smart start
intellegent motor control for car wash

from

CMI
Car Wash Management Integrators

New Car Wash Saves 30% on Energy Cost

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In June, Moo Moo Car Wash opened its second location in the past 9 months in the Columbus, Ohio marketplace. The new store, in the suburb of Pickerington, improved upon the original design on Broad St in several areas like signage using LED fixtures and value engineering on the building. However, the most significant improvement was the incorporation of Smart Start Electrical controls which has delivered a 30% energy savings per car.

Smart Start is the application of intelligent motor control for car wash to achieve smart operating conditions using advanced technology; only spend money to make money.

For Moo Moo Car Wash, all of the 3 phase loads (except for McNeil equipment) were incorporated into a single custom Motor Control Center enclosure. This design saved the owner thousands of dollars in acquisition costs and installation costs. Since most all of the motor controls were placed into one cabinet, the owner avoided paying for multiple enclosures, disconnects, main circuit breakers etc. All of the controls leveraged a single enclosure and amortized the costs across more loads. Additionally, the owner avoided the cost of mounting and pulling wire to multiple cabinets - not to mention saving precious back room wall space. Using some fancy footwork, the MCC was placed close enough to the Main Distribution Panel to avoid the need for its own disconnect saving another thousand dollars. “For new sites, using a custom MCC to house all of the three phase loads is definitely the way to go. For our next site, we are thinking of taking it a step further and having Smart Start provide a single panel which combines the MDP and MCC for an even more efficient power configuration;” said John Roush one of the owners.

Moo Moo Car Wash MCC controls the following 22 three phase loads detailed:

Qty	Power	Function	Control Device	Control Method and Benefit
5	15 HP	Dryer Group 1	• 100HP PowerFlex 755 AC Variable Frequency Drive (125A) • Door mounted HIM • Input Circuit Breaker • (5) Motor Circuit Protectors (MCP) • Output Reactor	Variable Frequency Drive. Fan motors are grouped in accordance with performance requirements to save money on independent drives. Auto.Drive for dryers allows Speed Tuning to save money on the top package and service tuning to match the car wash menu. Look back is eliminated and speed is reduced for P/U truck beds to reduce blow back. This control method saves 20%-50% on dryer power consumption
3	15 HP	Dryer Group 2	• 60HP PowerFlex 755 AC Variable Frequency Drive (77A) • Door mounted HIM • Input Circuit Breaker • (3) Motor Circuit Protectors (MCP) • Output Reactor	
3	1/10 HP	Oscillating Arch Motors	• 1HP PowerFlex 4 AC Drive (4A) • Drive mounted HIM • Input Circuit Breaker • (3) Motor Circuit Protectors (MCP)	Small VFD for oscillation control
2	15 HP	Reclaim Pumps	SMC-3 Soft Starters includes input circuit breaker	A soft starter temporarily reduces the load and torque motor during startup. Soft Starters will eliminate peak demand spikes and will reduce torque surges
1	7.5 HP	Prep Gun	SMC-3 Soft Starters includes input circuit breaker	
1	1 HP	RO Delivery Pump	Across the line Motor starter Inc. • Input Circuit Breaker w/Aux • Motor Contactor	Across the line starters connect the motor terminals directly to the power supply causing substantially high in rush starting peaks. This type of starting is suitable for small motors below 5 hp only. If used above 5 hp the operator will experience significant peak demand spikes increasing billing rates and electrical costs. Also, cold start torque surges will significantly stress the mechanical and electrical system.
1	1 HP	RO Reject Pump	Across the line Motor starter Inc. • Input Circuit Breaker w/Aux • Motor Contactor	
2	2 HP	Wheel Cleaners	Across the line Motor starter Inc. • Input Circuit Breaker w/Aux • Motor Contactor	
2	1/3 HP	Arch Pumps	Across the line Motor starter Inc. • Input Circuit Breaker w/Aux • Motor Contactor	
2	25 HP	Central Vacuum System Motors	• PowerFlex 755 AC Variable Frequency Drive • Drive mounted HIM • Input Circuit Breaker • Output Reactor • Door mounted fault pilot light • Door mounted Keyed On/Off/Auto selector • Electrical to Pneumatic transducer	Auto.Drive Control for Vacuums uses a manifold pressure transducer feedback signal to constantly monitor and dynamically adjust the vacuum suction pressure via the VFD so the vacuum motors always operate at maximum efficiency creating 40%-60% savings

Left: Free Vacuum Center controlled by Auto.Drive for vacuums Above: Dryer Zone controlled by Auto.Drive for Dryers.

Standard Features Unless Otherwise Specified

- Allen Bradley Components and Rockwell Automation technology
- Output Reactors on VFDs to protect non-inverter duty motors
- Individual motor circuit protectors to isolate problems with grouped motors
- Door mounted Human Machine Interface for easy programming and safety
- Interfacing Relays to accept controller inputs
- Keyed selector switches per motor for control, ease of repair and adjustment and safety
- ON/OFF/AUTO motor speed control for VFD controlled motors - auto.drive™
- Properly sized cabinets with fans and filters for optimal heat dissipation and controlled environment
- Comprehensive as built drawings
- 24/7 Rockwell Customer Support (Included)
- 24/7 Rockwell Field Support (Contracted)
- UL Certified

PowerFlex® 755 AC Drive Featured in Smart Start Panels from Allen-Bradley

The PowerFlex 755 AC drive helps maximize your investment and help improve productivity. See Slightly Slower Equals Big Savings and Applications for VFDs at Car Washes »

The PowerFlex 755 AC drive offers more selection for control and supporting hardware options than any other drive in it's class including:

- **DeviceLogix**™ embedded control technology that can control outputs and manage status information onboard the drive
- **Standard embedded Ethernet** feature for communication to easily configure, control and collect drive data over EtherNet/IP networks
- **Basic and Enhanced Safety** options are embedded into the drive to help protect personnel and equipment, conserve space in panels, and minimize downtime
- **Slot-based architecture** allows you to build the drive to suit your application needs. The five option slots are capable of accepting a combination of options for control, communications, I/O, feedback, safety and auxiliary control power.