



# Copeland Discus™ with CoreSense™ Diagnostics

January 2011



# ***Discus with CoreSense Diagnostics Case Studies***

## **Supermarket In Columbus, Ohio Saves \$4,500 With Discus with CoreSense Diagnostics**

Discus with CoreSense Diagnostics Locked Out Compressor Due To High Discharge Temp. Investigation Of High Discharge Temp Lead To Discovery Of High To Low Leak In Valve Plate. Copeland Discus with CoreSense Diagnostics Prevented Compressor Failure Resulting In Technician Replacing Valve Plate Instead Of Replacing Entire Compressor. Store Saves Approximately \$4,500.



## **Discus with CoreSense Diagnostics Technology Prevents Delay Of Store Opening Of Supermarket Location In North Carolina**

During System Installation, Contractor Started Compressors With Liquid Lines Incorrectly Piped Into Suction Header. When Compressors Started, Large Amounts Of Liquid Filled Suction Header And Compressors. Discus with CoreSense Diagnostics Detected The High Discharge Temperature And Pressure, And Instantaneously Locked All Compressors Off, Preventing Damage To The Compressor, Avoiding Delay Of Store Opening.

## **The Fault Detection And Protection Of Discus with CoreSense Diagnostics Saved Supermarket In Stone Mountain, GA, Approximately \$6,000**

One Leg Of Contactor Failed Sending Only 2 Phases Of Power To Compressor. Discus with CoreSense Diagnostics Immediately Shut-Off Compressor & Displayed "Single Phase Fault". Technician Reset Compressor To Restore. Contactor Completely Failed Sending No Power To Compressor. Discus with CoreSense Diagnostics Displayed "No 3-Phase Power" Which Prevented Compressor Failure Resulting In Technician Replacing Failed Contactor Instead Of Replacing Entire Compressor. Store Saves Approximately \$6,000.

# ***Hear What Customers Are Saying About Discus with CoreSense Diagnostics***

---

***“Discus® with CoreSense Diagnostics Is Simple – It Takes The Guess Work Out Of Troubleshooting.”***

***“Discus® with CoreSense Diagnostics Is A Good Thing...Technicians Are Benefiting From The Simplicity Of Troubleshooting.”***

***“When The Compressors Were Introduced To A Large Amount Of Liquid Because Of An Contractor Installation Error, Discus® with CoreSense Diagnostics Prevented My Compressors From Failing.”***

***“It Is Very Difficult To Find Good Technicians...This Product Makes Inexperienced Technicians Better.”***



# Copeland Discus with CoreSense Diagnostics = Simplified System With Advanced Protection & Control, Diagnostics And Communications

## Key Elements Efficiently Utilize Resources:

1.

### Simplified Rack With Fewer Components And Fittings

- Improves Compressor Reliability
- Simple, Fast & Consistent Installations
- Reduced Refrigerant Leak Points

2.

### Protection And Control From Integrated System Electronics

- Improves Compressor Reliability
- Simple, Fast & Consistent Installations
- Reduced Food Spoilage

3.

### Predictive Diagnostics

- Early System Detection Identifies Minor Conditions Avoiding Major Problems
- Improves Troubleshooting Diagnosis



4.

### Remote And On-Board Communications

- Technicians Can Troubleshoot Problems Before Traveling To The Site



1.

# Fewer Components Provide Simplified Solutions And Reduces Leak Points

## Components Removed:

### *(Compressor)*

- Oil Protection Module
- High Pressure Cut-Out
- Low Pressure Cut-Out
- Current Sensing Relay
- Oil Failure Relay
- Time Delay Relay

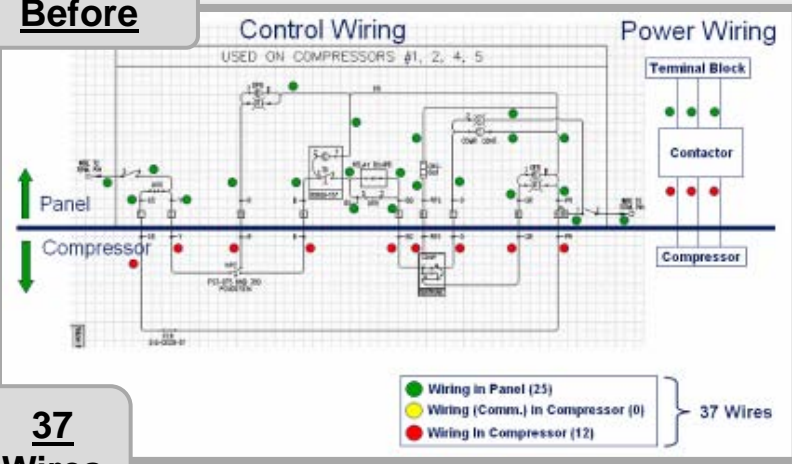
### *(Panel)*

- Relay Output Board
- Phase Monitor
- Lights
- Wire
- Conduit (24")
- Input Board (25%)



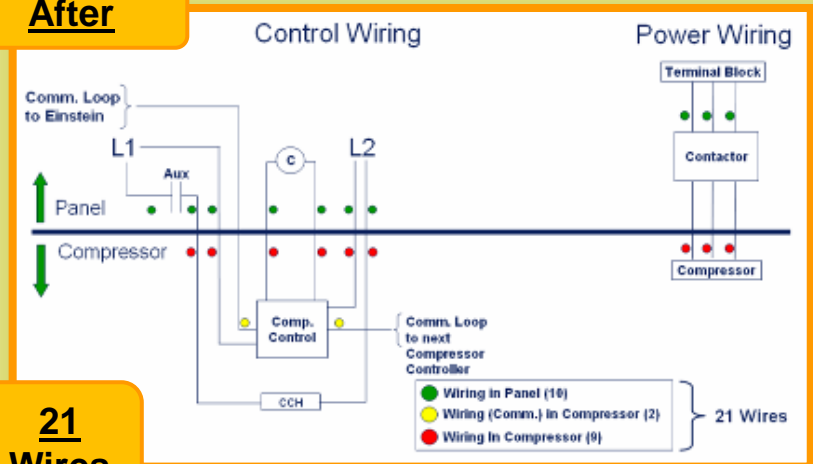
## 40% Reduction In Compressor Wiring

### Before



37  
Wires

### After

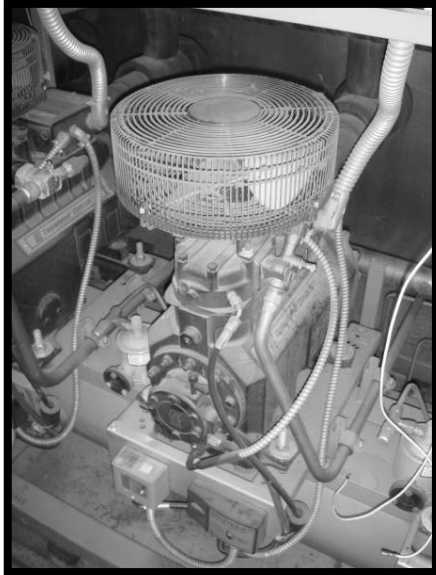


21  
Wires

2.

# **Integrated System Electronics For Protection And Control Are Built-In Standard Features**

**Before**



**After**



**Applicable On 2D, 3D, 4D, & 6D  
Discus<sup>®</sup> Compressors**

**Demand Cooling (R22, R-407A, R407C) –  
Under Development**

## **Enhanced Protection & Features**

- **Additional Motor Protection**
- **Power Interrupt Protection**
- **Welded Contactor Protection**
- **Discharge Temp Protection (Head Probe)**
- **Compressor Proofing**
- **Simplified Commissioning**
- **Comp Display – Status, Current, DLT**
- **Diagnostic/Troubleshooting Aid**
- **Communications – Open Protocol**
- **Software Upgradeable**
- **24V Control Circuit**

## **Standard Functions**

- **High & Low Pressure Cutout**
- **Oil Pressure Protection**
- **Motor Protection**

3.

# Predictive Diagnostics Contribute To Early System Detection

## Scenarios Of Early System Detection

LED Status

Display Code

System/Compressor Condition

Benefits / Advantages



Flashing Red

“Voltage”  
“Imbalance Trip”

Voltage Imbalance  
TRIP

Detects Inconsistent Phase-Phase Voltage And Protects Against Damage From Over Heating



Flashing Red

“Low Oil Pressure”  
“Lockout”

Low Oil Pressure  
LOCKOUT

Prevents Compressor Damage From Low Oil – Less System Downtime



Flashing Green

“Normal Running”  
“Low Oil Pressure”

Low Oil Pressure  
WARNING

Detects Low Oil Pressure During Compressor Operation – Warns Of Oil Pressure Condition



Solid Green = Okay



Flashing Green = Warning



Flashing Red = Trip or Lockout

4.

# Two Way Communication Allows Remote Diagnosis And Resetting

On-Board Diagnostics Provide Real-Time Remote Intelligence That Communicates Exactly What You Need To Know To Minimize Cost

Discus with CoreSense Diagnostics Can Centralize Compressor-Monitoring Operations

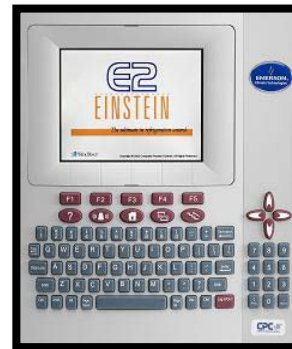
- Allows Technicians To Troubleshoot Problems Before Traveling To The Site
- Technicians Can Be Automatically Dispatched If There Is An Alarm Generated
- Technician Can Reset Compressor Remotely



Analysis / Easy Maintenance



Remote Monitoring



E2 Rack Controller



Control Module



Sensing Modules



Communications Architecture Roadmap



# Emerson Climate Technologies Online Product Information (OPI) Access

- Go To <http://www.emersonclimate.com>
- At OPI Portal Login Click On Register Here Or Type In User Name And Password If You Are Already Registered.
- When You Are In The Contractor Site Select From The Menu On The Right Side Of The Screen.
- OPI Is Especially Helpful For Application Engineering Bulletins:

*For Additional Information see:*

**AE Bulletin No.**

- AE8-1337 R1
- AE8-1351
- AE8-1368

The screenshot displays the Emerson Climate Technologies website interface. At the top, there are navigation tabs for PRODUCTS, SERVICES, RESOURCES, and ABOUT US. Below these, there is a 'Site Actions' dropdown menu. A search bar is visible with the text 'Publication Start Date: Immediately'. The main content area features an article titled 'Discuss with CoreSense™ Diagnostics' with a sub-heading 'Copeland Discus® compressors have long set the standard for reliability...'. To the right of the article, there is a login form with fields for 'User Name' and 'Password', a 'SUBMIT' button, and links for 'Why Register Here?', 'Click to Register', and 'Forgot Password'. The login form is circled in red. Below the login form, there are sections for 'Where to Buy' and 'Looking For Technical Data?'. At the bottom right, there is an image of a piece of industrial equipment.

**OPI  
Portal Login**