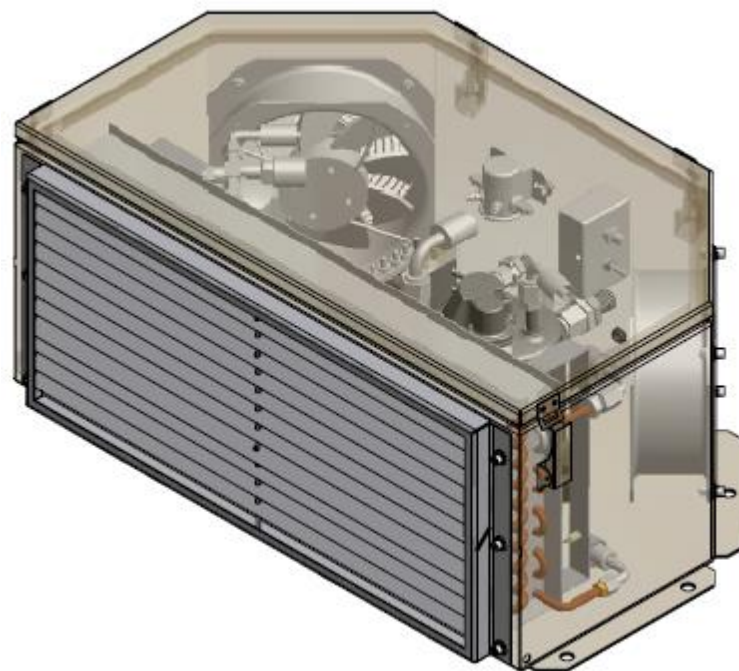




## REMOTE COMPRESSOR / CONDENSER



CREATING  
**VALUE**

**JOYGLOBAL**

# RCC ADVANCED TROUBLESHOOTING

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## Compressor Description and Features

- Rotary Vane Compressor
- 24VDC
- 3Ø
- Brushless DC Motor
- Variable Speed
- 2 speeds used in the RCC - 1600 & 3600RPM
- High Temperature External Overload used

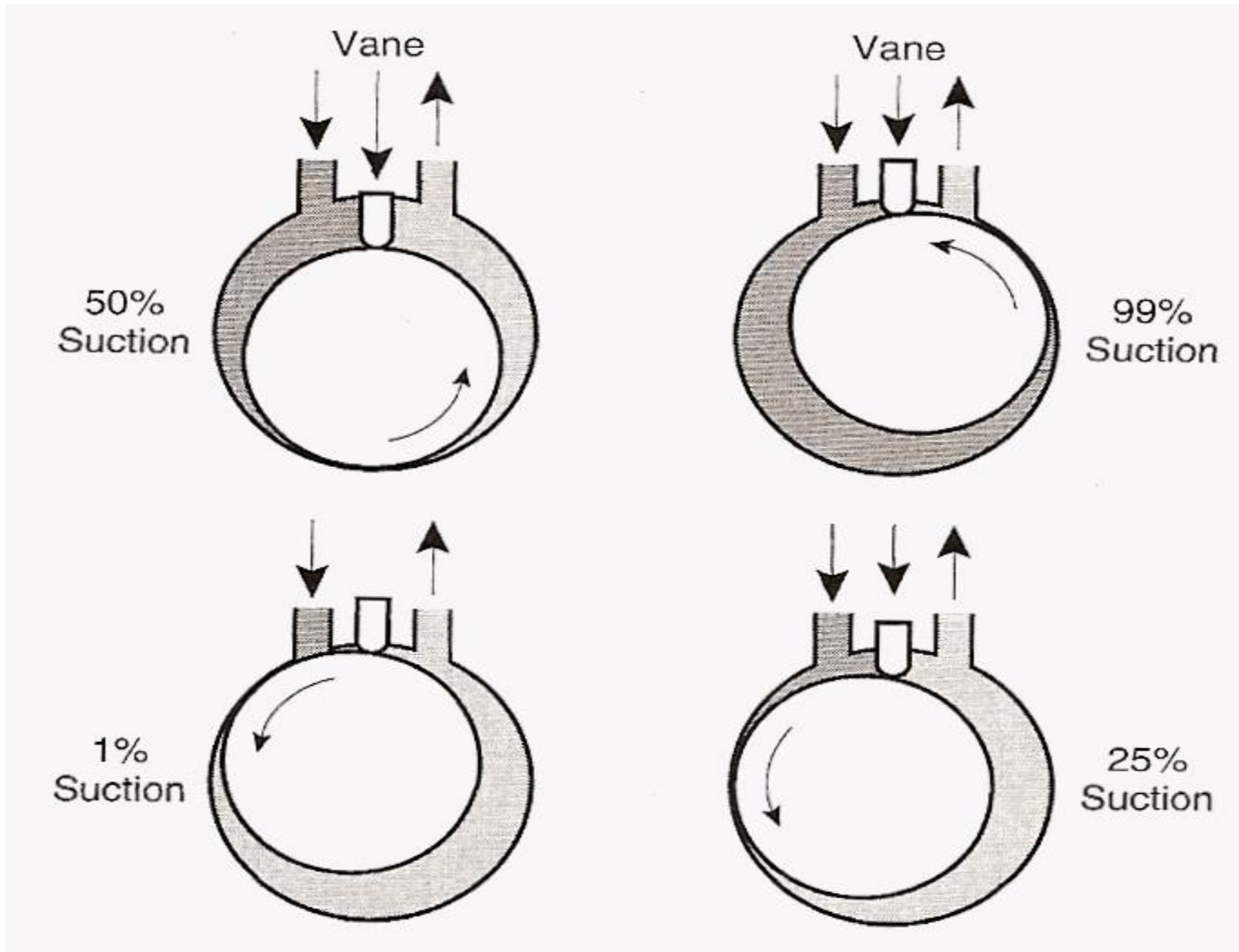
# RCC ROTARY VANE COMPRESSOR

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# COMPRESSION CYCLE

## ROTARY VANE COMPRESSOR



# VOLTAGE, RESISTANCE AND CURRENT READINGS

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## CORRECT VOLTAGE

- Because the controller provides a pulsing +/-DC signal, the voltage and current are measured in AC and DC.
- $\emptyset$  to  $\emptyset$  = 19 VAC
- $\emptyset$  to  $\emptyset$  = 0 VDC
- $\emptyset$  to ground = 11.25 VAC
- $\emptyset$  to ground = 13.34 VDC

## CORRECT RESISTANCE

- $\emptyset$  to  $\emptyset$  = 4 ohms
- $\emptyset$  to Ground = O.L.

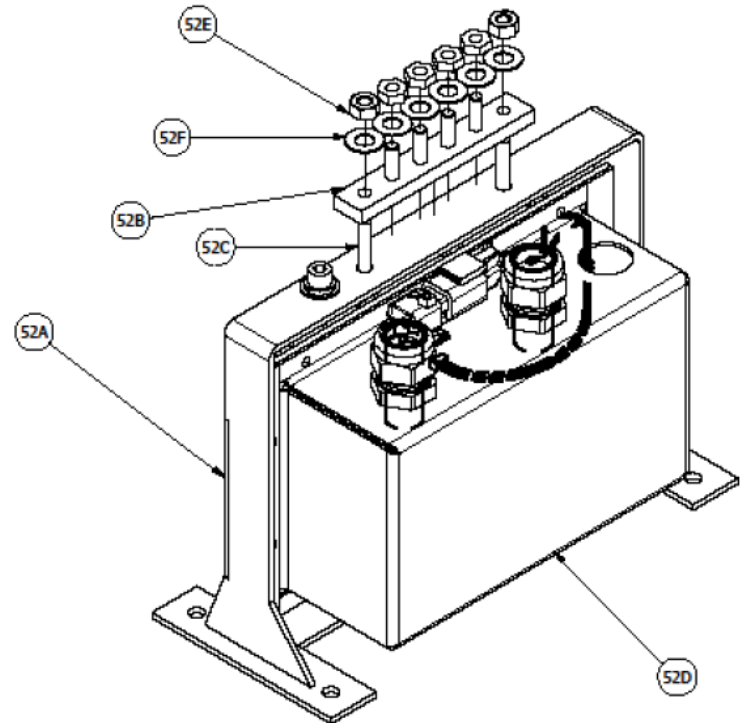
## CORRECT CURRENT

- 23 Amps AC measured on each compressor lead @ 85°F outside ambient air temperature.
- 0 Amps DC measured on each compressor lead
- Max Current = 45 Amps. The controller will shut down the compressor after 45 Amps.
- The current is dependent on the outside ambient air temperature. If the temperature goes up so does the current and vice versa.

# COMPRESSOR PROTECTION

- The function of the controller is to monitor and protect the compressor from damage, and to provide the compressor with 3 Ø VDC.
- If a fault occurs, the controller will Flash an LED code:

- 1 Flash – Over Current
- 2 Flash – Over Voltage
- 3 Flash – Under Voltage
- 4 Flash – Controller Overheat
- 5 Flash – Motor Overheat
- 6 Flash – Stalled
- 7 Flash – Low speed
- 8 Flash – Startup failed



# CONTROLLER CODE DIAGNOSTICS

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## CODE 1 - OVER CURRENT

- Low voltage
- Low Condenser airflow causing high condensing pressure.
- Condenser Fan failure
- Condenser Fan relay failure
- Condenser Fan breaker open
- Very high outdoor ambient
- Overcharge of refrigerant. Max charge = 4.5 lbs R134
- Non condensable's in the system preventing proper condensing
- Max Current = 45 Amps

## CODE 2 – OVER VOLTAGE

- Incorrect supply voltage from the battery source to the controller
- Max Voltage to the controller = 27.5 VDC
- Consult with mine electricians to correct the over voltage problem at the batteries.

# CONTROLLER CODE DIAGNOSTICS

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## CODE 3 – UNDER VOLTAGE

- Incorrect supply voltage from the battery source to the controller
- Minimum supply voltage to the controller = 22.5 VDC
- Check for voltage drop across solenoid, disconnect switch, breaker and power supply line.
- Consult with mine electricians to correct the under voltage problem at the batteries.

## CODE 4 – CONTROLLER OVERHEAT

- Low airflow over the controller heat sink
- Condenser Fan failure
- Condenser relay failure
- Condenser breaker open
- Excessive dirt in the controller heat sink
- Blocked condenser
- Faulty Controller

# CONTROLLER CODE DIAGNOSTICS

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## CODE 5 – MOTOR OVERHEAT

- If the compressor has not been running, check the overload. Contacts are normally open
- Overload faulty / cracked
- Overload not plugged in properly.
- High discharge temperature. 265°F maximum.
- High Compression Ratio
- Refrigerant undercharge
- Refrigerant overcharge
- Restriction in refrigeration system
- Bad compressor valve

## CODE 6 – STALLED

- Compressor failed to start due to high load
- Very high outdoor ambient temperature
- Refrigerant overcharge
- Compressor shut down due to compressor lead wiring problems
- Compressor windings open

# CONTROLLER CODE DIAGNOSTICS

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## CODE 7 – LOW SPEED

- Very high outdoor ambient conditions causing high load. The compressor will slow due to the increased high side pressure.

## CODE 8 – STARTUP FAILED

- Faulty compressor wiring.
- Very high outdoor ambient conditions causing high load.
- Compressor is seized internally and draws LRA.
- Shorted internal motor windings.
- Open compressor windings

# REFRIGERATION TROUBLESHOOTING

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## PROBLEM

- Binary switch open
- Low system pressure
- High System pressure

## POSSIBLE CAUSE

- Low system pressure
- High system pressure
- Faulty switch
- Low refrigerant charge
- Restriction in the drier, metering device or quick disconnect.
- Refrigerant overcharge
- Condenser coil dirty
- Condenser fans not working
- Non condensables in system

# REFRIGERATION TROUBLESHOOTING

---

## PROBLEM

- Restriction in the drier or metering device
- Condenser fans not working
- Non condensables in system

## POSSIBLE CAUSE

- Moisture in the system do to improper evacuation. Evacuate to 500 microns or less
- Dirt or debris do to dirty system
- Faulty fan
- Faulty fan relay
- Faulty fan breaker
- No clutch or main power
- Air or nitrogen in the system due to improper evacuation. Evacuate to 500 microns or less

# REFRIGERATION TROUBLESHOOTING

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## PROBLEM

- Everything is running but it does not cool

## POSSIBLE CAUSE

- Dirty evaporator
- Frozen evaporator
- Faulty evaporator fans
- Refrigerant overcharge
- Refrigerant undercharge
- Faulty TXV Valve
- Very high outdoor ambient temperature
- Compressor vane not seating properly. High suction pressure and low discharge pressure
- Non Condensables in system



# REFRIGERATION TROUBLESHOOTING

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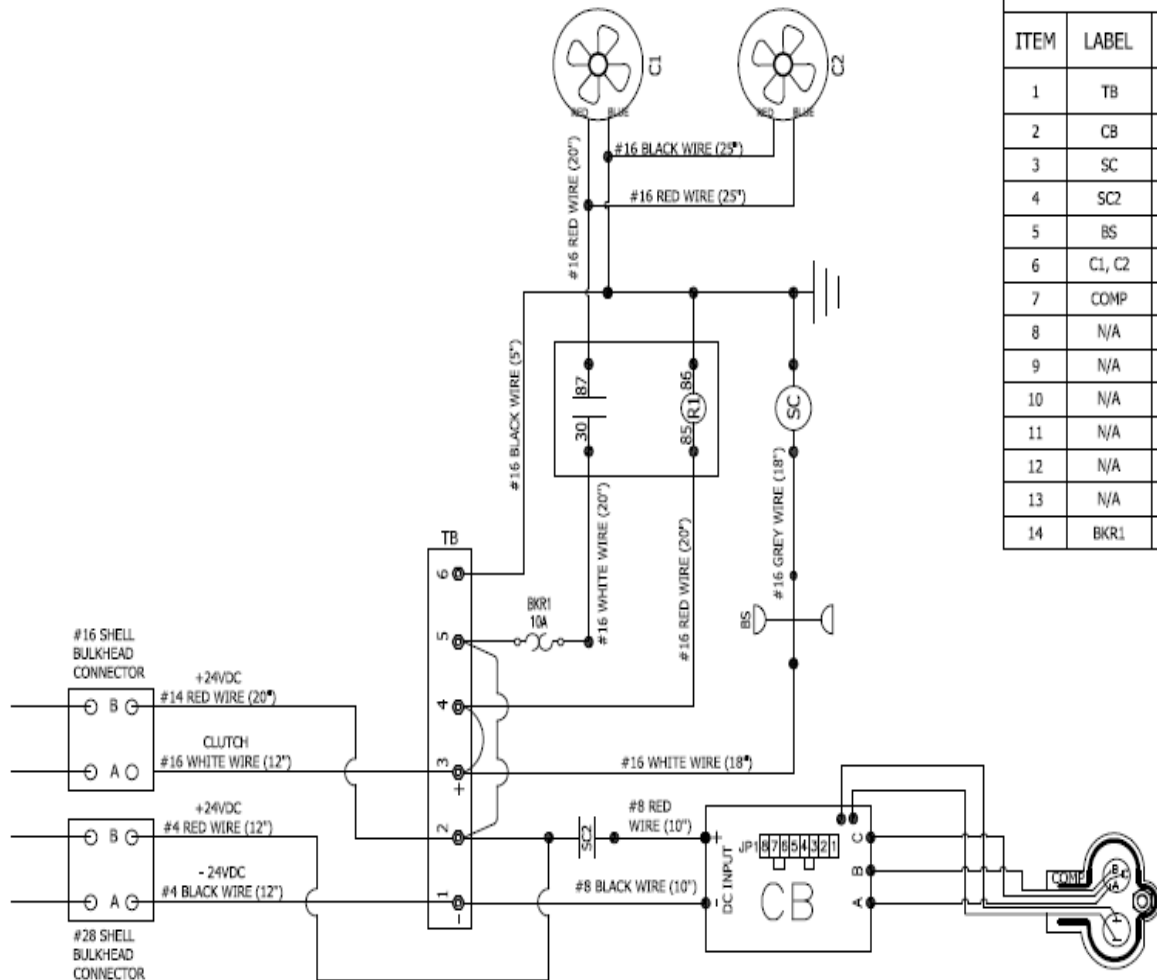
## PROBLEM

- Low Suction and Low Discharge Pressure

## POSSIBLE CAUSE

- Restricted metering device
- Restricted drier
- Low refrigerant charge
- Faulty evaporator fans
- Evaporator coil frozen
- Faulty freeze stat
- Restricted fresh air filter
- Low load on system

# RCC WIRING DIAGRAM



## BOM

| ITEM | LABEL  | PART NO.    | DESCRIPTION                       |
|------|--------|-------------|-----------------------------------|
| 1    | TB     | 53-01-003   | 4 GANG TERMINAL BLOCK-SINGLE STUD |
| 2    | CB     | 53-01-001   | 24/28VDC CONTROLLER FOR 65-01-001 |
| 3    | SC     | 41-01-000   | SOLENOID CONTINUOUS DUTY 25V,85A  |
| 4    | SC2    | 41-01-000   | SOLENOID CONTACT                  |
| 5    | BS     | 62-13-004   | BINARY SWITCH-350                 |
| 6    | C1, C2 | 07-01-007   | CONDENSER FAN 24VDC               |
| 7    | COMP   | 65-01-001   | COMPRESSOR MASTERFLUX 24VDC       |
| 8    | N/A    | 40-11-005   | #8 TEW BLACK (FINE STRAND)        |
| 9    | N/A    | 40-11-008   | #8 TEW RED (FINE STRAND)          |
| 10   | N/A    | 40-11-028   | #16 TEW WHITE (FINE STRAND)       |
| 11   | N/A    | 40-11-021   | #16 TEW BLACK (FINE STRAND)       |
| 12   | N/A    | 40-11-024   | #16 TEW GREY (FINE STRAND)        |
| 13   | N/A    | 40-11-027   | #16 TEW RED (FINE STRAND)         |
| 14   | BKR1   | MN40-02-001 | 10A AUTO RESET BREAKER            |

## LED FAULT INDICATOR OUTPUT

- 1 FLASH - OVER CURRENT
- 2 FLASHES - OVER VOLTAGE
- 3 FLASHES - UNDER VOLTAGE
- 4 FLASHES - CONTROLLER OVERHEAT
- 5 FLASHES - MOTOR OVERHEAT
- 6 FLASHES - STALLED
- 7 FLASHES - LOW SPEED
- 8 FLASHES - STARTUP FAILED