Medium Voltage Solutions

For Water and Wastewater Treatment

Allen-Bradley

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SOLVE.®

Allen-Bradley • Rockwell Software

Rockwell Automation

Water/Wastewater treatment plants reduce maintenance costs, energy charges and ensures reliability with Medium Voltage solutions.

The application of Medium Voltage products in the Water/Wastewater industry has increased dramatically in the last decade. Concerns with reliability, downtime, peak demand energy costs and maintenance costs have forced the industry to look at newer technologies to help meet the challenges faced today.
Solid-state reduced voltage motor control technology has advanced significantly over the past decade and now offers more flexibility than traditional wound rotor or reduced voltage autotransformer type solutions of the past. Variable frequency AC drives have made advances in reliability to the point where significant energy cost savings and process improvements are now possible. The right supplier can provide project management, a complete line of medium voltage products and coordination with the pump vendor to facilitate a lower initial capital cost and long-term operating cost. A medium voltage solution by Rockwell Automation can also be tested at the factory at rated load and voltage to help reduce installation and commissioning costs.

- Potential reduction in energy costs
- Increased reliability and up-time
- Reduced maintenance costs
- Enhanced control of water flow
- Improved process control
- Remote monitoring and diagnostics
- Project management
- Early involvement with consultants to ensure compliance with the project specification
- Close coordination with pump OEM, motor manufacturer, and contractor
- On-time submittal of documentation package
- Water/Wastewater industry-specific consultants on staff
- Common spare parts across all Medium Voltage control equipment
- Witness testing (at full load and voltage) with or without customer - supplied motor

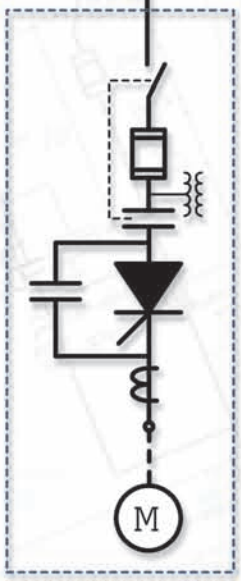
Choose the right solution for your application

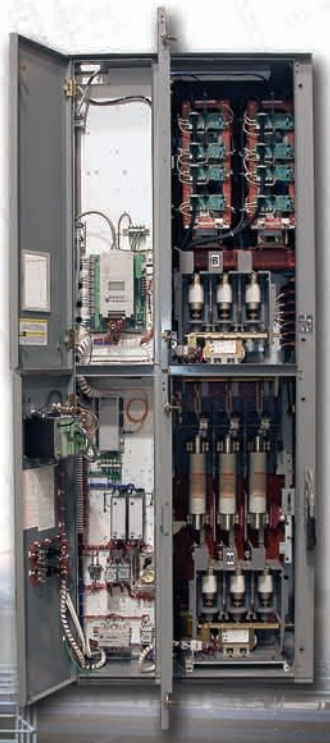
Fixed speed applications

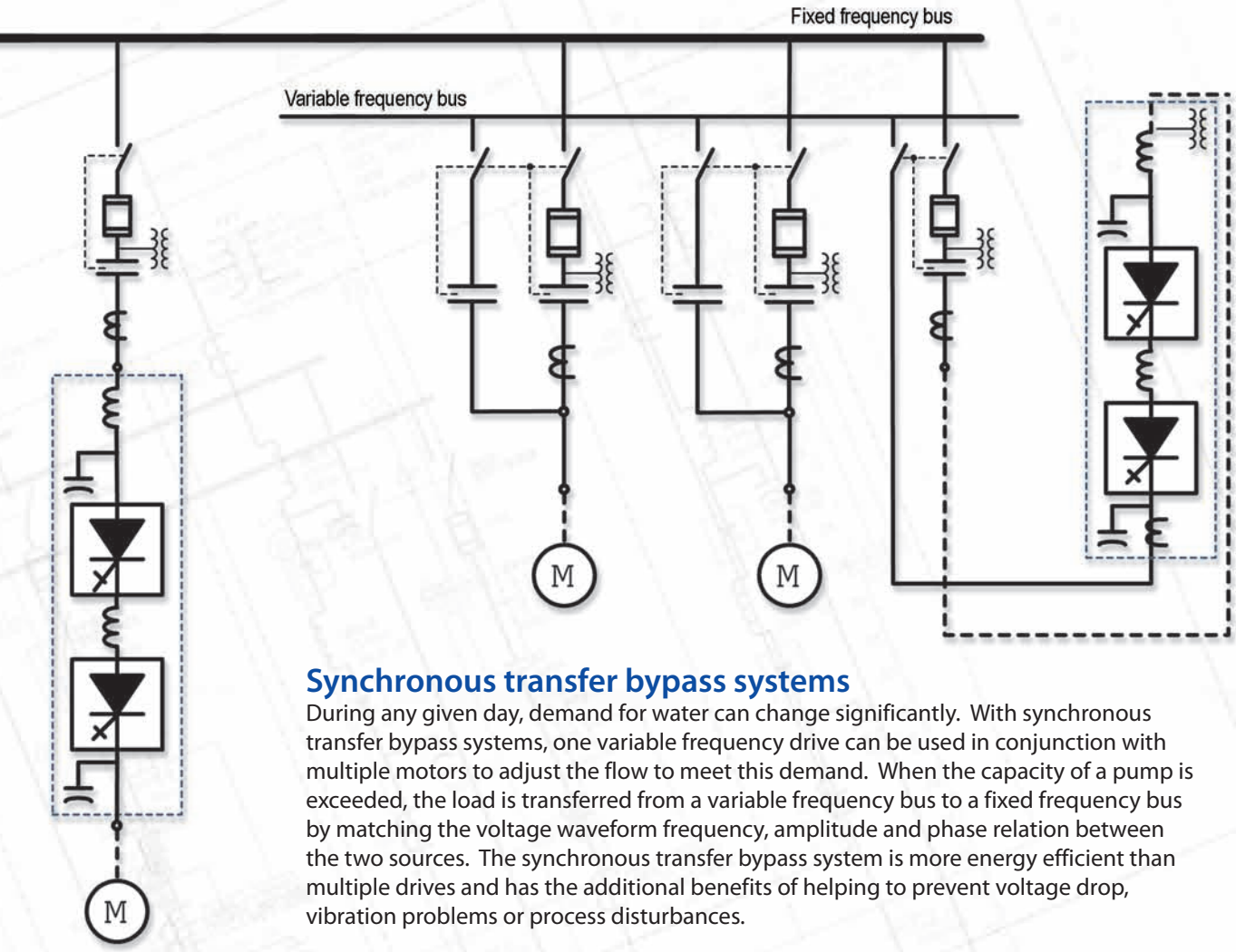
Wherever you need fixed speed control of medium voltage induction or synchronous motors, there is an Allen-Bradley CENTERLINE® controller to fit your needs. Many MCCs contain a wide array of intelligent electronic devices such as Bulletin 825P programmable motor protection, and IntelliVAC™ vacuum contactor control modules. The IntelliCENTER® motor control center is equipped to take full advantage of these new technologies and provide you with built-in communications, monitoring software and intelligent devices in a cost-effective package. Selected CENTERLINE controllers can be provided in an arc-resistant enclosure when compliance with IEEE C37.20.7 (Type 2) is required.

Solid-state reduced voltage applications

Reduce water hammer for constant speed pumping applications by applying the Allen-Bradley medium voltage SMC Flex™ controller with pump control option. This reduced voltage, solid state controller has a patented pump control algorithm that helps minimize excess torque delivered to the pump, virtually eliminating water hammer. The SMC Flex is ideally suited for applications that require soft starting and stopping of motors that do not require speed control. The medium voltage SMC Flex controller is equipped with a bypass contactor that bypasses the SCR stack once the motor is up to speed. The SMC Flex can also be used as a bypass controller in conjunction with the PowerFlex® 7000 AC drive in a synchronous transfer bypass scheme. This provides you with smooth reduced voltage starting and stopping when the variable frequency drive is off line.







Synchronous transfer bypass systems

During any given day, demand for water can change significantly. With synchronous transfer bypass systems, one variable frequency drive can be used in conjunction with multiple motors to adjust the flow to meet this demand. When the capacity of a pump is exceeded, the load is transferred from a variable frequency bus to a fixed frequency bus by matching the voltage waveform frequency, amplitude and phase relation between the two sources. The synchronous transfer bypass system is more energy efficient than multiple drives and has the additional benefits of helping to prevent voltage drop, vibration problems or process disturbances.

Variable speed applications

Variable frequency drives offer a number benefits to the Water/Wastewater industry. Applying medium voltage drives to pumping and blower applications helps reduce power consumption and increases flow control capability. The PowerFlex 7000 medium voltage variable frequency drive with Direct-to-Drive™ technology provides you with a solution to fit your specific needs. Direct-to-Drive technology allows you to connect utility power directly to the drive without an isolation transformer. It also allows you to connect both new and existing motors directly to the drive, eliminating unnecessary motor filtering. Direct-to-Drive technology offers you the lowest cost solution and reduced size and weight, while eliminating common mode voltage and maintaining the world's most accepted harmonic standards.

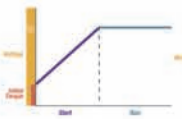
CENTERLINE® Medium Voltage Motor Control

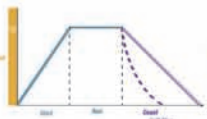
A complete line of induction and synchronous controllers now integrated with the intelligence of solid-state technology

- Full Voltage Non-Reversing
- Full Voltage Reversing
- Two-Speed
- Reduced Voltage Autotransformer
- Reduced Voltage Reactor
- Brush Type Synchronous
- Brushless Type Synchronous
- Incoming Line Units
- Fused & Non-Fused Load Break Switches
- ArcShield™ Controllers
- IntelliCENTER™ Controllers

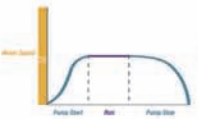
MV SMC Flex™ Smart Motor Controller

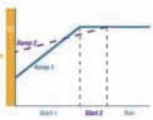
Allen-Bradley MV SMC Flex controllers apply reduced voltage to an AC motor to allow soft starting and stopping, limit inrush current, and reduce effects of water hammer in pumping systems. Allen-Bradley SMC Flex controllers include communication and diagnostic capabilities and high flexibility, making it ideal for virtually any Water/Wastewater application.


Soft Start


Soft Stop


Current Limit Start


Pump Start & Stop


Dual Ramp Start

PowerFlex 7000™ AC Drive

Allen-Bradley Medium Voltage Drives provide a single solution for all medium voltage speed control requirements. The PowerFlex 7000 family of drives exceeds industry expectations by delivering superior reliability, ease of use and lower total cost of ownership. The advanced power semiconductor technology reduces component count to the lowest of any medium voltage drive available, translating to increased savings and reliability, less downtime and fewer spare parts.

Medium Voltage testing at rated load and voltage

The medium voltage test facility at Rockwell Automation allows for testing MV SMCs and Drives at rated load and voltage. SMC products are fully tested under load simulating the intended application. Drives can be tested at a variety of voltage and rectifier styles, including 18-pulse and PWM rectifier, on 200 hp up to 6000 hp at voltages from 2300 to 6900 volts. The facility includes a new dynamometer (the motor and drive arrangement used for load testing) mounted on a 40-foot long T-slot base. It consists of two 2500 hp induction motors (3810/6600 volts) and one 5500 hp induction motor at 4160 volts. One of the motors is removable so that customers can bring their own motor (up to 8000 hp) for combined drive/motor testing.

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