

# VFD Motor Control for Vacuums

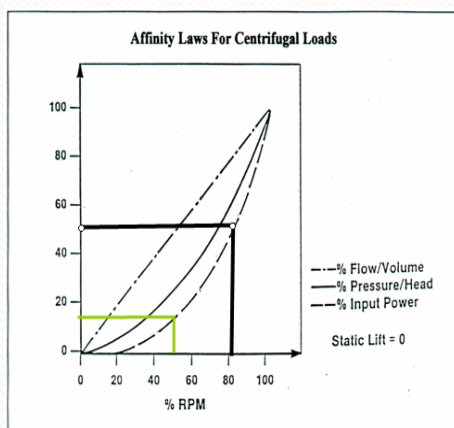
AB Power Flex 755 Adjustable Speed Drive

**Car Wash Management Integrators (CMI), a Systems Integrator of Rockwell Automation, saves Operators money by implementing automatic speed control on car wash vacuums.**

Operators have long realized the benefits of going Green; there is both a positive marketing message and saving that can translate to a bigger bottom line. CMI together with Rockwell Automation have developed a number of solutions that utilize Variable frequency Drives (VFD's) to significantly save energy in today's Car wash.

**Reducing speed a little, reduce Energy a lot!**

Energy savings on centrifugal applications (such as Vacuums), is dictated by Affinity Laws for Centrifugal loads.



Simply translated the power required varies as the cube of the speed. Thus a motor running at 80% speed has a 50% energy reduction. A fan running at 50% uses 12.5% of full power.

Additional benefits to Variable Frequency Drives (VFD)

- Reduced voltage starting, less peak demand charges.
- Reduced mechanical wear and tear, longer vacuum life.
- Reduced maintenance and longer life for belts and bearings.
- Energy rebates from many local energy companies and Government agencies.
- Supports Green initiatives both present and future.

VFD Motor Control for Vacuums with Auto.Drive™ Saves 40% to 60% in Power Cost Annually

Payback is 18-36 months

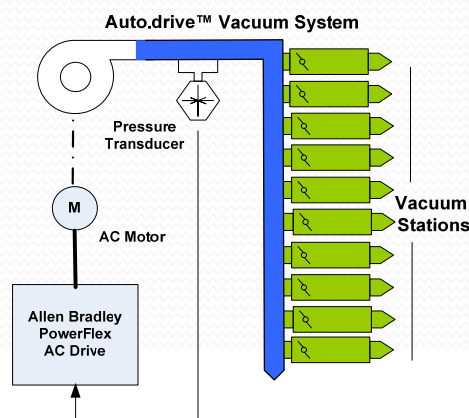


## Auto.Drive™ Vacuum VFD Package

The typical Vacuum in today's car wash is operated by a across the line starter. The Vacuum is either on at full speed or off. Our new Auto.Drive™ VFD system measures vacuum pressure with an Allen Bradley pressure transducer and feeds this back to the VFD. We then utilize a PI algorithm to dynamically control speed, thus maintaining constant vacuuming pressure. No longer will your vacuum motors be full on when only one customer is vacuuming. The system is straight forward and easy to setup.

## Standard Auto.Drive™ VFD

- NEMA 1 Steel enclosure (NEMA 12, 4 3R optional).
- Input Circuit Breaker with externally operable handle
- Output Reactor for non-inverter duty motors or longer motor lead lengths
- Digital Human Interface module for easy maintenance and trouble shooting.
- Designed for both new and retrofit applications



LISTEN.  
THINK.  
SOLVE.

**CMI**  
Car Wash Management Integrators

Allen-Bradley • Rockwell Software

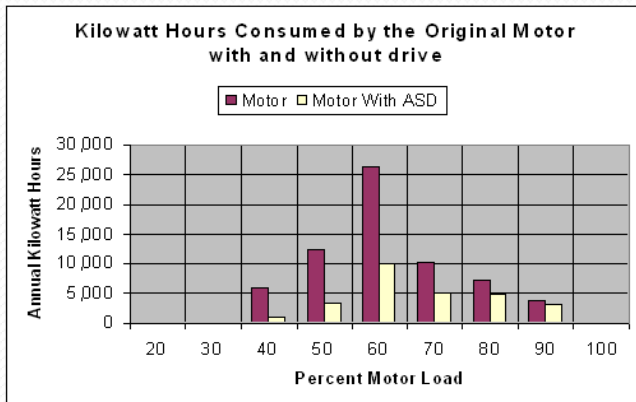
**Rockwell Automation**

## Case Study

**Location:** Wash Zone #1 Plymouth Michigan

**Equipment:** 25HP Vacuum System, 10 drops, VFD controlling the motor with pressure transducer in the manifold.

To demonstrate the energy savings by utilizing the Auto.Drive™, we ran the 25HP Vacuum system without the VFD for a number of weeks using a powermonitor to record energy usage along with motor loading. We then ran the same 25HP vacuum system with the Auto.Drive™ VFD and pressure transducer. Once again, using the power monitor to measure energy usage and motor loading.



### Conclusion

Annual usage and a power rate of .065 per KWhr

- Without the VFD, the vacuum system used 66,455KW x .065 = \$4320
- With the VFD the vacuum system used 27,860KW x .065 = \$1750

*“As a result of changing our vacuum motors over to VFD using Auto.Drive™ control, we continuously ramp up and down based on demand and typically idle at 70% of capacity. The corresponding savings is \$2,500 per year, giving us a two and half year payback on the retro-fit.”*

(Ellen Sorenson, Manager Wash Zone Car Wash 3/2009)

## Car Wash Solutions Built upon World Class Allen Bradley Products

Auto.Drive™ incorporates Allen Bradley product, the number one supplier of motor controls in North America. The major components in the Vacuum solution are the PowerFlex 755 Variable Frequency drive and the 836E Pressure transducer.

### PowerFlex 755

**Standard embedded Ethernet**, allows for easy connection to remote monitor systems such as WASHMONITOR™

**Protective Diagnostics**, since the drive has a real time clock, it can be programmed to monitor run times on machine maintenance items to avoid unplanned downtime

**DeviceLogix™** embedded control technology that can control drive I/O and manage status onboard the drive



### 836E Pressure Transducer

**Rugged Stainless steel Construction**, allows this Device to be mounted at the Vacuum or in the backroom. Also has convenient display For easy setup and Maintenance.

### Implementation and Service Network

CMI has developed a network of world class independent Car Wash Consultants across North America that help us identify your needs, develop solutions specifically for you and implement the integration. To find a consultant near you, contact us toll free at 866.868.5312 or by email [info@carwashcmi.com](mailto:info@carwashcmi.com)

As a full-spectrum automation provider, Rockwell automation offers a comprehensive approach to meeting your sustainability objectives in all facets of your operations. Our approach is specifically designed to help you turn sustainability challenges into business advantages.

