



Variable Speed EC Motor With Orbus™ Controller

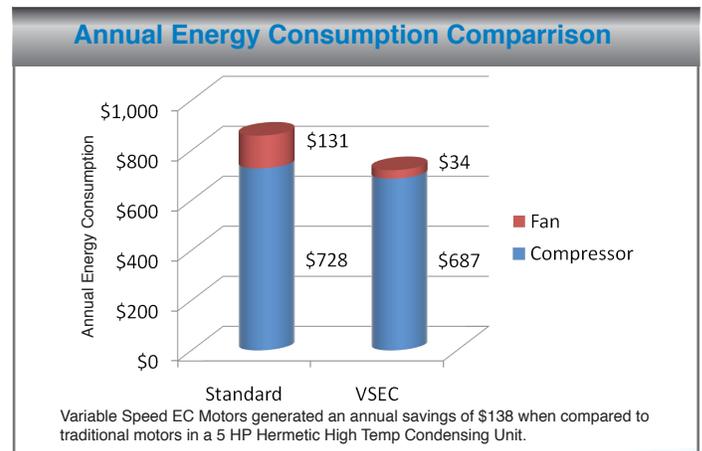


The Variable Speed EC motor with Orbus Controller system incorporates the latest advances in micro-processor controls and motor technology to provide the most efficient condenser motors in the industry using integrated variable speed technology. The system is a variable speed EC motor paired with Heatcraft Worldwide Refrigeration proprietary Orbus Controller.

- Significant performance improvement & energy savings
- Exclusive Variable Speed EC (VSEC) motor for 1/2 to 6 HP condensing units
- Proprietary Orbus Controller for Variable Speed EC Motor developed by Heatcraft Worldwide Refrigeration
- Controller standard with Variable Speed EC Motor option

BENEFITS & ADVANTAGES

- Provides a dramatic improvement in stable head pressure and liquid temperature
- Provides a significant reduction in fan motor power consumption
- Provides a more stable system
- Improves product integrity
- Improves compressor durability
- Reduces energy consumption



What is EC Motor Technology?

- Electronic commutation (EC), sometimes referred to as brushless direct current (BLDC)
- Offers up to 59% greater efficiency than a shaded-pole motor
- Offers up to 35% greater efficiency than a permanent split capacitor (PSC) motor

What is Variable Speed EC Motor Technology?

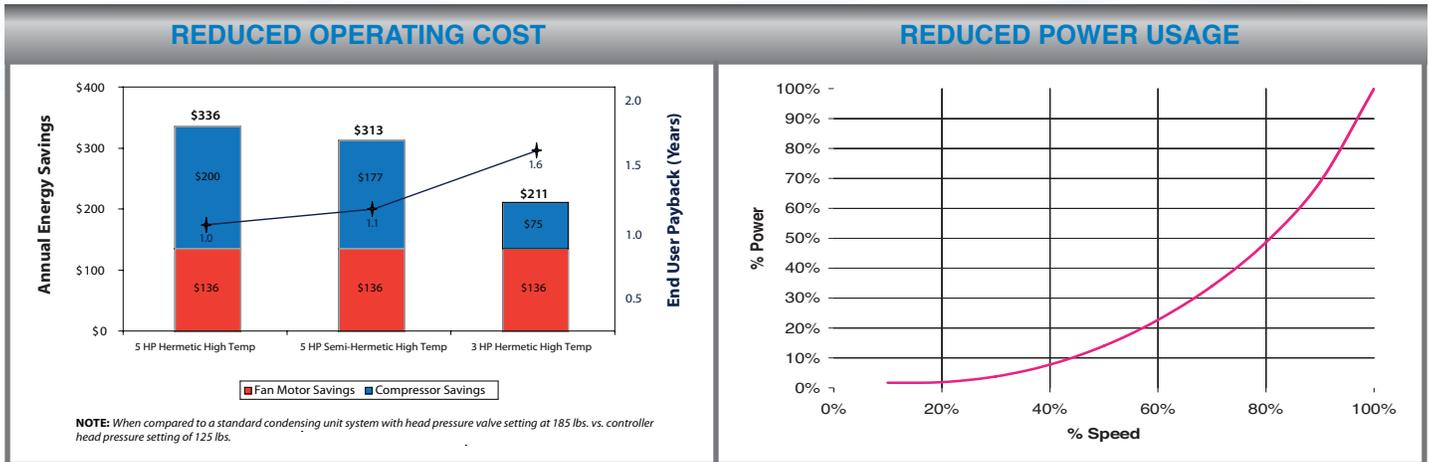
- The ability to control speed is automatic and allows for more efficient control over the speed of the motor
- Runs at near full efficiency whether it is at start-up, full speed or any speed in between
- Has an operating speed between 200-1500 rpm

Energy Savings with Variable Speed EC systems

The table below provides some examples of savings customers can expect with the variable speed EC system.

The savings for all three systems is calculated by comparing the energy savings of EC motors to a comparable system with fixed speed PSC motors and head pressure valve (set at the standard 170 psig)

- Assuming an electricity cost of \$0.08/kWH, with a variable speed system an end user can see savings of up to \$336 annually
- Savings incorporated not only the fan motor savings, but also compressor energy savings resulting from a lower, more stable head pressure setting of 125 psig



The Difference between a Head Pressure Valve and Variable Speed System



The variable speed EC system takes the place of the head pressure valve and reduces refrigerant charge. The VSEC system will not only provide stable head pressure, but because the fans are running at a reduced speed, will also provide a reduction in energy consumption.



How does the Orbus Controller work?

All of the communication electronics necessary for variable speed are built into the motor housing. To control the speed of the motor, an analog signal (0-10VDC) is supplied to the motor. The motor interprets the analog signal and changes the speed proportionally to match the input signal.

- The Orbus Controller measures system head pressure, compares the measurements to the head pressure set point, and through a proprietary algorithm outputs a 0-10V signal to the variable speed EC Motor.
- The Orbus Controller has two predefined set points selectable by a jumper. For R-404A systems the set point is 150 psig.
- To diagnose issues with the Orbus Controller, it has a blinking LED that will provide status/error codes to aid in troubleshooting.



If there is a problem with the Orbus Controller, it can be disconnected and the fans will run full speed.

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