# **Application Engineering**

## CoreSense Diagnostic Modules for Copeland Scroll Refrigeration Compressors

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BULLETIN NO:

AE8-1424 R4

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## Safety

#### **Important Safety Information**

Those involved in the design, manufacture, and installation of a system, system purchasers, and service personnel may need to be aware of hazards and precautions discussed in this section and throughout this document. OEMs integrating the compressor into a system should ensure that their own employees follow this bulletin and provide any necessary safety information to those involved in manufacturing, installing, purchasing, and servicing the system.

#### **Responsibilities, Qualifications and Training**

• OEMs are responsible for system design, selection of appropriate components, integration of this component into the system, and testing the system. OEMs must ensure that staff involved in these activities are competent and qualified.

• OEMs are also responsible for ensuring that all product, service, and cautionary labels remain visible or are appropriately added in a conspicuous location on the system to ensure they are clear to any personnel involved in the installation, commissioning, troubleshooting or maintenance of this equipment.

• Only qualified and authorized HVAC or refrigeration personnel are permitted to install, commission, troubleshoot and maintain this equipment. Electrical connections must be made by qualified electrical personnel.

• Observe all applicable standards and codes for installing, servicing, and maintaining electrical and refrigeration equipment.

#### **Terminal Venting and Other Pressurized System Hazards**



If a compressor's electrical terminal pin loses its seal, pressurized oil, refrigerant, and debris may spray out. This is called "terminal venting".

The ejected debris, oil, and refrigerant can injure people or damage property. The oil and refrigerant spray can be ignited by electrical arcing at the terminal or any nearby ignition source,

producing flames that may project a significant distance from the compressor. The distance depends on the pressure and the amount of refrigerant and oil mixture in the system. The flames can cause serious or fatal burns and ignite nearby materials.

Each compressor has a terminal cover or molded plug that covers electrical connections. The cover or plug helps to protect against electric shock and the risks of terminal venting. If terminal venting occurs, the cover or plug helps contain the spray of refrigerant and oil and reduces the risk of ignition. If ignition occurs, the plug or cover helps contain the flames. However, neither the terminal cover nor the molded plug can completely eliminate the risk of venting, ignition, or electric shock.

See <u>copeland.com/terminal-venting</u> for more details about terminal venting. Additionally, a compressor's refrigerant lines keep refrigerant and oil under pressure. When removing or recharging refrigerant from this component during service, this can pose a pressurized fluid hazard.

#### **Flammable Refrigerant Hazards**



If flammable refrigerant is released from a system, an explosive concentration can be present in the air near the system. If there is an ignition source nearby, a release of flammable refrigerant can result in a fire or explosion. While systems using flammable refrigerant are designed to mitigate the risk of ignition if the refrigerant is released, fire and explosion can still occur.

See <u>copeland.com/flammable-refrigerants</u> for more information on flammable refrigerant safety.

#### **Electrical Hazards**



Until a system is de-energized, and capacitors have been discharged, the system presents a risk of electric shock.

#### Hot Surface and Fire Hazards



While the system is energized, and for some time after it is deenergized, the compressor may be hot. Touching the compressor before it has cooled can result in severe burns. When brazing system components during service, the flames can cause severe burns and ignite nearby combustible materials.

#### **Lifting Hazards**



Certain system components may be very heavy. Improperly lifting system components or the compressor can result in serious personal injury. Use proper lifting techniques when moving.

#### **POE Oil Hazards**

This equipment contains polyol ester (POE) oils. Certain polymers (e.g., PVC/CPVC and polycarbonate) can be harmed if they come into contact with POE oils. If POE oil contacts bare skin, it may cause an allergic skin reaction.

#### Precautions

- · Always wear personal protective equipment (gloves, eye protection, etc.).
- Keep a fire extinguisher at the jobsite at all times.
- Keep clear of the compressor when power is applied.

- IMMEDIATELY GET AWAY if you hear unusual sounds in the compressor. They can indicate that terminal pin ejection may be imminent. This may sound like electrical arcing (sizzling, sputtering or popping). However, terminal venting may still occur even if you do not hear any unusual sounds.

• Never reset a breaker or replace a blown fuse without performing appropriate electrical testing

- A tripped breaker or blown fuse may indicate an electrical fault in the compressor. Energizing a compressor with an electrical fault can cause terminal venting. Perform checks to rule out an electrical fault.

• Disconnect power and use lock-out/tag-out procedures before servicing.

- Before removing the terminal cover or molded plug, check that ALL electrical power is disconnected from the unit. Make sure that all power legs are open. (Note: The system may have more than one power supply.)

- Discharge capacitors for a minimum of two minutes

- Always use control of hazardous energy (lock-out/tag-out) procedures to ensure that power is not reconnected while the unit is being serviced.

- Allow time for the compressor to cool before servicing.
  - Ensure that materials and wiring do not touch high temperature areas of the compressor.
- Keep all non-essential personnel away from the compressor during service.

• For A3 refrigerants (R290) remove refrigerant from both the high and low sides of the compressor. Use a recovery machine and cylinder designed for flammable refrigerants. Do not use standard recovery machines because they contain sources of ignition such as switches, high- and low-pressure controls and relays. Only vent the R290 refrigerant into the atmosphere if the system is in a well-ventilated area.

- Never use a torch to remove the compressor. Only tubing cutters should be used for both A2L and A3 refrigerants.
- Use an appropriate lifting device to install or remove the compressor.

• Never install a system and leave it unattended when it has no charge, a holding charge, or with the service valves closed without electrically locking out the system.

- Always wear appropriate safety glasses and gloves when brazing or unbrazing system components.
- Charge the system with only approved refrigerants and refrigeration oils.

• Keep POE oils away from certain polymers (e.g., PVC/CPVC and polycarbonate) and any other surface or material that might be harmed by POE oils. Proper protective equipment (gloves, eye protection, etc.) must be used when handling POE lubricant. Handle POE oil with care. Refer to the Safety Data Sheet (SDS) for further details.

- Before energizing the system:
  - 1. Securely fasten the protective terminal cover or molded plug to the compressor, and
  - 2. Check that the compressor is properly grounded per the applicable system and compressor requirements.

#### **Signal Word Definitions**

The signal word explained below are used throughout the document to indicate safety messages.



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

## CoreSense Diagnostics Module Introduction

#### Introduction

The CoreSense Diagnostics module for Copeland Scroll refrigeration compressors (referred to as "the CoreSense module" in this document) is a breakthrough innovation for monitoring and protecting the compressor as well as alerting the contractor to refrigeration system faults. It also can perform digital unloading, liquid injection control, and can detect the cause of system related issues by monitoring the discharge line temperature and current.

A flashing LED indicator communicates the alert code and guides the service technician more quickly and accurately to the root cause of a problem. The CoreSense module is factory installed in the electrical box of all 7.0 - 17 HP Scroll Family ZB\*K5 & ZF\*K5 refrigeration compressors. It is also offered as a panel mount for an aftermarket solution from Copeland Distribution Services for the 2.0 - 7.5HP Family (ZB\*KA/C/Q & ZF\*K4/KVE) compressors. Refer to Pg. 42 for charts with model number identification. The CoreSense modules offered on the different compressor families are not interchangeable due to different current operating ranges of the compressors.



Figure 1 – CoreSense Diagnostics Module

## CoreSense Diagnostics Module Overview

#### **Current Signal Input**

This connector is where the current transducer (CT) is plugged into the CoreSense module. In **Figure 1**, this input is labeled 'Current'. For 7.0 - 17 HP models, the minimum compressor running current is 3 Amps, and for the 2.0 -7.5HP compressors, it is 1 Amp. This input is used to tell the CoreSense module the running state of the compressor. Compressor protective alert codes, injection, and modulation control will only be active when the current transducer is plugged in and current is sensed through the CT.

#### 1-5V Analog Input

1-5V analog input supplied from a separate device, controller, etc. for digital modulation. This would utilize the input labeled 'DIG 1-5V'. A separate demand input is not required if this input is used. Digital modulation can also be performed via communication and would eliminate the need for a separate 1-5 V analog input.

#### **Discharge Temperature Input**

In **Figure 1**, the discharge temperature thermistor input is labeled 'Temp'. CoreSense can utilize both discharge line temperature probes and top cap probes for various compressor applications. When the probe is plugged into the thermistor input, the CoreSense module identifies the probe type (line or top cap) based on pin locations. Refer to **Table 6** and **Table 7** for specific probe part numbers. Please note that only a top cap temperature probe can be used for low temp models using liquid injection. If a line probe is used, an error code will occur.

# Digital Modulation and RS485 Network Communication

Digital modulation commands are communicated via RS485 network communications to the CoreSense module. If you are controlling through network communications, 1-5V and demand inputs are not used for this configuration.

Unloading capacities for the compressors are as follows:

ZBD\*KC/Q & ZFD\*K4/KVE 2.0 -7.0 HP Copeland Scroll: 10 to 100%

#### ZBD\*K5 & ZFD\*K5

7.0 -17 HP Low Temp Refrigeration K5 Scroll: 30 to 100% 7.0-17 HP Med Temp Refrigeration K5 Scroll: 10 to 100%

#### Liquid Injection Output

The CoreSense module can also provide liquid injection for Low Temp Scroll compressors. This connector is a 12VDC output to a stepper motor that drives the EXV that is plumbed to the compressor. In **Figure 1**, this output is labeled 'LIQUID INJ'.

Please note that the EXV for the compressor families are not interchangeable due to different orifice sizes.

ZB\*KA/C/Q & ZF\*K4/KVE 2.0 -7.0 HP Copeland Scroll: 1.3 mm EXV

ZB\*K5 & ZF\*K5 7.0-17 HP Refrigeration K5 Scroll: 1.8 mm EXV

Refer to **Table 6** for EXV, stepper motor, and extension cable part numbers.

#### **Solenoid Output**

The solenoid output labeled 'SOL' on the CoreSense module can be used for either digital capacity control or liquid line solenoid control. For digital compressors (ZFD/ZBD), Copeland recommends using this output for digital capacity control vs. liquid line solenoid control. For digital low temperature, compressors using liquid injection (ZFD\*K5 or K4), use a current sense relay for the liquid line solenoid control.

#### a) Digital Solenoid

This is a 110VAC/220VAC solenoid output (labeled 'SOL') which is used to control the digital operation.

#### b) Liquid Line Solenoid

For fixed capacity compressors, the liquid line solenoid can also be controlled by the CoreSense module, by using the 'SOL' output. This eliminates the need for a separate relay to control the liquid line solenoid supplying the liquid injection EXV. Use the connector supplied in the kit to attach the solenoid wires to the CoreSense.

NOTE: Refer Table 7 for kit details and extension cables for remote mount models.

## CoreSense Module LED Overview

#### **LED Overview**

The CoreSense module has four LED's, green, yellow, red, and blue, that are on the face of the module. These LED's will flash compressor codes or stay solid depending upon the code that is being annunciated by the CoreSense module.

The CoreSense module can shut down the compressor if an abnormal condition is detected. This is performed by opening M1-M2 relay on the CoreSense which is wired in series with the compressor contactor coil. For a list of protective alerts and features, see **Figure 11**.

There are different categories of flashing codes that the CoreSense Module can annunciate - (Green) normal operation, (Yellow) tripped condition, (Red) lockout, and (Blue) demand error codes and unloading status.

The CoreSense module will trip the compressor "off" when any of the following severe alert conditions (Codes 1, 2, 4, 6, 7 or 9) are detected. Refer to **Table 3** for Fault Code Identification. Alert code 7, reverse phase detection, is the only severe alert code that defaults to a lockout and cannot be configured. A trip condition is when the CoreSense pilot circuit relay interrupts the contactor which results in stopping the compressor motor. A trip condition will automatically allow the compressor to run once the trip condition is satisfied and a protective off time has elapsed. A lockout event results in the CoreSense module shutting down the compressor and not allowing it to restart until the situation is corrected and the module is manually reset. A manual reset is done by cycling power to the module. Other codes can be configured to lockout, these codes include high discharge temperature, locked rotor and phase loss. **See Table 3** for more information on the default number of consecutive trips before a lockout. These default values can be configured through the E2 or PCIF.

**Table 3** indicates how to read the LED's codes. If an alert code is present, the CoreSense module will continue to annunciate the code until the condition is cleared or module power is cycled.

#### Green LED:

SOLID: Normal compressor operation FLASHING: Alert codes that do NOT have a protective shutdown associated with them.

#### Yellow LED:

FLASHING: Alerts of an abnormal system condition via alert codes.

SOLID: Demand is present, but no current is detected. All protective shutdowns will auto reset once tripped condition is satisfied and a protective off time has elapsed.

#### Red LED:

FLASHING: Indicates the CoreSense module is locked out on the flashing alert code. Manual power cycle reset is required to clear the lockout and restart the compressor

#### Blue LED:

FLASHING: Indicates demand error codes.

SOLID BLUE LIGHT: Indicates digital unloader is energized. This time varies based on capacity request (2-20 seconds).

For an explanation of each code and troubleshooting tips, refer to **Table 4** at the end of this document.

## CoreSense Diagnostics Part Number & Compressor Applications

There are two different Scroll CoreSense module part numbers, one for the 7.0-17HP K5 and one for the 2.0-7.5 HP compressor families. This is due to the difference in the compressor operating current ranges. It is important to select the correct part number per the compressor family to avoid nuisance trips.

#### 2.0 -7.5 HP Scrolls (ZB\*KA/C/Q & ZF\*K4/KVE) CoreSense P/N 543-0223-00 (Panel Mounted)

The CoreSense module is not accurate below 1 Amp. If the current drawn by the compressor during operation falls below 1 Amp, the module may indicate a nuisance trip.

#### 7.5-15 HP Scrolls (ZB\*K5 & ZF\*K5) CoreSense P/N 543-0209-00 (T-Box Mounted)

The CoreSense module is not accurate below 3 Amps. If the current drawn by the compressor during operation falls below 3 Amps, the module may indicate a nuisance trip.

**NOTE:** In low current applications, it is applicable for both modules to loop the power leads through the current sensor twice. This will double the current value the CoreSense module reads and eliminate the low current nuisance trip.

## **Product Specifications**

#### Specifications

Operating Temp: -40° to 150°F (-40° to 65°C) Storage Temp: -40° to 175°F (-40° to 80°C) Power Supply Range: 85-265VAC, 50-60 Hz CoreSense Compressor Amperage Detection Range:

#### ZB\*KA/C/Q & ZF\*K4/KVE

1-76 Amps 2 - 7.5HP Copeland Scroll Applications

#### <u>ZB\*K5 & ZF\*K5</u>

3-200 Amps 7.5 - 15HP K5 Applications

Maximum continuous contactor coil current is 2A with a max inrush current of 20A.

The CoreSense module connections are  $\frac{1}{4}$  in male terminals.

## CoreSense Module Mounting

#### 2.0 -7.5 HP Scrolls (ZB\*KA/C/Q & ZF\*K4/KVE

CoreSense is offered as a **panel mounted** solution for the **2-7.5 HP Copeland Scroll compressors**. These kits are offered through Copeland Distribution Services. See Kits and Accessories Section, for kit number information. **Figure 2** shows the panel mounted solution for a refrigeration application. It should be noted that the module is not IP rated and requires an electrical enclosure for protection from the elements. Care should be taken to place the module in a location where it will not get wet.



Figure 2 – Panel Mount CoreSense Module 2.0 – 7.5HP Copeland Scroll Compressors

#### 7.5-15 HP Scrolls (ZB\*K5 & ZF\*K5)

The CoreSense module will come pre-mounted inside the compressor terminal box from the factory. The module is mounted so all LEDs are in front of the light pipes in the terminal covers so codes are visible when the terminal box cover is installed. The CoreSense module is installed inside the terminal box with a torque of 8-inch pounds. See **Figure 3.** 



Figure 3 – Terminal Box Mount CoreSense Diagnostics

## Network DIP Switch Configuration

**Figure 4** shows the two DIP switch panels. The brown DIP switch panel has 10 positions and is located near the center of the CoreSense module. The blue DIP switch panel has 6 positions and is in the upper left corner of the CoreSense module.



Figure 4 – CoreSense Diagnostics DIP Switches



Figure 5 - CoreSense Diagnostics DIP Switches



Figure 6 – Brown 10 Position

#### Switches 1-5

Switches 1 through 5 are used for setting the node address for each CoreSense module. The CoreSense module uses a binary addressing for switches 1-5. The unique combination of these switches will define the node address 1 -31. Use **Table 1** as a reference to setting node addresses.

#### Table 1 - Node Address DIP Switch Configurations

Node Address	1	2	3	4	5
#1	On	Off	Off	Off	Off
#2	Off	On	Off	Off	Off
#3	On	On	Off	Off	Off
#4	Off	Off	On	Off	Off
#5	On	Off	On	Off	Off
#6	Off	On	On	Off	Off
#7	On	On	On	Off	Off
#8	Off	Off	Off	On	Off
#9	On	Off	Off	On	Off
#10	Off	On	Off	On	Off
#11	On	On	Off	On	Off
#12	Off	Off	On	On	Off
#13	On	Off	On	On	Off
#14	Off	On	On	On	Off
#15	On	On	On	On	Off
#16	Off	Off	Off	Off	On
#17	On	Off	Off	Off	On
#18	Off	On	Off	Off	On
#19	On	On	Off	Off	On
#20	Off	Off	On	Off	On
#21	On	Off	On	Off	On
#22	Off	On	On	Off	On
#23	On	On	On	Off	On
#24	Off	Off	Off	On	On
#25	On	Off	Off	On	On
#26	Off	On	Off	On	On
#27	On	On	Off	On	On
#28	Off	Off	On	On	On
#29	On	Off	On	On	On
#30	Off	On	On	On	On
#31	On	On	On	On	On

**NOTE:** Each connected CoreSense Diagnostics device must have its own unique node address.

#### Switch 6

CoreSense Diagnostics Modbus communication baud rate setting is configurable to either 19200 or 9600 through DIP switch 6 on the 10-position dip switch.

ON = 9600 OFF = 19200 (Default)

The baud rate for each of the CoreSense devices should be set to match the rack controller. To determine the baud rate in the E2, follow these steps:

- From the main menu select 7 (System Configuration)
- Press 3 (System Information)
- Press 1 (General Controller Info)
- Access the Serial Communications Tab by pressing CTRL + 3
- Use the Page Down button or scroll down to view the settings for COM4.

#### Switch 7

CoreSense Diagnostics Modbus communication parity is user configurable (even or no parity) through DIP switch number 7

ON = even parity OFF = no parity (default)

The parity setting must match the parity setting of the rack controller.

#### Switch 8

Switch 8 is used to set the module to be in network mode or standalone.

ON = Network Mode OFF = Standalone (Default)

Network mode will generate a communications error if the rack controller fails to communicate with the device. For standalone mode, no communications are expected so the communication error is blocked. The CoreSense Diagnostics module can communicate with a rack controller using Modbus protocol. The communication cable is wired from the rack controller to the first compressor. Additional compressors are wired in a daisy chained configuration. A shielded, twisted pair cable such as Belden #8761 (22 AWG) should be used for the communication wiring. Passing the communications wire through the grommet in the plastic housing will help reduce abrasion to the wiring. Appropriate strain relief is recommended.

Modules using a communications network must be commissioned as part of the E2 rack controller setup. The commissioning process uploads compressor asset information (model and serial number) into the rack controller for future reference. Once the commissioning process is completed, the controller will supervise and communicate with the module unless the node is deleted. Refer to <u>AE-1383</u> section titled Modbus® Communication to CoreSense Diagnostics for K5.

Compressors or an E2 manual for more details on commissioning the scrolls with a Copeland Retail Solutions E2 rack controller.

NOTE: For digital capacity using an E2 controller, an enhanced suction group must be enabled.

More information: The E2 jumpers on the Network Interface Board should be set for "terminated".

NOTE: The RS485 is polarity sensitive. "+" wires must connect to other "+" terminals, and "-" wires must connect to other "-" terminals. The shield wire is connected to the center terminal, or "0 volt" position.



Figure 7 – CoreSense Modbus Connections

\* These guidelines are based on E2 firmware version

3.0 and are subject to change. Contact your Copeland representative or refer to the operation manual for more details on configuring an E2 module.

#### Switch 9

The Copeland Scroll compressor model numbers include the nominal capacity at the standard 60 Hertz "ARI" rating conditions with R-404A refrigerant. Switch 9 is NOT used.

#### Switch 10

The Copeland Scroll compressor model numbers include the nominal capacity at the standard 60 Hertz "ARI" rating conditions with R-404A refrigerant.

## Compressor DIP Switch Configuration



Figure 8 – Blue 6 Position





#### Switch 1

Switch 1 is used to enable liquid injection EXV control. The 'on' position enables the EXV control via the CoreSense module.

#### Switch 2

Switch 2 is used to enable digital capacity control. The 'on' position enables digital capacity control via the CoreSense Module.

#### ZB\*KC & ZF\*K4/KVE& ZB\*K5

10 -100 % Capacity for 2.0 - 7.5 HP & Medium Temp K5

#### ZF\*K5

30 -100% Capacity for Low Temp K5

#### Switch 3

Switch 3 is used for failsafe mode. The 'on' position will allow the compressor to run at full load if communications between the CoreSense module and the rack controller is lost. If in the 'off' position, the compressor turns off if communication is lost between the two devices.

#### Switch 4

Switch 4 affects standard Modbus®. For applications using IPRO or XWeb (Dixell) 'non-standard Modbus turn switch 4 'on'. For Standard Copeland Modbus, the DIP switch orientation doesn't matter. For all other standard Modbus, DIP switch 4 should be in the 'off' position.

CoreSense Diagnostics Modbus communication stop bits is user configurable to either be 1 or 2 stop bit.

DIP switch number 4 on the main DIP switch board is used to configure stop bit.

ON = 1 stop bits OFF = 2 stop bits (Default)

#### Switch 5

Switch 5 is used to return module to factory defaults. By resetting the module all configurations and module history will be erased. To reset, switch 5 must transition from 'off' to 'on' within 5 seconds of module power up.

#### Switch 6

Switch 6 is used to enable/disable lockouts. The 'on' position will enable lockouts for the following codes: high discharge temperature, missing phase, and locked rotor. Reverse phase is automatically a lockout and cannot be configured. If this switch is 'on' each of these lockouts can be individually configured to a specific number of trips before a lockout. This is done over communications or via the PCIF Software (available <u>Copeland/OPI</u> site).

## CoreSense Diagnostics Wiring

#### Current Transducer (P/N 543-0159-00)



#### Figure 10

A current transducer (CT) is used in conjunction with the CoreSense module to detect the running state of the compressor. The compressor power wires T1, T2, and T3 must be routed from the contactor through the CT L1, L2, and L3, respectively, to detect the running state of the compressor. It is important that the compressor power wires are routed in respect to the markings on the current transducer. For 7.0 - 28 HP compressors, the CT is mounted in the terminal box. For 2.0 - 7.0 HP applications, the CT is mounted in the panel near the CoreSense module. If needed for 2.0 - 7.0 HP applications, an extension cable is available.

**NOTE:** Only the compressor lead wires should be placed through the CT module. If the compressor lead wires do

not match the L1, L2, and L3 Current Transducer holes, the compressor current measurement will be incorrect.

#### 110-230VAC CoreSense Module Power Wiring

The CoreSense module requires 110-230VAC power between to the L1 and L2 terminals on the module. The module should remain powered through all states of compressor on/off operation. Refer to wiring schematic examples shown in the following section.

#### **Module Wiring Diagrams**

There are 3 basic applications that require specific wiring schematics and DIP switch configurations.

- 1. Fixed Capacity using the Demand Input (Figure 11)
- 2. Digital Compressors using Analog Input for the modulation (Figure 12)
- Digital or Non-Digital compressors using control via communications (Figure 13)

It should be noted that CoreSense modules with p/n 543-0209-00 and 543-0223-00 have a normally open M1-M2 relay and that will only close when the demand is present. This eliminates the need for a cycling device to be supplied externally from the module. On a detected tripped or lockout condition, the CoreSense module will de-energize the M1-M2 relay to stop the motor from running.

#### 1. Fixed Capacity Using Demand Input

**Figure 11** shows the wiring diagram for a fixed capacity compressor using a demand signal. The demand signal must be supplied from a control relay and wired to the "D" terminal of the module. It is preferred the demand wired upstream of any other device in the pilot circuit.

Note: Referring to **Figure 11**, the Blue DIP Switch #2 is "OFF" for fixed capacity.



Figure 11 - Fixed Capacity Using Demand Input

# 2. Digital Compressor Using Analog Input for Modulation

**Figure 12** shows the wiring for Digital Compressors using analog input for the modulation. The network dip switch #8 must be in the "off" position for the digital control when using a 1-5V analog input. A demand wire is not required to be run to the "d" terminal. The 1- 5V analog signal for the digital will close the module relay from normally open to closed when the compressor is called to run.

*Note:* Referring to **Figure 6**, Brown DIP Switch #8 is "OFF" for Digital Operation with Analog Input. Also, referring to Figure 8, Blue DIP Switch #2 is "ON" for Digital Operation.

#### 3. Digital and Non-Digital Compressors Using Control via Communications

**Figure 13** shows the wiring diagram for a digital or nondigital application using an E2 controller. Demand is supplied via communications and a wire is not required to be run to the "d" terminal. The communications must be hooked up to the E2, and the module brown dip switch #8 must be "on" and the blue dip switch #2 must be "on" for the digital control to work. There is no 1-5V analog input used to control the digital in this arrangement because digital control is provided via the E2. This is the easiest way of wiring for digital control if an E2 is present.

Note: Referring to **Figure 6**, Brown DIP Switch #8 is "ON" for Digital Operation via Communications. Also, referring to Figure 8, Blue DIP Switch #2 is "ON" for Fixed Capacity

For E2 commissioning please refer to the following instructions.







Figure 13 - Compressors Using Control via Communications

## **Programming Instructions**

**CoreSense Diagnostics E2 Programming Instructions** 



#### **CoreSense K5 Programming Instructions**

## From the Network Setup Menu select 2. Connected I/O Boards and Controllers 4. From the Setup Screen go to the C3: ECT Tab (Press Ctrl + 3) In Option #9, enter the number of K5 compressors being controlled by the E2.

Press 🥄	to save ch	nanges a	nd retur	n to	the <sub>[</sub>	orevio	ous scre	en.
08-23-12 🖤 🛄		RX DEV	UNIC 2 SUMMARY		A U	HI: 82		13:00:53
LOW TEMP	RACK 9.72	[11.50]	Circuits F	D ISL 4DR	State .Refr .Refr	Temp -1.66 -2.00	ADUISORY S Fails Alarms Notices	JMMARY 1 9 2
S1 S2 5	S3 NETWOI ON 1. Network Summary 2. Connected I/O I 3. Router Setup	RK SETUP ) Boards & Con	trollers	ØDR Si Si	.Refr .Refr .Refr	0 101.9 102.0	NETWORK OU IONet MODBUS-1 MODBUS-2 Echelon	ERVIEW • •
ТОМ ТЕМР	4. Controller Asso	ociations						
VS 46 Controlled By: D Liquid Level%: 2	<b>4</b> is <sup>8</sup> .		- t T T MRLDS4 LT	rl REM FLR FLR RACK	Value ON 7.00 8.25 9.50 8.00	Cmd ON OFF OFF OFF OFF	THIS CONTR Model: RX Unit: 2 IP: 10.21 F/W Rev: 4	DLLER -400 00 3.236.128 4.03F01
Press menu number	r or scroll to selecti	F4	F5 Log In/Ou					

08-24-12 🕚 🕜 🕻	M			RX-400 Unit 2		🕅 OAT: 71		8:55:51
Jse Ctrl-X to S	Select	CX Tabs		SETUP		NAMES FULL		*ALARM*
C1: This Unit	C2:	IO Network	C3: ECT	C4:	1	5: Echelon	ADUISORY	SUMMARY
C6:	C7:		C8:	C9:	(	:0:	Fails	1
		Num Net	work Ctrls	: NetSetup			Alarms	8
			nacionale sectoral longito	and interception and the			Notices	2
	ECT	Boar	d Type	Quantity	Max			
		#1 : CT [	rive	1	16 🗍			
		#2 : Ctr]	LLink ACC	0	63		NETWORK O	VERVIEW
		#3 : Ctrl	LLink CD	2	99		IONet	٠
		#4 : Ctr]	LLink RSC	0	99		MODBUS-1	•
		#5 : Disc	us	0	63		MODBUS-2	٠
		#6 : Ener	gy Meter	0	30		Echelon	•
		#7 : ISD-	-1.0	0	64			
		#8 : ISD-	-2.0	6	63			
		#9 : K5 F	Ref Scroll	2	31			
		#10 : MRLL	05	0	24			
		#11 : Perf	Alert	0	63			
		#12 : RLDS	5	U	15			
		#13 : Stat	us pispiay	ម				
		#14 : WR	-Stat	ម	9		THIS CONT	RULLER
		#15 : XEV	120	8	99		Model: K	X-400 00
		#10 : AEV2	220	5	99		Unit: 2	40 007 400
		#17 : AJ 3	scroll unit	U	10		IP: 10.2	13.230.128
1	<u></u>						F/W Rev:	4.03101
Enter 0 to 16	Ent	er desired m	number of t	hese boards				
F1: PREV TR	AB	F2: NEXT	TAB	F3: EDIT			F5: C	ANCEL
E1	E	2	E3	F4	E5			
				Menu	5			
disconnect				Log	In/Out			

# 6. From the Network Setup Menu select 1. Network Summary 7. The CoreSense K5 devices should be present on the Network. Select the CoreSense K5 module to be commissioned. Press F4: Commission

3-23-12 🔹 🕜 🤅	0	RX-1	100 Unit 2 SETUP	🖻 OAT: 84 Names Full	13:02:47 *ALARM*
1: This Unit 6:	C2: IO Network C7: Num Ne ECT 1. Networ 2. Connect 3. Router 4. Contro: #11 : Per #12 : RLC #13 : Sta #14 : WR #15 : XEU #16 : XEU #17 : XJ	C8:         C8:         twork Ctrls: Net         NETWORK SETUP         Summary         :ed I/O Boards &         Setup         .ler Associations         f Alert         S         tus Display         T-Stat         12D         Scroll Unit	C4: C9: (Setup Controllers	C5: Echelon C0:	ADUISORY SUMMARY Fails f Alarms 0 Notices 2 NETWORK OUERUIEW IONEt MODBUS-1 MODBUS-1 Echelon Echelon Echelon Echelon Echelon 00 Unit: 2 IP: 10.213.236.128 F/W Rev: 4.03F01
ress menu num	<u>ber or scroll to</u>	selection			
F1 ? • disconnect	F2	F3 F4	F5 Log In/Out		

Name         Type         Network Address         Rev         Status           RX400 LT         RX400-Refrig         LONWorks:         2 4.037611 This Controller           CS-100 LT.01         CS100-Ckt Sucti         0230FBEA0100:         2 2.01802 Online           16A1_001         16A1         IONet:         1 0.000 Online           16A1_002         16A1         IONet:         2 0.01802 Online           16A1_002         16A1         IONet:         3 0.00 Online           16A1_002         16A1         IONet:         3 0.00 Online           16A1_002         16A1         IONet:         3 0.00 Online           16A1_002         16A1         IONet:         1 0.00 Online           880_002         880         IONet:         0.00 Online           880_002         880         IONet:         0.00 Online           880_002         4A0         IONet:         0.00 Online           MAD_003         4A0         IONet:         0.00 Online           MAD_003         4A	88-23-12 • 🕜 🔟		RX-400 Network	Unit 2 Summary	🛕 OAT: 83 NAMES FULL	13:04:44
RX400 LT       RX400-Refrig       LONWorks:       2 4.03F01 This Controller         CS-100 LT.01       CS100-Ckt Sucti       023DFBEA0100:       2 2.01802 Online         16A1_001       16A1       IONet:       1 0.00       Online         16A1_001       16A1       IONet:       2 0.00       Online         16A1_002       16A1       IONet:       2 0.00       Online       NetWork OUERUIEW         16A1_003       16A1       IONet:       3 0.00       Online       NetWork OUERUIEW         16A1_004       16A1       IONet:       3 0.00       Online       NetWork OUERUIEW         16A1_005       16A1       IONet:       3 0.00       Online       NetWork OUERUIEW         16A1_005       16A1       IONet:       3 0.00       Online       NetWork OUERUIEW         16A1_005       16A1       IONet:       1 0.00       Online       NetWork OUERUIEW         16A1_005       10Net:       1 0.00       Online       NoDBUS-1       Echelon       Echelon <th>Name</th> <th>Туре</th> <th>Network Address</th> <th>Rev</th> <th>Status</th> <th>ADVISORY SUMMARY Fails</th>	Name	Туре	Network Address	Rev	Status	ADVISORY SUMMARY Fails
CS-100       LT.01       CS100-Ckt Sucti       023DFBEA0100:       2 2.01802       Online         16AI_001       16AI       IONet:       1 0.00       Online       NETWORK OUERUIEW         16AI_002       16AI       IONet:       2 0.00       Online       NETWORK OUERUIEW         16AI_002       16AI       IONet:       3 0.00       Online       NETWORK OUERUIEW         16AI_003       16AI       IONet:       3 0.00       Online       MODBUS-1       •         16AI_005       16AI       IONet:       5 0.00       Online       MODBUS-2       •         8R0_003       8R0       IONet:       1 0.00       Online       MODBUS-2       •         8R0_003       8R0       IONet:       3 0.00       Online       HODBUS-2       •         8R0_003       8R0       IONet:       3 0.00       Online       HODBUS-1       •         4A0_003       4A0       IONet:       1 0.00       Online       Hodel: RX-400       00         IRLDS_001       IRLDS       IONet:       1 0.00       Online       Hodel: RX-400       00         IRLDS_001       KS Ref Scroll       MODBUS-1:       6 2.07F61       Online       Hodel: RX-400       00	RX400 LT	RX400-Refrig	LONWorks:	2 4.03F01	This Controller	Notices 3
16AI_001       16AI       IONet:       10.080       0nline         16AI_002       16AI       IONet:       20.00       0nline       NETWORK OUERUIEW         16AI_003       16AI       IONet:       40.00       0nline       NETWORK OUERUIEW         16AI_004       16AI       IONet:       40.00       0nline       MODBUS-1       MODBUS-2       Echelon       Echelon </td <td>CS-100 LT.01</td> <td>CS100-Ckt Sucti</td> <td>023DFBEA0100:</td> <td>2 2.01B02</td> <td>Online</td> <td>(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)</td>	CS-100 LT.01	CS100-Ckt Sucti	023DFBEA0100:	2 2.01B02	Online	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
16A1_002       16AI       IONEt:       2 0.60       0nline       NETWORK OUERUIEW         16A1_003       16AI       IONEt:       3 0.00       0nline       IONEt       •         16A1_005       16AI       IONEt:       4 0.00       0nline       MOBBUS-1       •         16A1_005       16AI       IONEt:       4 0.00       0nline       MOBBUS-2       •         8R0_002       8R0       IONEt:       2 0.00       0nline       HODBUS-2       •         8R0_002       8R0       IONEt:       2 0.00       0nline       •       •         8R0_002       8R0       IONEt:       2 0.00       0nline       •       •         8R0_002       4A0       IONEt:       4 0.00       0nline       •       •         4A0_002       4A0       IONEt:       2 0.00       0nline       •       •         4A0_002       4A0       IONEt:       1 0.00       0nline       •       •       •         4A0_002       4A0       IONEt:       1 0.00       0nline       •       •       •       •       •         18LDS_001       IRLDS       IONEt:       1 0.00       0nline       •       • <td< td=""><td>16AI_001</td><td>16AI</td><td>IONet:</td><td>1 0.00</td><td>Online</td><td></td></td<>	16AI_001	16AI	IONet:	1 0.00	Online	
16A1_083       16AI       IONEt:       3 0.68       0nline       HODBUS-1         16A1_095       16AI       IONEt:       4 0.60       0nline       HODBUS-1       HODBUS-2       HODBUS-1       HODBUS-2       HODBUS-2       HODBUS-1       HODBUS-1       HODBUS-1       HODBUS-1       HODBUS-1       HODBUS-1       HIS       HOHBUS-1       HIS       HOHE       HODBUS-1       HIS       HOHE       HOHE       HIS       HIS       HIS       HIS       HIS       HIS       HIS       HIS       HIS <td>16AI_002</td> <td>16AI</td> <td>IONet:</td> <td>2 0.00</td> <td>Online</td> <td>NETWORK OVERVIEW</td>	16AI_002	16AI	IONet:	2 0.00	Online	NETWORK OVERVIEW
16AI_0094       16AI       IONEt:       4 0.00       Online       HODBUS-1         16AI_005       16AI       IONEt:       5 0.00       Online       HODBUS-2       Echelon         8R0_001       9R0       IONEt:       1 0.00       Online       Echelon       Echelon         8R0_003       9R0       IONEt:       2 0.00       Online       Echelon       Echelon         9R0_004       9R0       IONEt:       3 0.00       Online       Echelon       Echelon         9R0_003       9R0       IONEt:       3 0.00       Online       Echelon       Echelon         9R0_004       9R0       IONEt:       1 0.00       Online       Echelon       Echelon         9R0_002       4A0       IONEt:       1 0.00       Online       Echelon       Echelon         4A0_003       4A0       IONEt:       1 0.00       Online       Echelon       Echelon         HLDS       IONEt:       1 0.00       Online       HISCONTROLLER       Echelon       Echelon         MDE0903       4A0       IONEt:       1 0.00       Online       HISCONTROLLER         MDE0904       ISLFR2       CtrlLink CD       MODBUS-1:       5 2.07F61       Online	16AI_003	16AI	IONet:	3 0.00	Online	IONet 🔹
16AI_005       16AI       IONEt:       50.00       Online       HODBUS-2       Echelon         8R0_001       8R0       IONEt:       10.00       Online       Echelon       Echelon<	16AI_004	16AI	IONet:	4 0.00	Online	MODBUS-1 🔶
8R0_001       8R0       IONet:       10.00       0.00       0.01       Echelon       •         8R0_002       8R0       IONet:       20.00       0.01       ine       Echelon       •         8R0_003       8R0       IONet:       20.00       0.01       ine       •       •         8R0_003       8R0       IONet:       20.00       0.01       ine       •       •         8R0_004       8R0       IONet:       40.00       0.01       ine       •       •         4A0_002       4A0       IONet:       10.00       0.01       ine       •       •         4A0_003       4A0       IONet:       10.00       0.01       ine       •       •         4A0_003       4A0       IONet:       10.00       0.01       ine       •       •         4A0_003       4A0       IONet:       10.00       0.01       • <td>16AI_005</td> <td>16AI</td> <td>IONet:</td> <td>5 0.00</td> <td>Online</td> <td>MODBUS-2 🔹</td>	16AI_005	16AI	IONet:	5 0.00	Online	MODBUS-2 🔹
8R0_002       8R0       IONEt:       2 0.00       Online         8R0_003       8R0       IONEt:       3 0.00       Online         8R0_004       8R0       IONEt:       3 0.00       Online         4A0_002       4A0       IONEt:       1 0.00       Online         4A0_002       4A0       IONEt:       2 0.00       Online         4A0_002       4A0       IONEt:       1 0.00       Online         HAD_003       4A0       IONEt:       1 0.00       Online         HLDS       IONEt:       1 0.00       Online       HIS CONTROLLER         MFLEX ESR_001       Hultiflex ESR       IONEt:       1 0.00       Online         MFLEX ESR_001       Hultiflex ESR       IONEt:       1 0.00       Online         MFLEX ESR_001       Hultiflex ESR       IONEt:       1 0.00       Online         MFLEX ESR_001       K5 Ref Scroll       MODBUS-1:       5 2.07F01 Online       Unit: 2         CT_001       CT Drive       MODBUS-1:       13 0.00       Online       IP: 19.213.236.128         K5RS_001       K5 Ref Scroll       MODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1:       DELETE RCRD       F2: STATUS       F3<	8R0 001	8R0	IONet:	1 0.00	Online	Echelon 🔹
8R0_903       8R0       IONEt:       3 0.00       Online         8R0_904       8R0       IONEt:       4 0.00       Online         4A0_801       4A0       IONEt:       1 0.00       Online         4A0_802       4A0       IONEt:       2 0.00       Online         4A0_803       4A0       IONEt:       2 0.00       Online         4A0_803       4A0       IONEt:       3 0.00       Online         HIDS_001       IRLDS       IONEt:       1 0.00       Online         RELEX ESR_801       MultiFlex ESR       IONEt:       1 0.00       Online         MFLEX ESR_801       MultiFlex ESR       IONEt:       1 0.00       Online         CD95 01       ISLFR2 Ctrllink CD       MODBUS-1:       5 2.07F 01 Online       Model: RX-400       00         CT 001       CT Drive       MODBUS-1:       6 2.07F 01 Online       Int: 2       Int: 2       Int: 2       Int: 2         KSRS_801       K5 Ref Scroll       MODBUS-1:       - 0.00       Unknown       F/W Rev: 4.03F 01         LRS_802 LT       K5 Ref Scroll       MODBUS-1:       8 1.00F 03 Online       F/W Rev: 4.03F 01         F1:       DELETE RCRD       F2:       F3       F4       F5 </td <td>8R0_002</td> <td>8R0</td> <td>IONet:</td> <td>2 0.00</td> <td>Online</td> <td></td>	8R0_002	8R0	IONet:	2 0.00	Online	
8R0_904       8R0       IONEt: 4 0.00       0nline         4A0_902       4A0       IONEt: 1 0.00       0nline         4A0_903       4A0       IONEt: 3 0.00       0nline         IRLDS_001       IRLDS       IONEt: 1 0.00       0nline         HELEX ESR_001       MultiFlex ESR       IONEt: 1 0.00       0nline         MULTER ESR_001       MULTIFLEX ESR       IONEt: 1 0.00       0nline         MDELEX ESR_001       MULTIFLEX ESR       IONEt: 1 0.00       0nline         MULTER ESR_001       MUDBUS-1: 5 2.07F01 0nline       Model: RX-400 00         CD 06 01       ISLFR2 CtrlLink CD       MODBUS-1: 6 2.07F01 0nline       IN: 2         CT_001       K5 Ref Scroll       MODBUS-1: -0 0.00       0nline       IP: 10.213.236.128         KSRS_001       K5 Ref Scroll       MODBUS-1: 8 1.00F03 0nline       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       MODBUS-1: 8 1.00F03 0nline       F5: SETUP         F1: DELETE RCRD       F2: STATUS       F3-WET 3TMMS       F4: COMMISSION       F5: SETUP         F1       F2       F3       F4       F5       F5         Gisconset       F3       F4       F5       F5       F4	8R0 003	8R0	IONet:	3 0.00	Online	
4A0_001       4A0       IONet:       1 0.00       Online         4A0_002       4A0       IONet:       2 0.00       Online         4A0_002       4A0       IONet:       2 0.00       Online         4A0_003       4A0       IONet:       2 0.00       Online         HILDS_001       IRLDS       IONet:       1 0.00       Online         WFLEX ESR_001       Hultiflex ESR       IONet:       1 0.00       Online         Wobs 01       ISLFR2 Ctrllink CD       MODBUS-1:       5 2.07F01 Online       Wodel: RX-400 00         CD06 01       ISLFR2 Ctrllink CD       MODBUS-1:       13 0.00       Online       Hodel: RX-400 00         CT_001       CT Drive       HODBUS-1:       - 0.00       Unknown       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       HODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1:       DELETE RCRD       F2: STATUS       F3       F4: COMMISSION       F5: SETUP         F1:       DELETE RCRD       F2: STATUS       F4       COMMISSION       F5: SETUP         F1:       DELETE RCRD       F2: STATUS       F4       COMMISSION       F5: SETUP         F2       F3       F4       COMMISSION	8R0 004	8R0	IONet:	4 0.00	Online	
4A0_602       4A0       IONEt:       20.00       Online         4A0_603       4A0       IONEt:       30.00       Online         IRLDS_601       IRLDS       IONEt:       10.00       Online         IRLDS_601       IRLDS       IONEt:       10.00       Online         MFLEX_ESR_601       MultiFlex_ESR       IONEt:       10.00       Online         CD05 01       ISLFR2 CtrlLink CD       MODBUS-1:       52.07F01       Online         CT_001       CT       Drive       MODBUS-1:       62.07F01       Online         ISLFR2 CtrlLink CD       MODBUS-1:       13.0.00       Online       Unit: 2         IST_02_LT       K5 Ref Scroll       MODBUS-1:       81.000       Online         ISFS_001       K5 Ref Scroll       MODBUS-1:       81.000       Solition         IRS_002_LT       K5 Ref Scroll       MODBUS-1:       81.00063       Online         F1:       DELETE RCRD       F2:       STATUS       F3-MET-STATUS       F4:       COMMISSION       F5:       SETUP         F1       F2       F3       F4       F5       Girconect       Log In/Out       F5:       SETUP	440 001	4A0	IONet:	1 0.00	Online	
4A0_003       4A0       IONEt:       3 0.00       Online         IRLDS_001       IRLDS       IONEt:       1 0.00       Online         IRLDS_001       IRLDS       IONEt:       1 0.00       Online         MHELX ESR_001       MultiFlex ESR       IONEt:       1 0.00       Online         CD05 01       ISLFR2 CtrlLink CD       MODBUS-1:       5 2.07F01 Online       Model: RX-400 00         CD 06 01       ISLFR2 CtrlLink CD       MODBUS-1:       6 2.07F01 Online       IIP: 10.213.236.128         CT_001       K5 Ref Scroll       MODBUS-1:       - 0.00       Onknown       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       MODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1:       DELETE RCRD       F2:       STATUS       F4:       COMMISSION       F5: SETUP         F1:       DELETE RCRD       F2:       F3       F4:       F5       F0:       F5: SETUP         F1:       DELETE RCRD       F2:       F3       F4       F5       F5: SETUP         F1:       DELETE RCRD       F2:       F3       F4       F5       F5: SETUP         F2:       F3       F4       F0       F5: SETUP       F5: SETUP       F5: SE	440 002	460	IONet:	2 0.00	Online	
IRLDS_001       IRLDS       IONet:       1 0.00       Online         MFLEX ESR_001       Multiflex ESR       IONet:       1 0.00       Online         CD05 01       ISLFR2 CtrlLink CD       MODBUS-1:       5 2.07F01 Online       Model: RX-400 00         CD06 01       ISLFR2 CtrlLink CD       MODBUS-1:       6 2.07F01 Online       Unit: 2         CT_001       CT Drive       MODBUS-1:       1 0.00       Online         KSRS_001       K5 Ref Scroll       MODBUS-1:       - 0.00       Unknown         LRS_002 LT       K5 Ref Scroll       MODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01	440 003	4A0	IONet:	3 0.00	Online	
MFLEX_ESR_001       MultiFlex_ESR       IONet:       1 0.00       Online       THIS CONTROLLER         CD060       01 ISLFR2       CtrlLink CD       MODBUS-1:       5 2.07F01       Online       Model: RX-400       00         CT_001       CT Drive       MODBUS-1:       6 2.07F01       Online       Int: 2       Int: 2         CT_011       CT Drive       MODBUS-1:       6 2.07F01       Online       Int: 2         K5R5_001       CT Drive       MODBUS-1:       1 0.00       Unknown       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       MODBUS-1:       8 1.00F03       Online       F/W Rev: 4.03F01         F1:       DELETE RCRD       F2:       STATUS       F3:       MET STATUS       F4:       COMMISSION       F5: SETUP         F1:       DELETE RCRD       F2:       STATUS       F4       F5       F5: SETUP         Gisconnect       Gisconnect       Log In/Out       Log In/Out       Log In/Out       F5: SETUP	IRLDS 001	IRLDS	IONet:	1 0.00	Online	
CD 05 01 ISLFR2 CtrlLink CD       HODBUS-1:       5 2.07F01 Online       Model: RX-400 00         CD 06 01 ISLFR2 CtrlLink CD       HODBUS-1:       6 2.07F01 Online       Unit: 2         CT 001       CT 001       K5 Ref Scroll       HODBUS-1:       - 0.00       Unknown         LRS_002 LT       K5 Ref Scroll       HODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1: DELETE RCRD       F2: STATUS       F3-MET STATUS       F4: COMMISSION       F5: SETUP         F1       F2       F3       F4       F5         (1)       (1)       F3       F4       F5         (1)       (1)       F4       F5       Log In/Out	MFLEX ESR 001	MultiFlex ESR	IONet:	1 0.00	Online	THIS CONTROLLER
CD 06 01       ISLFR2 CtrlLink CD       MODBUS-1:       6 2.07F01 Online       Unit: 2         CT 001       CT Drive       MODBUS-1:       13 0.00       Online       IP: 10.213.236.128         KSRS_001       K5 Ref Scroll       MODBUS-1:       - 0.00       Unknown       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       MODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1:       DELETE RCRD       F2:       STATUS       F4:       COMMISSION       F5: SETUP         F1       F2       F3       F4       F5       SETUP       F3       F4       F5         CUIDED       F2       F3       F4       F5       SETUP       F5       SETUP         F1       GEORDERT       F3       F4       F5       SETUP       F5	CD05 01 ISLFRZ	CtrlLink CD	MODBUS-1:	5 2.07F01	Online	Model: RX-400 00
CT_001       CT Drive       HODBUS-1:       13 0.00       Online       IP: 10.213.236.128         K5R5_001       K5 Ref Scroll       HODBUS-1:       - 0.00       Unknown         LRS_002 LT       K5 Ref Scroll       HODBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1: DELETE RCRD       F2: STATUS       F3: HET STATUS       F4: COMMISSION       F5: SETUP         F1       F2       F3       F4       F5         Menu       F3       F4       COMMISSION       F5: SETUP	CD06 01 ISLFRZ	CtrlLink CD	MODBUS-1:	6 2.07F01	Online	Unit: 2
KSRS_001       K5 Ref Scroll       H0DBUS-1:       - 0.00       Unknown       F/W Rev: 4.03F01         LRS_002 LT       K5 Ref Scroll       H0DBUS-1:       8 1.00F03 Online       F/W Rev: 4.03F01         F1: DELETE RCRD       F2: STATUS       F3: MET STATUS       F4: COMMISSION       F5: SETUP         F1       F2       F3       F4       F5         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (1)       (1)       (1)       (1)       (1)         (2)       (1)       (1)       (1)       (1)         (2)       (1)       (1)       (1)       (1)         (2)       (1)       (1)       (1)       (1)         (2)       (1)       (1)       (1)       (1)         (2)       (1)       (1	CT 001	CT Drive	MODBUS-1:	13 0.00	Online	IP: 10.213.236.128
F1: DELETE RCRD     F2: STATUS     F3: MET STATUS     F4: COMMISSION     F5: SETUP       F1     F2     F3     F4     F5       (1)     (1)     (1)     (1)     (1)       disconnect     Log In/Out     Log In/Out     Log In/Out	K5RS 001	K5 Ref Scroll	MODBUS-1:	- 0.00	Unknown	F/W Rev: 4.03F01
F1: DELETE RCRD F2: STATUS F3: MET STATUS F4: COMMISSION F5: SETUP F1 F2 F3 F4 F5 C Menu Log In/Out	LRS_002 LT	K5 Ref Scroll	MODBUS-1:	8 1.00F03	Online	
F1: DELETE RCRD F2: STATUS F3: MET 3TAMUS F4: COMMISSION F5: SETUP						
F1 F2 F3 F4 F5 C menu Log In/Out	F1: DELETE RC	RD F2: STAT	IUS F3: HE	STATUS	F4: COMMISSION	F5: SETUP
disconnect	F1	F2	F3	F4	F5	
Log In/Out	?			ienu		
	disconnect				og In/Out	

# 8. Select the Modbus® that the CoreSense device is connected to. (If only Modbus® network is connected, this step will automatically complete itself, skip to step 9) 9. From the Modbus® Device Menu select an unused space that matches the DIP switch Address of the CoreSense device and press Enter.

		Network	Summary	NAMES FULL	
Name	Туре	Notwork Addrocc	( Rev	Status	ADVISORY SUMMARY Fails 1
RX400 IT	RX400-Refric	Select Network	2 4.83F81	This Controller	Notices 3
CS-100 LT.01	CS100-Ckt Su		2 2.01802	Online	
16AI 001	16AI	1. MUDBUS-2	1 0.00	Online	
16AI 002	16AI	2. MUDBUS-1	2 0.00	Online	NETWORK OVERVIEW
16AI 003	16AI —	IONCC.	3 0.00	Online	IONet 🔹
16AI 004	16AI	IONet:	4 0.00	Online	MODBUS-1 🔶
16AI 005	16AI	IONet:	5 0.00	Online	MODBUS-2
8R0 001	8R0	IONet:	1 0.00	Online	Echelon 🔹
8R0 002	8R0	IONet:	2 0.00	Online	
8R0_003	8R0	IONet:	3 0.00	Online	
8R0 004	8R0	IONet:	4 0.00	Online	
460_001	4A0	IONet:	1 0.00	Online	
440 002	460	IONet:	2 0.00	Online	
440 003	4A0	IONet:	3 0.00	Online	
IRLDS 001	IRLDS	IONet:	1 0.00	Online	
MFLEX ESR 001	MultiFlex ESR	IONet:	1 0.00	Online	THIS CONTROLLER
CD05 01 ISLFRZ	CtrlLink CD	MODBUS-1:	5 2.07F01	Online	Model: RX-400 00
CD06 01 ISLFRZ	CtrlLink CD	MODBUS-1:	6 2.07F01	Online	Unit: 2
CT_001	CT Drive	MODBUS-1:	13 0.00	Online	IP: 10.213.236.128
K5RS_001	K5 Ref Scroll	MODBUS-1:	- 0.00	Unknown	F/W Rev: 4.03F01
LRS_002 LT	K5 Ref Scroll	MODBUS-1:	8 1.00F03	Online	
Press menu num	ber or scroll t	o selection			
					F5: CANCEL
F1	F2	F3 F4	F5		
		Menu			
			Log In/Out		
alsconnect			ang mout		

						eri 🗇 🖻
08-23-12 🔹 🤇	6 🔟 👘		RX-400 U	nit 2	<u> 🖻 Oat:</u> 8	3 13:06:22
			Network S	ummary	NAMES FULL	*ALARM*
Name RX400 LT CS-100 LT. 16AI_001 16AI_002 16AI_003 16AI_004 16AI_005 8R0_001 8R0_003 8R0_004 4A0_003 IRLDS_001 MFLEX_ESR_ CD95 01 IS CD96 01 IS CT_901 K5RS_001 LRS_002 LT-	MODBU 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 17. 18.	S-1 Devices           (Unused)           (Unused)           (Unused)           XR75CX CD_001           CD06 01 ISLFR2           CD06 01 ISLFR2           CUnused)           LRS_002 LT           (Unused)           (Unused)	XR75CX CaseDs CtrlLink CD CtrlLink CD K5 Ref Scroll CT Drive	р о т. сол	Ctatur ntroller	ADUISORY SUMMARY Fails 1 Alarms 0 Notices 3 NETWORK OUERUIEW IONet 0 MODBUS-1 0 MODBUS-2 Echelon 0 Echelon 0 THIS CONTROLLER Model: RX-400 00 Unit: 2 IP: 10.213.236.128 F/W Rev: 4.03F01
TTESS Herry	number u	i serer to sere				
						ES: CANCEL

# 10. Verify the address matches the address assigned by the CoreSense module's DIP switch settings and press Enter.

8-23-12 🗣 📢 🛄	,		Network	unit 2 Summary		NAMES FULL		*ALARM*
Nama	T	blackssauls	Unknow	n Device Ø	)7 Shat		ADVISORY	SUMMARY
Name	1066	NOTHOPD	Innenee	DAI			Fails	<b></b>
 RX100   T						ntroller	Noticos	2 2
CS-100   T						nerorrer	nocrecs	•
16AI 001								
16AI 0						1	NETWORK O	VERVIEW
16AI 0							IONet	٠
16AI_0			_				MODBUS-1	•
16AI_0	Setting P	'hysical Addres	s for:	Unknown [	)evice 07		MODBUS-2	
8R0_00							Echelon	
8R0_00	oic. n		- 06 0					
8R0_00	specity P	'nysical Hodres	s ut con	troller				
8R0_00		ddworce -	1					
4A0_00	H	uuress.						
4A0_00								
440_00								
IRLDS_								
MFLEX ESR_							THIS CONT	ROLLER
0005 01 15							Model: H	1X-400 00
UD 00 01 15							Unit: 2	40 007 40
61_001 VEDS 004							IP: 10.2	13.230.12
K5K5_001							F7W Rev:	4.03F01
LNS_002 LI	NJ HET SOLO	11 1100		0 1.00	N 00 01111			
Enter value and	d Press ENTE	R to Set Addre	55					
							E5 • C	ANCEL

11. Press to return to the Network Summary screen. The device should now be "Online".

Repeat steps 8-10 to address the remaining CoreSense K5 modules.

12. Once all the devices are addressed, press

to save changes and exit the Network

Summary.

					-
08-23-12 🔹 🧑 🗓	<u></u>	RX-400 I	Unit 2 Summaru	A DAT: 84	13:07:50
		necwork	summary		
Name	Tupe	Network Address	Rev	Status	ADVISORY SUMMARY Fails 1
					Alarms 0
RX400 LT	RX400-Refrig	LONWorks:	2 4.03F01	This Controller	Notices 3
CS-100 LT.01	CS100-Ckt Sucti	023DFBEA0100:	2 2.01B02	Online	
16AI_001	16AI	IONet:	1 0.00	Online	
16AI_002	16AI	IONet:	2 0.00	Online	NETWORK OVERVIEW
16AI_003	16AI	IONet:	3 0.00	Online	IONet 🔮
16AI_004	16AI	IONet:	4 0.00	Online	MODBUS-1 🔶
16AI_005	16AI	IONet:	5 0.00	Online	MODBUS-2 🔶
8R0_001	8R0	IONet:	1 0.00	Online	Echelon 🌻
8R0_002	8R0	IONet:	2 0.00	Online	
8R0_003	8R0	IONet:	3 0.00	Online	
8R0_004	8R0	IONet:	4 0.00	Online	
4A0_001	440	IONet:	1 0.00	Online	
4A0_002	440	IONet:	2 0.00	Online	
4A0 003	440	IONet:	3 0.00	Online	
IRLDS_001	IRLDS	IONet:	1 0.00	Online	
MFLEX ESR_001	MultiFlex ESR	IONet:	1 0.00	Online	THIS CONTROLLER
CD05 01 ISLFRZ	CtrlLink CD	MODBUS-1:	5 2.07F01	Online	Model: RX-400 00
CD06 01 ISLFRZ	CtrlLink CD	MODBUS-1:	6 2.07F01	Online	Unit: 2
CT_001	CT Drive	MODBUS-1:	13 0.00	Online	IP: 10.213.236.12
K5RS_001	K5 Ref Scroll	MODBUS-1:	7 1.00F03	Online	F/W Rev: 4.03F01
LRS_002 LT	K5 Ref Scroll	MODBUS-1:	8 1.00F03	Online	
E1. DELETE RE	CRD F2 STA	TIIS E3: NET	STATUS	F4: COMMISSION	F5: SETUP

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#### 14. From the System Configuration Menu select 7. Network Setup

08-23-12 🔹 🔟	RX-400 RX DEU	Unit 2 SUMMARY	🖄 OAT: 82	13:00:28
LOW TEMP F 51 52 53 0N 0N	ACK 9.72 [11.50] SYSTEM CONFIGURATION 1. Input Definitions 2. Output Definitions	Circuits FD ISL 4DR 19DR PSI PSI	State Temp .Refr -1.66 .Refr -2.00 .Refr 0 .Refr 101.9 .Refr 102.0	ADUISORY SUMMARY Fails 1 Alarms 0 Notices 2 NETWORK OVERVIEW
	<ol> <li>System Information</li> <li>Remote Communications</li> <li>Alarm Setup</li> <li>Longing Setup</li> </ol>			IUNET • MODBUS-1 • MODBUS-2 • Echelon •
LOW TEMP ( VS 464	<ol> <li>Retwork Setup</li> <li>Global Data</li> </ol>	trl T REM	Value Cmd ON ON 7.00 DFF	THIS CONTROLLER Model: RX-400 00 Unit: 2
Press menu number o	9. Licensing	T FLR T FLR MRLDS4 LT RACK	8.25 OFF 9.50 OFF 8.00 OFF	IP: 10.213.236.128 F/W Rev: 4.03F01

88-23-12 ♥ ····	RX DEV S	UMMARY	*ALARM*
LOW TEMP RA	ACK 9.72 [11.50]	Circuits State Temp	ADVISORY SUMMARY Fails
S1 S2 S3 ON ON 2 	MAIN MENU 1. Suction Groups 2. Condenser Control 3. Circuits 4. Sensor Controls 5. Configured Applications 6. Add/Delete Application	FD ISL .Refr -1.66 4DR .Refr -2.00 10DR .Refr 0 PSI .Refr 101.9 PSI .Refr 102.0	Alarms U Notices 2 NETWORK OVERVIEW IONet • MODBUS-1 • MODBUS-2 • Echelon •
VS 464 a Controlled By: Dis Liquid Level%: 28.00	7. System Configuration 8. Status 9	tr1 Value Cmd ON ON T REM 7.00 OFF MRLDS2 LT FLR 8.25 OFF MRLDS3 LT FLR 9.50 OFF MRLDS4 LT RACK 8.00 OFF	THIS CONTROLLER Model: RX-400 00 Unit: 2 IP: 10.213.236.128 F/W Rev: 4.03F01
TTESS MENG HUMBER OF	Seren co serección		

#### 15. From the Network Setup Menu, select 4. Controller Associations. Then Select 4. Compressor (Press Enter)

<b>98-23-12 🔹 🦪 </b>	D			RX-400 Network	Unit Summa	2 ary	🖻 OAT: 8 NAMES FULL	5 13:09:34
Name	ту	pe		Network Address		Rev	Status	ADUISORY SUMMARY Fails 1
RX400 LT	RX4	00-R	efriq	LONWorks:	2	4.03F0	1 This Controller	Notices 3
CS-100 LT.01	CS1						Online	
16AI 001	16A			NETWORK SETUP			Online	
16AI 002	16A						Online	NETWORK OVERVIEW
16AI_003	16A	1.	Network S	Summary			Online	IONet 🔮
16AI_004	16A		_				Online	MODBUS-1 🔮
16AI_005	16A	2.	Connected	i I/O Boards & con	itro1.	lers	Online	MODBUS-2 🔮
8R0_001	8R0						Online	Echelon 🌻
8R0_002	8R0	3.	Router Se	etup			Online	
8R0_003	8R0						Online	
8R0_004	8R0	4.	Controlle	er Associations			Online	
4A0_001	4A0						Online	
4A0_002	4A0			IONet:	2	0.00	Online	
4A0_003	4A0			IONet:	3	0.00	Online	
IRLDS_001	IRL	DS		IONet:	1	0.00	Online	
MFLEX ESR_001	Mul	tiFle	ex ESR	IONet:	1	0.00	Online	THIS CONTROLLER
CD05 01 ISLFRZ	Ctr	lLin	k CD	MODBUS-1:	5	2.07F0	1 Online	Model: RX-400 00
CD06 01 ISLFRZ	Ctr	lLin	k CD	MODBUS-1:	6	2.07F0	1 Online	Unit: 2
CT_001	CT /	Drive	e	MODBUS-1:	13	0.00	Online	IP: 10.213.236.12
K5RS_001	K5	Ref S	Scroll	MODBUS-1:	7	1.00F0	3 Online	F/W Rev: 4.03F01
LRS_002 LT	K5	Ref S	Scroll	MODBUS-1:	8	1.00F0	3 Online	
Press menu num	ber	or se	croll to s	election				

08-24-12 🛛 🦪 🔟	RX-400 Unit RX DEV SUMM	2 👩 OI Ary Names	AT: 72 9:17:48 S FULL
LOW TEMP RA( <sup>S1 S2 S3</sup> <sup>ON ON ON</sup>	CK 14.13 real of Controller Associations 1. Case Control Circuit 3. MultiFlex ESR 4. Compressor	cuits State FD ISL .Refr 4DR .Refr ØDR .Refr SI .Refr SI .Refr	ADUISORY SUMMARY Femp Fails 1 20.48 Alarms 0 Notices 2 2.50 101.9 NETWORK OVERVIEW IONet • MODBUS-1 • MODBUS-2 • Echelon •
<b>VS 144</b> Controlled By: Dis Liquid Level%: 28.	I <sup>MRI</sup>	trl Value ON T REM 7.00 T FLR 8.25 T FLR 9.25 LDS4 LT RACK 9.25	Cmd THIS CONTROLLER ON Model: RX-400 00 OFF Unit: 2 OFF IP: 10.213.236.128 OFF F/W Rev: 4.03F01 OFF
Press menu number or s	croll to selection		
			F5: CANCEL

# 16. Highlight the Suction Group<sup>2</sup> field, select F4: Look Up (Press F4) and select the appropriate suction group for the device and press Enter.

3-23-12 🔹	6 🔟		RX-400 Unit 2 Compressor Asso	C	A NAM	OAT: 85 1es full		13:10	9:27
	Compressor K5RS_001 LRS_002 LT	Compressor<> Suction (	t Group Associati Group Comp 0 0	.on Stage v Unld1 Ø Ø	Un1d2 0 0	 Proof YES YES	ADUISORY Fails Alarms Notices NETWORK ( IONet MODBUS MODBUS Echelon THIS CONT Model: f Unit: 2 IP: 10.2 F/W Rev:	SUMMAF DVERUIE 2 FROLLEF 2X-400 213.236 : 4.03F	₹¥ <b>9</b> <b>3</b> <b>8</b> <b>9</b> <b>8</b> <b>9</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>12</b> <b>13</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>14</b> <b>15</b> <b>15</b> <b>15</b> <b>16</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b>17</b> <b></b>
scroll app	plications wi	th NEXT/PREV keys	or use LOOK-UP t	o select					
					JI- I O O I	2 IIP	EE - 0	ONCEL	



## 2 For more information on setting up suction groups in the E2, consult your Copeland Retail Solutions representative.

#### 17. Scroll over to the Comp Stage and type in the compressor stage. (CoreSense Protection provides proofing only on the compressor.) Note! The compressor stage number should correspond to the stage numbers in the suction group setup (Step 7)

08-23-12 • 🕜 🔟		RX-400 Ur Compresso	nit 2 r Assoc	:		OAT: 85 TES FULL		13:12:14
	Compressor<>	> Suct Group Ass	ociatio	'n			ADVISORY	SUMMARY
Compres	sor Suct	tion Group					Alarms	0
K5RS_00 LRS_002	1 LOW LT	TEMP RACK	Comp	Stage Unld1 0 0	Un1d2 0 0	Proof YES YES	NOTICES NETWORK O IONet MODBUS-1 MODBUS-2 Echelon	UERUIEW
							THIS CONT Model: F Unit: 2 IP: 10. F/W Rev	(ROLLER 1X-400 00 213.236.128 : 4.03F01
Enter Compressor	Stage 1 to 16							
							F5: C	ANCEL

#### **CoreSense Diagnostics E2 Programming Instructions for Enhanced Suction Group**

The Enhanced Suction Group has all the important features of the older Suction Group application, but instead of employing user-configured PID constants to optimize operation, the Enhanced Suction Group determines optimum control by "learning" the effect each compressor and circuit load has on the suction input. The Enhanced Suction Group is easier to configure and more conservative with compressor cycling than the standard Suction Group. In addition, the Enhanced Suction Group also supports use of the Copeland Digital Scroll and Copeland Digital Discus compressors. **1. Logging into E2.** 

05-21-12 0	9	RX-500 RX DEV	Unit 2 🖄	14:11:43 #ALARN#
EN SUC	GRP001	NONE [22.00]		ADUISORY SUHMARY Fails Alarns 0
DGTL 10	U P	User Login sername: USER assword: ****	Notices 14 NETVORK OVERVIEV IONet 6	
CONDENS VS Controlled By	C Comp This produc user interf by copyrigh and interna	opyright (c) 2002-2011 uter Process Cantrols, All rights reserved. t and systen, including ace and algorithms, is t law, intellectual pro tional treaties.	Inc. protocols, protocted perty law	THIS CONTROLLER Hoodel: RX-500 00 Unit: 2 IP: 10.101.200.207 F/V R0V: 4.03913
Enter desired	text	l	1	F5: CANCEL
	• Pr	ess the <mark>o</mark> Button.		

- Type in "USER" in the Username field.
- Press the e button.
- Type in "PASS" in the Password field.
- Press the e button.
  - 2. Press 6 for Add/Delete Application Menu.

#### Press 1 to Add Application.



05-21-12 🔹 🕜 🔟	RX-409 Unit 2 📩	14:35:19
	ADD APPLICATION	FULL
	Add Application	ADVISORY SUMMARY
	• •	Fails 1
	Select an application type to add, then	Alarms 0
	enter the number to add and press "Enter".	Notices 14
+ Type + How nany	: Analog Combiner ? O	NETWORK OVERVIEW IONet 🗣
	Note: Only applications that can be added will be displayed.	
Results		
		THIS CONTROLLER Hodel: RX-480 06 Unit: 2 IP: 10.161.200.207 F/V Rev: 4.63813
Scroll application	s with NEXT/PREV keys or use LOOK-UP to select	
	L F4: LOOK U	P F5: CANCEL

#### 3. Press **\$** for Look Up and search for Enhanced Suction application. *Press Enter once Enhanced Suction is highlighted.*

85-21-12 🔹 🌈 🔤	RX-400 Unit 2 ADD APPLICATION	EULL	14:40:38 *ALARN*
	Add Application	AD F	OVISORY SUMMARY Tails 1
Se 1 en t	Select Application Type n er".	r F	Alarns 0 Notices <mark>14</mark>
+ Type :	1. Analog Combiner ▲ 2. Analog Import Point 2. Analog Sangar Stri	NE	TWORK OVERVIEW
+ How many ? Not	5. Anti-Sueat Control 5. Case Control Circuit	· · · · ·	lONet e
Results	6. Condenser Control dea 7. Conversion Cell 8. Digital Combiner		
	9. Digital Import Point 10. Digital Sensor Ctrl 11. Enhanced Suction		
	12. Flexible Combiner 13. HUAC Simulation 14. Heat/Cool Control	TH	IIS CONTROLLER
	15. Holiday Schedule 16. Impulse 17. Log Group	P U	10del: RX-400 00 Jnit: 2 (P: 10 141 200 207
	18. Loop/Sequence Ctrl V		-/W Rev: 4.03B13
Press nenu number or s	croll to selection		
			F5: CANCEL

# 4. Press the down arrow to the "How many?" field and type in the required number of applications needed. (Refer to programming details.)

add Application       ADVISORY SUMMARY         Select an application type to add, then       Alarms         enter the number to add and press "Enter".       Alarms         • Type       : Enhanced Suction         • How many ?       Image: Select an applications that can be added         Note: Only applications that can be added       Image: Select an added         Results       Image: Select an added         Image: Select an applications that can be added       Image: Select added         Image: Select an applications that can be added       Image: Select added         Image: Select added       Image: Select added <th>05-21-12 🔹 🥱 🔟</th> <th>RX-400 Unit 2 ADD APPLICATION</th> <th>A) Full</th> <th>14:47:26 <mark>*ALARN</mark>*</th>	05-21-12 🔹 🥱 🔟	RX-400 Unit 2 ADD APPLICATION	A) Full	14:47:26 <mark>*ALARN</mark> *
<pre>+ Type : Enhanced Suction + How many ? 1 Note: Only applications that can be added uill be displayed. Results THIS CONTROLLER Model: RX-498 0 Unit: 2 IP: 16.161.260.2 F/W Rev: 4.03B13</pre>		Add Application Select an application type to add, then enter the number to add and press "Enter".		ADVISORY SUMMARY Fails <mark>1</mark> Alarms 0 Notices <mark>14</mark>
Results THIS CONTROLLER Model: RX-400 0 Unit: 2 IP: 10.161.200.2 F/W Rev: 4.03B13 Enter 1 to 3 1 Enter number of applications. Press ENTER to ADD.	+ Type + How many	: Enhanced Suction ? <mark>1</mark>		NETWORK OVERVIEW Tonet o
THIS CONTROLLER Model: RX-400 Unit: 2 IP: 10.161.200.2 F/W Rev: 4.03B13	Results	vil be displayed.		
Enter 1 to 3   Enter number of applications, Press ENTER to ADD.				THIS CONTROLLER Model: RX-400 00 Unit: 2 IP: 10.161.200.207 F/W Rev: 4.03813
	Enter 1 to 3   Ente	er number of applications. Press ENTER to ADD.		

5. Enhanced Suction Group Set Up

In the C1: General Tab, this allows the user to change the name, set the number of stages (compressors and unloaders), condenser and set the required parameters needed. (Refer to programming details.)

96-27	7-12 🔹 😚 🔟			RX-46	00 Unit 3	E.	8:45:16
lse (	Ctrl-X to Se	lect	CX Tabs	S	ETUP		
C1:	General	C2:	Circuits	C3: Setpoints	C4:	C5: Inputs	ADVISORY SUNMARY
Có:	Outputs	C7:	Stage Setup	C8: Stage Outs	C9: Var Cap	CO: MORE	Fails 0
			Enhanced	Suction: EN SUC	GRP 001		Alarms 2
							Notices <mark>12</mark>
	General		Ualue				
	Name		EN SUC	GRP 001			
	Long Name						NETWORK OVERVIEN
	strategy		: Normal				IONEC
	NUMBER - St	ages	- 000	D			MODRO2-1 🧄
	Refrigerant		= KZZ				
	PHOSE Prote	UL.	= No				
	Comp On H10	rost	- No				
	Comp On Bec	laim	: No				
	Enable Floa	t	: No				
	Tuo Stage		: None				
	Condenser		:				
							THIS CONTROLLER
							Model: RX-400 00
							Unit: 3
							IP: 10.161.200.37
							F7W ReV: 4.04H01
Ente	er desired t	ext	Name of t	his suction grou	ip		
F	1: PREV TAB		F2: NEXT	TAB F3	: EDIT	F4: STATUS	F5: CANCEL

*Highlight the condenser parameter and press the \$ key to see the options* 

#### 6. When done, press @ to go to C2: Circuits Tab. This screen associates the Standard and Case Control Circuits to the Enhanced Suction Group. (Refer to programming details.)

Under Application, press \$ for Look Up, this will display all Circuits that are set up in the E2.

05-22-12 🔹 🥱 🔟		RX-40	00 Unit 2	<u>a</u>	11:47:41
Use Ctrl-X to Sele	ect CX Tabs	2	SETUP		FULL
C1: General 🛛 🖸	2: Circuits	C3: Setpoints	C4:	C5: Inputs	ADVISORY SUMMARY
Có: Outputs C	7: Stage Setup	C8: Stage Outs	C9: Var Cap	CO: NORE	Fails 1
	Enhanced	Suction: EN SUC	GRP 001		Alarns 0 Noticos 17
Circuits	Applica	tion			nocices 17
Circuit1	=			Ī	
Circuit2					NETWORK OVERVIEW
Circuit3	:				IONet 🔶
Circuit4	:				
Circuit5	:				
Circuit6	:				
Circuit7	:				
Circuit8	8				
Circuit9	:				
Circuit10	3				
Circuit11	-				
Circuit12	=				
Circuit13	:				
Circuit14					THIS CONTROLLER
Circuit15					Hodel: RX-400 00
Circuit16					Unit: 2
Circuit17					IP: 10.161.200.207
					F/V Rev: 4.03B13
Enter Board/Appli	ication   Circu	it Association			
F1: PREU TAB	F2: NEXT	TAB F3	EDIT	F4: LOOK U	P F5: CANCEL

ß5-22-12 ♦ 🕜 🗓		RX-400 Unit 2	<u>ل</u> ا	11:48:03
		CELL LOOKUP	FULL	
C1: General	C2: Circuits	C3: Setpoints C4:	C5: Inputs	ADVISORY SUMMARY
C6: Outputs	C7: Stage Setup	C8: Stage Outs C9: Var Cap	CO: MORE	Fails 1
				Alarms Ø
				Notices 17
Circuits		Annlication Selection		
C1rcuit1				
CIPCUIT2	ADD1/Poi	nt Tupe		TOWAR OVERVIEW
Circuita Circuita				Ionec 🗧
Circuit4	CASECTL	CKT001 Case Control Circuit		
Circuit6	CASECTL	CKT002 Case Control Circuit		
Circuit7				
Circuit8				
Circuit9				
Circuit10				
Circuit11				
Circuit12				
Circuit13				
Circuit14				THIS CONTROLLER
Circuit15				Model: RX-400 00
Circuit16				Unit: 2
Gircuit17				IP: 10.161.200.207
L.				F7W Rev: 4.03B13
Use Up-Down Ar	row keys or funct	ion keys to select entry. Pres	SS BACK.	
F1: SELECT		F3: BEGINNING	F4: END	F5: CANCEL



to associate the Circuit in the Enhanced Suction Group.

7. When done, Press @ to go to C3: Setpoints Tab. This screen enables the user to set the Suction Pressure setpoint to be maintained by the Enhanced Suction Group. (Refer to programming details.)

05-22-12 🔶 🤇 Use Ctrl-X t	7 ™ o Select CX	Tabs	RX-400 Unit 2 SETUP	© FULL	11:59:33 *ALARH*
C1: General C6: Outputs	C2: Circ C7: Stag E	cuits <u>C3: Setpo</u> ge Setup C8: Stage nhanced Suction:	<mark>ints C4:</mark> Outs C9: Var Cap EN SUC GRP001	C5: Inputs C8: HORE	ADUISORY SUMMARY Fails 1 Alarns 0 Nations 17
Setpoir SUCT PF Pres De Ext Pre	its ES SETPT : Padband : Ps Shift :	Ualue 22.08 2.06 6		L	NETVORK OVERVIEW
					THIS CONTROLLER Hodel: RX-400 00 Unit: 2 IP: 10.161.200.207 F/V Rev: 4.03B13
Enter -999.	01 to 1000 P	SI   Suction pres	sure setpoint		
F1: PREU	TAB	F2: NEXT TAB	F3: EDIT	F4: STATUS	F5: CANCEL

Type in the required suction pressure setpoint. Press the key and type in the desired dead band. Recommended dead band:

Less than 3 compressors = 3 – 4

More than 3 compressors = 2

• 8. When done, press @ to go to C5: Inputs Tab. This screen enables the user to set the necessary sensors and transducers that are at a minimum suction pressure as required. (Refer to programming details.)

05-22	2-12 🔹 🦪 🔟				RX-4	00 Unit 2		<u>ii</u>		12:04:40
Use (	trl-X to Se	lect	CX Tabs			SETUP			FULL	
C1:	General	C2:	Circuits	C3: Se	tpoints	C4:		C5: Inputs		ADVISORY SUMMARY
C6:	Outputs	C7:	Stage Seti	up C8: St	age Outs	C9: Var	Cap	CO: MORE		Fails 1
			Enhance	d Suction	n: EN SUC	GRP 001				Alarms 0
1	T			<b>D</b> .		D -				Notices 17
	Inputs	5	_	80	jar d	- PC	int			
	SUCT MON TEL	.a MP								NETWORK OUERUITEN
	DISCHARGE T	FNP	-							INNet .
	SUCTION STE	PUP	-							
	DISCHARGE PI	RES	-			-				
	RECLAIN TST	AT	:			:				
	DISABLE LEAD	RN	:	:		:				
	FORCE RELEAD	RN	:	:		:				
	PHASE LOSS		: E2 Un	it02:6L00	3AL DATA	:REFR F	HASE LOS	s		
	DEMAND SHED		:	:		:				
	EMERGENCY O	UR	: E2 Un	it02:GL00	BAL DATA	:REFR E	MER OV			
	ENABLE		=	:		-				
										Model: PX-J00 00
										linit: 2
										IP: 10.161.200.207
										F/W Rev: 4.03B13
Ente	er Board/App	lica	tion   Suc	tion pres	sure con	trol inpu	t			
F	1: PREV TAB		F2: NE	XT TAB	F\$	B: EDIT		F4: LOOK U	P	F5: CANCEL

## Note: Once a board and point for the Input is configured, a dialogue box will appear that a sensor must be selected



07-63-12 🌢 🦿 🔟	RX-400 Unit : ANALOG INPU	B 🖄 T	14:42:56
Boar Poin Sens Sele	d/Point # : 1.1 t Name : _AI.03.01.01 or Type : <mark>Temperature</mark> of Fun. Units: DF		ADVISORY SUMMARY Fails <mark>2</mark> Alarms 0 Notices <mark>11</mark>
Defa Defa Defa	ult on Open : NONE ult on Short : NONE ult Other : NONE		NETWORK OVERVIEW TONet •
Sens	or Offset : O		
			THIS CONTROLLER Model: RX-400 00 Unit: 3 IP: 10.161.200.133 F/W Rev: 4.84A01
Scroll using Mext/Prev k	eys   Sensor Type Select		
F1: SET ALARMS F2:	SET LOGGING	F4: LOOK UP	F5: CANCEL



#### 9. Press **\$** for Look Up and select appropriate sensor. Press **e** button

10. When done, press @ to go to C6: Outputs Tab. (If system has no related functions, leave Outputs in default.) (Refer to programming details.)

05-22-12 🔍 🍘 🔟 Use Ctrl-X to Select CX Tabs	RX	-400 Unit 2 SETUP	🖻 FULL	12:18:40
C1: General C2: Circuits	C3: Setpoints	5 C4:	C5: Inputs	ADVISORY SUMMARY
<u>C6: Outputs</u> Enhanc	up C8: Stage Out ed Suction: EN S	<u>:5   CY: Var Cap</u> UC GRP001	CU: MURE	_ Fails <mark>3</mark> Alarms 0 Notices 21
Outputs GROUP LLSU : SWITCH BACK : CONTROL STATUS : STAGE STATUS1 : RACK FAIL : SHUTDOWN CKT : SUBCOOLER : SAT SUCT TEMP : CUR SUPERHEAT : FILTERED PRES :	Board : : : : : :	Point : : : : : : : : : : : : :	L	NETWORK OVERVIEW IONet •
CUR PRES SETPT : PERCENT USED : CURRENT CAP : TOTAL STAGES : ACTIVE STAGES : ALG STATUS : LEAD CIR OUT : Enter Proved/Openicotion 1 Su	: : : :	: : : :	L	THIS CONTROLLER Model: RX-400 00 Unit: 2 IP: 10.161.200.207 F/W Rev: 4.03B13
F1: PREV TAB F2: N	EXT TAB	F3: EDIT	F4: LOOK UP	F5: CANCEL

11. When done, press @ to go to C7: Stage Setup Tab. This screen enables the user to set the configuration of the compressors if it is running with an unloader if it is controlled by a variable frequency drive or if it is controlled digitally. For compressors with unloaders, the unloader must always follow a compressor. It is recommended that the compressor with the largest capacity should be placed first. (Refer to programming

uetans./							
06-27-12 • 🥱 🔟	RX-44	30 Unit 3	ä	9:08:41			
USE CTF1-X to Select CX labs	2	SETUP					
C1: General C2: Circuits	C3: Setpoints	C4:	C5: Inputs	ADVISORY SUMMARY			
C6: Outputs C7: Stage Setur	) C8: Stage Outs	C9:	CO: NORE	Fails 0			
Enhanced	Suction: EN SUC	GRP 0 01		Alarns 2 Notices 12			
Stage Setup Type Capacity #1 - Dot1 XXXXX	y Proof Oil Se No None	ensor Oil Dly	Oil Pres				
#2 : Comp XXXXX	no nome			NETVORK QUERUTEW			
#3 : Unid XXXXX	Но Нопе			10Net 🔶			
#4 : Comp XXXXX				NODBUS-1 🔮			
#5 : Unid XXXXX	No None						
#6 : US XXXXX							
				THIS CONTROLLER Hodel: RX-400 00 Unit: 3 IP: 10.161.200.37 F/V Rev: 4.04A01			
Scroll using Next/Prev keys	Type of stage						
F1: PREU TAB F2: NEXT	I TAB F3	EDIT	F4: LOOK UP	F5: CANCEL			

#### Press \$ for Look Up and select the proper configuration of the compressor.



Press the e button to set the configuration.

To change the value in the "Capacity" column, highlight the number to the right of the compressor and enter its capacity.

12. When done, press @ to go to C8: Stage Outs Tab. The Stage Outs activates the compressor or unloader in the appropriately numbered Stage Out output definition. Enter the respective board and point for each compressor and unloader. (Refer to programming details.)

06-27-12 🔹 🧒 🗓 Use Ctrl-X to S	n elect CX Tabs	RX-4	00 Unit 3 SETUP	ä	9 :36 : 49 ★ALARH★
C1: General C6: Outputs	C2: Circuits C7: Stage Setur Enhanced	C3: Setpoints C8: Stage Outs Suction: EN SUC	C4: C9: GRP001	C5: Inputs C0: MORE	ADUISORY SUMMARY Fails 0 Alarms 2
Stage Outs STAGE OUT STAGE OUTS STAGE OUTS STAGE OUTS STAGE OUTS STAGE OUTS		Board	Point : : : : :		NOTICES 12 NETWORK OVERVIEV TONET • MODBUS-1 • THIS CONTROLLER
Enter Board/Ap	plication   Comp	ressor output			Model: RX-480 90 Unit: 3 IP: 10.161.209.37 F/W Rev: 4.04A01
F1: PREV TA	B F2: NEX	T TAB _ F:	B: EDIT	F4: LOOK UP	F5: CANCEL

Press \$ for Look Up and select the necessary board and point for the Stage Out.

14. When done, Press @ twice to go to C0: More Tab and open the Compressor Proof Screen. This is a digital or an analog sensor input to which tells the E2 that the compressor is running or not when it is being called to operate. This act as a safety function, which will shut down the compressors to prevent damage to the equipment or the system. (Refer to programming details.)

05-22 lise C	-12 🔹 🚰 🛄 trl-X to Se	lect	CX Tahs		RX-4	00 Unit SETUP	2		<u>A</u>	F111 1		12:47:16
C1: 6 C6: 0	General Dutputs	C2: C7:	Circuits Stage Setup Enhanced	C3: Se C8: St Suctio	etpoints tage Outs n: EN SUC	C4: C9: GRP001		05: C0:	<u>Inputs</u> MORE	VEE	ADVISORY Fails Alarms	SUMMARY 3 0
	Proof COHP PROOF Proof Fail Proof FailPr Proof Shutd Proof Reset PROOF FAIL1	D1y io own	: : 0:01:0 : 2 : Yes : No :	B 10 10	oard	:	Point				Notices NETWORK   IONet	23 DUERU LEW
											THIS CON Model: Unit: 2 IP: 10. F/W Rev	FROLLER XX-400 00 161.200.207 : 4.03813
Ente	r Board/App	lica	tion   Compr	essor	run proof	input						
F*	1: PREV TAB		F2: NENT	TAB	J F	3: EDIT		F4:	LOOK UP		F5: (	ANCEL

Press *\$* and select the necessary board and point where the input is located.

15. When done, press the @ button twice to go to Control Cycling screen. This parameter can be adjusted to reduce or increase the number of times the compressor is being switched. (Refer to programming details.)

אד-12 🔹 🚰 💷 RX-400 Unit 2 🖻 Jse Ctrl-X to Select CX Tabs SETUP FULL	12:57:23
C1: General     C2: Circuits     C3: Setpoints     C4:     C5: Inputs       C6: Outputs     C7: Stage Setup     C8: Stage Outs     C9:     C9: HORE       Enhanced     Suction: EN SUC GRP001	ADUISORY SUMMARY Fails <mark>3</mark> Alarns 0
Nornal Value Control/Cycles : Moderate Control Min On Tine : 0:00:00 Min Off Time : 0:05:50	Notices 25 NETVORK OVERVIEW IONet •
	THIS CONTROLLER Model: RX-400 00 Unit: 2 IP: 10.161.200.207 F/V Rev: 4.03B13
Scroll using Next/Prev keys   Sets the cycling/control of the algorithm E1- PREW TAB   E2- NEXT TAB   E3: EDIT   E4- LOOK UP	ES- CANCEL

It is recommended to use Moderate Control for first time running operation. This enables the E2 to learn the frequency of compressor cycling and this offers a balance between the compressor cycling and the tightest control of the suction pressure.

If the user wants to improve the accuracy of the suction pressure and the compressors does not experience excessive cycling, the parameter can be set to the tightest control. The suction pressure will be maintained in a tighter control range; however, this will likely increase compressor cycling as a result. (See table for Control / Cycles definition)

Table 2 –	Control /	Cycles	Definition
-----------	-----------	--------	------------

Control/Cycles	
Tightest Control	Maintains the suction pressure accurately close to the setpoint because the compressor is being switched on and off at a rapid rate and this results to increased compressor cycling.
Tight Control	Maintains the suction pressure very close to the setpoint because the compressor is being switched on and off at a rapid rate and this result to increased compressor cycling.
Moderate Control	Balances the compressor cycling and maintains the suction pressor in a tight control.
Less Cycling	This reduces compressor cycling and it reduces its accuracy in maintaining the suction pressure.
Least Cycling	This has very low compressor cycling and low accuracy in maintaining the suction pressure.

#### Alert Codes & Troubleshooting Tips

**Table 3** is an explanation of the alert codes for the CoreSense and what the flash codes mean. It is also available on the inside of the terminal box lid on all 7.0 - 15 HP compressors or as part of the 2.0 - 7.0 HP kits. **Table 4** are some trouble shooting tips for the alert codes. There are 4 colors that can flash from the module:

#### Green: all is o.k.

Yellow: There has been a system trip, and this will auto reset once the trip has cleared.

**Red** is a lockout and will require a manual reset on the contractor's part. This means the power must be cycled to the CoreSense.

Blue is used for digital applications and will light up when the scroll set is unloaded. There are also trouble shooting tips to help identify and fix the issue.

Alert Code		Code Description	Protection Shutdown (Default)	Protection off Time (Default)	Consecutive Detections Until Lockout				
Lockout feature is NOT enabled form the factory except on code 7									
**	1	High Discharge Temp - See diagram for setting	Yes	20 Min.	4				
*	2	Excess System Limit Trips - 4 consecutive system limit trips having 1-15 Min Runtime Each	Yes	5 Min.	No Lockout				
*	3	Excessive Demand Cycling - Default is 240 cycles per 24 hr. period	No	-	-				
**	4	Locked Rotor - Compressor did not start within allotted time	Yes	20 Min.	4				
*	5	Demand Present - No current detected over 4hr. period	No	-	-				
**	6	Phase Loss Detected	Yes	20 Min.	10				
*	7	Reversed Phase Detected	Yes	Until Module is Reset	1				
*	8	Welded Contactor - Current detected without demand <sup>1</sup>	No	-	-				
*	9	Low Module Voltage	Yes	5 Min.	No Lockout				
*	10	Module Communications Error	No	-	-				
*	11	Discharge Temperature Sensor Error	No	-	-				
*	12	Current Transducer Error	No	-	-				
Digital Alert Codes:         1 - Loss of analog demand - Check analog voltage         2 - Network mode ON, 1 - 5 V input present- Check position of DIP Switch #8         3 - Network mode OFF, receiving Modbus™ communication - Check position of DIP switch #8									
		Lockouts can be enabled by DIP sw	ritch 6 setting						
<sup>1</sup> Code 8 displays for 24 hours after last detection The M1-M2 relay only opens during a protection shutdown. To reset module, cycle module power. Module must be reset for DIP switch changes to take effect. For technical support call 1-888-367-9950 or visit Copeland.com/OPI Refer to <u>AE-1383</u> for more details.									

#### Table 3 – Alert Code Description

LED SOLID FLASHING ₩ Normal ALERTS Demand, TRIP No Current (Auto Reset) LOCK OUT ₩ -(Manual Reset) ₩ Digital

#### Blue LED Added For 1. Digital Alerts \* Quick Flashes 2. Digital Unloader \* Solid LED

Table 4 - CoreSense Diagnostics Module Troubleshooting			
Status LED	Status LED Description	Status LED Troubleshooting Information	
Yellow Alert LED 4 Flashes	Locked Rotor Compressor is drawing current without rotating or four consecutive compressor trips after run time of 1-15 seconds	<ol> <li>Low Line voltage (contact utility if voltage at disconnect is low).</li> <li>Verify presence of all legs of power line.</li> <li>Excessive liquid refrigerant in compressor.</li> <li>Compressor bearings are seized.</li> <li>Verify operating current.</li> </ol>	
Yellow Alert LED 6 Flashes	Missing Phase Demand signal is present, but current is missing in one phase.	<ol> <li>Improper wiring. Correct order of phases in wires.</li> <li>Failed contactor. Check contacts for pitting.</li> <li>Compressor current could be too low. Refer to Specifications.</li> <li>Verify presence of all legs of power line.</li> </ol>	
Yellow Alert LED 9 Flashes	Low Voltage Detected Control voltage dips below 85V for 110V or 170V for 220V	<ol> <li>Low Line voltage (contact utility if voltage at disconnect is low).</li> <li>Check wiring connections.</li> </ol>	
Red Alert LED 1 Flash	LOCKED OUT ON: High Discharge Line Temperature Trip See inside label to determine cut out temp.	<ol> <li>Possible loss of refrigerant charge.</li> <li>Blocked condenser.</li> <li>Verify that discharge valve is open.</li> <li>On low temperature scroll compressors check liquid injection.</li> </ol>	
Red Alert LED 4 Flashes	LOCKED OUT ON: 4 Consecutives Locked Rotors Detected Compressor is drawing current without rotating or four consecutive compressor trips after run time of 1-15 seconds.	<ol> <li>Low Line voltage (contact utility if voltage at disconnect is low).</li> <li>Verify presence of all legs of power line.</li> <li>Excessive liquid refrigerant in compressor.</li> <li>Compressor bearings are seized.</li> <li>Verify operating current.</li> </ol>	
Red Alert LED 6 Flashes	LOCKED OUT ON: 10 Missing Phase Detections Demand signal is present but current is missing in one phase.	<ol> <li>Improper wiring. Correct order of phases in wires.</li> <li>Failed contactor. Check contacts for pitting.</li> <li>Compressor current could be too low. Refer to Specifications.</li> <li>Verify presence of all legs of power line.</li> </ol>	
Red Alert LED 7 Flashes	LOCKED OUT ON: 1 Reverse Phase Detected Demand signal is present but current is not detected in the correct sequence.	<ol> <li>Improper wiring. Correct order of phases in wires.</li> <li>Compressor current could be too low. Refer to Specifications.</li> <li>Verify presence of all legs of power line.</li> </ol>	

#### Table 4 - CoreSense Diagnostics Module Troubleshooting

#### **Kits & Accessories**

Kits and accessories are available through Copeland Distribution Services. Below are references for the kit part numbers you will need when ordering parts. Please note that there are different lists for 7.0 - 17 HP, 2 - 4.0 HP and 0 - 7.5HP Copeland Scroll compressors when searching for kit numbers.

Table 5	- CoreSense Diagnostics Service Kits for 7.0 – 17 HP Scroll compressors (ZB*K5 & ZF*K5)		
P/N	N Modules		
943-0159-00	Current Sensing Module		
943-0209-00	CoreSense Diagnostic Module		
P/N	Crankcase Heaters		
918-0047-00	120 V Crankcase Heater 90W 48" Lead Length		
918-0047-01	240 V Crankcase Heater 90W 48" Lead Length		
918-0047-02	480 V Crankcase Heater 90W 48" Lead Length		
918-0047-03	575 V Crankcase Heater 90W 48" Lead Length		
998-7029-00	Crankcase Heater Enclosure Box		
P/N	Digital Components		
998-0060-03	120V Digital Solenoid Coil		
998-0060-04	240V Digital Solenoid Coil		
998-0189-00	Closed Loop Digital Controller (Single Compressor Applications)		
998-0341-00	1 - 5 V Analog Input Wire Kit		
998-0342-00	Digital Solenoid Coil Wire (CoreSense Module to Digital Solenoid Coil)		
P/N	Discharge Line Thermostats/Thermistors		
998-0176-00	Thermistor Kit (Includes Top Cap, and DLT Thermistors)		
998-0229-00	Top Cap Thermistor Kit (Top Cap Thermistor Only)		
P/N	Liquid Injection Components		
998-0177-00	DTC Vapor Injection Adapter		
998-0340-00	Electronic Liquid Injection Valve Kit		
998-0359-00	Liquid Solenoid Cable Kit		
998-0500-03	DTC Kit, 250F Set Point DTC With 268F Thermistor for Liquid Injection		
P/N	Motor Protection		
971-0641-00	External Motor Protection Module		
- 4 1			
P/N	Mounting		
527-0116-00	Spacer Mounting Kit, 30-35 Durometer, 1.45" OD, 0.44" ID, 0.75" Height		
527-0210-00	Spacer Mounting Kit, 55-65 Durometer, 1.62" OD, 0.44" ID, 1.75" Height		
998-0178-00	Hard Mount Kit, 1.87" OD, 0.69" ID, 0.31" Height		
5/1			
P/N	Oil Management		
65365	Oil Management Control w/ Junction Box 24V, 50/60Hz		
65366	Oil Management Control w/ Series Relief Connector 24V, 50/60Hz		
66652	Oil Management, OMB Adapter (One Piece)		
D/N			
P/N	Schwide Valwes and Adaptor 4 4/41 40 Thread to 7/01 Owent		
998-0034-08	Rotalock to Stub Tube Adapter, 1 1/4"-12 Infead to 7/8" Sweat		
998-0034-13	Rotalock to Stub Tube Adapter, 1 3/4"-12 Infead to 1 3/8" Sweat		
998-0034-18	Rotalock to Stud Lube Adapter, 1°-14 Inread to 1/2° Sweat		
990-0010-90	Service Valve Kit, 1 1/4 -12 Infead to //8 Sweat		
998-0510-46	Service Valve Kit, 1 3/4 - 12 Infead to 1 3/8" Sweat		
990-0100-27	Service valve Kil, 1 3/4 -12 mileau to 1 3/6 Sweat and 1 1/4 -12 mileau to 1/8 Sweat		

#### Table 6 - 2.0 – 7.5HP Copeland Scroll Compressors Service Kits

2.0 - 7.0 HP Medium Temp Kit (P/N 943-0050-00)	P/N's included
CoreSense Module	543-0223-00
Current Transducer Module	543-0159-00
Thermistor- Top Cap and Line	998-0176-00
CoreSense Information/Alert Code Label	052-2852-00
Digital Solenoid Wire	029-0512-01
RS485 Connector	021-0408-00

	4
For use on	4
these Models	2
Models	2

Medium Temp Models		
ZB*KA-	ZBD*KC	
4 – 7.5HP	4 – 7.5HP Digital	
ZB*KC*-	ZBD*KQ	
4 – 7.5HP	4 – 7.5HP Digital	
ZB*KA 2-4.0HP		
ZB*KQ	ZBD*KC	
2-4.0HP	2 – 4.0HP Digital	
ZB*KC 2 – 4.0HP	ZB*KQ 2.0 – 4.0HP Digital	

4 .0 – 7.5 HP Copeland Scroll Compressors Low Temp Kit (P/N 943-0051-00)	P/N's included
CoreSense Module	543-0223-00
Current Transducer Module	543-0159-00
EXV - 1.3mm orifice w/ 1" Rotalock	510-0881-00
Stepper Motor	050-0345-00
Seal - Rotalock Fitting (3 pcs.) 020-0028-	
Tee Fitting	036-1372-00
FM-2014ECT-57 INSTRUCTIONS	FM-2014ECT57
Digital Solenoid Wire	029-0512-01
FM-2014ECT-58 INSTRUCTIONS	FM-2014ECT58
Top Cap Thermistor	085-0240-00
Syringe- Dielectric Grease	093-0044-00
CoreSense Information/Alert Code Label	052-3149-00
Silicone Sealant	999-5170-66
RS485 Connector	021-0408-00

	Low Temp Models		
	ZF*KV-	ZFD*KV-	
	4.0-7.5HP	4.0 – 7.5HP	
on	EVI	Digital EVI	

For use of these Models

ZF\*KQE-4.0 – 7.5HP

4.0 – 7.5HP Scroll Compressors Low Temp Kit (P/N 943-0051-01)	P/N's included
CoreSense Module	543-0223-00
Current Transducer Module	543-0159-00
EXV - 1.3mm orifice w/ 11/16" Rotalock	510-0880-00
Stepper Motor	050-0345-00
Seal - Rotalock Fitting (3 pcs.)	020-0903-02
CoreSense Information/Alert Code Label	052-3149-00
FM-2014ECT-57 INSTRUCTIONS	FM-2014ECT57
Digital Solenoid Wire	029-0512-01
FM-2014ECT-58 INSTRUCTIONS	FM-2014ECT58
Top Cap Thermistor	085-0240-00
Syringe- Dielectric Grease	093-0044-00
Silicone Sealant	999-5170-66
RS485 Connector	021-0408-00

	Low Temp Models		
→	ZF*K4-	ZF*KQE	
For use on	4.0 – 7.5HP	4.0 - 7.5	

these Models

2.0 – 4.0HP Scroll Compressors				
Low Temp Kit (P/N 943-0051-02)	P/N's included		Low Temp I	Models
CoreSense Module	543-0223-00		ZF*K4 2.0 – 4.0HP	ZF*KQE 2.0 – 4.0HP
Current Transducer Module	543-0159-00		ZS*K4	
EXV - 1.0mm orifice w/ 11/16" Rotalock	510-0928-00	For use on	2.0 – 4.0HP Extended Medium	
Stepper Motor	050-0345-00	these	Temp	
Seal - Rotalock Fitting (3 pcs.)	020-0903-02	Models		
CoreSense Information/Alert Code Label	052-3149-00			
FM-2014ECT-57 INSTRUCTIONS	FM-2014ECT57			
Digital Solenoid Wire	029-0512-01			
FM-2014ECT-58 INSTRUCTIONS	FM-2014ECT58			
Top Cap Thermistor	085-0240-00			
Syringe- Dielectric Grease	093-0044-00			
Silicone Sealant	999-5170-66			

021-0408-00

RS485 Connector

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#### Table 7 – Harness and Misc. Kits

4.0 – 7 HP Scroll Compressors Digital Kits	Kit Number
110 V Solenoid	923-0058-08
220 V Solenoid	923-0058-09
Digital Tubing Kit- (4.0 – 7.5HP Scroll compressors)	998-0073-00

For use on these Models

Digital Models			
ZBD30KCE-TFD ZFD13KVE-TFD			
ZBD38KCE-TFD ZFD18KVE-TFD			
ZBD45KCE-TFD ZFD25KVE-TFD			
ZBD57KCE-TFD			

2.0 - 4.0HP Scroll			Digital Models		
Compressors Digital Kits	Kit Number	<b></b>	ZBD21K0	CE-TFD/TF5	ZBD19KQB-TFD
110 V Solenoid	923-0058-08	For use on	ZBD21K0	CL-TFD/TF5	ZBD21KQ-TFD/TF5/TF7
220 V Solenoid	923-0058-09	these	ZBD29K0	CE-TFD/TF5	ZBD21KQE-TFD/TF5/TF7
Digital Tubing Kit- (2.0 –	000 0000 00	Models			ZBD24KQB-TFD
4.0HP Scroll compressors)	998-0066-09	modele			ZBD29KQ-TFD/TF5/TF7
					ZBD29KQE-TFD/TF5/TF7
2.0 – 7.0 HP Scroll compressors Models Extension Harnesses			Length	Cable P/N	Kit Number
Current Transducer Mod	ule Extension Cab	le	3'	529-0297-00	529-0297-00
Current Transducer Module Extension Cable		10'	529-0297-02	L 529-0297-01	
EXV Extension Cable fo	or Liquid Injection		8'	529-0298-00	0 543-0253-00
EXV Extension Cable for	or Liquid Injection		10'	529-0298-02	L 543-0253-01
EXV Extension Cable for	or Liquid Injection		12'	529-0298-02	2 543-0253-02
EXV Extension Cable for	or Liquid Injection		15'	529-0298-03	3 543-0253-03
EXV Extension Cable for	or Liquid Injection		18'	529-0298-04	4 543-0253-04
EXV Extension Cable for Liquid Injection			20'	529-0298-05	5 543-0253-05
		1			
Top Cap Thermistor Extension Cable			8'	529-0299-00	) 529-0299-00
Top Cap Thermistor Extension Cable		10'	529-0299-02	l 529-0299-01	
Top Cap Thermistor Extension Cable		12'	529-0299-02	2 529-0299-02	
Top Cap Thermistor Extension Cable			15'	529-0299-03	3 529-0299-03
Top Cap Thermistor Extension Cable		18'	529-0299-04	4 529-0299-04	
`Top Cap Thermistor Extension Cable		20'	529-0299-05	5 529-0299-05	
Digital Tray Cable		8'	529-0300-00	529-0300-00	
Digital Tray Cable		10'	529-0300-02	L 529-0300-01	
Digital Tray Cable		12'	529-0300-02	2 529-0300-02	
Digital Tray Cable		15'	529-0300-03	3 529-0300-03	
Digital Tray Cable		18'	529-0300-04	4 529-0300-04	
Digital Tray Cable		20'	529-0300-05	5 529-0300-05	
1-5V Analog Input wire with Butt Splice			529-0347-00	)	
1-5 V Analog Input wire without Butt Splice			029-0511-00	) 998-0341-00	
Liquid Line solenoid cable (non digital applications)			029-0512-02	1 998-0359-00	

Miscellaneous Kits	P/N	Kit Number
Current Transducer Module	543-0159-00	943-0159-00
CoreSense Module- (2 – 7.5HP Scroll Compressors models)	543-0223-00	943-0223-00
CoreSense Module-(K5 Models)	543-0209-00	943-0209-00
Liquid Injection Kit for 11/16" Rotalock Fitting (036-1638-00) includes stepper motor & harness	510-0880-00	998-0740-00
Liquid Injection Kit for 1" Rotalock Fitting (036-1506-00) includes stepper motor & harness	510-0881-00	998-0741-00
Stepper Motor		950-0188-00
4.0 -7.0 HP Scroll compressors K4E Models -510-0881-00 Liquid Injection Valve Assembly Only- (1.3mm orifice injection valve 11/16" rotalock)		910-0046-00
4.0 -7.0 HP Scroll compressors KVE Models - 510-0880-00 Liquid Injection Valve Assembly Only- (1.3mm orifice injection valve 1" rotalock)		910-0045-00
K5 Liquid Injection valve assembly (1.8mm orifice injection valve with 1" Rotalock)		910-0047-00
2.0 -4.0 HP Scroll Compressors Models - 510-0928-00 Liquid Injection valve assembly 1.0mm with 11/16" rotalock	510-0928-00	910-0045-01

#### Table 8 - Miscellaneous Kit 2HP-17HP Copeland Scroll Compressors model

#### 2.0 HP – 7.0 HP Copeland Scroll Compressors model designation.

#### Table 9 - 4.0 - 7.5HP Copeland Scroll compressors model for Medium Temperature Application Kit P/N: 943-0050-00

4.0 HP - 7.0 HP Copeland Scroll Compressor Models Medium Temperature Application				
<b>ZB*KA</b> (Obsoleted models)	ZB*KC*	ZBD*KC Digital	ZBD*KQ Digital	ZS*K4 - Extended Medium Temp
ZB30KA- TFD/TFE/TF5	ZB30KC- TFD/TFE/TF5/TF7	ZBD28KCB-TFD	ZBD31KQB-TFD	ZS30K4-TFD/TF5
ZB38KA- TFD/TFE	ZB30KCE- TFD/TFE/TF5/TF7	ZBD30KC- TFD/TF5/TF7	ZBD38KQ- TFD/TF5/TF7	ZS30K4E- TFD/TFE/TF5/TF7
ZB45KA- TFD/TFE/TF5	ZB30KCL- TFD/TFE/TF5/TF7	ZBD30KCE- TFD/TFE/TF5	ZBD38KQE- TFD/TF5/TF7	ZS30K4L- TFD/TFE/TF5/TF7
	ZB38KC- TFD/TFE/TF5/TF7	ZBD38KCE- TFD/TFE/TF5/TF7	ZBD38KQE- TFD/TF5/TF8	ZS38K4-TFD/TF5
	ZB38KCE- TFD/TFE/TF5/TF7	ZBD38KCL- TFD/TFE/TF5	ZBD45KQ- TFD/TF5/TF7	ZS38K4E- TFD/TFE/TF5/TF7
	ZB38KCP- TFD/TFE/TF5	ZBD38KCP-TFD/TF5	ZBD45KQE- TFD/TF5/TF8	ZS38K4L- TFD/TFE/TF5/TF7
	ZB38KCL- TFD/TFE/TF5	ZBD45KC- TFD/TFE/TF5/TF7	ZBD48KQE- TFD/TF5/TF7	ZS45K4-TFD/TF5
	ZB45KC- TFD/TFE/TF5/TF7	ZBD45KCE- TFD/TFE/TF5/TF7	ZBD38KQE- TFD/TF5/TF7	ZS45K4E- TFD/TFE/TF5/TF7
	ZB45KCE- TFD/TFE/TF5/TF7	ZBD45KCL- TFD/TFE/TF5/TF8		ZS45K4L- TFD/TFE/TF5/TF7
	ZB45KCL- TFD/TFE/TF5/TF7			
	ZB48KC- TFD/TFE/TF5/TF7			
	ZB48KCE- TFD/TFE/TF5/TF7			
	ZB48KCL- TFD/TFE/TF5/TF7			
	ZB57KCE- TFD/TFE/TF5/TF8			
	ZB57KCL- TFD/TFE/TF5/TF7			

4.0 - 7.SHP Coperand Scroll Compressors models				
ZF*K4- Quest	ZF*KQE- Quest	ZF*KV- Quest EVI	ZFD*KV- Quest Digital EVI	
11/16" Rotalock models	11/16" Rotalock models	1" Rotalock models	1" Rotalock models	
ZF13K4-TFD/TF5/TF7	ZF13KQE- TFD/TFC/TF5/TF7	ZF13KVE- TFD/TFC/TF5/TF7	ZFD13KVE- TFD/TFC/TF5/TF7	
ZF13K4E- TFD/TFE/TF5/TF7	ZF15KQE- TFD/TFE/TF5/TF7	ZF15KVE- TFD/TFE/TF5/TF7	ZFD13KVL- TFD/TFC/TF5/TF7	
ZF13K4L- TFD/TFE/TF5/TF7	ZF18KQE- TFD/TFE/TF5/TF7	ZF18KVE- TFD/TFE/TF5/TF7	ZFD18KVE- TFD/TFC/TF5/TF7	
ZF15K4-TFD/TF5/TF7	ZF25KQE- TFD/TFE/TF5/TF7	ZF18KVL- TFD/TFE/TF5/TF7	ZFD18KVL- TFD/TFC/TF5/TF7	
ZF15K4E- TFD/TFE/TF5/TF7	ZF28KQE- TFD/TFE/TF5/TF7	ZF25KVE- TFD/TFE/TF5/TF7	ZFD25KVE- TFD/TFE/TF5/TF7	
ZF15K4L- TFD/TFE/TF5/TF7		ZF25KVL- TFD/TFE/TF5/TF7	ZFD25KVL- TFD/TFE/TF5/TF7	
ZF18K4-TFD/TFE/TF5/TF7		ZF28KVE- TFD/TFE/TFC/TF7		
ZF18K4E- TFD/TFE/TF5/TF7		ZF28KVL- TFD/TFE/TFC/TF7		
ZF18K4L- TFD/TFE/TF5/TF7				
ZF25K4-TFD/TFE/TF5/TF7				
ZF25K4E- TFD/TFE/TF5/TF7				
ZF25K4L- TFD/TFE/TF5/TF7				
ZF28K4E- TFD/TFC/TFE/TF7				

#### Table 10 - 4.0 - 7.5HP Copeland Scroll compressors model for Low Temp. Applications Kit P/N: 943-0051-00 & 943-0051-01

2.0 HP - 4.0 HP Copeland Scroll Compressor Models Medium Temp. Applications				
ZB*KA	ZB*KC	ZB*KQ	ZBD*KC Digital	ZB*KQ Digital
ZB21KA- TFD/TFE/TF5	ZB12KCU-TFD	ZB15KQ- TFD/TF5/TF7	ZBD21KCE- TFD/TF5	ZBD19KQB-TFD
	ZB15KC-TFD/TF5	ZB15KQE- TFD/TF5/TF7	ZBD21KCL- TFD/TF5	ZBD21KQ- TFD/TF5/TF7
	ZB15KCE-TFD/TF5	ZB19KQ- TFD/TF5/TF7	ZBD29KCE- TFD/TF5	ZBD21KQE- TFD/TF5/TF7
	ZB15KCL-TFD/TF5	ZB19KQB-TFD		ZBD24KQB-TFD
	ZB17KCU-TFD/TFM	ZB19KQE- TFD/TF5/TF7		ZBD29KQ- TFD/TF5/TF7
	ZB19KC-TFD/TF5	ZB21KQ- TFD/TF5/TF7		ZBD29KQE- TFD/TF5/TF7
	ZB19KCU-TFD/TF6			
	ZB19KCE-TFD/TF5	ZB21KQE- TFD/TF5/TF7		
	ZB19KCL-TFD/TF7	ZB29KQ- TFD/TF5/TF7		
	ZB20KCU-TFD/TFM	ZB29KQE- TFD/TF5/TF7		
	ZB21KC-TFD/TF5			
	ZB21KCE- TFD/TFE/TF5/TF7			
	ZB21KCL- TFD/TFE/TF5/TF7			
	ZB26KC-TFD/TF5			
	ZB26KCE-TFD/TF5			
	ZB26KCL-TFD/TF5			
	ZB28KCB-TFD	-		
	ZB29KCE- TFD/TFE/TF5/TF7			

#### Table 11 - 2.0 - 4.0HP Copeland Scroll compressors model for Medium Temperature Applications Kit P/N: 943-0050-00

2.0 - 4.0HP Copeland Scroll Compressors Models Low Temp. Applications			
ZF*K4-	ZF*KQE-	ZS*K4 Extended Medium Temp	
11/16" Rotalock models	11/16" Rotalock models	11/16" Rotalock models	
ZF06K4-TFD/TF5	ZF06KQE-TFD/TFC/TFP/TF5	ZS15K4-TF5	
ZF06K4E-TFD/TF5	ZF08KQE-TFD/TFC/TFP/TF5	ZS15K4E-TFD/TF5	
ZF06K4L-TFD/TF5	ZF09KQE-TFD/TFC/TFP/TF5	ZS15K4L-TFD/TF5	
ZF08K4-TFD/TF5	ZF11KQE-TFD/TFC/TFP/TF5	ZS19K4-TFD/TF5	
ZF08K4E-TFD/TF5		ZS19K4E-TFD/TF5	
ZF08K4L-TFD/TF5		ZS19K4L-TFD/TF5	
ZF09K4-TFD/TFE/TF5		ZS21K4-TFD/TF5	
ZF09K4E-TFD/TFE/TF5		ZS21K4E-TFD/TFE/TF5	
ZF09K4L-TFD/TFE/TF5		ZS21K4L-TFD/TFE/TF5	
ZF11K4-TFD/TF5		ZS26K4-TFD/TF5	
ZF11K4E-TFD/TFE/TF5		ZS26K4E-TFD/TFE/TF5	
ZF11K4L-TFD/TFE/TF5		ZS26K4L-TFD/TFE/TF5	

Table 12 - 2.0 HP - 4.0 HP Copeland Scroll Compressors models for Low Temp. Applications <u>Kit P/N: 943-0051-02</u>

#### **Revision Tracking R4**

The document format has been updated to the new Copeland format All occurrences of "Emerson" have been removed A note regarding A3 and R290 venting has been updated

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## Appendix A

#### **Electronic Liquid Injection Valve Kits**



### Electronic Liquid Injection Valve Installation

- 1. Assemble valve body onto the compressor. Make sure valve orientation is within ± 15° and apply full torque (620 ±20 inch-pound). Make sure compressor fitting has Rotolock seal installed.
- 2. When brazing incoming liquid line, wet rag valve body completely. Allow the body to cool down before removing the wet rag.
- 3. Install the stepper motor. **Lock** the motor on the valve body using any one of the three locations.









4. Use ¾" knockout as shown. For terminal box mounting, run the wire through the box. For panel mounting, run the wire directly to the CoreSense module. Apply torques below.

Lock Nut Sealing Nut

Sealing nut = 50-60 in-lb

Lock nut = 40-45 in-lb

Do not over-torque.

5. With tabs facing up, insert the connector from stepper motor into the 'LIQUID INJ' port on CoreSense<sup>™</sup> module.



<sup>48</sup> For more details refer to Application Engineering bulletin AE-1383.

#### BULLETIN AE8-1424 R4

## Electronic Liquid Injection Valve Installation with T-Fitting Adapter Kit

1. T-fitting kit# 998-0177-00 for wet injection application



- 2. Assemble T-fitting onto the compressor. Make sure fitting orientation is horizontal and has Rotolock seal. Apply torque 620 ±20 inch-pound.
- 3. Assemble the valve body onto the T-fitting. Make sure valve orientation is within ± 15° and apply full torque (620 ±20 inch-pound)



PTFE Resin Seal (both sides) Emerson Part# 020-0028-00



 Install the stepper motor.
 Lock the motor on the valve body using any one of the three locations.





7. Use <sup>%</sup> knockout as shown. For terminal box mounting, run the wire through the box. For panel mounting, run the wire directly to the CoreSense module. Apply torques below.

> Sealing nut = 50-60 in-lb

Lock nut = 40-45 in-lb

Do not over-torque.



 When brazing incoming liquid line, wet rag valve body completely. Allow the body to cool down before removing the wet rag.



8. With tabs facing up, insert the connector from stepper motor into the 'LIQUID INJ' port on CoreSense module.



For more details refer to Application Engineering bulletin AE-1383.

## Appendix B

#### Refrigeration K5 CoreSense and Wire Kit (943-0209-00)



Remove warning label to connect M1, M2, L1 and L2

#### Refrigeration K5 CoreSense and Wire Kit (998-0341-00, 998-0342-00 and 998-0359-00)



For more details refer to Application Engineering bulletin AE-1383.