INEFFICIENT

Shaded-Pole (SP) Motor

- 15-30% approximate peak efficiency
- Induction type motor
- Requires low starting torque
- Simply constructed and low cost
- Very reliable
- Very common in refrigeration and HVAC applications

BETTER

Permanently Split Capacitor (PSC) Motor

- 55-65% approximate peak efficiency
- Induction type motor
- Reduced starting torque
- Simply constructed
- Reliable
- Not programmable
- Single speed but can incorporate "speed taps" to be adjusted to meet needs

BEST

Electronically Commutated Motor (ECM)

- 70-80% approximate peak efficiency
- Brushless DC motor- uses a permanent magnet rotor
- Constant torque
- Extended motor life
- Reliability improving
- Control speed to produce constant flow
- Quiet
- Reduced operating temperature and less waste heat

ELECTRONICALLY COMMUTATED MOTOR (ECM)

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OVERVIEW

Grocery stores and convenience stores use a lot of energy per square foot, mainly due to refrigeration and HVAC. A typical grocery store may have well over 100 small motors. In the past, shaded pole (SP) motors were the standard because they are simple, cheap, and reliable. Today, more efficient options are available with permanently split capacitor (PSC) or electronically commutated motors (ECM). SP or PSC motors in refrigeration and HVAC can be retrofitted with high efficiency ECMs to save energy and money. Maintaining proper air flow ensures you get the max efficiency out of an HVAC or refrigeration system. Additionally, less waste heat will be in the airstream with an efficient motor, further saving energy.

INCENTIVES

Incentives are available through Idaho Power's Commercial and Industrial Energy Efficiency Program for **HVAC** and **refrigeration retrofit** applications.

HVAC: An incentive of $100 per motor is available for any ECM when replacing a conventional shaded pole or permanent split capacitor motor.

Refrigeration: For refrigeration applications, SP motors can be retrofitted with a PSC motor or ECM, but a PSC motor can only be retrofitted with ECM. Incentives of $100 per motor and $60 per motor are available for medium or low temperature walk-in and reach-in freezers and coolers, respectively. To qualify for an incentive, the existing equipment is assumed to be operating continuously and at full speed prior to retrofit.

Visit **idahopower.com/business** for program details and requirements.

Payback

The cost for an ECM varies, depending on the size needed for the application. A 1-2 year payback, including incentives, is typical when upgrading to an ECM for refrigeration and HVAC applications.

References

U.S. Department of Energy, Motor Energy Savings Potential Report. Retrieved on September 1, 2016 from **http://energy.gov/sites/prod/files/2014/02/f8/Motor%20Energy%20Savings%20Potential%20Report%202013-12-4.pdf**

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