

Commercial Refrigeration

Commercial and industrial refrigeration systems can be very energy intense and expensive to operate. However, there are a variety of newer products and controls technologies that can be implemented to increase the efficiency of refrigeration systems. Strategies include both mechanical refrigeration system upgrades such as fan motors and a variety of other products that help reduce refrigeration system losses due to air infiltration such as night curtains.

MULTIDECK CASE DOORS

- Existing open multi-deck style cases can be retrofitted with doors that are designed to fit right onto the open multi-deck style cases.
- Multideck case doors provide an estimated 70-82% reduction in refrigeration energy use compared to open cases.

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ANTI-SWEAT HEAT CONTROLS

- Standard glass doors on grocery refrigerator and freezer cases typically use anti-sweat (anti-condensation) heaters in the frames and mullions, which operate continuously to prevent moisture buildup.
- Anti-sweat heater controls ensure that refrigerated door heaters do not run continuously when not needed.
- Anti-sweat heater controls provide 30-90% reduction of the annual energy consumed by door heaters and reduce heat load in these refrigerator and freezer cases.

REFRIGERATED CASE NIGHT COVERS

- Deployed when grocery centers close overnight, night covers insulate cold refrigeration cases while maintaining the desired displayed food temperature. Night covers are typically constructed of a flexible, woven fabric.
- Night covers offer savings of up to 35% of the cases annual energy consumption dependent on the number of hours the curtain is used.



WALK-IN FREEZER AND COOLER STRIP CURTAINS

- Strip curtains reduce refrigeration load by limiting heat transfer from adjacent warm, humid spaces when walk-in doors are open. As a result, the curtains help reduce ice build up in the coolers and freezers which can lead to costly maintenance and downtime. Additionally, compressor run time and energy consumption is reduced.
- Strip curtains must be at least 0.06 inches thick.
- Low temperature strip curtains must be used for low temperature applications.

ELECTRONICALLY COMMUTATED MOTOR (ECM) COMPRESSOR AND CONDENSER FAN MOTORS

- Replacing existing shaded pole and permanent split capacitor motors with higher efficiency electronically commutated motors (ECMs) on condensers and compressors provide savings via the increased motor efficiency of the ECM.
- ECM motors consume 50-75% less energy than shaded pole and permanent split capacitor (PSC) motors while doing equal work.

DEMAND DEFROST CONTROLS

- Evaporator coils in walk-in freezers will accumulate ice unless they are periodically defrosted. Defrosting introduces heat to the coils, temporarily reducing their ability to exchange heat. Electronic demand defrost controls use sensors and control algorithms to monitor operating conditions and initiate defrost cycles only when needed.
- Demand defrost controls help to reduce overall defrost cycle time and commonly cuts defrost cycle annual energy consumption by 20%.

EVAPORATOR FAN MOTORS

- By replacing an existing, working standard-efficiency shaded-pole or permanent split capacitor (PSC) evaporator fan motor in refrigerated display cases or walk-in coolers with an electronically commutated motor (ECM) you can reduce fan energy consumption by 50-75%.

EVAPORATOR FAN SPEED CONTROLS

- Adding controls to vary the speed of evaporator fan motors in walk-in coolers and freezers can provide between 13-59% energy savings compared to using standard shaded pole and permanent split capacitor motors without speed controls.

LOW-HEAT AND NO-HEAT DOORS

- Replacing standard refrigerated case doors, which incorporate electric resistance heaters in the door, with more efficient doors that have a smaller electric resistance heaters (low heat doors) or no heaters at all (no heat doors) can provide significant door energy savings in the range of 20-100%.
- Cuts Compressor Runtime: Less heat means the refrigeration system runs less, which is a huge energy saver, as refrigeration is 50% of a supermarket's energy bill.
- Improves HVAC Efficiency: By keeping cold air in and warm air out, less energy is needed for air conditioning and heating.

FLOATING HEAD PRESSURE CONTROLS

- Reducing the compressor discharge pressure reduces the pressure ratio across the compressor and improves operating efficiency. Many systems have controls that maintain a minimum condensing pressure to ensure proper operation of all components. By using head pressure controls to lower condensing pressure during cooler ambient conditions, refrigeration systems can operate more efficiently and save energy.
- Floating head pressure controls typically offer significant savings. Annual energy savings often range from 5-15% for general systems, but can reach 20-40% or even higher (up to 45%) in cooler climates or with advanced VFD retrofits.

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Rebate Application

BUSINESS MEMBER INFORMATION

Business Name _____
Installation Address _____
City _____ State _____ ZIP _____
Contact Name _____ Account # _____
Email _____ Phone _____

REBATE RECIPIENT

To release the rebate incentive check to an alternate party other than the cooperative business member, the member must specify an alternative mailing address and authorize with a signature below.

Please send rebate to (check one):

☐ Business Member ☐ Alternative Recipient

Recipient Name _____
Mailing Address _____
City _____ State _____ ZIP _____
Contact Name _____

WARRANTY INFORMATION

Rebate qualifications do not imply any representation or warranty of such equipment, design or installation by the cooperative. The cooperative shall not be responsible or liable for any personal injury or property damage caused by this equipment. The cooperative does not guarantee that a specific level of energy or cost savings will result from the implementation of energy conservation measures or the use of products funded under this program. In no event shall the cooperative be liable for any incidental or consequential damages.

ADDITIONAL PROGRAM RULES

1. Installation must be complete before application is submitted and funds are issued.
2. To ensure installed equipment meets the cooperative's performance standards, members and vendors must submit itemized equipment invoices, along with rebate application and equipment specifications.
3. All equipment must be ENERGY STAR certified.
4. Rebates must be applied for within 12 months of invoice date.
5. The cooperative reserves the right to conduct random inspections of installations.
6. The member is responsible for checking with the cooperative to determine funding availability and to verify program parameters.
7. Project must comply with all program specific rules and qualifications.
8. The rebate shall not exceed 50% of total project cost. Total rebate limited to **\$X.XX** per member account annually.

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Rebate Application

ECM Compressor/Condenser Fan Motors

Manufacturer _____ Model _____

Motor Size		Rebate Amount	Quantity
1/20 HP	New construction eligible	\$5/Motor	
1/15 HP	New construction eligible	\$10/Motor	
1/10 HP	Not eligible for new construction applications	\$10/Motor	
1/6 HP	Not eligible for new construction applications	\$10/Motor	
1/3 HP	Not eligible for new construction applications	\$15/Motor	
1/3HP–1HP	Not eligible for new construction applications	\$15/Motor	

Existing Motor Type: ☐ Shaded Pole Motor ☐ Permanent Split Capacitor Motor ☐ Unknown
Refrigeration Type: ☐ Cooler ☐ Freezer

ECM Evaporator Fan Motor Retrofit

Manufacturer _____ Model _____

Refrigeration Type: ☐ Cooler ☐ Freezer (select one)
Entry Type: ☐ Reach In ☐ Walk In (select one)

	Motor Size		Rebate Amount	Quantity
HP Range	<1/20 HP, 1-15 watts	Not eligible for new construction applications	\$5/Motor	
	<1/20 HP, 15-23 watts	Not eligible for new construction applications	\$5/Motor	
	1/20 HP	Not eligible for new construction applications	\$5/Motor	
	1/15 HP	Not eligible for new construction applications	\$10/Motor	
	1/10 HP	Not eligible for new construction applications	\$10/Motor	

Multideck Case Doors

Cooler Combined Case Length (ft) Rebate \$10/ft
Freezer Combind Case Length (ft) Rebate \$30/ft

- Not eligible for new construction

Anti-Sweat Heat Control

Install anti-sweat heat controls to the following door types to receive the rebates shown in the table below.

		Door Quantities	
Door Type	Rebate Amount	Cooler Doors	Freezer Doors
Low Heat Door	\$30/Door		
No Heat Door	\$10/Door		
Standard Door	\$50/Door	N/A	

Controls Type: ☐ Humidity ☐ Conductivity

*If multiple controls types are used, please submit two separate tables

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Rebate Application

Case Night Covers

	Refrigerated Case Temp		
	-35 to -1°F	0 to 30°F	31 to 55°F
Total Length (ft)' of Cooler Case Covers:			
Rebate per ft	\$2/ft	\$1/ft	\$1/ft

Strip Curtains for Walk in Freezers and Coolers

Facility Type:	Cooler Door Quantity	Rebate	Freezer Door Quantity	Rebate
Supermarket		\$150		\$450
Convenient Store		\$15		\$20
Restaurant		\$25		\$100
Refrigerated Warehouse		\$300		\$300

Demand Defrost Controls

Total wattage of defrosting elements controlled (kW) \$15 per kW Connected

Measure notes:

- Timers do not qualify as demand defrost controls
- Rebate is rounded down to nearest 0.5kW

Low Heat No Heat Doors

Enter quantity of doors in the table below in the appropriate categories:

Number of Doors	Application Type	Upgrade Description	Rebate
	Freezer	standard door to low-heat door	\$30/Door
	Freezer	low-heat door to no-heat door	\$30/Door
	Cooler	low-heat door to no-heat door	\$15/Door

Floating Head Pressure Controls

Space Type: ☐ Refrigerator ☐ Freezer
Condenser Type: ☐ Condensing Unit ☐ Remote Condenser

Compressor Horsepower \$30/HP

Please note:

- For commercial ice machines & commercial fridge/freezer units see the commercial food service application