



Korean Supermarket Improves Refrigeration Performance by 20% with Copeland™ Variable Speed Integrated Solutions

Challenges to ensuring food safety and reducing energy costs

Retailers are seeking new growth opportunities in their offline stores to offer their customers low-cost, fresh and convenient foods and non-food products. To complicate matters, rising average summer temperatures create further demands in terms of food safety management. As a result, supermarkets have become much more focused on solutions that can help safeguard the quality of their food and other popular products.

Positioned as Korea's most approachable and consumer-friendly store, a local chain supermarket is constantly striving to improve its customer value proposition by offering quality products. The company also wanted to add value to its supply chain by maximizing energy efficiency and cost savings.

They chose Emerson's Copeland integrated solutions - delivering high-performance, energy efficiency and operational stability. Following the installation, The supermarket's refrigeration coefficient of performance (COP) was improved by 20%, with year-round fresh food safety. The company also saw a reduction in overall life-cycle costs, and savings of up to 20% in annual power consumption, thanks to the Copeland variable speed solutions.

Project Background

The Korean chain supermarket needed a solution that could provide stellar refrigeration performance and operational stability in a high-temperature environment – ensuring food quality and safety even on the hottest summer days. Additionally, they needed an efficient and reliable solution to meet the unique requirements of a supermarket environment – such as space, location and staffing – which are quite different from those of large retailers.

On testing Copeland's drive and controller package, optimized with variable speed compressors, the company observed the system's stable high-performance, energy efficiency and overall reliability. Based on their years of know-how and experience in several locations, the Korean supermarket decided to adopt the package at its stores.

Challenges

The supermarket needed to operate a refrigeration system in a relatively limited space when compared to larger retailers, and to use quieter compressors to reduce noise pollution and inconvenience to the public in city center locations. It also required proven system reliability to minimize additional staffing needs, specifically in the area of safety management.

Solutions

The supermarket chain installed Copeland compressor, drive and controller package, utilizing variable speed refrigeration condensing units. The Emerson variable speed compressor delivers system stability and high-efficiency, based on reliable refrigeration performance and vapor injection technology, and ensures reduced noise and vibration. The system is a foundation for their business expansion built on safety and stability.





Benefits



Low Sound

Adoption of Copeland variable speed compressor – which produces significantly lower noise when compared to semi-hermetic reciprocating compressors and supports part load operation that enables low noise running – supported the business growth without inconveniencing neighbors and nearby residents.



Food Safety

Emerson's pre-validated compressor, drive and controller reduced downtime and services calls, and improved food safety and quality by keeping fresh goods in optimal conditions.



Accurate Control

Use of Copeland variable speed compressors, which easily enables the matching of the operating range and speed to the refrigeration load through an enhanced control algorithm, achieving precise evaporating temperatures and improving refrigeration efficiency.



20% Increased Efficiency

By adopting a variable speed compressor equipped with vapor injection technology, refrigeration performance and part load modulation was enhanced, successfully reducing the overall life-cycle cost.



Premium Protection & Diagnostics

Emerson's CoreSense technology enabled the deployment of an optimal compressor algorithm to protect the drive, detect the maximum operating current, and shield the compressor and drive from unfavorable conditions such as over-current and over-heating which to boosts overall performance reliability. CoreSense technology allows for faster and more accurate system diagnosis, maximizing system uptime.



Intelligent Store

The intelligent store solution installed on Emerson's controller and drive offers an integrated monitoring solution for refrigeration facilities, allowing operators to monitor each unit's running condition, and thus make better decisions to optimize resources and enhance profitability.



Green Refrigerant

Use of the R404A refrigerant in place of R22 (the most representative chlorofluorocarbon-type refrigerant that is known for its damaging impact on the earth's ozone layer) enables a significantly more environmentally friendly operation. Copeland compressors are also rated for R448A/R449A refrigerants with low GWP.

Future Plans

The Korean supermarket chain plans to upgrade existing 5 HP compressors with 7.5-20 HP compressors at every supermarket location. The firm is also closely reviewing its current refrigerant system using R404A refrigerant, with the intention of shifting to a more eco-friendly refrigerant technology, reducing its impact on global warming, within the coming two-to-three years.

From the Customer



Emerson provided us with a comprehensive refrigeration package solution equipped with outstanding compression performance and durability and founded on their 25 years of expertise in the scroll compressor area. By adopting Emerson's solution, we were able to guarantee food safety and quality and to minimize operating costs, and this enabled us to stay true to our brand mission of valuing low-cost and consumer convenience.



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