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EC Motors and Controllers

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EC Motors are a proven, main stream technology and have been studied extensively throughout the US. This technology is employed within the refrigeration industry in order to reduce energy consumption at the evaporator fans in walk-in coolers and freezers.

ECM*TEK* takes this a step further with its patented motor controller and is able to deliver significantly increased energy savings.

ECM*TEK*

The ECM*TEK* controller works in conjunction with 2 speed EC (electronically commutated) motors to maximize their efficiency and nearly double the energy savings provided by EC motors alone.

The ECM*TEK* Advanced Motor Controller functions by sensing the operational status of the cooling system, and controls the speed of the EC evaporator fans. When the thermostat is satisfied and the compressor cycles off, the ECM*TEK* controller will sense the compressor off cycle and will switch the motors to the slower speed.

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It is a fact that all of the electrical power which is used by the fan motors ends up as heat inside the refrigerated space.

By operating the fans at a low speed when no cooling is called for, and at high speed only when the system is actively cooling the refrigerator, much less heat is introduced into the refrigerator.

Although this results in an additional savings in evaporator fan motor energy consumption, the reduction in fan motor heat generated causes a significant reduction in refrigeration operation, saving enough energy at the compressor to almost double the savings provided by the EC motors alone.

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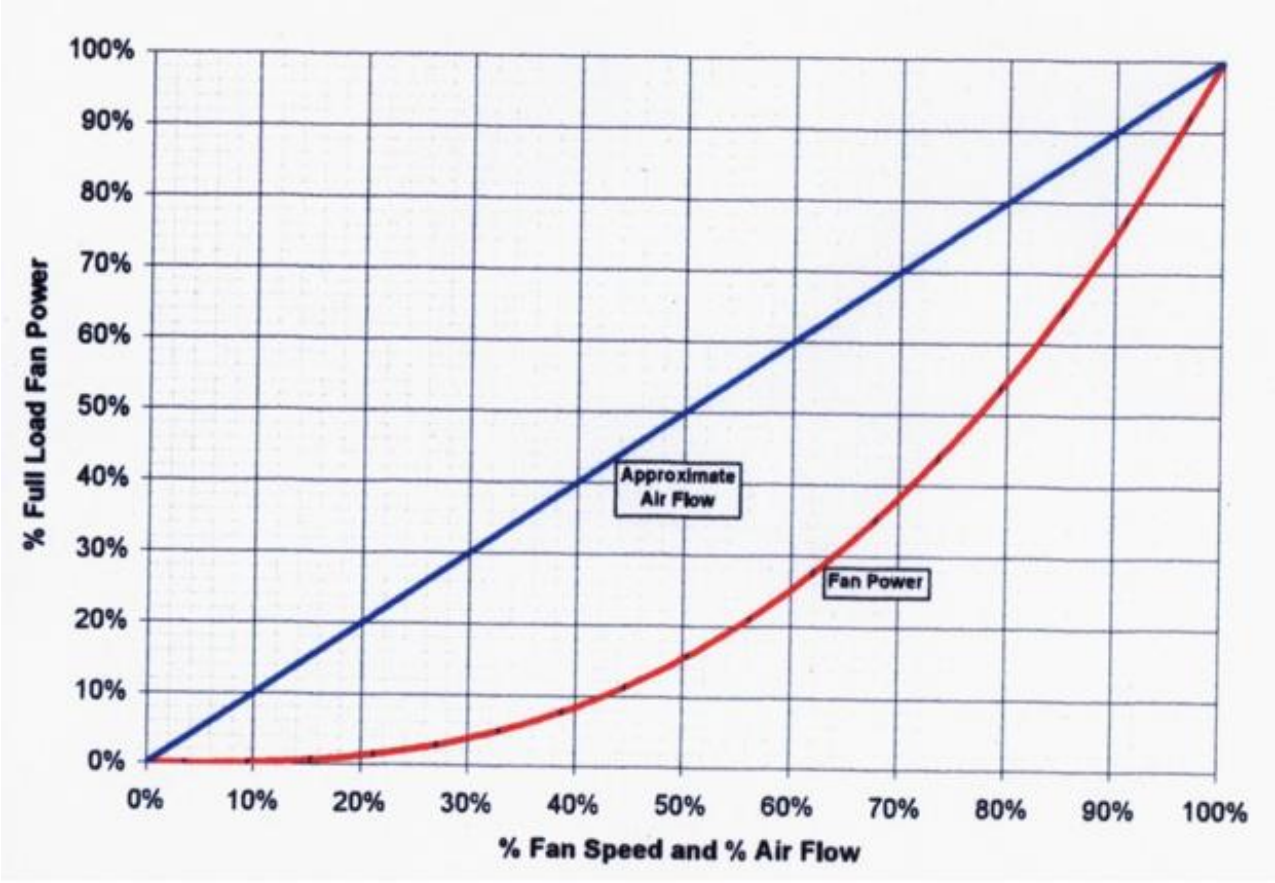
Air Flow vs. Power Requirement

The following chart may be found in ASHRAE literature and in California building codes. It illustrates the relationship between Fan Speed, Air Flow and Power Requirement. Two Speed EC motors are uniquely qualified to take advantage of this concept since their efficiency varies little with change of speed. This is because they are brushless DC motors where the commutation is controlled through a micro-processor rather than through changing hertz.



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7 Reasons to use ECM*TEK* Motors -

1. High Efficiency: A big advantage of EC motors is that they are significantly more efficient when compared to AC motors. EC motors maintain a high level (65 to 90 percent depending on size) of efficiency at a variety of speeds. This is not true for AC motors operated on variable frequency drives. As a result, ECM's are cost and energy efficient and can reduce operating costs. In most cases they use from less than one third to one half of the electricity used by traditional induction motors used in HVAC applications.

2. Ease of Control: ECM's are DC motors that function using a built-in inverter and a magnet rotor (no external VFD). The motor's operation is simply controlled by software allowing customers to optimize and integrate the motor, fan and controller with the application. Features like data communications, constant volume control and variable speed control are simple to integrate.

3. Low Operating Temperatures: EC motors' high efficiency also means that the motors run "cool", and dramatically reduce the amount of waste heat produced.

4. Extended Life: Motor life of the ECM is extended due to its low operating temperature operation. ECM's are also relatively low-maintenance; the use of true ball bearings reduces the need for oiling, and varied start-up speeds reduce stress on mounting hardware. Less components, less trouble.

5. Quiet Operation: EC motors are also quieter than traditional inefficient motors.

6. Wider Operating Range: EC motors also have a wider operating range than traditional induction motors, which means that one EC motor can replace a number of induction motor models. In this way, the number of models required by a typical customer is significantly decreased, which decreases and simplifies inventory.

7. Compact footprint: EC motors have a reduced footprint. They provide a significant savings in design layout for units.

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EC Motors vs VFD's?

Variable Frequency Drives (VFD or VSD) controllers are a method frequently use to control the speed of 3 phase industrial motors. These controllers operate by changing the frequency of the power sent to the motor.

In the refrigeration applications applied with ECM*TEK*, VFD's amount to over-kill because evaporator fan motors only need to operate at two speeds – full speed when the refrigeration system is cooling and low speed, to save energy, when the system is idle.

VFD's also have some characteristics that are undesirable and even costly.

Link to more info: **http://ecmweb.com/content/low-cost-drives-can-be-expensive-alternative**

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EC Motors vs VFD's?

ECM*TEK* literally has none of the undesirable characteristics of VFD's and is a much better and more efficient alternative.

Characteristic	VFD	ECMTEK
Requires special motors	Yes	No
Requires special location	Yes	No
Requires extended wiring	Yes	No
Creates power line noise	Yes	No
Creates radio interference	Yes	No
Expensive to purchase	Yes	No
Expensive to install	Yes	No
Generates heat	Yes	No
Requires installation setup	Yes	No

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Benefits and Savings Summary

- Up to 93% reduction on energy costs at the evaporator coil
- Fan motor heat reduced by 70-80%
- ROI under 24 months
- Utility Rebate Programs
- Increased equipment's lifespan
- Reduced maintenance costs
- Reduced CO2 emissions
- 1 Year Motor Warranty / Lifetime Controller Warranty

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