

## Fans & Blowers

### #1 Variable Frequency Drive Application

#### Fans & Blowers:

**Horsepower: Up to 4,200**

**Savings: 30-60%**

**(Depends on duty cycle.)**

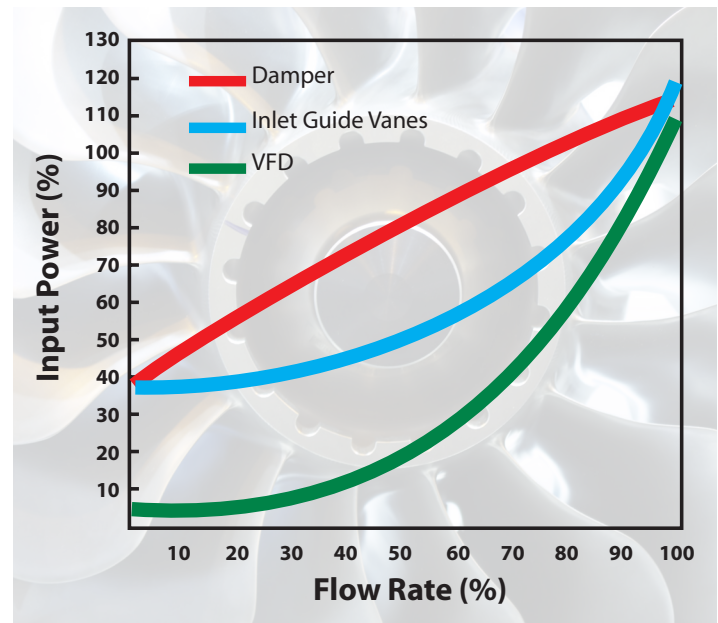
Fans are the single most popular application for variable frequency drives because they are easy to retrofit and the energy savings typically pay for the drive within 4-12 months.

Fans and blowers consume 14% of the power used by industry for motor driven equipment, ranking third behind pumps and compressors. Fans and most blowers operate as a variable torque load, a load that increases as the speed increases. They follow the Affinity Laws which state:

1. Flow is proportional to speed ( $n$ ).
2. Pressure is proportional to speed squared ( $n^2$ ).
3. Power is proportional to speed cubed ( $n^3$ ).
4. Noise is proportional to speed to the fifth power ( $n^5$ ).

Reducing speed dramatically reduces power consumption and noise. Control Techniques AC drives, also known as variable frequency drives adjust fan speed to control flow and pressure directly.

Pressure and flow have traditionally been regulated using mechanical dampers and inlet vanes to restrict the flow of air. These mechanisms waste energy, require frequent maintenance, and provide inaccurate control. Energy usage



may be charted as follows for different control methods.

The distance between the curves is the energy saved at a given speed. Control Techniques' Energy Savings Estimator PC tool will calculate these savings for a specific application. It is a complimentary download from [www.controltechniques.com](http://www.controltechniques.com).

**Look for fans and blowers which do not need to run at full speed to meet process requirements. HVAC is a good example because these systems are sized for hottest and coldest days of the year. AC drives save energy and dollars every other day.**

# Fan & Blower Solutions

Since these applications were early adopters of new technology, you may find fans and blowers powered by some very old drives. These early generation AC drives have long since paid for themselves but are relatively inefficient compared to today's generation of IGBT drives which boast 97%+ efficiency. They were large because they dissipated significant heat with typical efficiencies of 75-90% depending on the technology used. This substantial improvement in efficiency justifies a drive upgrade. The upgrade is easy since the control is already in place and the new drive is smaller than the existing drive.

**Look for older AC drives for opportunities to improve efficiencies, reliability, and functionality; not to mention a new 2 or 5 year warranty.**

Control Techniques AC drives feature all the latest energy-saving features and integrated control to keep performance up and costs down as you find new ways to save energy in your facility.

The included PLC functionality, PID controller, and optional advanced machine control module allows you to eliminate external controls if needed.

Skip Frequencies feature allows the user to avoid resonate equipment frequencies which cause high vibration levels.

Supply Loss Ride Through will keep the drive up and running through most power outages. It uses the inertia of the load to provide drive power until the load stops turning fast enough to generate the power necessary. When input power returns, the drive ramps back up to set-point speed.

Catch a spinning motor feature handles motors already rotating due to back pressure on the blades. They will be smoothly accelerated to the desired speed in the forward direction. This significantly reduces stress on the fan blades, bearings, and belting or coupling.

Dynamic V/Hz further improves efficiency by reducing motor voltage during low demand. AC drives improve power factor (>0.95) and eliminate belt slippage by lowering motor starting current to reduce power demand from your utility. Control Techniques even helps you document energy savings by including a kWh energy and running cost meters in the drive. Additionally, a complimentary energy savings software is provided to assist with estimated annual savings. Contact Control Techniques for assistance identifying energy savings opportunities in your facility.

## Drives plus...

### World Class Products & Support

- Assistance estimating energy savings
- Worldwide Application & Field Service Network
- 24/7 support line +1 800 893-2321
- Custom software and panel configurations



*AC Drives fractional to 4,200 HP*