

Why Install A VFD?

What is a VFD?

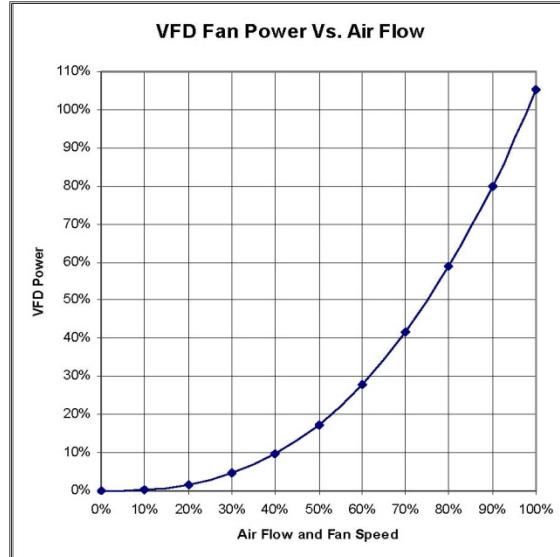
A variable frequency drive (VFD) is an electrical device used to control the speed of a standard three-phase induction motor. A VFD allows you to conveniently adjust the speed of a motor by changing the frequency applied to the motor. So, for convenience, cost-efficiency, and precision, a VFD changes the frequency (and voltage). At any given frequency output of the drive, you get a new torque / speed curve from the motor.

We recommend the installation of VFDs to soft start your motor in conjunction with a CO monitoring system. When the CO system calls for the fans, they will ramp up to between 30 and 50% speed. The fans will only ramp up again if the sensors are not satisfied with the reduction in CO after 15 minutes of run time. We have found that 90-95% of the time, the slower speed is all that is required.

What Benefits Can I Expect?

Variable frequency drives offer many benefits to reduce energy costs and extend the life of your mechanical equipment. VFDs allow fan motors to run at variable speeds, based on demand, eliminating the power surge encountered when the device is simply turned on. When a motor is hard started, it will typically draw 600 to 800% of its rated current while it is accelerating. A motor started by a VFD will be limited to 110% inrush current – in the worst case scenario. Additionally, by running a fan motor at 40% speed, you save approximately 90% of the energy cost associated with the motor operation. In the case of one 40hp fan motor, that translates to an additional 2,682.26 kw/h saved per year when used in conjunction with CO controls.

Another benefit associated with the installation of a VFD is in the lessening of wear and tear and a longer life for your fan motor. From a mechanical standpoint, bearings run at lower speed will typically last longer than bearings run at full speed. VFD's inherently "soft start" the motor. This soft start extends the life of both the motor and bearings, and drastically reduces belt wear and tear. While these mechanical and electrical side-effects are many, they are often ignored because they are harder to quantify from a dollar and cents standpoint than the kWh savings which are easily measured. However, these benefits are real and can often provide savings as dramatic as the kilowatt hour savings.



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Many of our clients also find that installing a VFD gives the additional benefit of noise reduction. Many exhaust fans are quite noisy run at full speed and may bother building tenants or guests. The installation of a VFD can prevent noise by running the fan at a much reduced speed.

Most fan motors used for ventilation do not need to operate at 100 percent capacity when called for by the CO System to effectively ventilate the garage. Motors running unnecessarily at full speed can be a waste of energy and an unnecessary expense.

How Can I Use a VFD Effectively?

Each property we have worked with has unique needs and situations which are solved by effective use of a VFD. One of the most common is that an underground parking structure can become quite hot without the fans running. A VFD can have the fans run at 10% power and circulate air to provide a cooling effect. This provides the desired ventilation without using the power running the fan at full speed would require. By working with AC Energy to determine what issues you would like to resolve, we can recommend a sequence of operations tailored to your building.

Many utility companies have started to provide incentives based on energy savings associated with VFDs. Be sure to check with your AC Energy representative to see if this may apply to you.