



The Evolution of **Predictive Protection**



Copeland Scroll™ Outdoor Refrigeration Unit offers advancements in efficiency, uptime and flexibility.

For years, the outdoor refrigeration condensing unit has been the workhorse of small- and large-format food retailers. It's called upon to endure extreme climates and continuously support walk-in refrigerator and freezer operations.

With energy costs rising, corporate sustainability goals increasing, and embedded electronics and equipment technologies emerging, many food retailers are looking to add efficiency and eco-friendliness to their refrigeration checklist. The Copeland Scroll Outdoor Refrigeration Unit (X-Line) is Emerson Climate Technologies' answer to those

questioning the long-term practicality and viability of their refrigeration technology.

Addressing this need in the market is not new to Emerson — X-Line units were introduced to North America back in 2008. The new, second generation X-Line (X-Line 2.0) builds upon the technology of the original models to offer best-in-class energy efficiency, uptime and flexibility, all while providing advanced diagnostics and protection from an integrated suite of electronic controls.

Unique Proactive Diagnostics

What is most unique about X-Line 2.0 compared to others in the industry is the

comprehensive range of system protection it offers. Based on a fully integrated electronic control system that combines pressure, defrost, electronic valve, fan speed, diagnostics and communications controls into one modular control, X-Line 2.0 offers comprehensive control, protection and smart store technology that meets the demands of modern food retail requirements.

Using our proven CoreSense™ technology for Copeland compressors, the unit's controls and sensors are designed to provide both proactive and reactive protection. Issues are not only detected as they occur — including problems such as lost phase,

incorrect phase, high pressure, high discharge temperature and compressor overheating — but also before they occur.

X-Line 2.0 is always on alert for things in the system that could cause problems — liquid floodback, compressor short cycling and low voltage conditions, for example. The proactive diagnostics even protect bearings from wear caused by flooded starts. This level of protection and diagnostics allows system issues to be identified before case temperatures rise and product is lost.

When a system issue is identified, the on-board diagnostics and time-stamped data log provide refrigeration contractors an unparalleled level of information to help quickly and accurately correct the system. The advanced knowledge provided by CoreSense has been shown to improve service technician accuracy and reduce call-backs.

As we have studied the effectiveness of units with CoreSense technology compared to units without CoreSense, we found a 75 percent difference (92–17) in accuracy among entry-level technicians, and a 37 percent difference (100–63) in accuracy among experienced technicians. Warranty costs are also significantly reduced.

Increase Efficiencies

X-Line units utilize Copeland Scroll compressors and contain variable speed PSC fan motors, both of which are highly efficient with industry-leading low noise levels. The compressors are compatible with the emerging class of newly approved, low-GWP refrigerants — including R-450A, R-513A, R-448A and R-449A — making them compliant with new EPA standards and eco-friendly. The fan motors optimize air flow for maximum heat transfer and are compliant with CEC and national standards.

The condenser's sizing has been optimized as well, with large coils and integrated electronic controls, which, when combined with the variable speed fans, enable the unit to operate at maximum efficiency. This design not only meets the DOE's annual walk-in efficiency factor (AWEF) standards, it also supports low-condensing operation, which provides 15–20 percent energy efficiency ratio improvements for every 10 °F drop in head pressure.

At test sites, users are saving 20 percent on average in energy costs with X-Line 2.0 units compared to other units, making it ideal for walk-in coolers and freezers, reach-in display merchandisers,

and even new, outside-the box-applications. See our energy savings calculator here: <http://xjenergycalc.emersonclimate.com/xjenergycalc/>.

Maximize Uptime

X-Line's electronic controls provide the advanced diagnostics and complete system protection to prevent catastrophic compressor failures and accelerate the repair process. By preventing damage that would otherwise require a compressor replacement, costly downtime is avoided and repairs are unnecessary. The system's on-board diagnostics codes and data log allow refrigeration contractors to quickly and accurately diagnose system issues, reducing downtime due to troubleshooting and misdiagnosis.

X-Line's communication capabilities further enable advanced warnings and improved uptime. By connecting the unit to a site supervisory control — such as an E2 controller or ecoSYS Site Supervisor available from Emerson, or other controls available from third parties — system issues can be identified and scheduled for repairs before leading to a system failure or product loss. Some issues can even be diagnosed and repaired remotely.

A New Standard in Refrigeration Flexibility

X-Line has many attributes that make it the most versatile and flexible refrigeration unit available today:

- **Lightweight** — 30 percent lighter than other units, X-Line can often be used when other units may require new roof support structures.
- **Quiet** — at the low sound level of 55 decibels, X-Line units are ideal in noise-restricted residential areas; they have been installed only feet away from hotel windows, and even inside big-box stores on top of refrigeration cases.
- **Small footprint** — allows the X-Line units to also be installed on a wall, or reduces required space when mounting on a roof or on the ground.
- **Corrosion resistant** — with galvanized and powder-coated steel construction, and a hydrophilic condenser fin coating, the X-Line is resistant to the corrosive salt air of coastal regions.
- **Extreme ambient conditions** — large condensers and demand cooling allow operation in up to 120 °F ambient, while a heated and insulated receiver, condenser check valve, variable speed fan, and low pressure control time delay allow operation down to -40 °F.
- **Operates with multiple refrigerants** — compatible with R-404A as well as many of the new EPA-approved refrigerants, including: R-407C/A, R-448A, R-449A, R-513A, R-450A; makes X-Line units suitable for both new equipment and service replacement applications.