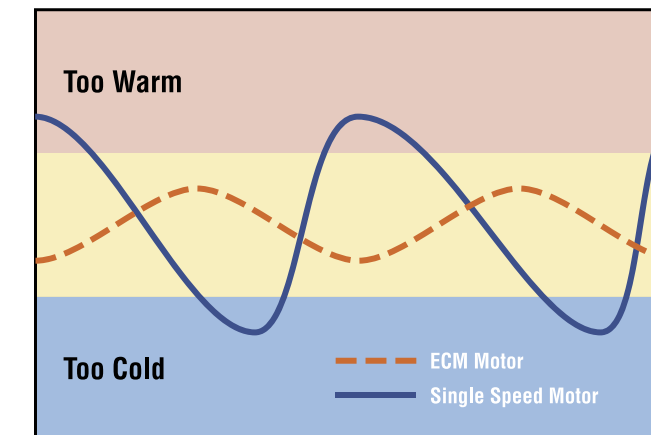
#### Training, Technical and Commercial Support

Our technical support staff is available to answer any questions concerning installation and maintenance. Most questions are addressed in our technical manuals and on our web site @ [www.aosmithmotors.com/AOS\\_ECM](http://www.aosmithmotors.com/AOS_ECM). Commercial inquiries can be made with our Sales and Marketing departments.

#### High Efficiency for Energy Savings

AOS ECM motors meet or exceed the energy savings of competitors' designs using this type of technology. They are also 20 to 25% more efficient than standard induction motors. The permanent magnets have inherent stored energy, which allows the motor to maintain higher efficiency levels over a wide-loading range. Soft-Start, adjustable speed ramp-up and the ability to run for long periods of time at lower speeds all contribute to increased energy savings.

#### Furnace Heating Cycle



**Furnace Heating Cycle** notice how the ECM equipped furnace stays in the comfort zone – unlike the single speed equipped furnace.

#### More Consistent Temperatures

A major complaint concerning heating and cooling systems is that there is too much variance between high and low temperatures. The unit does not come on until it's uncomfortable, then it stays on until it's uncomfortable again. This problem is caused by an incorrect volume of air being driven by a conventional fan motor, as well as by the conventional motor's single speed nature. The variable speed AOS ECM motor starts slowly, gently pushing air into rooms virtually unnoticed. The AOS ECM can compensate for various ductwork and provide improved dehumidification, and, in standby mode, uses less electricity than a standard light bulb.

## Proven Motor and Control Technology... Rugged, Reliable, Efficient

FEATURES AND BENEFITS	A. O. SMITH	LEADING COMPETITOR
Ease of characterization	◆	
Factory calibrated at two load points to ensure consistent operation in application	◆	
Bi-directional serial communication (4 pins)	◆	◆
Patented minimum detent torque for smoother, quieter operation	◆	
Corrosion and moisture resistant	◆	◆
Agency approved	◆	◆
Production ready	◆	◆
Constant CFM, Torque and Speed modes of operation	◆	◆
Daughter board designs available for all types of furnace and air handler applications	◆	◆
Available in TEAO and open construction	◆	◆

#### Great Solutions for Tomorrow's Home

Imagine being able to offer your customers not just unparalleled system efficiency and improved comfort in any kind of condition, but unprecedented ability to monitor and control their heating or air conditioning system. That is the promise of CoolBLUE Solutions.

By partnering with A. O. Smith, a system can be designed that takes advantage of all our high-efficiency motors controlled by one integrated set of electronics. The result - one comprehensive system that delivers ultimate comfort-conditioning for the homeowner... at 13 SEER or beyond... and at a competitive price.

And system efficiency is just one part of the CoolBLUE Solution. Integrated electronics mean you can build sophisticated diagnostics into the system for enhanced reliability and more consistent performance. Electronics that sense changes in the operating conditions of the system and adjust the motors automatically to deliver constant CFM to the consumer. Electronics that allow the homeowner to program the system to meet his or her specific needs... any time of year.

Achieve that vision with a competitive edge... by selecting A. O. Smith as a design partner. Because only A. O. Smith offers CoolBLUE Solutions.

**Great ideas for today... Great solutions for tomorrow**