

Supermarket more eco-friendly using Copeland Scroll® compressors

Result

- Reduced refrigerant charge from 1,800 pounds to 275 pounds
- Reduce refrigerant leakage by 475 pounds per year
- Equivalent to six per store
- Reduced CO2 emissions 1.5M pounds per store
- 50 – 75% less field refrigerant piping and braze joints

Application

Distributed refrigeration system for supermarket.

Customer

Whole Foods Market with more than 300 stores nationwide.

Challenge

Whole Foods Market wanted to build an environmentally friendly supermarket with energy efficient refrigeration systems. Traditional parallel rack refrigeration systems have long runs of copper pipe and large refrigerant charges, which increases the opportunity for refrigerant leaks. Distributed refrigeration systems incorporate tight suction groupings and close proximity to the evaporator load which can increase energy efficiency compared to traditional DX rack systems.

To minimize their carbon footprint, Whole Foods Market took into consideration several factors, including Total Equivalent Warming Impact (TEWI), high energy efficiency, reduced use of refrigerants, low rate of refrigerant leaks, and reduced use of copper piping and other materials.



Solution

Distributed refrigeration systems use compact multiple compressor refrigeration units. Unlike back room systems, individual units are “distributed” throughout the store or on the roof, close to the display case loads. This reduces the amount of refrigerant in the system while increasing energy efficiency. Whole foods market chose a distributed refrigeration system which uses high efficiency, vapor injected Copeland Scroll compressors for both low and medium temperature applications. This produces the most energy efficient refrigeration option available for virtually all food store applications.

This distributed refrigeration system uses less refrigerant than backroom rack systems because they are placed closer to their load. This means 50-70% less piping and 60-80% less refrigerant, which reduces costs while significantly helping to protect the environment.

For low temperature applications, the refrigeration system uses high efficiency vapor injected scroll compressors in a parallel configuration. The economizer cycle enhances the system performance by subcooling the liquid refrigerant via “mid-pocket” interstage injection. Traditionally, this feature has only been available on large commercial screw compressors, but is now available with vapor injected scroll compressors.

The Copeland Scroll compressors used in medium temperature units have been specifically designed for energy saving performance. The design has been optimized to provide improved efficiency at lower condensing temperatures while maintaining efficiency and capacity at typical design conditions. design conditions.

Resources

Learn more about the Copeland Scroll Compressor at:
EmersonClimate.com



EmersonClimate.com

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