



FOCUS ON EMERGING TECHNOLOGY

SOFTWARE-CONTROLLED SWITCHED RELUCTANCE MOTORS

Technology Description

Software-controlled or “Smart” Switched Reluctance Motor systems represent the latest advancements in switched reluctance motor (SRM) design. These motors feature a high pole-count rotor in combination with a purpose-built motor controller to achieve energy efficiency ratings that exceeding National Electrical Manufacturers Association (NEMA) premium. The architecture and operation of these motors is unique because there are more poles on the rotor than the stator. As a result, a controller is needed to coordinate the energizing sequence of the stator poles. The compulsory motor controller also promotes efficient operation across a wide range of speeds.

Smart SRMs can be easily integrated into modern building automation and control networks, with the native motor controller also capable of providing real-time monitoring of motor health and control parameters using cloud-based connectivity. These motors do not use rare earth materials and have no rotor windings, which makes them more cost effective to manufacture. The absence of rotor windings also lowers the heat generated inside of the motor and eliminates the potential for rotor currents to damage the motor bearings, thereby improving the efficiency and reliability of these motors.

Most installations see an average efficiency gain of 1.5 - 11% versus a NEMA premium motor with a VFD. Savings can be higher in retrofit applications using older vintage motors, or when the application would benefit from added speed control.

Benefits

1. More efficient over a wide torque and speed range when compared to a NEMA Premium motor.
2. Software enables speed control, real-time remote system monitoring, and motor diagnostics via a web dashboard that communicating cloud-based data and analytics. Includes automated fault detection.
3. Simple mechanical design and low equipment costs make it a cost effective alternative to buying a new motor with a VFD.
4. Concentrated stator windings and absence of permanent magnets make it easy to service.
5. Equipment operation and construction reduces thermal stress and minimizes potential for bearing failure.

Customer Type

Farms, restaurants, retail and grocery stores, offices, manufacturing, warehouses, campuses, hotels.

Applications

Most applicable to variable speed centrifugal loads (pumps and fans/blowers) with a range of 1-15 HP

Market Sectors

Agriculture, Commercial, Government, Industrial.

Potential Energy Savings

Average efficiency gains of 1.5 - 11% versus a NEMA premium motor with a VFD. Savings can be higher in retrofit applications using older vintage motors, or when the application would benefit from added speed control.

Potential Payback Range

Immediate when new motor and drive are required (end of life replacement).

Incentives Available

Download and complete the [Custom Project Incentive Guide](#) [PDF] or Find an [Energy Advisor](#) to get started.

REDUCING ENERGY WASTE ACROSS WISCONSIN

Focus on Energy, Wisconsin utilities' statewide program for energy efficiency and renewable energy, helps eligible residents and businesses save energy and money while protecting the environment.

Focus on Energy information, resources, and financial incentives help to implement energy efficiency and renewable energy projects that otherwise would not be completed.

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