

COPELAND DIGITAL SCROLL COMPRESSORS

Digital compression and temperature monitoring extend product life

Long-term apple cold storage requires precise control of temperatures in a controlled atmosphere environment.

This apple orchard replaced a dozen traditional outdoor refrigeration condensing units with air-cooled outdoor modulating condensing units and remote monitoring.

Result

- Condensing unit cycles less often by matching load from 20-100%
- Estimated \$7,000 energy savings compared to units with hot gas bypass modulation
- Seamless integration with smart unit cooler and remote monitoring
- Precise setting and tight control over box temperatures
- Copeland™ compressor electronics technology diagnostics protection
- Slim profile opens up floor space for operations

Customer

Chazy Orchards in Upstate New York is the home of the "Largest McIntosh Apple Orchard in the World". Originally planted in the 1920's, Chazy Orchards annually produces nearly 300,000 bushels of the finest apples in the world. The work was performed by Crosby-Brownlie, a family-owned HVAC/R service company in Rochester. System components and controls were provided by Meier Supply, an employee owned HVAC/R wholesale distribution business.

Challenge

Chazy Orchards wanted to add four additional controlled atmosphere rooms for apple storage at their orchards in West Chazy, New York. The rooms are exposed to outdoor ambient temperatures and experience large load variations from summer to winter. The load peaks when the rooms are loaded, and falls off significantly once the rooms are sealed and at target temperature. Each room requires up to 15 horsepower of refrigeration units, but the farm has only single phase power available. Traditional units either need to cycle frequently to maintain temperatures, or incorporate inefficient hot gas bypass modulation. The orchard wanted their service company to have remote access, control, and remote monitoring capabilities for the refrigeration systems.

Solution

Precise temperature control and significant energy savings are now available with the Copeland digital outdoor refrigeration unit, X-Line Series. Building on the field-proven Copeland scroll compressor and X-Line outdoor condensing unit platforms, the digital X-Line

“ With the capacity modulation of the Copeland digital scroll compressors, on board protection and diagnostics of the Copeland X-Line units, and EEV’s and smart defrost capabilities, Chazy Orchards has highly efficient systems and precise control over the room and product storage conditions for maintaining the integrity of their product for extended time. ”

Michael Nohle

Refrigeration Division Manager
Meier Supply Co., Inc.

Series delivers superior cooling and energy efficiency for walk-in coolers and remote display cases—helping owners and operators to manage their refrigeration and food safety needs. The contractor was able to install three single-phase five horsepower units for each room that can each modulate down to 20 percent capacity.

Digital modulation enables owners to maintain much more precise setting and tight control of temperatures. This helps operators minimize temperature deviations in refrigeration fixtures so that food is kept safe and at maximum quality. The digital X-Line Series combines compression technology with variable speed fan motor control, large-capacity condenser coils, and smart protection and diagnostics to meet today’s challenging refrigeration requirements.

Chazy Orchards will save an estimated \$7,000 a year in electricity with the digital X-line, compared to units with hot gas bypass modulation.

Built-in compressor electronics technology allows operators to take action to minimize product loss from equipment downtime. Errors can be quickly communicated to service technicians, and the system can make changes to protect against faults that might otherwise cause a compressor failure. Operators can expect improved reliability, an extended compressor lifespan and greatly reduced lifecycle costs.

Site Supervisor is a flexible facility control platform giving operators powerful control over key systems. Optimized for commercial facilities, Site Supervisor manages refrigeration, HVAC, lighting and other critical equipment and systems. It collects and analyzes data, generating key performance indicators, allowing operators to quickly improve customer experience, protect food safety and enhance sustainability.



Michael Nohle, Refrigeration Division Manager for Meier Supply Co., Inc, says that Copeland’s Site Supervisor gives Chazy Orchards the ability to locally and remotely track and monitor room and product temperatures as well as all operating conditions, as well as data logging for up to 60 days. They can also receive caution alerts and full alarm alerts via email or text messaging.

The digital X-Line Series’ slim profile, lightweight design and wall-mount option give operators the flexibility to install the units, even in locations with significant space constraints. In fact, digital X-Line Series units are so unobtrusive they’re often mistaken for an AC split unit.

This helps operators lower installation costs and avoid expensive system design workarounds and/or relocation issues. The digital X-line Series can even be applied to systems featuring multiple evaporators.

Operators located near residential areas or noise-restricted zones benefit from using the quietest standard unit available. Under most expected operating conditions, the units produce less sound than a normal conversation. In most applications, noise from the digital X-Line Series is practically undetectable. The units are discrete and allow more mounting options where the sound produced by traditional units might prevent their use, such as customer-facing locations near entryways, patios or even indoors.

Diagnostic features



Onboard diagnostics provides connectivity to facility management control systems (including Copeland’s Site Supervisor suite of control products) to alert owner/operators of faults and key performance indicators (KPIs).

- Over-current protection
- Incorrect phase detection
- High-pressure lockout
- Flood-back prediction
- Demand Cooling™
- Flooded start protection (“bump-start” logic)
- Discharge temperature protection
- Anti-short cycle time delay
- Digital fault code display/remote alarming
- Over/under voltage protection

Resources

Learn more about the Copeland digital outdoor refrigeration unit, X-Line Series at Copeland.com/en-us/products/refrigeration/commercial-refrigeration/digital-x-line

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