

FOCUS ON EMERGING TECHNOLOGY

DEMAND DEFROST CONTROLS

Technology Description

Demand defrost or defrost optimization technology is software designed to replace mechanical and digital defrost controls. Defrost optimization controls are available on walk-in evaporators and on freezer cases if they are operated by case controllers.

Typical defrost systems have a set timeframe and duration for defrost cycles. These systems complete a defrost cycle regardless of the freezer case conditions. Defrost optimization controls reduce energy used by the refrigeration system by precisely monitoring evaporator coil conditions. When the coil conditions indicate a defrost is required, the controls either initiate a defrost (smart or adaptive defrost controls) for the amount of time required to clear the coil of ice, or wait until the next allowed “defrost time” to initiate defrost (demand defrost). If evaporator coil conditions indicate ice is not forming on the coils, the defrost will be skipped. After a defrost cycle has completed, most new defrost controls allow refrigerant to flow into the evaporator to cool it down before the fans turn on. This prevents blowing warm air over frozen product.

Defrost optimization controls can be purchased integrated into new evaporators and cases or retrofitted onto existing equipment. Incremental costs are dependent on each manufacturer and typically range between \$400 and \$600 per evaporator.

Benefits

- Significantly reduces product and walk in temperature fluctuation.
- Saves energy through shorter defrost cycles by eliminating unnecessary defrosts
- Significantly reduces ice formation on floors, ceilings, and product.

Customer Type

Grocery and convenience stores, restaurants, hospitals, food processing, schools (list is not all inclusive).

Applications

All walk-in freezers, freezer cases.

Market Sectors

Agriculture, Commercial, Industrial, Schools, Government.

Potential Energy Savings

Average energy savings on a per fan basis for low profile evaporators (typical walk-in freezer evaporators) is 273 kWh / year. Assuming \$0.15 / kWh, this could result in \$41 per year in energy savings. This assumes the system is operating with shorter defrost cycles (40% energy savings) or skipping defrost cycles (75% energy savings).

Potential Payback Range

Facilities replacing three or more motors can expect a payback of 3 to 5 years. Facilities replacing fewer than three motors results in a payback between 7 and 15 years when considering electricity savings only*.

Rebates Available

Prescriptive incentives are available for PMSM installed in refrigeration applications.

Download the [Commercial Refrigeration catalog](#) to learn more or [Find an Energy Advisor](#) to get started.

REDUCING ENERGY WASTE ACROSS WISCONSIN

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