

# Speed Drives

# Variable

EMERSON CLIMATE TECHNOLOGIES

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## Would You Like to See Results from Other VSD Users?

The immediate results of Emerson VSDs on store energy consumption has been a pleasant surprise to many of our retail customers. Would you like to see actual field data on Emerson VSDs? We've developed a compelling presentation that explains VSD technology and shows actual field energy data. To arrange a meeting, contact Emerson Climate Technologies at 800-527-6978, or email us at [sales@ersus.com](mailto:sales@ersus.com).

## Would You Like to Set Up a Trial Store?

The best way to view results is to see VSDs in action at one of your stores. Using existing store energy bills over the same time period and other similar stores energy documentation, you can get an accurate comparison of actual savings from Emerson VSDs. Call for details on setting up your first trial store.

## Emerson Retail Services Group

The Retail Services group of Emerson Climate Technologies is the leading provider of energy and site monitoring services to the U.S. supermarket, retail, convenience, and restaurant industries.



**Reduce Energy Cost**  
and Improve Store  
Environment with  
Emerson Variable  
Speed Drives

## What are Variable Speed Drives (VSDs)?

Variable Speed Drives (also called Variable Frequency Drives, VFDs) allow you to control and modulate the speed of motors. By slowing the motors down, based on actual load requirements, energy consumption is reduced. The most practical application of VSDs for retail stores would be on the air handling motor, whether you have a simple rooftop unit or split system.

## Why Do Variable Speed Drives Reduce Energy Consumption?

Conventional fan control motors are either running at constant speed, or not at all. This means when your air handling unit (AHU) motor is running, it is consuming the maximum amount of energy possible. Add to that abrupt on/off cycling which consumes more energy, and the end result is an inefficient air handling process – a process representing up to 30% of your entire HVAC system's energy consumption.

**Conventional one and two-speed fan control motors are either running at full speed, or not at all.**

Emerson's VSD are, in effect, a load monitoring and optimizing control system for your air handling motor – one that significantly reduces energy consumption.

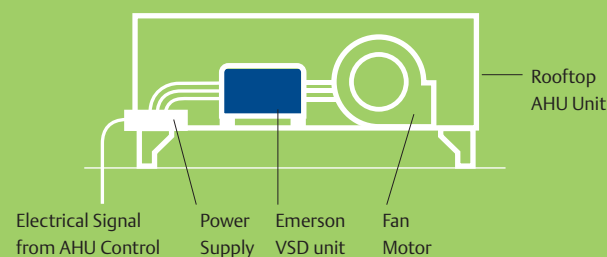
## How do VSDs Work?

Affinity Laws show that you can significantly reduce the power to the motor without significantly effecting fan speed or air flow. This provides the opportunity for VSDs to regulate and reduce the required power going to the fan motor while maintaining sufficient air flows in your facility. The VSD converts incoming AC power to DC power, then back to AC power at pre-programmed optimum frequency and voltage levels to achieve the desired motor speed for minimizing energy consumption. The ability of the VSD to regulate incoming power to the AHU provides gradual modulation of motor speeds based on actual environmental and system load conditions.

Emerson VSDs are applicable to any three-phase electric motor. They are stand-alone, pre-programmed units that require no control system – although they are compatible with control systems. They attach between the incoming power source and the AHU – almost always inside the RTU cabinet.

## HOW VSDs WORK

Typical commercial rooftop application of VSDs.



## Emerson Climate Technologies

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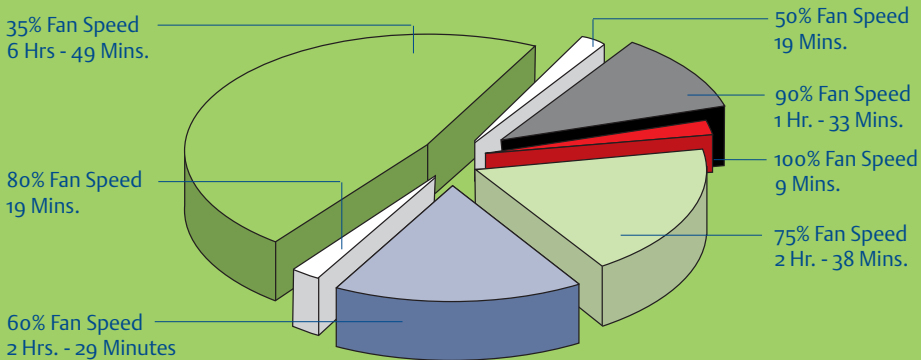
# Reduce Energy Usage

EMERSON CLIMATE TECHNOLOGIES



## Make an Immediate Impact on Energy Consumption with Emerson Variable Speed Drives

Almost all AHU motors run at 100% power for the entire day. This pie chart shows how VSD modulation of fan motor speeds average approximately 55% over a 15.5 hour business day.



EMERSON ENERGY SOLUTIONS

### VSD Energy Solutions

The application of Variable Speed Drives (VSDs) to air handling unit fan motors is a fast, easy way to see immediate energy-saving results.

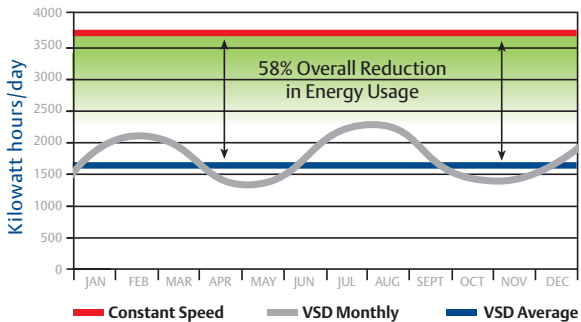
- Fast Payback — Typically 1- 2 years
- Documented energy cost reductions up to 8%
- Rooftop and split system retrofits with no in-store interruptions

### What Kind of Savings Should You Expect?

One customer reported an 8% total energy savings from Emerson VSDs. Eliminating the significant power-pull from cold start-ups – especially during peak demand hours is another source of savings. Whether you are heating or cooling, VSDs reduce energy consumption.

### Fast Payback – Under 2 Years

Expect payback in less than two years. There are many variables, but even in regions where energy costs are moderate, we are seeing under two year returns.



### VSDs Qualify for State Rebate Cash Too

Over 24 states now offer cash rebates for equipment purchases that reduce energy consumption. Emerson VSDs qualify.

### VSDs Prolong Equipment Life

VSDs eliminate abrupt on/off shocks to the system. The steady modulation of operating power provides less stress on almost all AHU system components prolonging life and reducing maintenance costs.

### VSDs Reduce Humidity and Mold Susceptibility

Humidity is a real issue in certain parts of the country. Because VSDs reduce the fan speed of the air handling motor, less air flows over the DX cooling coil, meaning less moisture is blown into the store environment. Less moisture equals less susceptibility to mold.

### VSDs Are An HVAC Retrofit With No In-Store Interruptions

Whether you have a rooftop unit or split system, installing Emerson VSDs is a simple process. It will not interrupt store operations, and your in-store personnel won't even know we are doing the work.

### Quiet Too.

VSDs deliver a quieter store environment. The gradual modulation of motor speeds eliminates noisy start-ups and shut downs. A 10% reduction in fan speed produces a 40% reduction in noise.

### Reliable Emerson Variable Speed Drives from Control Techniques

For more than 30 years, Control Techniques has been a technological leader in AC and DC drives and other servo-control technology. As the pioneer of the world's first DC drive and the worlds first universal AC drive, Control Techniques is the recognized leader in quality, well-engineered drive products. As an Emerson company, they bring an unmatched depth of understanding to retail applications.

### Turnkey, Single Source Installation from Emerson

Emerson drives + Emerson service + Emerson installation makes implementing your nationwide VSD program fast, efficient, and cost effective. Our understanding of the technology, its application, and installation take the uncertainty out of what can be a complex operation.