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TO: Refrigeration Original Equipment Manufacturers
FROM: Emerson Climate Technologies, Inc. – Refrigeration Division
SUBJECT: Copeland PerformanceAlert™ Modules

We are pleased to announce the latest advancement in compressor control, protection and diagnostics with the Copeland PerformanceAlert™ for refrigeration systems.

The Copeland PerformanceAlert diagnostics module is a breakthrough innovation for troubleshooting refrigeration system faults. By monitoring and analyzing data from Copeland® brand compressors, the Copeland PerformanceAlert module can accurately detect the cause of electrical and system related issues. When an issue occurs, the Copeland PerformanceAlert communicates an alert through a flashing LED indicator on the module and through modbus communication, guiding the service technician to identify the root cause of a problem quickly and accurately. The module can be applied in many refrigeration applications such as supermarket racks, walk-ins and industrial refrigeration.



Figure 1:
Copeland PerformanceAlert™

The type of compressor and its application determine which version of Copeland PerformanceAlert module is required. The table below lists the part numbers of each module associated with each compressor type.

Table 1
Copeland PerformanceAlert Part Numbers

Compressor Type	Single Pack P/N	Bulk Pack P/N
1-phase Scroll Or Reciprocating	943-0053-00	543-0053-03
3-phase Scroll	943-0057-00	543-0057-05
3-phase Reciprocating	943-0055-00	543-0055-04

Advanced Protection

The Copeland PerformanceAlert diagnostic module detects adverse situations that can affect the compressor or system behavior and flashes alert codes when those faults are detected. It also has the capability to protect the compressor from potentially harmful operating conditions and premature compressor failures. When the compressor experiences severe conditions such as high discharge temperature, locked rotor, missing phase or reverse phase, the Copeland PerformanceAlert module takes action and shuts down the compressor, preventing permanent compressor damage and/or failure. When shutting down the compressor, Copeland PerformanceAlert can either trip the compressor and automatically reset after a certain time has passed, or lock-out the compressor until a service contractor can service the system. In addition, the module has a built-in phase protection feature which protects the compressor against adverse power conditions such as missing phase and reverse phase. Another benefit is the built-in anti-short-cycling feature, which guarantees the compressor meets a minimum On and Off time for each compressor demand cycle.

Diagnostics

Using the compressor as a sensor, the Copeland PerformanceAlert module provides 11 fault codes (listed in Table 2), key compressor attributes, and compressor history that helps contractors improve speed and accuracy of system diagnostics and problem solving. Getting the equipment repaired correctly on the first visit is a key objective for every contractor.

Table 2: Alert Codes

Alert Codes	System Conditions
Code 1	High Discharge Temperature
Code 2	System Pressure Trip
Code 3	Short Cycling
Code 4	Lock Rotor
Code 5	Open Circuit
Code 6	Missing Phase
Code 7	Reverse Phase (Scroll Only)
Code 8	Welded Contactor
Code 9	Low Voltage
Code 10	Lost Communications
Code 11	Discharge Line Temperature Sensor Failure

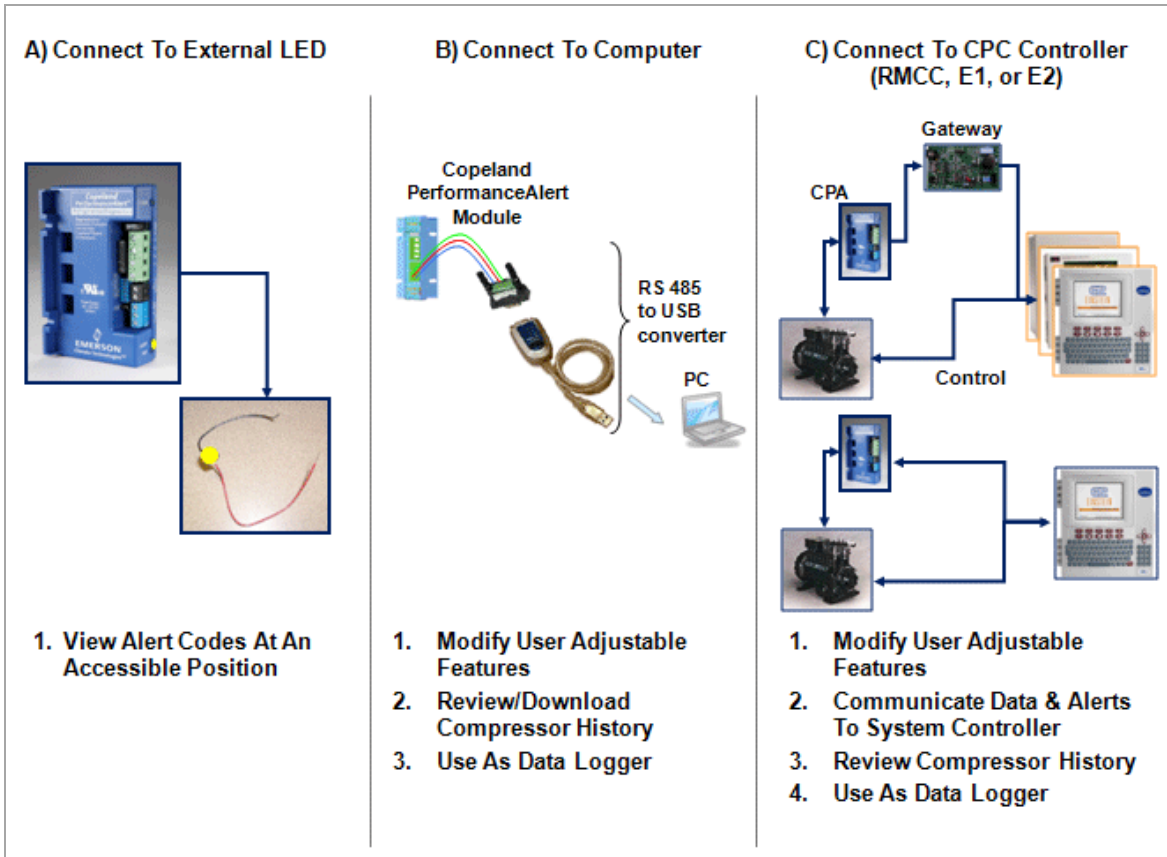
By utilizing Copeland PerformanceAlert, the contractor can identify the status of the system visually via the module's LEDs, and obtain detailed compressor information including history through the module's modbus communication to either an energy management system such as an E2 or a PC as shown in Figure 2. The modbus communication capability also expands Copeland PerformanceAlert's assistance in troubleshooting by allowing the module to be used as a data logger and by enabling remote monitoring of the data.

Industry Recognition

The Copeland PerformanceAlert diagnostic module has been recognized by the industry as a cutting edge technology which has won two industry awards, the 2008 Dealer Design Award and the 2009 AHR Expo Innovations Award.



Figure 2: Copeland PerformanceAlert's Communication Capability



Additional product performance, electrical, and mechanical information can be accessed online on the Emerson Climate Technologies website, www.emersonclimate.com/copelandperformancealert or by logging into the Online Product Information. Further product detail is also available in the Application Engineering Bulletin AE8-1328.

For additional information, please contact your Sales Representative, Application Engineer, or Customer Service Representative.