

Up to 70% Reduction in Energy!

Century Refrigeration has developed an Efficiency Upgrade Assembly to be added to existing FV and FH style unit coolers.

The upgrade to a high efficiency ECM motor assembly is available as follows: ECM motor, fan blade, and motor bracket. These components are available for the **FH Series (part number RTF-003)** and **FV Series (part number RTF-001)** unit coolers. The complete Efficiency Upgrade Assembly includes the ECM motor assembly as well as a hinged drain pan for ease of clean ability and is available for the **FV Series (part number RTF-002)** of unit coolers. The entire assembly can be changed out in a matter of minutes, but you can receive up to a 70% reduction in operating costs for a lifetime.



ECM Motor Technology

The electronically commutated motor (ECM) was developed in 1969. The term "commutate" means to convert alternating electric current to direct current or vice versa. This conversion is what allows the ECM motor to be efficient by having an electronically controlled inverter moving a magnetic field. There are many advantages to using an ECM motor over a permanent split capacitor (PSC) motor. The one advantage most often cited is efficiency, especially during turndown or partial loads. Many ECM motors can reach efficiencies as high as 82%.

Century Unit Cooler	Motor Size	Existing Standard Motor				Replacement ECM Motor				
		Motor Amperage		Motor Efficiency	Sound Data	Motor Size	Motor Amperage		Motor Efficiency	Sound Data
		120 V	230 V				120 V	230 V		
FH Series	16 Watt	1.0 A	.5 A	24%	54.3 DBA @ 10'	16 Watt	.2 A	.1 A	66%	54.0 DBA @ 10'
FV Series	50 Watt	1.0 A	.5 A	26%	52.9 DBA @ 10'	38 Watt	.3 A	.1 A	66%	50.2 DBA @ 10'

Energy Savings Example

The following tables demonstrate the annual energy savings potential of these motors. Using the standard formula of $[kwh = (hp \times .746 \times \text{hours of operation}) / \text{Motor Efficiency}]$ to calculate the Kilowatt Hours we then multiply the kwh times the assumed cost per kilowatt hour to yield an estimated annual operating cost per motor. To estimate your specific application you can substitute your actual cost per kilowatt hour and actual hours of operation.

FH Series	Actual		Assumed		Annual Savings
Standard Motor	16 watts	24% Motor Efficiency	7,000 Operating Hours	\$0.10 cost per kilowatt hour	\$29.63 per motor - or a - 63% reduction in energy cost
ECM Motor	16 watts	66% Motor Efficiency			
16 watts x 7,000 operating hours / 24% motor efficiency = 466,667 watts (466.6 kwh)			Operating cost per motor is 466.6 kwh x \$0.10 = \$46.60		
16 watts x 7,000 operating hours / 66% motor efficiency = 169,697 watts (169.7 kwh)			Operating cost per motor is 169.7 kwh x \$0.10 = \$16.97		

FV Series	Actual		Assumed		Annual Savings
Standard Motor	50 watts	26% Motor Efficiency	7,000 Operating Hours	\$0.10 cost per kilowatt hour	\$96.10 per motor - or a - 70% reduction in energy cost
ECM Motor	38 watts	66% Motor Efficiency			
50 watts x 7,000 operating hours / 26% motor efficiency = 1,346,154 watts (1,346 kwh)			Operating cost per motor is 1,346 kwh x \$0.10 = \$136.40		
38 watts x 7,000 operating hours / 66% motor efficiency = 403,030 watts (403 kwh)			Operating cost per motor is 403 kwh x \$0.10 = \$40.30		

Efficiency

In a study that compared motors, the ECM had a higher electrical efficiency (66 percent efficient) than PSC (49 percent efficient) or shaded-pole (26 percent efficient). Watt-for-watt, ECM can use up to a third as much energy when running at rated speed. ECM also maintains its efficiency across its speed range, whereas an induction motor's efficiency plummets when its rated speed is

altered. In addition to the direct benefits, there are a number of indirect benefits including "cooler" motor operation which creates less heat load on the conditioned space when used with evaporator coils.

The ability to replace traditional shaded-pole motors with more efficient ECM motors was confirmed by researchers at the Food Service Technology Center (FSTC) in testing for Pacific Gas & Electric Co. The testers installed and monitored two GE ECM motors in a walk-in freezer. The motor utilized a permanent magnet, brushless DC motor combined with a built-in electronic AC inverter that was used to drive it. The freezer evaporator unit originally came equipped with two shaded-pole 1/15 HP fan motors, but was retrofitted. The initial measurement of the original shaded-pole motors' input power was 271 watts with the two

fans combined. Following the retrofit, the power was 88 watts for two fans combined. Overall, the ECM equipped fans used 67 percent less energy.

Century Refrigeration is making a world of difference with the addition of the optional ECM motor technology. Century's complete line of unit coolers have now become more efficient and quiet. Utilizing industrial grade construction and state of the art components we specialize in providing innovative solutions for your refrigeration application. Century Refrigeration offers our customers a host of specialty options and flexibility in design.

ECM Motor Replacement Kit:

To place an order Contact your local representative with the following:

- Unit Model Number
- Unit Serial Number
- Motor Voltage
- Part Number



www.rae-corp.com

P.O. Box 1206 - Pryor, OK 74362 - (918) 825-7222 - Fax (800) 264-5329

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