

# FAQs

## Frequently Asked Questions – Variable Speed Drive

**Q: How do I know if my application is a good fit for a Variable Speed Drive (VSD) compressor? Will the manufacturer just say “yes”?**

**A:** A compressed air energy audit or assessment including a review of the demand profile and storage available, as well as the operating environment, will determine if a VSD compressor can provide the energy efficiency that you desire. In short, you should never invest in a VSD product without the manufacturer showing you a very clear pay back analysis.

**Q: How exactly do they work?**

**A:** The VSD concept simply measures the system pressure and maintains a constant delivery pressure within a narrow pressure band. This is achieved by regulating the motor speed of the compressor by frequency conversion, which results in a varying air flow delivery. With today’s advanced VSD electronic controls the delivery pressure is kept within a  $\pm 1.5$  psi band (not the conventional 10–15 psig pressure band used on inlet controls for load/no-load and modulating equipment). Therefore, a lower air compressor delivery pressure can be used to maintain the required minimum working pressure of the system – which results in increased energy savings and profitability. Remember, for every 2 psi reduction in pressure, power consumption is reduced by 1 percent. That’s more than a 6 percent energy savings.

The converter in the VSD system performs a “soft” start/stop operation by automatically controlling both acceleration and deceleration levels, eliminating amperage draw peaks. This also helps protect electrical and mechanical components from the stresses that can shorten the life of an air compressor. As mentioned above, that equates to several low in-rush current starts per hour, some consider this infinite starts per day.

**Q: Tell me a little bit about how they have changed in the last three years?**

**A:** The compressor manufacturers have researched the screw element design and actually tweaked the bell curve. This includes rotor tip speed sweet spot for better compression efficiencies as well as worked with the drive manufacturers to improve the reliability of compressors incorporating drives. The ability to cancel electrical interference, operate in some harsher environments with drive filtration and expanded breadth of VSD options are just some examples.