



TROUBLE SHOOTING & VENTILATION GUIDE

For Marine and Truck DC/DE Refrigerators

Part No. 620265
July 06, 1998

Troubleshooting

| | |
|--|----------------------------|
| ms: | |
| not cool - Compressor does not run on AC or DC | See Checks: 1 thru 6 |
| not cool - Compressor runs on AC; not DC | See Checks: 1 thru 6 |
| not cool - Compressor runs on DC; not AC | See Checks: 1 thru 6 |
| not cool - Compressor runs continuously on AC or DC | See Checks: 5, 7 & 9 |
| efficient cooling - Compressor runs continuously on AC or DC | See Checks: 5, 7 & 9 |
| efficient cooling on AC - DC cooling O.K. | See Checks: 1 thru 6 |
| efficient cooling on DC - AC cooling O.K. | See Checks: 1 thru 6 |
| efficient cooling - Compressor slow or erratic | See Checks: 1, 2, 3, 5 & 7 |
| cooling | See Check: 5 & 6 |
| cessive Frost | See Check: 8 |
| rmostat out of calibration or ineffective | See Checks: 5 & 6 |

all checks before replacing component parts.

Input Voltage

Input voltage is properly connected and within 108 volts AC - 132 volts AC/60 Hz.

Input voltage is properly connected (polarity not reversed) and within 10.5 volts DC - 15.4 volts DC.

2 volts DC input voltage, do not use a battery charger or a converter.

Power Supply Output to the Compressor

When performing check-out procedure, allow compressor temperature to stabilize and equal to room ambient temperature.

Measure the Power Supply Output Voltage between Point A and

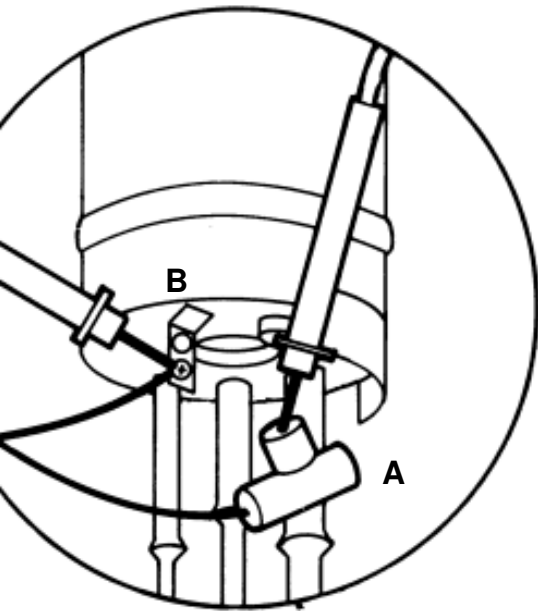


Figure 1

Power Supply Output Voltage Specification:

40 Watt Compressor:

AC & DC Operation 23-28 volts AC

60 Watt Compressor:

AC & DC Operation 24-31 volts AC

T:

removed from the compressor and if the voltage reading is not as defined under the Power Supply Specifications, proceed to Power Supply Check Out Procedure (Check 4).

Power Supply Output to the Compressor

During the performing check-out procedure, allow compressor temperature to stabilize and equal the room temperature.

Compressor ON.

When the compressor is connected to the power supply, measure the AC output of the Power Supply to the compressor between Point A and Point B (Figure 1).

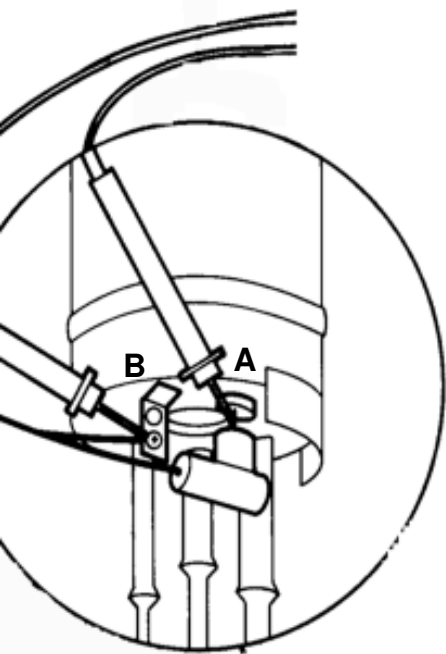


Figure 2

Power Supply Output Voltage Specifications:

40 Watt Compressor:

AC & DC Operation 18-23 volts AC, 1-2 Amps

60 Watt Compressor:

AC & DC Operation 23-26 volts AC, 1.9-2.5 Amps

If the voltage or Amp readings are higher or lower than defined under the Power Supply Specifications, replace the cooling unit.

For 40 and 60 watt compressors, when the current draw exceeds 2.5 Amps, the compressor is locked. Replace cooling unit.

Compressor Winding Resistance

erator to OFF.

ack wire to the compressor as
Figure 3 and Figure 4. Measure the
compressor bewteen Point A and

and 60 watt = compressor coil
Cooling Unit.

0 watt compressor = compressor

0 watt compressor = compressor

40 and 60 watt = open compres-
place Cooling Unit.

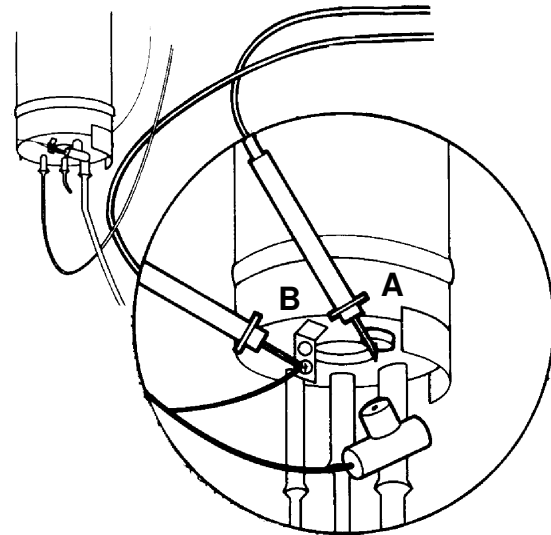


Figure 3

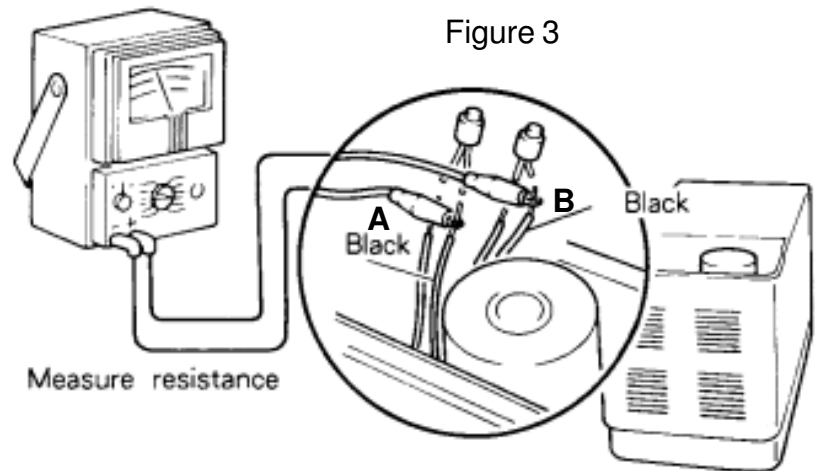


Figure 4

the resistance values were established at room ambient temperatures. Insure the the readings are
for the motor windings have stablized at room temperatures before replacing the cooling unit.

Transformer Resistance

and DC power OFF.
 e transformer and remove
 t.
 former resistance.

orted Transformer Windings . Re-
 er.

pen Transformer windings. Re-
 er.

Transformer Windings Values

| Primary Input | | Secondary (Out) |
|----------------------|------------------------|----------------------|
| 5 & 7 (PNK & TAN) | 10 & 11 (ORG & WHT) | 8 & 9 (BLU & BLU) |
| 0.1Ω | 25Ω | 1.0Ω |
| 0.1Ω | 8-15Ω | 1.0Ω |

former Winding values are normal, the Oscillator is defective and requires replacement.

Replacing the Oscillator, insure the Power Supply output voltages are correct and the input DC
 s 12 volts DC while the refrigerator is operating.

Test Points - Measuring Transformer Windings

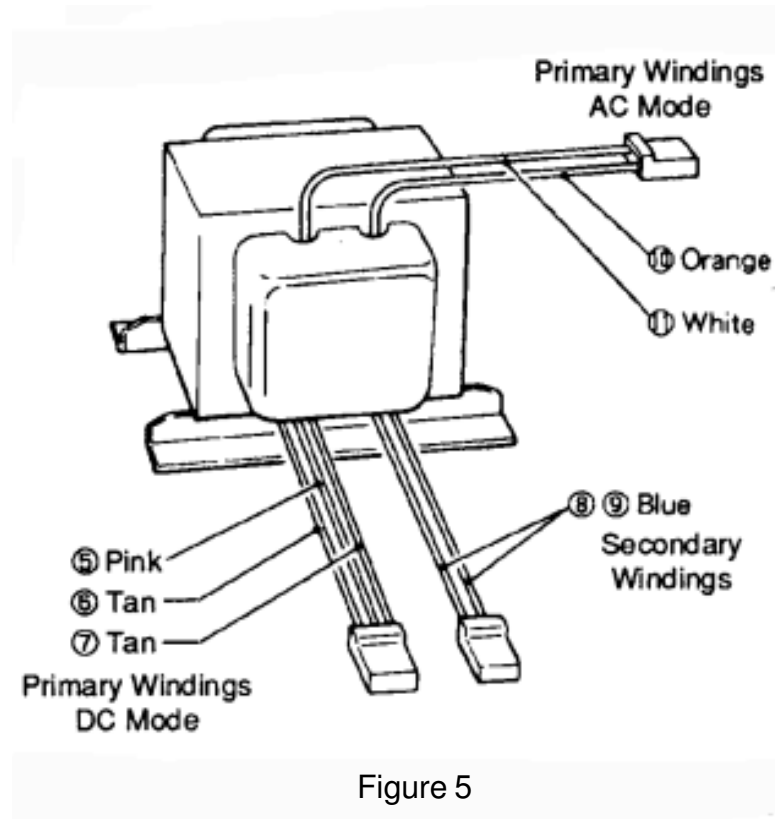


Figure 5

Evaporator Thermistor

Evaporator to OFF and measure resistance of the Evaporator Thermistor as shown in Figure 6.

The Evaporator Thermistor is checked by measuring the voltage and resistance of the Thermistor.

See Figure 6 below and Figure 6.

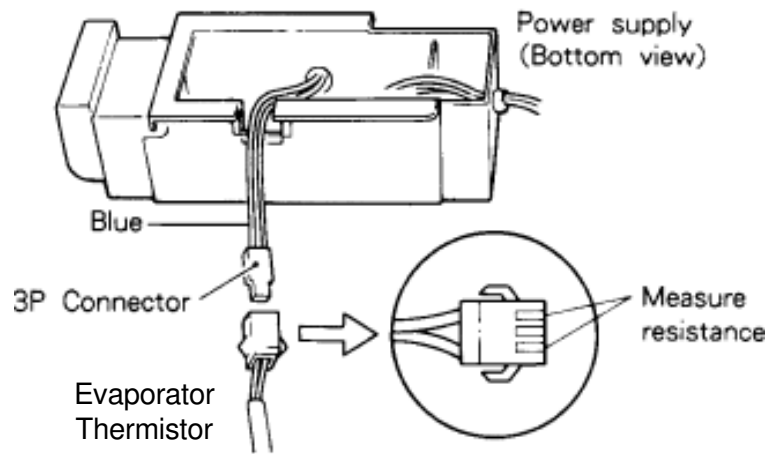


Figure 6 - Evaporator Thermistor

| Evaporator Thermistor Resistance | |
|----------------------------------|----------------------------|
| Resistance | Allowable Resistance Range |
| 9.7K | 28.7K - 10.7K |
| 7.8K | 7.0K - 8.6K |
| 6.4K | 5.7K - 7.0K |
| 5.3K | 4.8K - 5.7K |
| 4.5K | 4.0K - 4.9K |
| 3.6K | 3.2K - 4.0K |
| 2.8K | 2.5K - 3.1K |
| 2.1K | 1.9K - 2.3K |
| 1.9K | 1.7K - 2.0K |
| 1.8K | 1.6K - 1.9K |

0 Ω = shorted thermistor. A shorted Thermistor will cause the compressor to run continuously . Replace Thermistor.

1.6K - 29K Ω for both thermistors = good Thermistor.

∞ Ω = open Thermistor windings. An open Thermistor will stop compressor operation. Replace Thermistor.

Condenser Thermistor

Turn the compressor to OFF and measure the condenser thermistor as shown in Figures 7.

Condenser Thermistor only functions on.

Check the connections. The compressor will not operate when there is an open in the Condenser Thermistor circuit.

Refer to Figure 7.

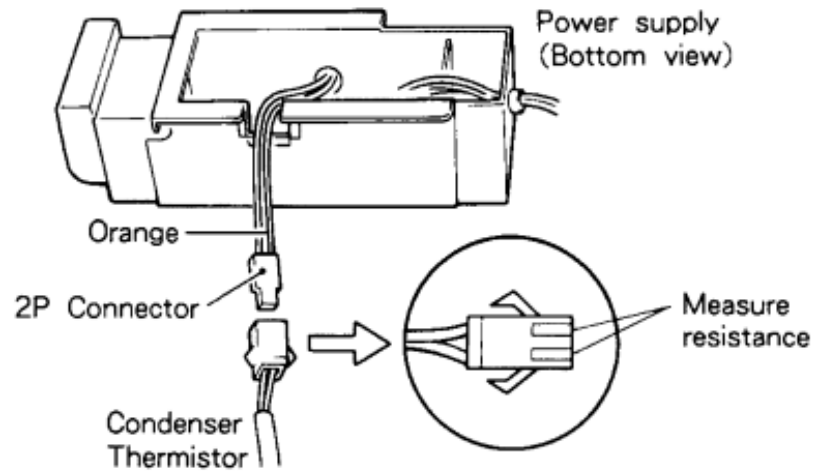


Figure 7 - Condenser Thermistor

| Condenser Thermistor Resistance | |
|---------------------------------|----------------------------|
| Resistance | Allowable Resistance Range |
| 26K | 23K-29K |
| 20K | 18K-22K |
| 15K | 13.5K-16.5K |
| 11K | 10K-12K |
| 10.5K | 9K-11.5K |
| 8K | 7K-9K |
| 7.5K | 6.5K-8K |
| 6.5K | 6K-7K |

0 Ω reading = shorted thermistor. A shorted Thermistor will cause erratic compressor operation. Replace Condenser Thermistor.

6K - 29K Ω reading = good Thermistor. (Refer to Chart)

∞ Ω reading = open Condenser Thermistor. An open Thermistor will stop compressor operation. Replace Thermistor.

Temperature Control Circuit

is applied to the
the Temperature Control
LED lamp will illuminate

Control switch **ON** and
illuminate or the compres-
remove the Temperature
refrigerator without discon-

between point 1 and point

of:

icates Temperature

icates a defective Oscillator.

icates a defective Temperature

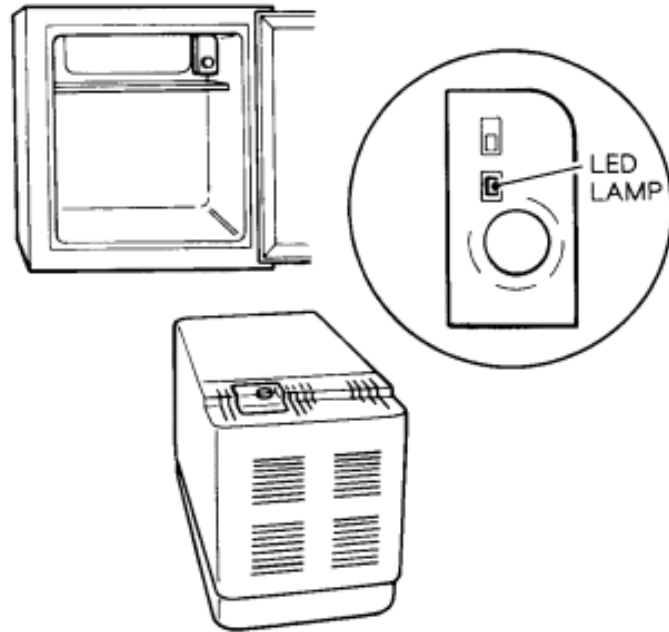


Figure 8

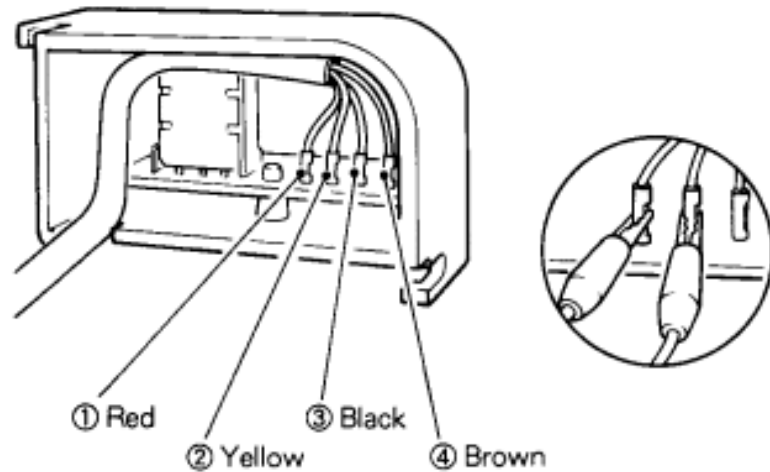


Figure 9

Inspection

unit assembly for signs of damage.

and connections for refrigerant leaks

Checks

Figure 10)

The refrigerator is normal. When the door is closed correctly, excessive frost will collect on the interior of the door.

Place a piece of paper that is the size of a dollar bill

in the door. You should feel a slight drag when you pull the paper. This indicates the door gasket and the refrigerator cabinet are properly sealed.

Check the door on all four sides of the door. If a slight drag is felt, adjust the door or door hinges.

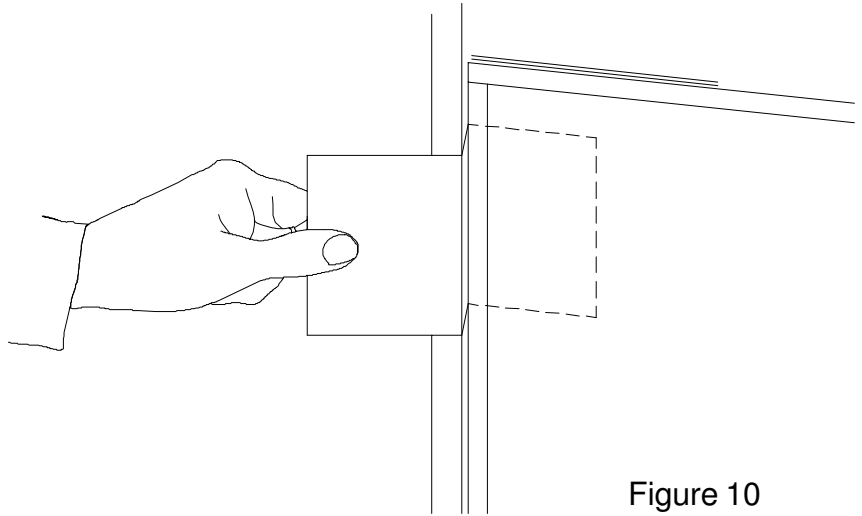


Figure 10

Ventilation

Proper ventilation is required to assure efficient operation of the refrigerator and to increase the life expectancy of the refrigerator's compressor. Ventilation allows fresh air to come from and exhaust to the living area of the vehicle by means of an inlet and outlet. These vents allow an adequate airflow over the rear mounted refrigerator condenser and cooling unit. These vents are properly constructed and provide an open path to the rear of the refrigerator.

There is a specified **minimum** air flow requirement. It is suggested to provide as much ventilation as possible. The more air flow over the rear of the refrigerator, the more efficient the refrigerator will operate. Refer to Figures 11, 12 and the Ventilation Requirement Chart on page 11.

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closure

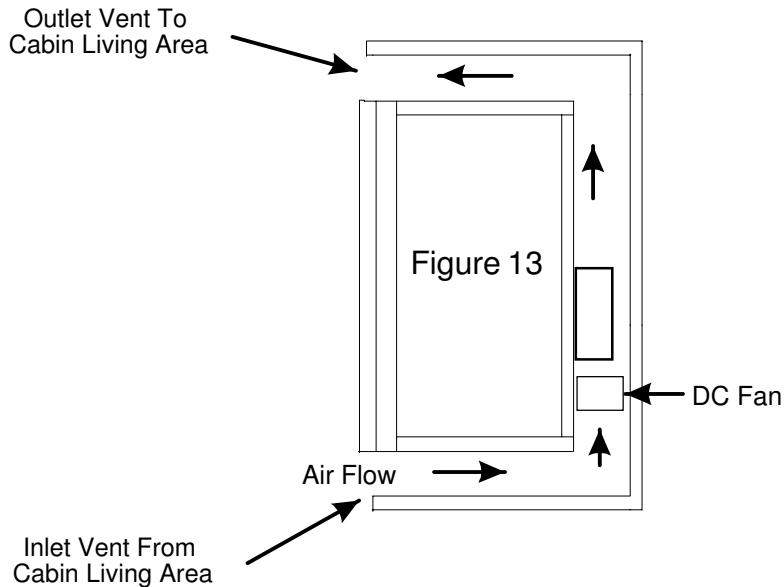
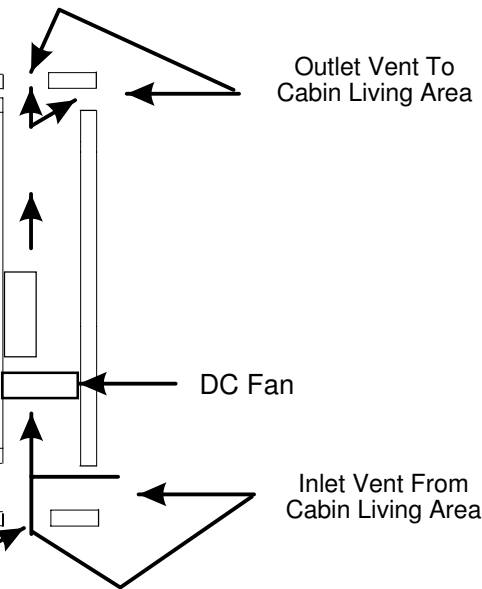
C

D

red venting arrangements - venting
using any of the following cutout loca-

| | | | | | |
|-----|-----|-----|-----|-----|-----|
| C/D | D/E | E/I | F/I | G/J | H/I |
| C/I | D/F | E/J | | | H/J |
| C/J | D/G | | | | |
| | D/H | | | | |

Figure 11



CAUTION

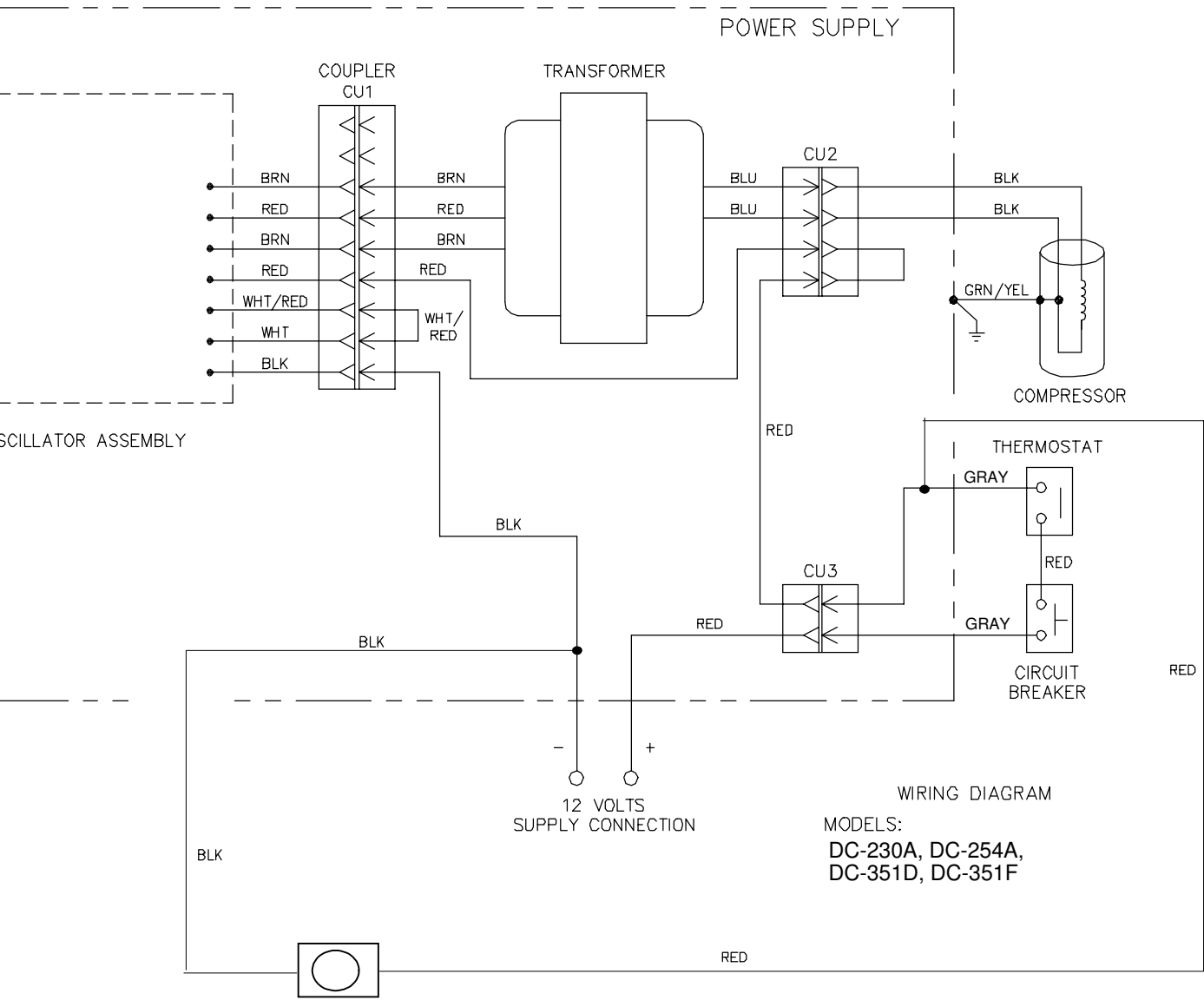
Failure to provide the required ventilation will result in shortened life expectancy of the cooling unit, poor refrigeration, continuous operation, accelerated battery discharge and will void the refrigerator warranty.

In addition to the required vents sizes, a fan can be added to increase the refrigerator performance and to decrease the refrigerator current consumption . A fan kit is available through Norcold part distribution network. Refer to Fan Kit Assembly chart on page 12.

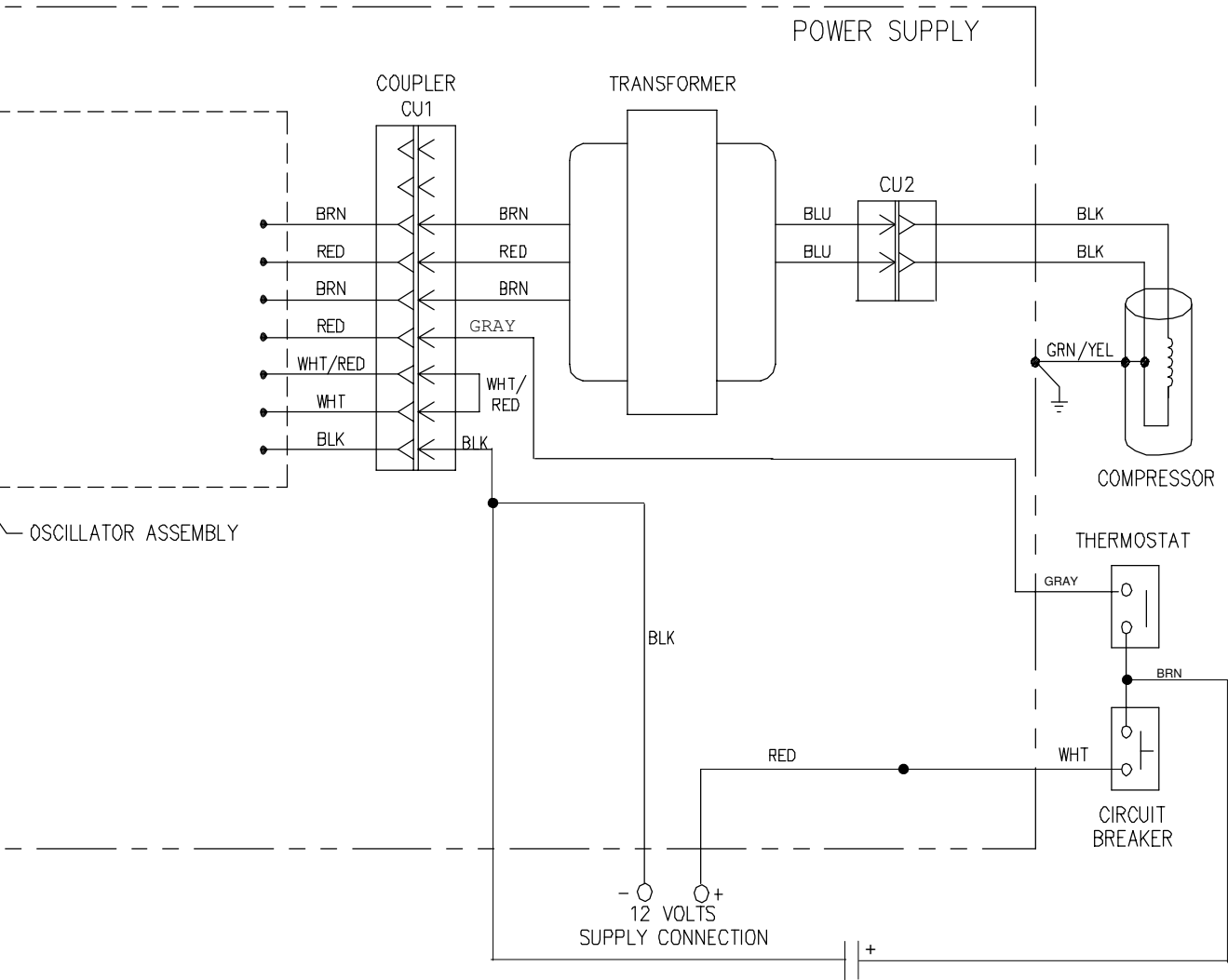
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| VENTILATION REQUIREMENT CHART | | | |
|--------------------------------------|---|---|---------------------|
| Motor Model | Min. Vent Sizes Without Fan | Min. Vent Sizes With Fan | Recommended Fan CFM |
| 0D,F,K | 50 Square Inches Inlet 50 Square Inches Outlet | 25 Square Inches Inlet 25 Square Inches Outlet | 28 |
| 351D | 50 Square Inches Inlet 50 Square Inches Outlet | 25 Square Inches Inlet 25 Square Inches Outlet | 28 |
| 351D | 50 Square Inches Inlet 50 Square Inches Outlet | 25 Square Inches Inlet 25 Square Inches Outlet | 28 |
| 350D | 50 Square Inches Inlet 50 Square Inches Outlet | 25 Square Inches Inlet 25 Square Inches Outlet | 28 |
| 90D,V | 100 Square Inches Inlet 100 Square Inches Outlet | 35 Square Inches Inlet 35 Square Inches Outlet | 28 |
| 390D | 100 Square Inches Inlet 100 Square Inches Outlet | 35 Square Inches Inlet 35 Square Inches Outlet | 28 |
| EV541 | 100 Square Inches Inlet 100 Square Inches Outlet | 50 Square Inches Inlet 50 Square Inches Outlet | 28 |
| EV561 | 100 Square Inches Inlet 100 Square Inches Outlet | 50 Square Inches Inlet 50 Square Inches Outlet | 60 |

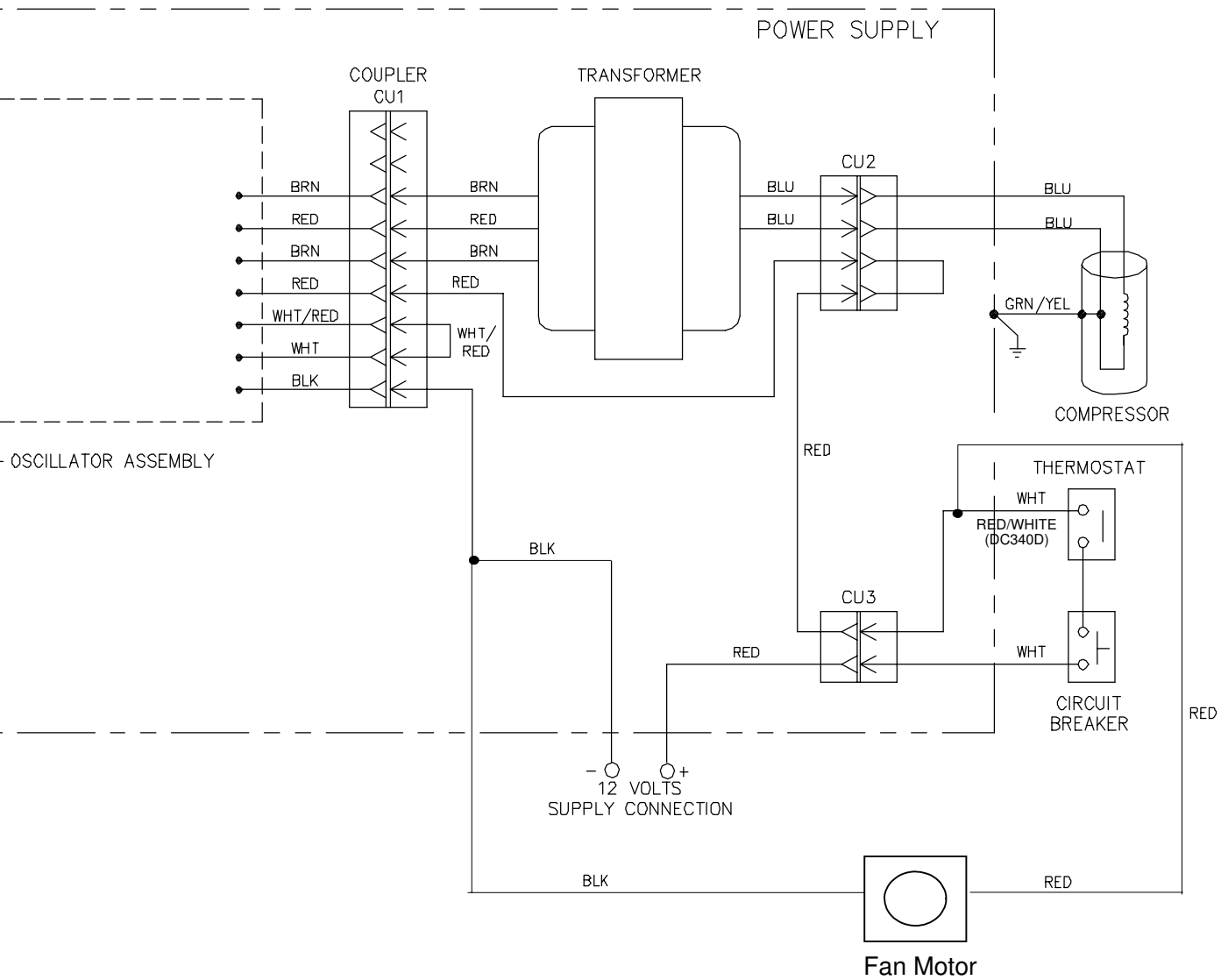
| FAN KIT ASSEMBLY | | | |
|-------------------------|-------------|---------------|-----|
| Part Number | Description | Model | AMP |
| 16092490009 | Fan Kit | DE351D | .15 |
| 16092493007 | Fan Kit | DC351D | .15 |
| 16092493008 | Fan Kit | DC340D/DC340K | .15 |
| 16092850009 | Fan Kit | DE561 | .1 |
| 16092496009 | Fan Kit | DE541 | .15 |
| 16092497009 | Fan Kit | DE390D | .15 |



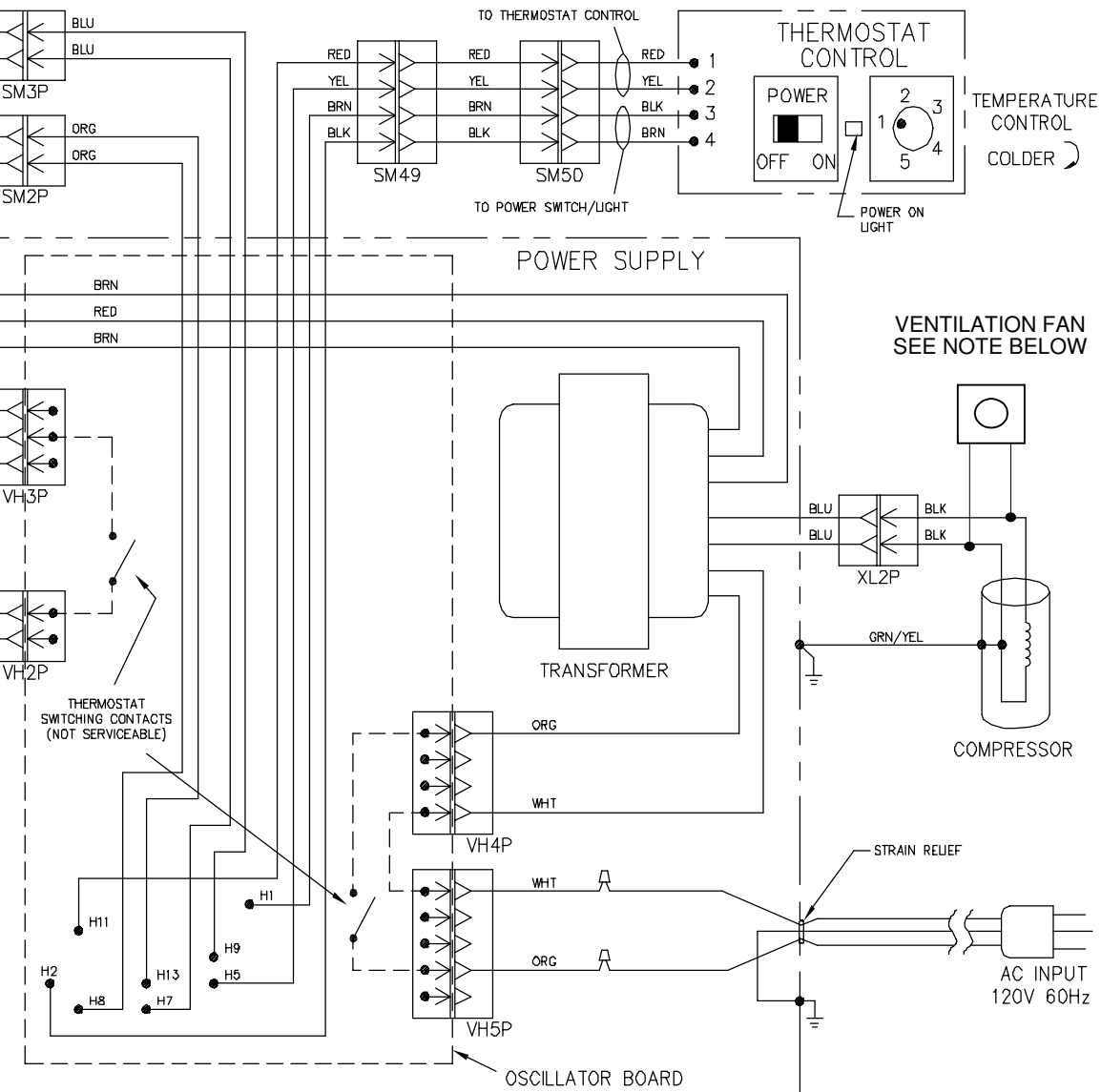
DC-351D (Fan Optional - Fan Kit Available)
DC-351F (Fan Standard Equipment)



Wiring Diagram
DC340K

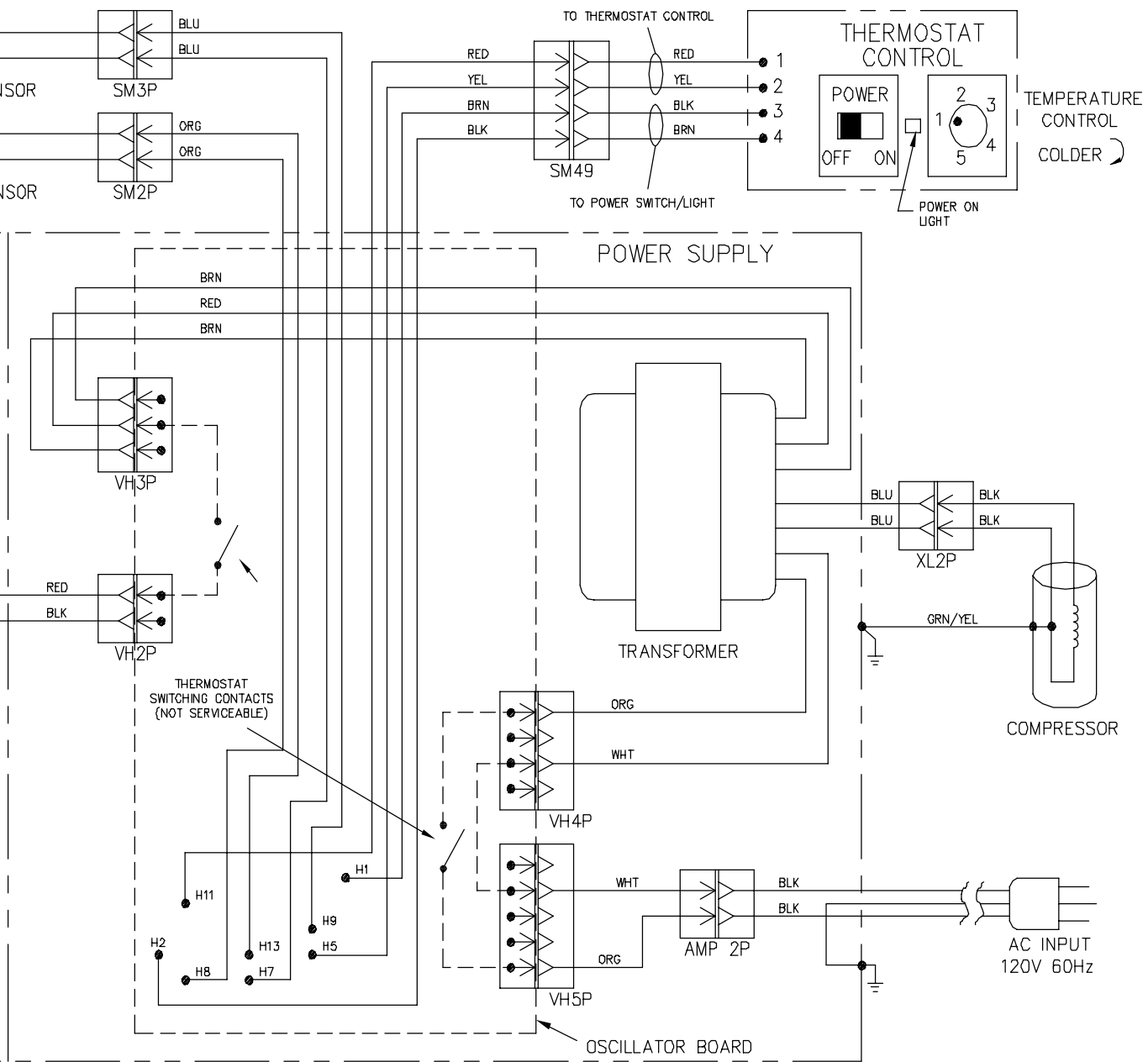


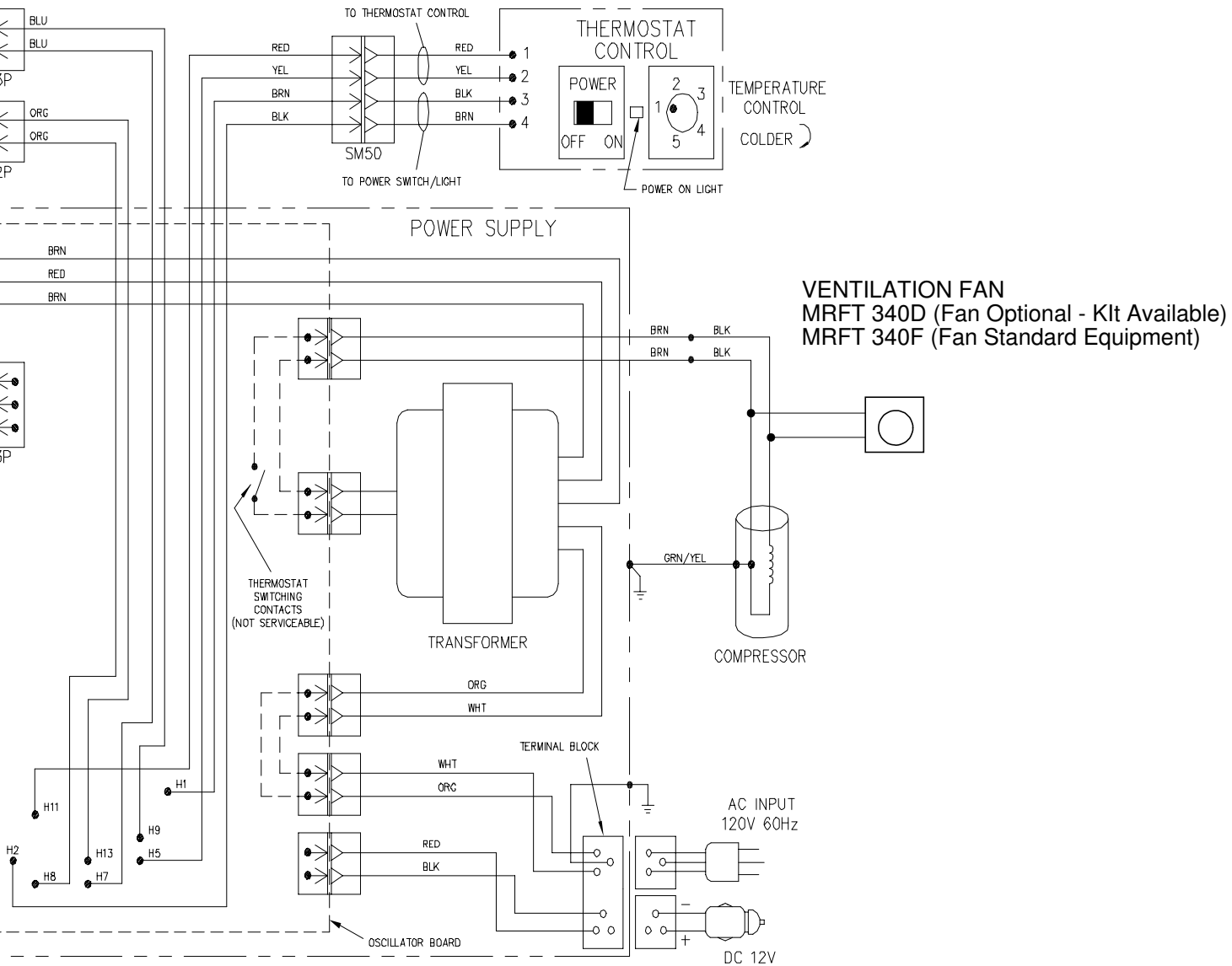
Wiring Diagram
 DC340D (Fan Optional - Kit Available)
 DC340F (Fan Standard Equipment)



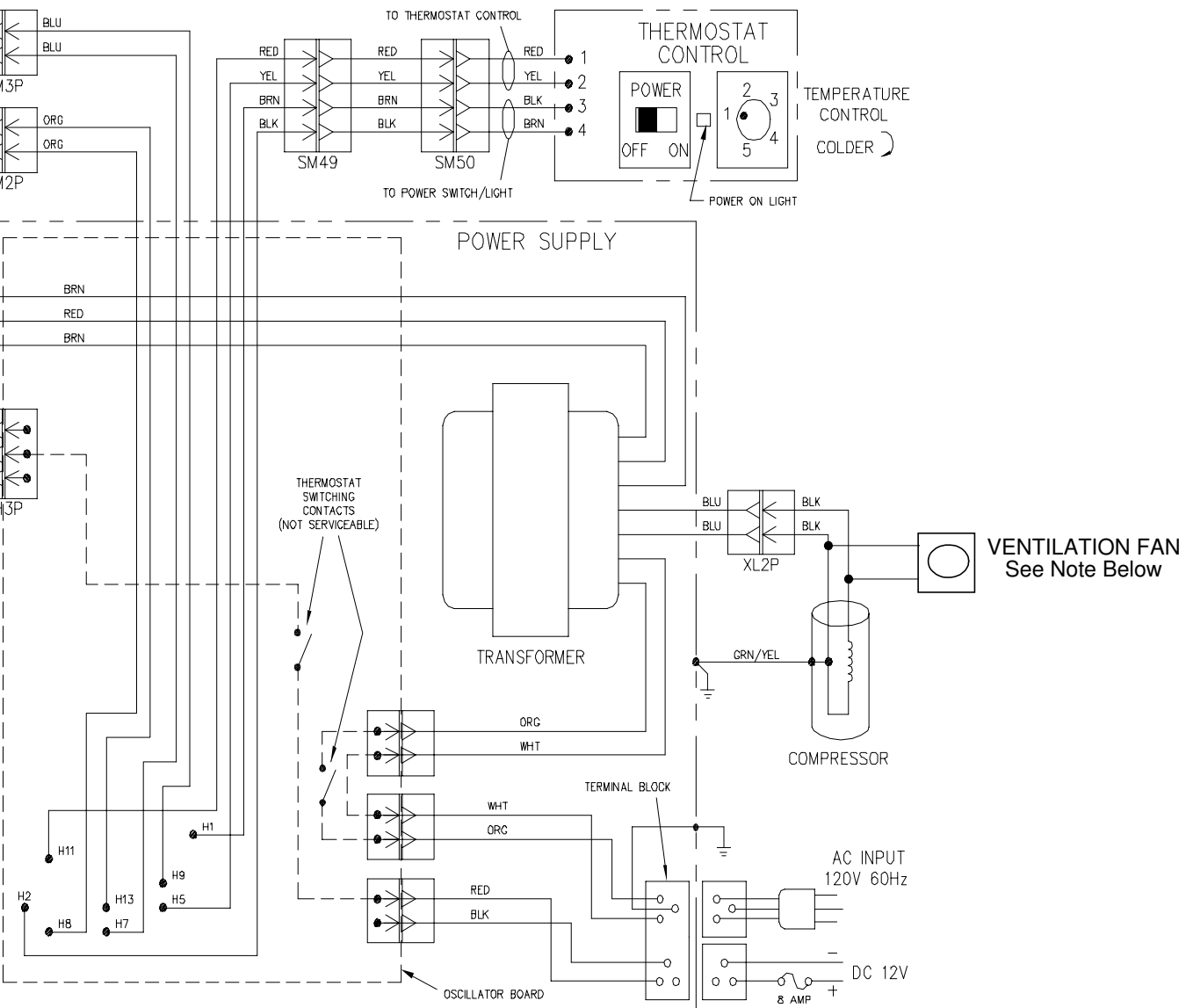
**WIRING DIAGRAM
MODELS:**

DE250G, DE251E, DE400D, DE540 DE560, DE350D,
 NOTE: DE351D (Fan Optional - Kit Available) DE351F (Fan Standard Equipment)
 DE390D (Fan Optional - Kit Available) DE390F (Fan Standard Equipment)
 DE541F & DE561F (Fan Standard Equipment)





WIRING DIAGRAM - MRFT MODELS; 315D, 330D, 340D, 340F, 615C, 630C, & 640C



WIRING DIAGRAM MRFT660A, MRFT360D & MRFT360F
 NOTE: MRFT360F (Fan Standard Equipment)
 MRFT360D (Fan Option Not Available)

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Service manuals provided with the understanding that persons using them are well versed in proper safety practices, and are familiar with basic safety procedures, including, but not limited to safety procedures dealing with 120 volt electricity, high amperage 12 volt circuits an LPG (propane) systems.

If in doubt, consult a professional (better safe than sorry).