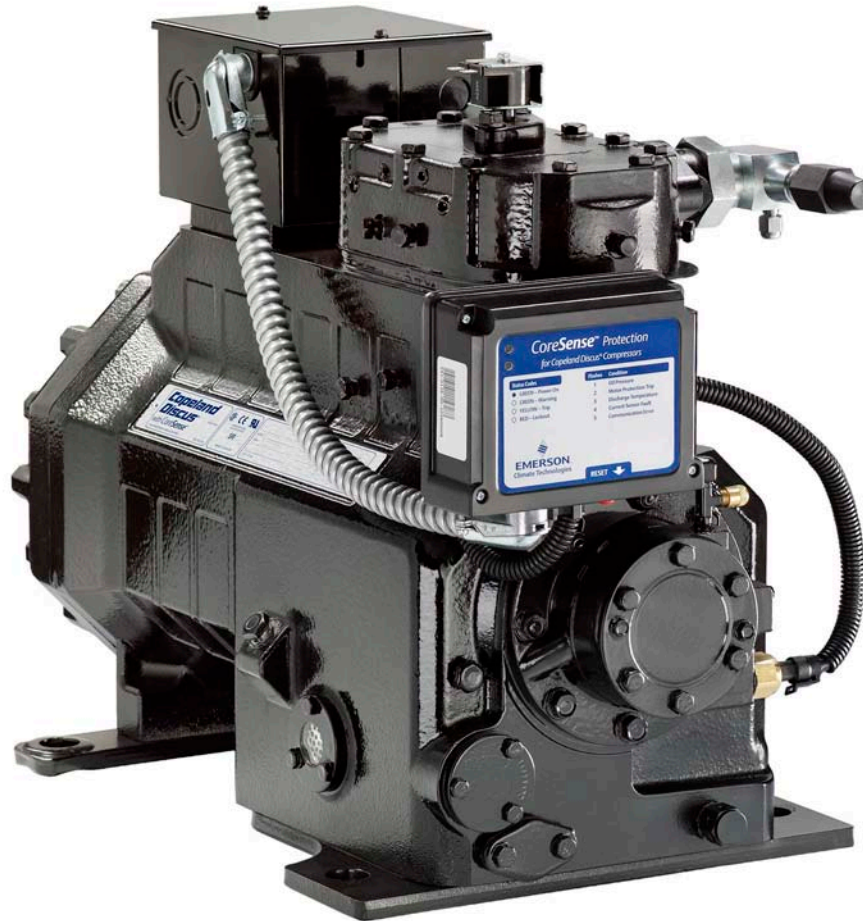# Copeland Discus™ With CoreSense ™ Protection
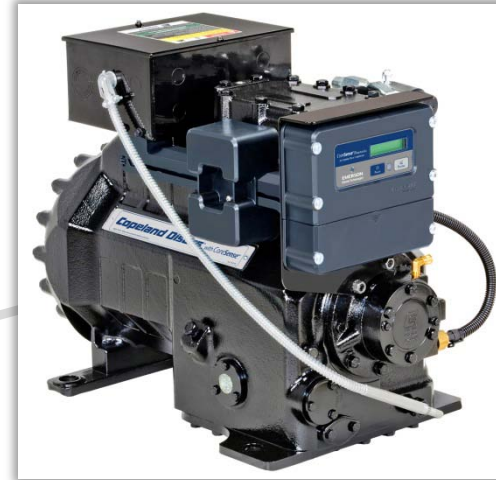
Copeland Discus with CoreSense Technology Provides Higher Value

Value

■ <u>**Copeland Discus With CoreSense Protection**</u>
■ **Basic Protection And Diagnostics**
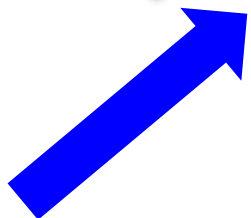 - **Oil & Standard Motor Protection**
■ **Communication On Every Discus**

■ <u>**Copeland Discus With CoreSense Diagnostics**</u>
■ **Applied Cost Savings**
  - **Integration Of Traditional Accessories**
  - **Reduced Wiring**
  - **Reduced Assembly Labor**
■ **Advanced Diagnostics**
■ **Improved Reliability**
  - **Reduced Warranty Costs**
■ **Communications**

All 2D, 3D, 4D & 6D Copeland Discus Compressors Have CoreSense Technology On Board

Copeland Discus With CoreSense Protection vs. CoreSense Diagnostics Feature Comparison

Additional Functionality Available With CoreSense Diagnostics

Integrated I/O Board

Integrated HPCO / LPCO
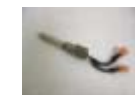
Digital Control

Adv. Motor Prot & Measurement

Optional Field Retrofit

DLT Protection

DLT Protection

Standard

Comm. & Diagnostics

Comm. & Diagnostics

Oil Protection

Oil Protection

Motor Protection

Motor Protection

CoreSense Protection

CoreSense Diagnostics

Copeland Discus With CoreSense Protection - Features

1. Oil Protection
2. Motor Protection
3. Low Oil Pressure Warning
4. Manual Reset
5. Compressor "Jog" Feature
6. External Alarm Relay Contact
7. Oil Warning & Lockout Notification
8. Motor Trip Notification (4D/6D Only)
9. Modbus Communication
10. Remote Reset
11. Compressor Run Status (Proofing)
12. Asset Information
13. Fault And Run History
14. Optional Feature
    – Discharge Line Temp Protection

More Information → Quick, accurate identification → Reliability and cost savings → Freedom to refocus time and money

CoreSense Protection Functionality Comes Standard On All Copeland Discus Compressors

Copeland Discus With CoreSense Protection - Features

1 Oil Protection

- *Functionality*
    - Module Will Shut Down The Compressor When Oil Pressure Falls Below 7-9 PSID For 2 Minutes

- *Features*
    - Precise Electronic Control Module To Monitor Oil Pump Differential Pressure Switch
    - Oil Trip Triggered By 2 Minutes Of No Positive Oil Pressure
    - Provides Alarm Indication Via LED Status Display
    - Communications
    - External Alarms

2 Motor Protection

- *Functionality*
    - Temperature Based PTC Sensors Provide Protection Against High Motor Temps
    - Temperature And Low Voltage Conditions

- *Features:*
    - PTC Temperature Sensor Based Motor Protection
    - Communications
    - External Alarms

Copeland Discus With CoreSense Protection - Features

3 *Low Oil Pressure Warning*

- **CoreSense Protection Will Issue A Warning When Oil Pressure Falls Below 7-9 PSID**

  - **Green LED Will Flash Once As Warning**

4 *Manual Reset*

- **Red Button On Bottom Of Module Can Be Pressed To Reset The Module**
- **Alternately, Power To The Module Can Be Cycled**

5 *Compressor Jog Feature*

- **The Compressor Will Stop As Long As The Reset Button On The Bottom of The CoreSense Protection Module Is Held In.**
- **This Can Be Used For Clearing Liquid During A Start-up.**
- **After The CoreSense Protection Re-boots (Approx 3 Seconds) The Compressor Will Resume Operation If Demand Is Still Present.**
- **The Reset Button May Be Pushed As Necessary To Stop The Compressor.**

External Alarm Relay Contact

6

- **CoreSense Protection Provides a N.C. Auxiliary Alarm Contact**

Copeland Discus With CoreSense Protection - Features

7 *Oil Warning & Lockout Notification*

- **New Communication Feature**
- **CoreSense Protection Module Will Shut Down The Compressor When Oil Pressure Falls Below 7-9 PSID For 2 Minutes**
- **The Oil Pressure Lockout May Be Reset Through The E2, Remotely Through Ultrasite™, Or Other Software If The Reset Option Is Enabled.**

8 *Motor Trip Notification*

- **New Communication Feature**
- **When A Motor Trip Occurs It Is Communicated to the E2 or 3rd Party Rack Controller If Equipped.**

9 *Modbus Communication*

- **Open MODBUS Communication Protocol**
- **Modbus Protocol Is A Messaging Structure Used To Establish Client-Server Communication Between Intelligent Devices**

Copeland Discus With CoreSense Protection - Features

10 *Remote Reset*

- **Enables Restart of Compressors Without Traveling To The Site By Using Ultrasite™ or Other Software If The Remote Reset Option Is Enabled**

- **Enables Restart Of Compressors**

- **The Service Contractor And End User Policies Need To Be Considered When Deciding Whether To Enable Or Disable The Oil Pressure Remote Reset Feature**

11 *Compressor Run Status (Proofing)*

- **Proofing Verifies That The Compressors Is Running As Commanded By The Suction Group Requirements**

Copeland Discus With CoreSense Protection - Features

12 *Compressor Asset Information*

- **The Commissioning Process Uploads Compressor Asset Information (Model And Serial Number) Into The Rack Controller For Future Reference**

- **Useful For Asset Tracking And Service Documentation**

- **Remotely Check The "Name Plate" For Service Replacements**

13 *Compressor Fault History*

- **Compressor Events Are Recorded Within The CoreSense Protection Module**

  - **Last 10 Alarm Codes**

  - **7 Day Alarm Table**

  - **Total Count Of Each Alarm Code**

- **E2 7 Day Alarm Table For CoreSense Protection Shown Below**

Copeland Discus With CoreSense Protection - Features

14 *Compressor Run History*

- **Compressor Run History Is Recorded Within The CoreSense Protection Module Displayed on E2**
  - Accumulated Runtime Hours
  - Runtime Without Good Oil Pressure
  - Number of Compressor Starts
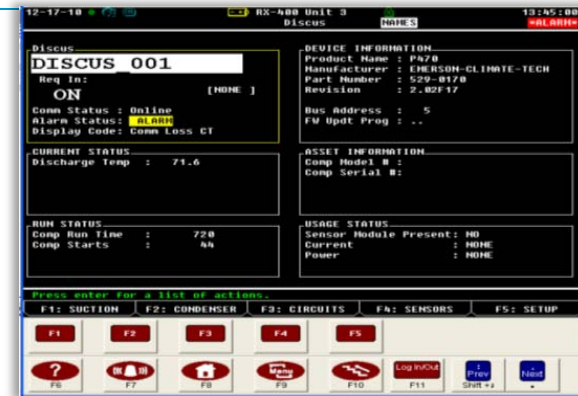
15 **Discharge Temperature Protection** *(Optional)*

- **Provide (3) Additional Alarms**
  - DLT Lockout
  - DLT Trip
  - DLT Thermistor Fault
- **Discharge Temperature Protection Related Alarms are Enabled/Disabled Using A Dip Switch #10**
- **Uses NTC Sensor Probe To Monitor   Discharge Temperature**
- **Default Settings:**
  - Trip Value ≥ 310F For 2 Sec
  - Reset Value ≤ 267F For 2 Sec
  - Alarm : No Reset Required

Discharge Temperature Protection Thermistor

CoreSense Protection
Compressor *Warning* Condition

# Flashes	Green LED - Warning Condition (The Compressor May Run With These Conditions)
1	**Low oil pressure - Indicates that the device has detected low oil pressure for longer than 2 seconds. The compressor is able to run, because not enough time has elapsed without oil pressure to cause a shutdown. The warning will clear if 2 seconds of good oil pressure is detected.**
2	**Not used**
3	**Discharge Temperature Probe Open Or Disconnected - The system is not reading temperature data from the discharge temperature sensor input. The compressor is able to run when this condition is present. The condition will clear if the system reads valid temperature data from the probe for more than 2 seconds.**
4	**Current Sensor Disconnected - The current sensor is not connected to the system. The compressor continues to run. The condition will clear when the current sensor is connected to the module for more than two seconds.**
5	**Communication Error Between CoreSense Protection Module And E2 –** **A. The rack controller is not communicating with the CoreSense module. The compressor continues to run. The condition will clear when a valid message is received from the rack controller.** **B. If the E2 is configured to expect a Sensor Module and none is supplied, the module will flash Code "5"**

CoreSense Protection Compressor *Trip* Condition

# Flashes	Yellow LED - Trip Condition (Compressor Stops until Condition Clear and/or Time Delay has Expired)
1	Not used
2	Motor Protector Trip - The motor temperature as measured by the PTC sensors have exceeded their trip limit. The compressor will remain off for at least 2 minutes and until the motor temperature is below the reset limit.
3	Discharge Temperature - The head temperature probe has detected a temperature greater than 310 F. The compressor will remain off for at least 2 minutes and until the compressor head is below the reset limit.
4	Not used
5	Not used

CoreSense™ Protection
for Copeland Discus® Compressors

Status Codes
- ● GREEN – Power On
- ☼ GREEN – Warning
- ☼ YELLOW – Trip
- ☼ RED – Lockout

Flashes	Condition
1	Oil Pressure
2	Motor Protection Trip
3	Discharge Temperature
4	Current Sensor Fault
5	Communication Error

EMERSON
Climate Technologies

RESET ⬇

CoreSense Protection
Compressor *Lockout* Condition

# Flashes	Red LED - Lockout Condition (RESET Required)
1	Low Oil Pressure Lockout - The compressor has accumulated 2 minutes of run time without sufficient oil.
2	Not used
3	Discharge Temperature - The head temperature probe has detected a temperature greater than 310 F and Discharge Temperature Lockout has been enabled in the rack controller.
4	Not used
5	Not used
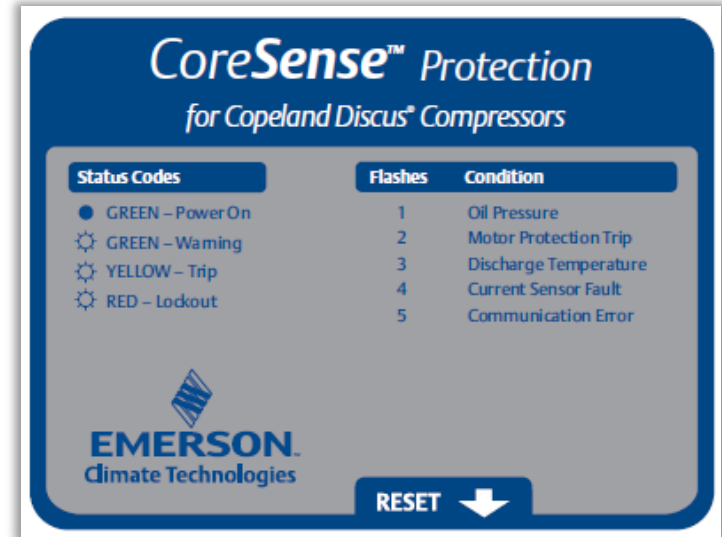
Copeland Discus with CoreSense Protection Benefits Summary

- LED Indicators for Alerts, Trips, & Lockouts
- Remote Reset
- Alarm History
- Lower Maintenance Costs
- Greater Refrigeration Uptime

Copeland Discus With CoreSense Protection Support Materials

AE Bulletin – AE1367

Marketing Bulletin

Brochure

www.EmersonClimate.com/CopelandDiscus