GE Appliances

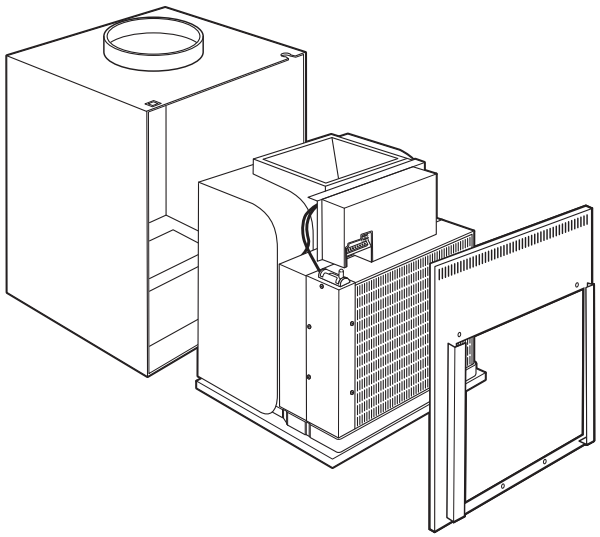
Technical Service Guide

September 2010

Zoneline Vertical Air Conditioners

Model Series

AZ85E09DAC
AZ85H09DAC
AZ85E09EAC
AZ85H09EAC
AZ85E12DAC
AZ85H12DAC
AZ85E12EAC
AZ85H12EAC
AZ85E18DAC
AZ85H18DAC
AZ85E18EAC
AZ85H18EAC
AZ85W09DAC
AZ85W12DAC
AZ85W18DAC



31-9197

GE Appliances
General Electric Company
Louisville, Kentucky 40225

SYSTEM PRESSURES

Technicians with R-22 experience will need to become familiar working with high and low side pressures that are much higher when using R-410A. A typical R-22 system operates normally with a high side pressure of approximately 260 psi at a 120°F condensing temperature and a low side pressure of approximately 76 psi at 45°F evaporator saturation temperature.

A typical R-410A system operates normally with a high side pressure of approximately 525 psi at a 120°F condensing temperature and a low side pressure of approximately 250 psi at 45°F evaporator saturation temperature.

IMPORTANT SAFETY NOTICE

The information in this service guide is intended for use by individuals possessing adequate backgrounds of air conditioning and heat pump experience. Any attempt to repair an air conditioning or heat pump system may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

WARNING

To avoid personal injury, disconnect power before servicing air conditioning or heat pump systems. If electrical power is required for diagnosis or test purposes, disconnect the power immediately after performing the necessary checks.

RECONNECT ALL GROUNDING DEVICES

If grounding wires, screws, straps, clips, nuts, or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

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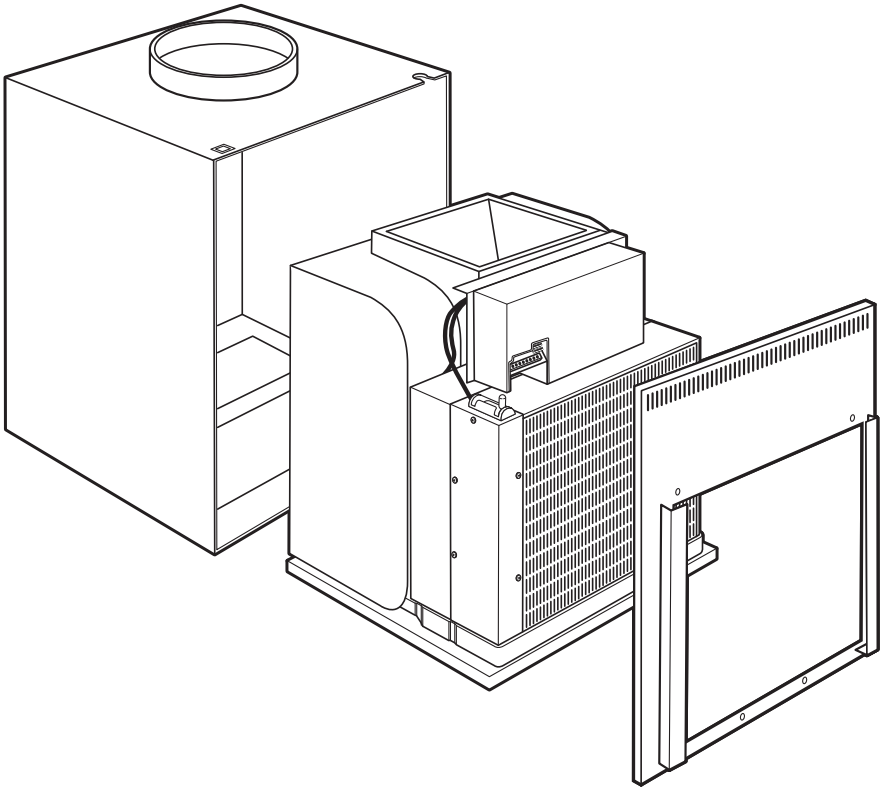
Introduction



The Zoneline Vertical Air Conditioners are ideal for hotel/motel installations. Programmable for central desk control, electric heat, freeze sentinel, fan speed, and temperature limiting, these units allow for efficient control of power usage. The Energy Management System is also available, providing automatic comfort at peak energy efficiency.

The information on the following pages will help you service the Zoneline Vertical Air Conditioners effectively and efficiently.

Nomenclature

Model Number

AZ 85 H 12 D A C W 1

- Zoneline®
- Chassis Series
- E = Cooling w/Electric Resistance Heat
- H = Cooling w/Heat Pump and Electric Resistance Heat
- W = Cooling only (Hydronic)
- BTU/hr
  - 09 = 9000
  - 12 = 12000
  - 18 = 18000
- D = 230/208 V single phase
- E = 265 V single phase
- A = Revision
- C = Corrosion
- M = MEI Compressor
- W = Rechi Compressor
- Engineering Revision

The nomenclature tag is located on the front upper left-hand corner of the unit. This tag contains important information such as:

- Model/serial number
- Refrigerant charge
- Voltage rating
- Heat and cool amperes
- Heat resistance amperes
- BTU/hr

Serial Number

The first two characters of the serial number identify the month and year of manufacture.

Example: ST123456S = September, 2010

S - SEP	2010 - T
T - OCT	2009 - S
V - NOV	2008 - R
Z - DEC	2007 - M
A - JAN	2006 - L
D - FEB	2005 - H
F - MAR	2004 - G
G - APR	2003 - F
H - MAY	2002 - D
L - JUN	2001 - A
M - JUL	2000 - Z
R - AUG	1999 - V

The letter designating the year repeats every 12 years.

Example:

T - 2010
T - 1998
T - 1986

Note:

The technical sheet is located inside the front panel behind the nomenclature tag.

A small additional tag is located on the bottom front of the chassis indicating model number and manufacturing date.

Electrical Requirements

Wire Size and Breaker Size

Warning: All wiring, including installation of the receptacle, must be in accordance with the National Electric Code, local codes, ordinances, and regulations.

- Use only the wiring size recommended for single outlet branch circuit.
- Use only the type and size fuse of HACR circuit breaker indicated on the unit's rating plate. Proper current protection is the responsibility of the owner.

Recommended branch circuit wire sizes*	
Nameplate maximum circuit breaker size	**AWG Wire size****
15A	14
20A	12
30A	10

AWG—American Wire Gauge

* Single circuit breaker from main box

** Based on copper wire, single insulated conductor at 60° C

Note: Use copper conductors only.

Power Supply Kits

Tandem *15 Amp.*

Perpendicular *20 Amp.*

Large Tandem *30 Amp.*

265/230/208 Volt Power Supply Kits	Wall Plug Configuration	Circuit Protective Device	Heater Wattage @ 230/208 volts
RAK3152	Tandem	15 Amp Time Delay Fuse or Breaker	2.61/2.19 KW
RAK3202	Perpendicular	20 Amp Time Delay Fuse or Breaker	3.42/2.87 KW
RAK3302	Large Tandem	30 Amp Time Delay Fuse or Breaker	4.81/4.07 KW
RAK4157	Direct Connect	15 Amp Time Delay Fuse or Breaker	2.61/2.19 KW
RAK4207	Direct Connect	20 Amp Time Delay Fuse or Breaker	3.42/2.87 KW
RAK4307	Direct Connect	30 Amp Time Delay Fuse or Breaker	4.81/4.07 KW
RAK5157	Direct Connect	15 Amp Time Delay Fuse or Breaker	2.61 KW
RAK5207	Direct Connect	20 Amp Time Delay Fuse or Breaker	3.42 KW
RAK5307	Direct Connect	30 Amp Time Delay Fuse or Breaker	4.81 KW

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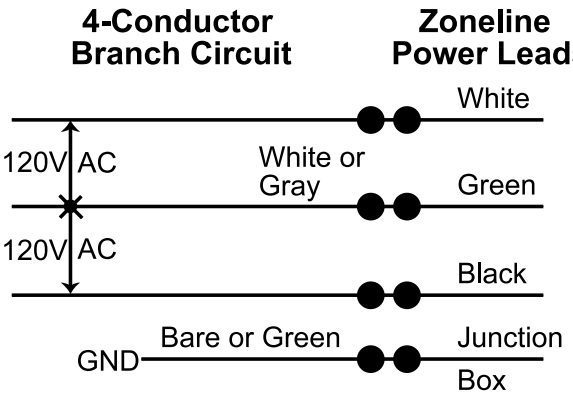
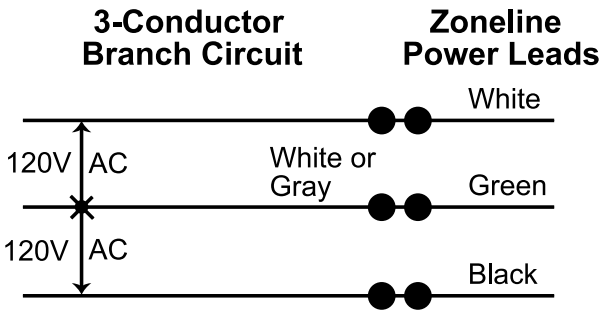
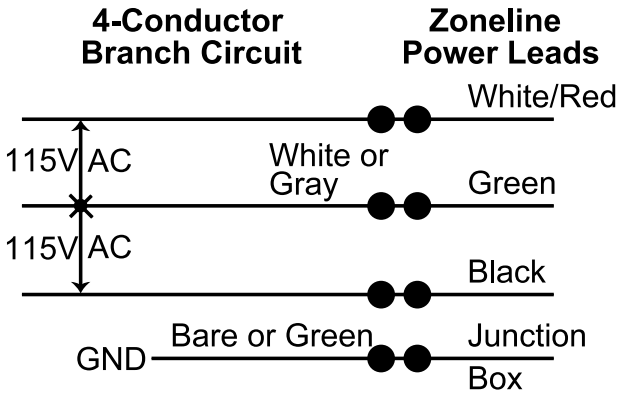
Direct Connection

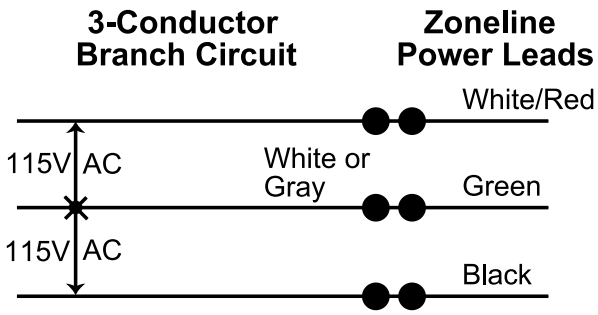
208 VAC



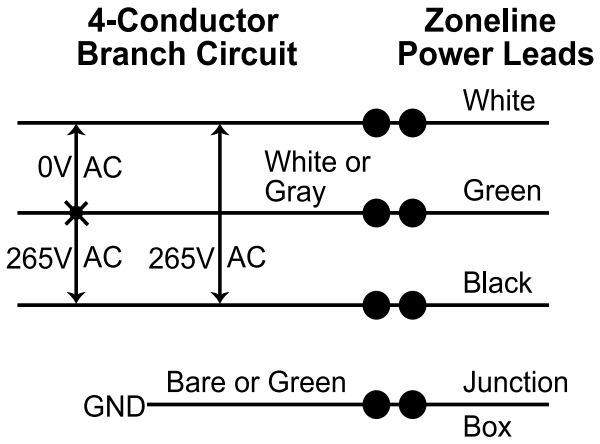


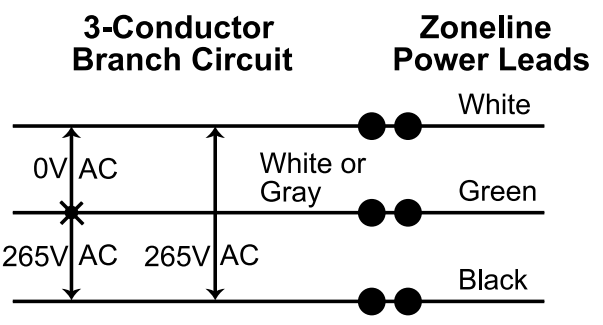
230 VAC





265 VAC





Heat Pump Model AZ85H12DACW1

⚠ WARNING: Risk of electric shock. Can cause injury or death: Read all instructions and safety information before servicing this product.

DISCONNECT POWER BEFORE SERVICING

IMPORTANT - RECONNECT ALL GROUNDING DEVICES

All parts of this appliance capable of conducting electrical current are grounded. If grounding wires, screws, straps, clips, nuts or washers used to complete a path to ground are removed for service, they must be returned to their original position and properly fastened.

WARNING DISCONNECT UNIT FROM ELECTRICAL POWER SUPPLY BEFORE MAKING ANY ELECTRICAL CHECKS.

MAXIMUM CURRENT LEAKAGE: 0.75 MILLIAMP
MAXIMUM GROUND PATH RESISTANCE: 0.1 OHM

IMPORTANT SAFETY NOTICE

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RUNNING CURRENT

With unit in case, operate for ten minutes on Hi-Cool. See Power Supply and Temperature Check table for normal limits.

CONDENSER

1. Check for blockage with dirt, or other material.
2. Check for corrosion.

FILTER

Check for cleanliness.

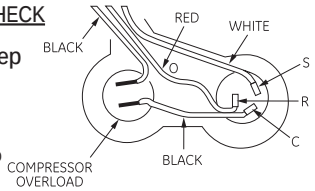
POWER SUPPLY AND TEMPERATURE CHECK

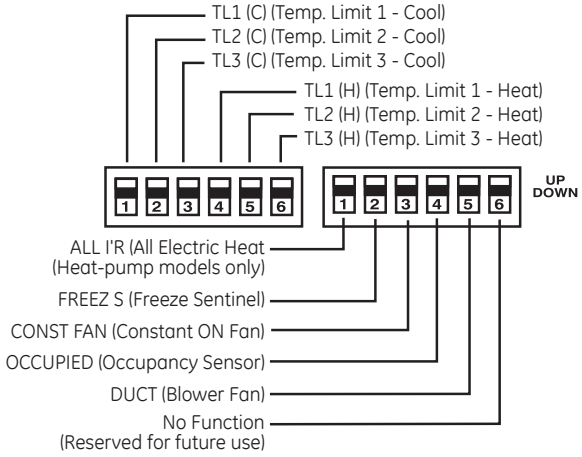
MODEL	RATED VOLTAGE	VOLTAGE LIMITS	COOLING						R/C HEATING					
			EVAP AIR TEMP IN °F	EVAP AIR OUT °F		AIR TEMP COND. IN °F	COOLING CURRENT		EVAP AIR TEMP IN °F	EVAP AIR OUT °F		AIR TEMP COND. IN °F	CURRENT	
				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.
AZ85H09D	208V	187-253	70	74	82	80	3.5	3.9	70	112	121	47	3.3	3.9
			80	83	89	95	3.9	4.4	75	117	126	60	3.4	4.0
			90	90	98	110	3.9	4.6	80	121	131	75	3.4	4.1
	230V		70	74	82	80	3.2	3.6	70	112	121	47	3.1	3.6
			80	83	89	95	3.6	4.1	75	117	126	60	3.1	3.7
			90	90	98	110	3.6	4.2	80	121	131	75	3.2	3.8
AZ85H09E	265	238-292	70	74	82	80	2.8	3.1	70	112	121	47	2.7	3.1
			80	83	89	95	3.1	3.5	75	117	126	60	2.7	3.2
			90	90	98	110	3.1	3.7	80	121	131	75	2.7	3.3
AZ85H12D	208V	187-253	70	74	82	80	4.4	5.1	70	117	126	47	4.1	4.8
			80	82	90	95	4.8	5.7	75	120	131	60	4.3	5.1
			90	89	96	110	5.4	6.5	80	125	136	75	4.5	5.4
	230V		70	74	82	80	4.1	4.7	70	117	126	47	3.8	4.5
			80	82	90	95	4.4	5.3	75	120	131	60	3.9	4.7
			90	89	96	110	5.0	6.0	80	125	136	75	4.2	5.0
AZ85H12E	265 187-253	238-292	70	74	82	80	3.5	4.1	70	117	126	47	3.3	3.9
			80	82	90	95	3.9	4.6	75	120	131	60	3.4	4.1
			90	89	96	110	4.3	5.2	80	125	136	75	3.6	4.3

WIRING - COMPRESSOR DIRECT CHECK

⚠ CAUTION: Risk of injury. Keep head clear of terminal area when cover is removed.

- Check windings first. If open or grounded, **DO NOT** apply power to compressor terminals.





TEMPERATURE DIFFERENTIAL - COOLING

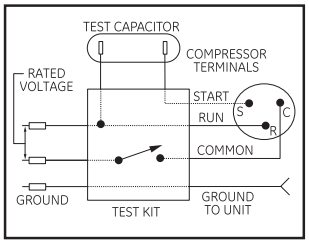
Unit must operate for one hour with thermostat at coldestsetting prior to measuring air temperatures. See Power Supply and Temperature Check table for normal limits.

SEALED SYSTEM

MODEL	COMPRESSOR	REFRIG. R410A	CAPILLARY OD x ID x LENGHT (PC)
AZ85H09D AZ85H09E	Rechi	34 oz.	.106" x .055" x 15.75" (3) .106" x .055" x 31.50" (1)
AZ85H12D AZ85H12E	Rechi	39 oz.	.106" x .055" x 15.75" (4) .106" x .059" x 9.84"(1) .106" x .059" x 25.59" (1)

RUN CAPACITOR CHECK

1. Replace unit run capacitor with a known good test capacitor which may be 10 MFD higher than specified and attempt to start compressor.
2. If compressor starts, install a new run capacitor which has a rating specified for the unit.



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DISCONNECT POWER BEFORE SERVICING

IMPORTANT - RECONNECT ALL GROUNDING DEVICES

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WARNING DISCONNECT UNIT FROM ELECTRICAL POWER SUPPLY BEFORE MAKING ANY ELECTRICAL CHECKS.

MAXIMUM CURRENT LEAKAGE: 0.75 MILLIAMP

MAXIMUM GROUND PATH RESISTANCE: 0.1 OHM

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RUNNING CURRENT

With unit in case, operate for ten minutes on Hi-Cool. See Power Supply and Temperature Check table for normal limits.

CONDENSER

1. Check for blockage with dirt, or other material.
2. Check for corrosion.

FILTER

Check for cleanliness.

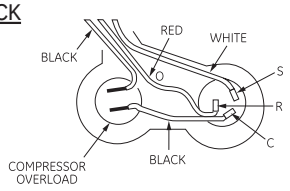
POWER SUPPLY AND TEMPERATURE CHECK

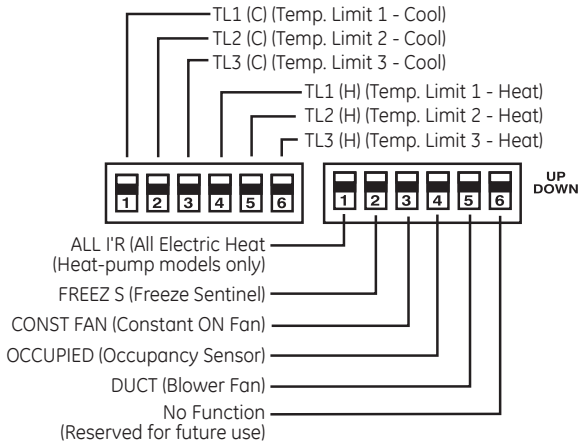
MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAPORATOR AIR TEMP IN °F	EVAP AIR OUT °F MIN.	EVAP AIR OUT °F MAX.	AIR TEMP CONDENSER IN °F	COOLING CURRENT MIN.	COOLING CURRENT MAX.
AZ85E09DACW1	208V	187-253	70	74	82	80	3.5	3.9
			80	83	89	95	3.9	4.4
			90	90	98	110	3.9	4.6
	230V		70	74	82	80	3.2	3.6
			80	83	89	95	3.6	4.1
			90	90	98	110	3.6	4.2
AZ85E09EACW1	265	238-292	70	74	82	80	2.8	3.1
			80	83	89	95	3.1	3.5
			90	90	98	110	3.1	3.7
AZ85E12DACW1	208V	187-253	70	74	82	80	4.4	5.1
			80	82	90	95	4.8	5.7
			90	89	96	110	5.4	6.5
	230V		70	74	82	80	4.1	4.7
			80	82	90	95	4.4	5.3
			90	89	96	110	5.0	6.0
AZ85E12EACW1	265	238-292	70	74	82	80	3.5	4.1
			80	82	90	95	3.9	4.6
			90	89	96	110	4.3	5.2

WIRING - COMPRESSOR DIRECT CHECK

⚠ CAUTION: Risk of injury. Keep head clear of terminal area when cover is removed.

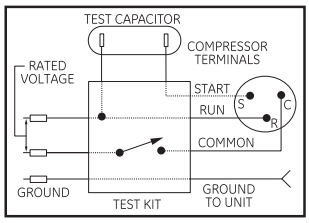
- Check windings first. If open or grounded, DO NOT apply power to compressor terminals.





RUN CAPACITOR CHECK

1. Replace unit run capacitor with a known good test capacitor which may be 10 MFD higher than specified and attempt to start compressor.
2. If compressor starts, install a new run capacitor which has a rating specified for the unit.



TEMPERATURE DIFFERENTIAL - COOLING

Unit must operate for one hour with thermostat at coldestsetting prior to measuring air temperatures. See Power Supply and Temperature Check table for normal limits.

SEALED SYSTEM

MODEL	COMPRESSOR	REFRIG. R410A	CAPILLARY OD x ID x LENGHT (PC)
AZ85E09D AZ85E09E	Rechi	27.5 oz.	.106" x .051" x 23.62" (1)
AZ85E12D AZ85E12E	Rechi	27.5 oz.	.106" x .059" x 25.59" (1) .106" x .055" x 15.75" (2)

(*Continued next page*)

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DISCONNECT POWER BEFORE SERVICING

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RUNNING CURRENT

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CONDENSER

1. Check for blockage with dirt, or other material.
2. Check for corrosion.

FILTER

Check for cleanliness.

POWER SUPPLY AND TEMPERATURE CHECK

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAPORATOR AIR TEMP IN °F	EVAP AIR OUT °F		AIR TEMP CONDENSER IN °F	COOLING CURRENT	
				MIN.	MAX.		MIN.	MAX.
AZ85W09DACW1	208V	187-253	70	74	82	80	3.5	3.9
			80	83	89	95	3.9	4.4
			90	90	98	110	3.9	4.6
	230V		70	74	82	80	3.2	3.6
			80	83	89	95	3.6	4.1
			90	90	98	110	3.6	4.2
AZ85W12DACW1	208V	187-253	70	74	82	80	4.4	5.1
			80	82	90	95	4.8	5.7
			90	89	96	110	5.4	6.5
	230V		70	74	82	80	4.1	4.7
			80	82	90	95	4.4	5.3
			90	89	96	110	5.0	6.0

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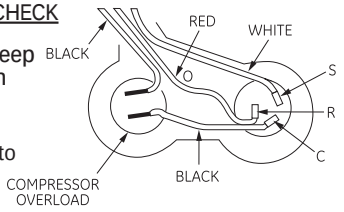

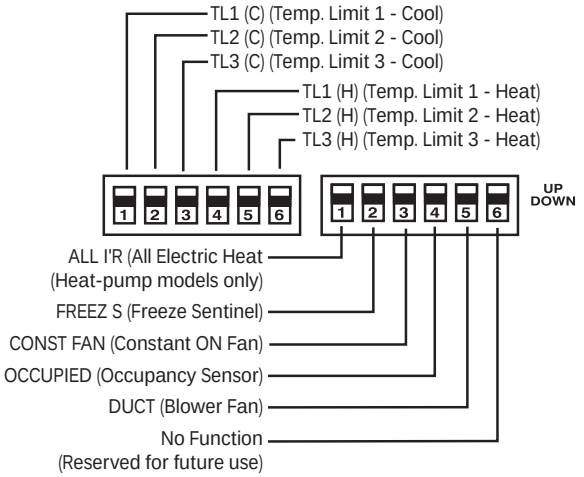

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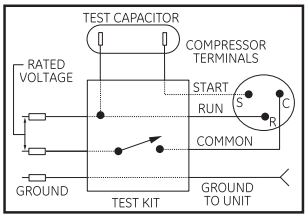

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SEALED SYSTEM

MODEL	COMPRESSOR	REFRIG. R410A	CAPILLARY OD x ID x LENGHT (PC)
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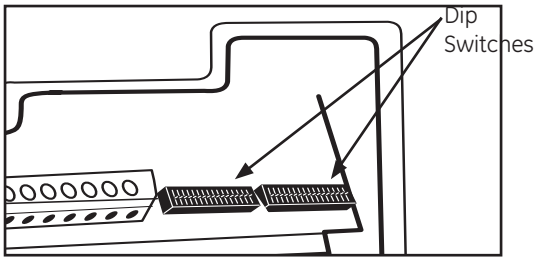
AZ85W12D	Rechi	27.5 oz.	.106" x .059" x 25.59" (1) .106" x .055" x 15.75" (2)

Temperature limiting during COOL mode (all temperatures shown in °F)			
UP	Down	Min.	Max.
NONE	1,2,3	60°	85°
1	2,3	64°	85°
1,2	3	66°	85°
2	1,3	68°	85°
2,3	1	70°	85°
1,2,3	NONE	72°	85°
1,3	2	74°	85°
3	1,2	76°	85°

Controls-Dip Switches

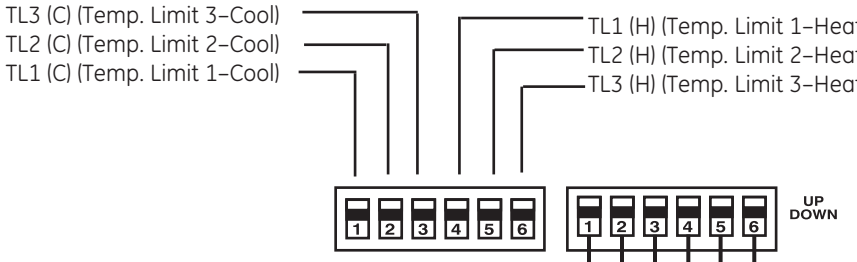
Dip Switches

The dip switches are located behind the front case panel, and are accessible through an opening on the front of the unit. The left row of dip switches controls Temperature Limiting. The right row of dip switches controls the heat pump lockout, Freeze Sentinel, constant fan, Energy Management System, and indoor fan speed.



Note:

- The dip switches are set in the down position from the factory.
- The owner is responsible for setting the appropriate dip switches and connecting terminals.



All I2R (Heat Pump Lockout)

When this switch is up, heat pump operation is locked out. Only electric resistance heat is available when switch is up.

Note: Not all models are equipped with heat pumps. Refer to the Nomenclature chapter to determine if your model is equipped with a heat pump.

NOT USED

DUCT

This switch, in conjunction with the thermostat connection, controls indoor fan speed.

Refer to the Fan Speed section of this chapter for more information

FREEZ S (Freeze Sentinel)

Refer to the Freeze Sentinel section of this chapter for more information.

OCCUPIED

Refer to the Energy Management System section of this chapter for more information.

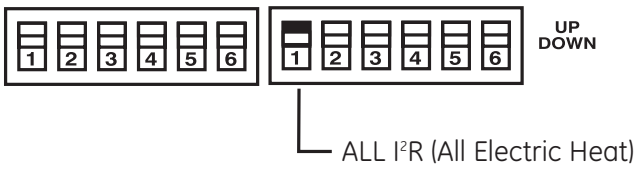
CONST FAN

When this switch is up, the fan runs continuously at high speed even if unit is off.

(*Continued next page*)

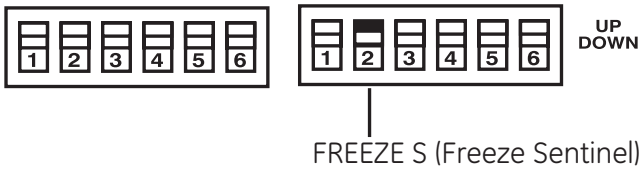
All Electric Heat (Heat pump models only)

When this switch is enabled (UP), heat pump operation is locked out, causing the unit to provide only electric resistance heat.



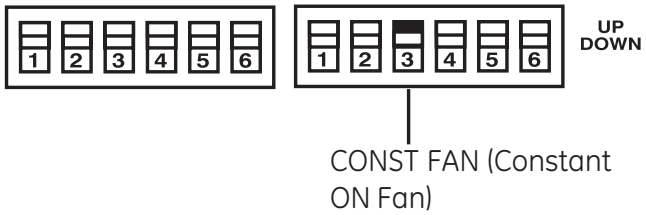
Freeze Sentinel (Requires room air sensor kit-RAVRMS)

When this switch is enabled (UP), it turns OFF the freeze sentinel protection feature. With the switch disabled (DOWN), the freeze sentinel is activated, which automatically provides heat without user interface. This helps prevent plumbing damage by turning the heater and fans ON at 41°F and OFF at 46°F.



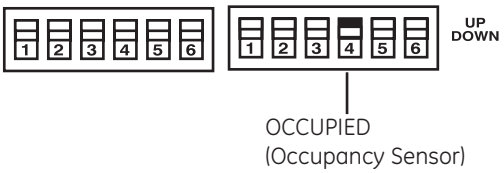
Constant ON Fan

When this switch is enabled (UP), it allows the fan to run continuously.



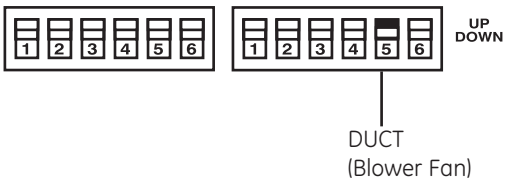
Occupancy Sensor (Field Supplied)

When this switch is enabled (UP), it allows the unit to utilize an infrared motion sensor and a door switch for occupancy detection. This feature combined with field devices automatically cycles the unit between normal operation and a preset energy management operation.



Duct

The duct select function allows the indoor fan to be operated at two variable fan speeds. When this switch is enabled (UP), the unit automatically selects high or middle fan speed (for longer ductwork applications). When set in the disabled (down) position, the unit is automatically operated in either the middle or low fan speed (for shorter ductwork applications).



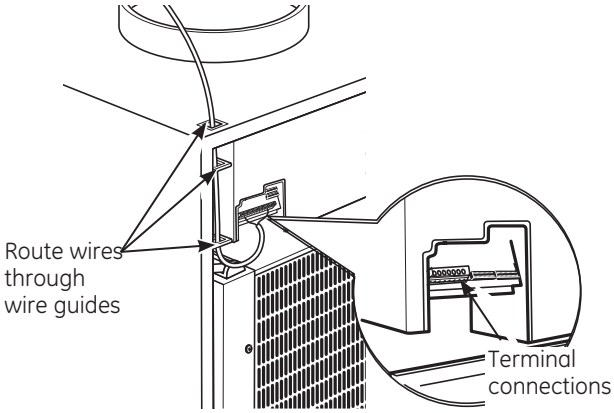
Main Board Terminal Strip

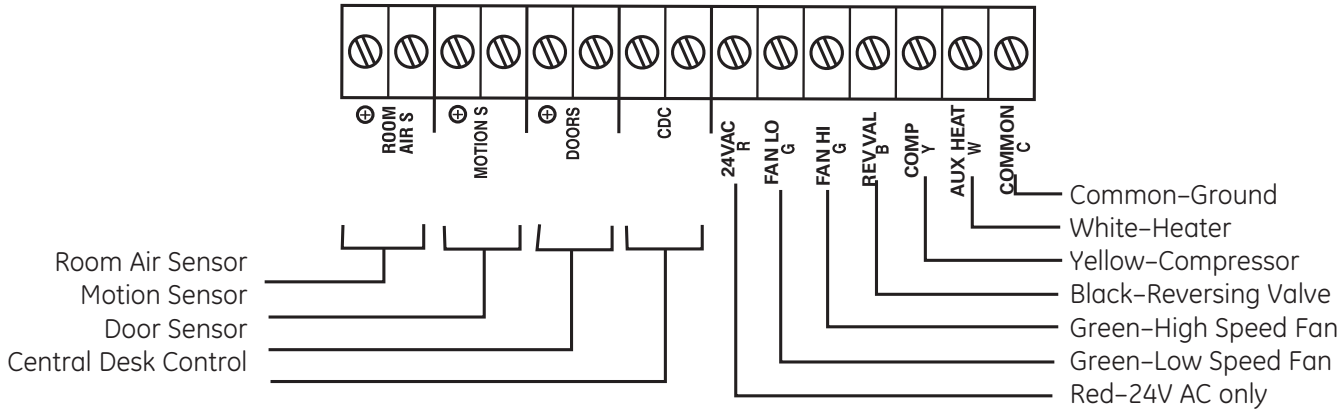
Caution: Improper wiring may damage the Zoneline electronics. Damage or erratic operation may result. No common busing is permitted. A separate wire pair must be run from each separate controlling switch to each individual Zoneline.

The terminal connections are located behind the front case panel.

Insert the building hookup wires into the bottom of the terminal and tighten screw securely to make the desired connections.

Route any wires from the terminal connections through the case loop.





Remote Thermostat Control

The unit is controlled by an externally mounted, remote thermostat.

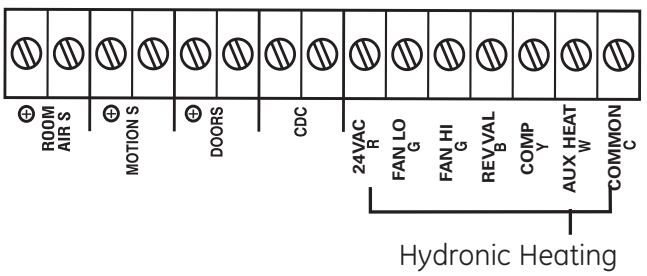
The Zoneline thermostat connections provide 24 VAC only. If using a digital/electronic wall thermostat, it must be set to the 24-VAC setting. Refer to the thermostat installation instructions for details.

Note: Some thermostats can be programmed to energize the reversing valve in heating mode or cool mode. If the thermostat is not programmed correctly, the unit will heat when the thermostat is set to cool and cool when the thermostat is set to heat. Refer to the instructions provided with the thermostat for thermostat programming procedures. Also refer to the Reversing Valve section of the Components chapter for more information.

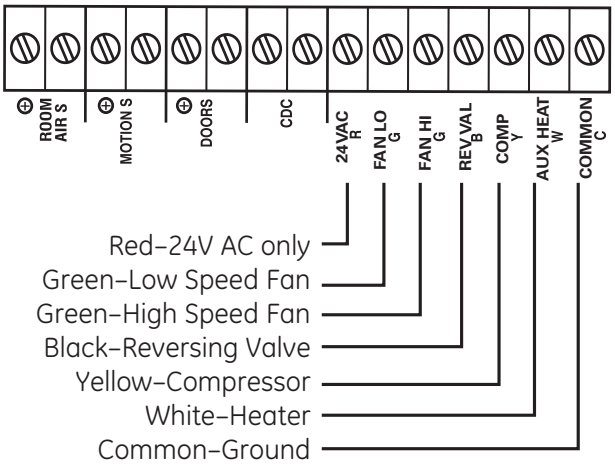
Hydronic Heating (Requires Hydronic Heating Kit- RAVHW1, RAVHW2, or RAVHW3)

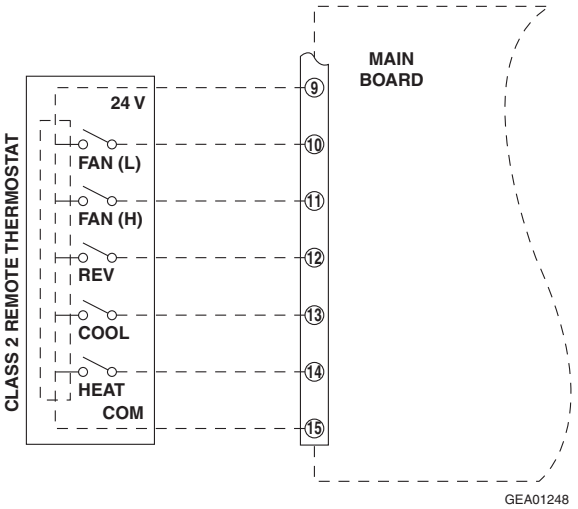
Required connections for hydronic heating kit.

Note: R, W, and C terminal connections will also be connected to the remote thermostat if applicable.



Central Desk Control (CDC)





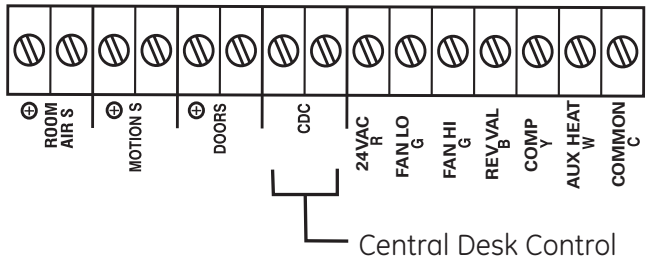
When a CDC switch is connected to the main board terminal strip, the unit can be turned on and off from a remote location. Up to 2000 feet of wire may be used to connect a remote CDC switch to the unit.

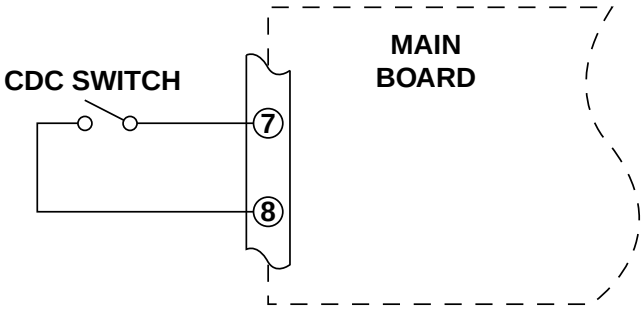
A separate wire pair must be run from each CDC switch to each Zoneline. Multiple units cannot be run from the same CDC switch.

The remote CDC switch will be closed when the unit is off.

REMOTE CDC SWITCH CLOSED = UNIT OFF
REMOTE CDC SWITCH OPEN = UNIT ON

Note: The Freeze Sentinel is still operational when the remote CDC switch has turned the unit off. The room air sensor must be installed and Freeze Sentinel dip switch must be in the down position for the Freeze Sentinel to operate.





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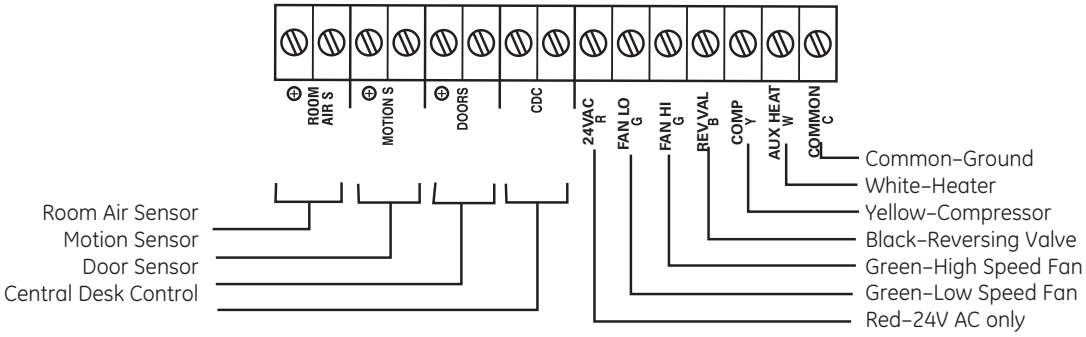
Temperature Limiting

Temperature limiting limits the lowest temperature that can be set for cooling and the highest temperature that can be set for heating. The dip switches are used to control temperature limiting.

Temperature limiting is dependent on the Room Air Sensor (kit). If the Room Air Sensor (kit) is not installed, temperature limiting will not operate. Temperature limiting is not dependent on the Occupied dip switch, Motion Sensor (kit), or Door Sensor (kit).

Freeze Sentinel



Temperature Limiting During Cool Mode			
UP	DOWN	Minimum	Maximum
NONE	1,2,3	60°F	85°F
1	2,3	64°F	85°F
1,2	3	66°F	85°F
2	1,3	68°F	85°F
2,3	1	70°F	85°F
1,2,3	NONE	72°F	85°F
1,3	2	74°F	85°F
3	1,2	76°F	85°F

Temperature Limiting During HEAT Mode*			
UP	DOWN	Minimum	Maximum
NONE	4,5,6	60°F	85°F
4	5,6	60°F	80°F
4,5	6	60°F	78°F
5	4,6	60°F	76°F
5,6	4	60°F	74°F
4,5,6	NONE	60°F	72°F
4,6	5	60°F	70°F
6	4,5	60°F	65°F

* Not applicable to Cool-only models.

(*Continued next page*)

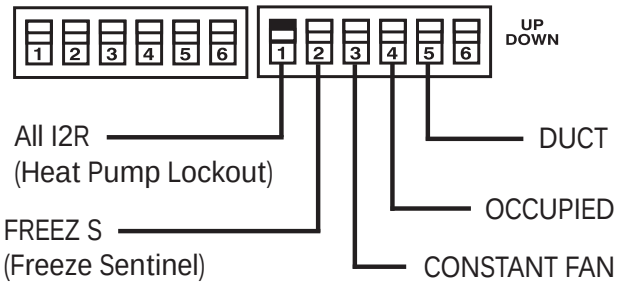
The Freeze Sentinel is enabled by a dip switch and is dependant on the Room Air Sensor (kit). If the Room Air Sensor (kit) is not installed, the Freeze Sentinel will not operate. The FREEZE S dip switch must be down for Freeze Sentinel operation.

FREEZE S SWITCH DOWN = ON

FREEZE S SWITCH UP = OFF

The Freeze Sentinel turns on the resistance heater(s) and indoor fan when the Room Air Sensor (kit) sees 41°F. When the temperature of the room has risen to 46°F, the unit will turn off.

The Freeze Sentinel will remain enabled when the unit has been turned off by the remote Central Desk Control.



Fan Speed (Indoor Fan)

The Indoor fan operates at one speed during unit operation. The duct dip switch, in conjunction with the thermostat connection, controls at what speed the indoor fan operates.

When the green thermostat wire is connected to the high speed fan (FAN HI) terminal:

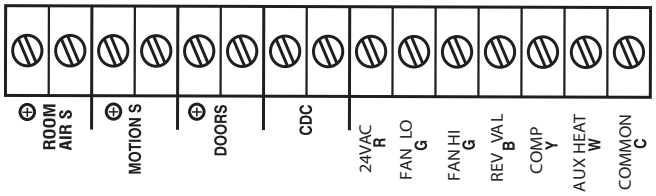
DUCT SWITCH UP = HIGH FAN SPEED

DUCT SWITCH DOWN = MEDIUM FAN SPEED

When the green thermostat wire is connected to the low speed fan (FAN LO) terminal:

DUCT SWITCH UP = MEDIUM FAN SPEED

DUCT SWITCH DOWN = LOW FAN SPEED



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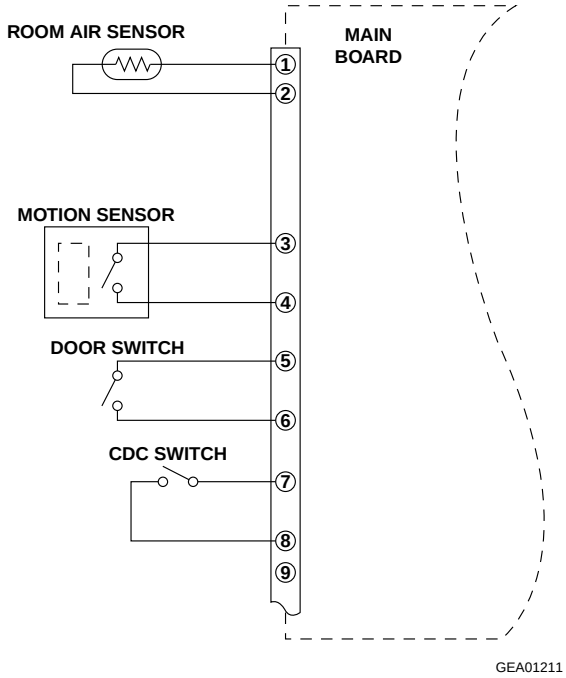
Energy Management System

The following conditions must exist for the Energy Management System to operate:

- OCCUPIED dip switch is up.
- Room Air Sensor (kit) is installed.
- Door Sensor (kit) is installed.
- Motion Sensor (kit) is installed.

The Energy Management System uses input from the Door Sensor (kit) and Motion Sensor (kit) to establish if the room is occupied or unoccupied. When the Energy Management System has established that the room is unoccupied, it uses input from the Room Air Sensor (kit) and allows the temperature of the room to lower to 68°F (heat mode) or raise to 78°F (cool mode). When the room becomes occupied, the Energy Management System will return to thermostat-controlled operation and will return the room to the temperature set on the thermostat.



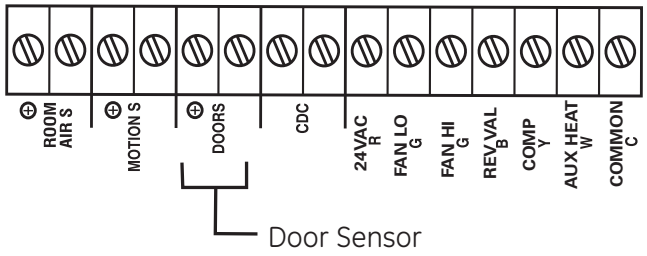
Schematic shown with unit on, door closed, and motion sensed.

Door Sensor (kit)

The Door Sensor has a two-wire circuit that is connected to the main board terminal strip. When the door opens, the door sensor (switch) closes.

When the Energy Management System sees the door sensor circuit close (door opened), the Energy Management System will then check the motion sensor circuit.

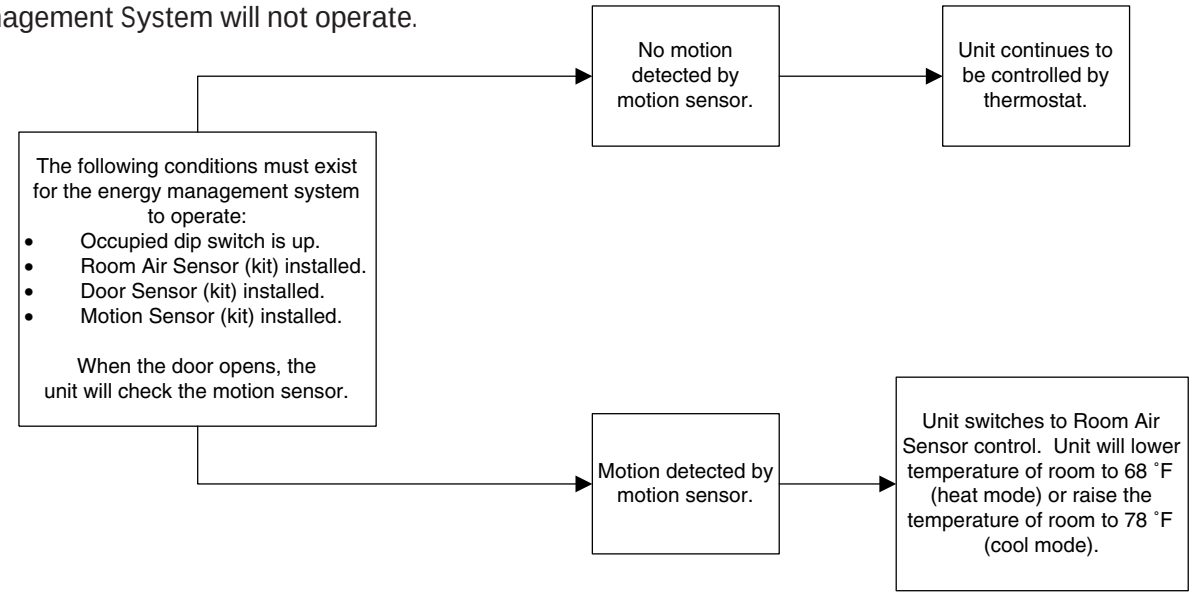
Note: The Energy Management System is dependent on the Room Air Sensor, Motion Sensor, and Door Sensor. If the Room Air Sensor, Motion Sensor, and Door Sensor are not all installed, the Energy Management System will not operate.



DOOR OPEN = SENSOR (SWITCH) CLOSED

DOOR CLOSED = SENSOR (SWITCH) OPEN

MAIN BOARD OUTPUT TO DOOR SENSOR = 24 VAC



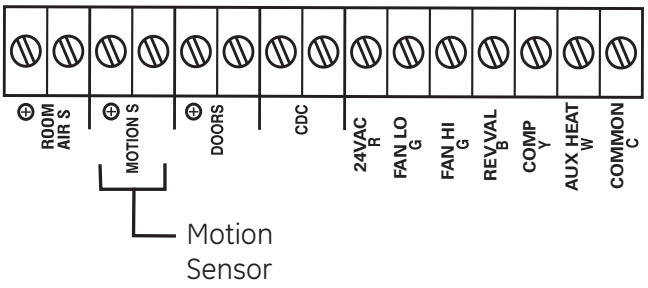
(*Continued next page*)

Motion Sensor (kit)

The motion sensor has a 2-wire circuit that is connected to the main board terminal strip. The motion sensor is an electronic sensor that, when motion is sensed, closes a switch (internal to the sensor), completing the motion sensor circuit.

After the Energy Management System has seen the door sensor circuit closed (door opened), it will check the motion sensor circuit. If the Energy Management System sees the motion sensor circuit closed (no motion detected by the sensor), it will then check the temperature being reported by the room air sensor. If the Energy Management System sees the motion sensor circuit open (motion detected by sensor), the unit will continue to be thermostat-controlled.

Note: The Energy Management System is dependent on the Room Air Sensor, Motion Sensor, and Door Sensor. If the Room Air Sensor, Motion Sensor, and Door Sensor are not all installed, the Energy Management System will not operate.



NO MOTION = SENSOR (SWITCH) CLOSED

MOTION = SENSOR (SWITCH) OPEN

MAIN BOARD OUTPUT TO
MOTION SENSOR = 24 VAC

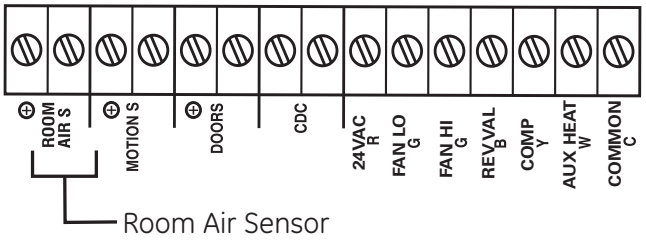
Room Air Sensor (kit)

The room air sensor is a thermistor with a negative coefficient (as temperature rises, resistance goes down). The sensor has a 2-wire circuit that is connected to the main board terminal strip.

The room air sensor is used for Temperature Limiting and for the Energy Management System.

When the Energy Management System sees the door sensor circuit close and then the motion sensor circuit close (room unoccupied), the Energy Management System will ignore the thermostat and check the temperature reported by the room air sensor. Based on the input from the room air sensor, the Energy Management System will allow the temperature of the room to lower to 68°F (heat mode) or raise to 78°F (cool mode).

Note: The Energy Management System is dependent on the Room Air Sensor, Motion Sensor, and Door Sensor. If the Room Air Sensor, Motion Sensor, and Door Sensor are not all installed, the Energy Management System will not operate.



MAIN BOARD OUTPUT TO

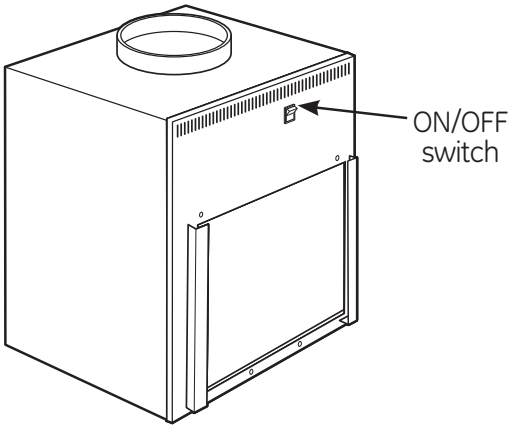
ROOM AIR SENSOR = 5 VDC

Room Air Sensor Resistance Values	
Temperature	Resistance
32 °F	60 kΩ
68 °F	20 kΩ
77 °F	10 kΩ
86 °F	9 kΩ
95 °F	8 kΩ

ON/OFF Switch

WARNING: ON/OFF switch does not disconnect power from all circuits.

The ON/OFF switch is located on the electronics cover behind the front case panel. The ON/OFF switch disables all relays, but does not disconnect power from all circuits. No functions are available when the switch is off.

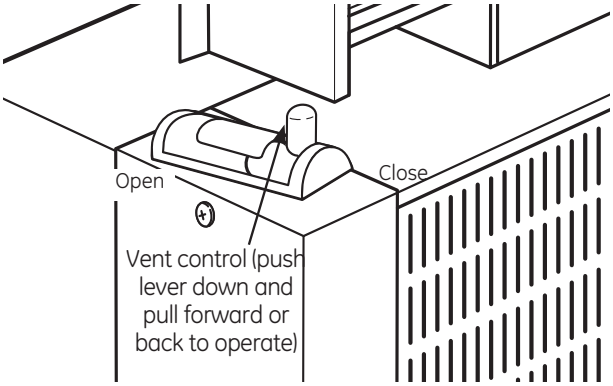


Ventilation Control

The ventilation control lever is located on the left side of the Zoneline unit, behind the front case panel.

When the lever is in the CLOSE position, only air inside the room is circulated and filtered.

When the lever is in the OPEN position, some outdoor air will be drawn into the room. This will reduce the heating or cooling efficiency.



About Heat Pumps (on some models)

Heat pumps can reduce operating costs by exchanging heat from the outside air-even when the outside temperature is below freezing-and releasing that heat indoors.

To get the best economic benefit from the heat pump, don't change the room thermostat setting very often. Raising the heat setting 2-3 degrees will cause the Zoneline to use its electric heating elements in order to reach the new temperature setting quickly.

There is a 3-minute minimum compressor run time at any setting to prevent short cycling.

The indoor fan motor starts before the compressor starts, and stops after the compressor cycles off.

The electric heating elements use much more electricity than heat pumps and cost more to operate.

Do Not Operate the Air Conditioner (cool mode) in Freezing Outdoor Conditions

Air conditioners are not designed for use when freezing outdoor conditions exist. They must not be used in freezing outdoor conditions.

(*Continued next page*)

Automatic Defrosting of Indoor and Outdoor Coils

During continued compressor operation, there is potential for ice to form on the indoor coil when in cool mode and for ice to form on the outdoor coil when in heat mode. The Zoneline is equipped with Automatic Defrost to eliminate this potential problem.

Indoor coil defrost will occur when the indoor coil thermistor reads a temperature of 34°F or less for a duration of 5 minutes. The main board will automatically shut the compressor off, allowing the indoor coil temperature to rise. The fans will continue to operate throughout the defrost cycle for continued air circulation. When the indoor coil thermistor detects a temperature of 50°F or above, the compressor will resume normal operation. A 3-minute minimum compressor off time will be in effect.

Outdoor coil defrost will occur for one of the following reasons:

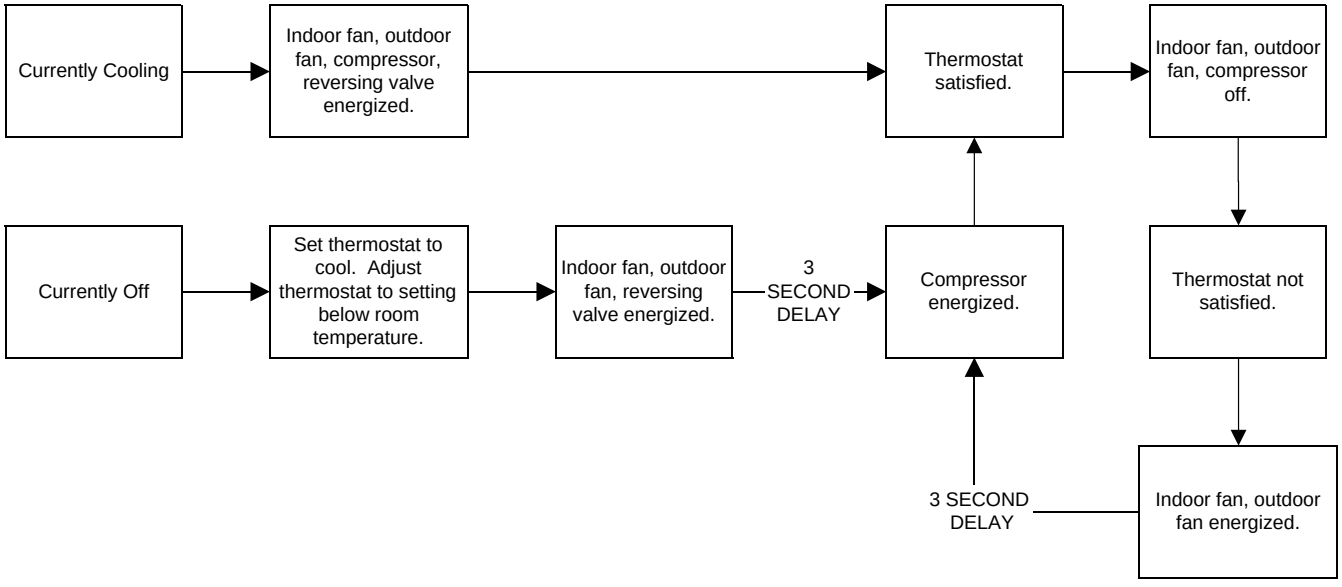
- The outdoor temperature thermistor reads a temperature of 14 °F or less for a duration of 2 hours and 59 minutes.
- The accumulated run time of the compressor is greater that 3 hours with an outdoor temperature of 32°F or less.

The outdoor coil is defrosted by reverse cycle defrosting (reversing the direction of the refrigerant flowing through the sealed system). This will cause hot refrigerant flowing through the outdoor coil to quickly and efficiently melt any ice that has formed. Outdoor coil defrosting will terminate when the outdoor coil thermistor reads a temperature of 68°F, or when a period of 9 minutes has elapsed, whichever comes first. When outdoor defrosting has been completed, the resistance heater(s) and fans will run for a minimum of 90 seconds or until the room has reached the thermostat set point.

Cool Mode Operation

Note:

- Minimum compressor/fans off time is 3 minutes +/- 10 seconds.
- Reversing valve is energized at all times in cool mode. Reversing valve is not de-energized when thermostat is satisfied.
- Indoor and outdoor fans always operate at the same time in cool mode.

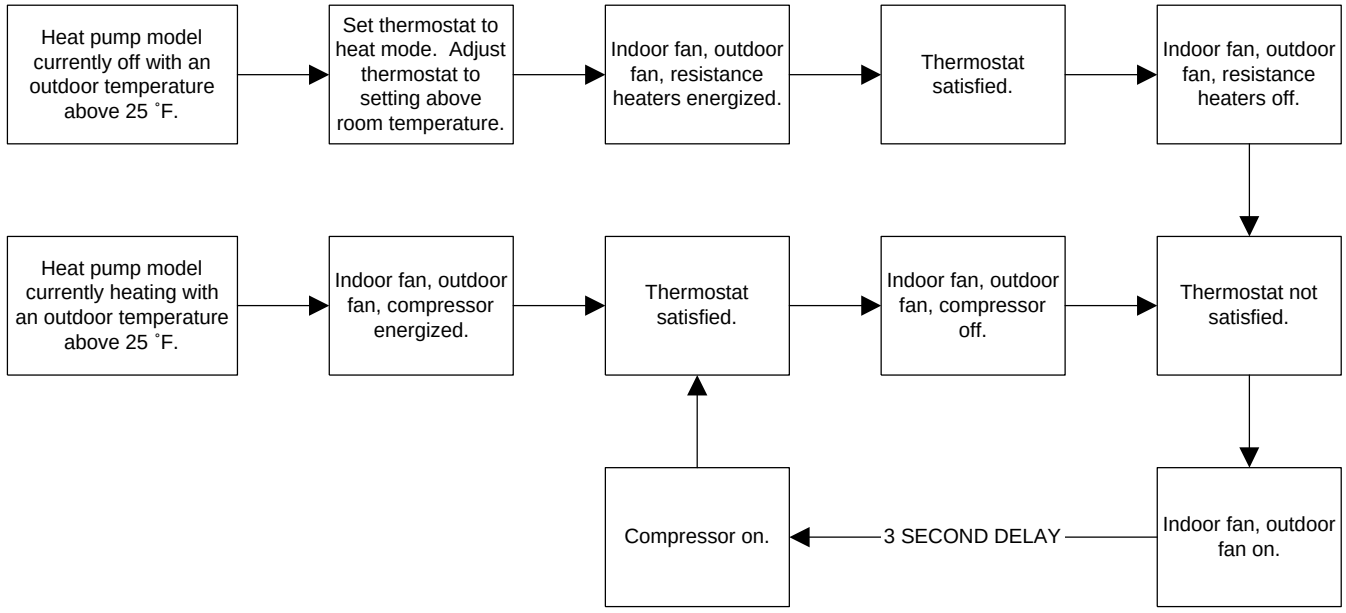


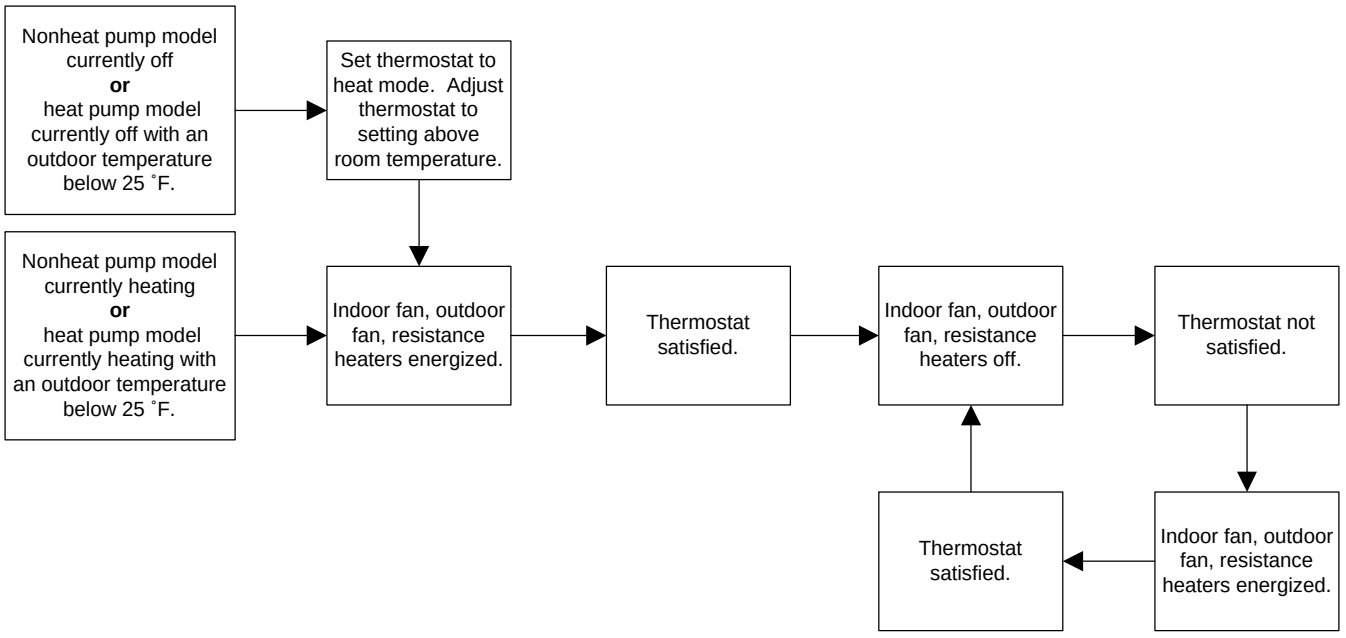
(*Continued next page*)

Heat Mode Operation

Note:

- Minimum compressor/fans off time is 3 minutes +/- 10 seconds.
- Heat pump will not operate if outdoor thermistor sees 25°F or less.
- Heat pump and resistance heater(s) do not operate at the same time.
- Indoor and outdoor fans operate at the same time, with the following exception: Should the indoor coil temperature reach 131°F, the outdoor fan will stop until the indoor coil temperature lowers to 126°F.





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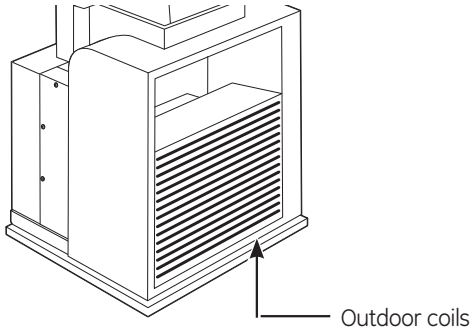
Care and Cleaning

Turn off the Zoneline and disconnect the power supply before cleaning.

Indoor/Outdoor Coils

The exhaust coils on the Zoneline should be checked regularly. If they are clogged with dirt or soot, they may be professionally steam cleaned by your GE service center. You will need to remove the unit from the case to inspect the coils because the dirt build-up occurs on the exhaust side.



Have the coils cleaned regularly.

Drain

Clean the drain system regularly to prevent clogging.

Base Pan

In some installations, dirt or other debris may be blown into the unit from the outside and settle in the base pan (the bottom of the unit).

In some areas of the United States, a “gel-like” substance may be present in the base pan.

Check it periodically and clean, if necessary.

Air Filters

To maintain optimum performance, change the filter at least every 30 days.

The most important thing you can do to maintain the Zoneline is to change the filter at least every 30 days. Dirty filters reduce cooling, heating, and airflow.

Changing the filter will: Decrease the cost of operation, save energy, prevent clogging the heat exchanger coils, and reduce the risk of premature component failure.

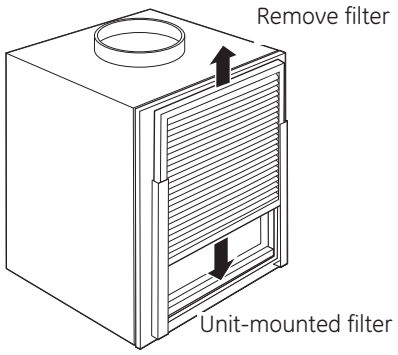
NOTICE: Do not operate the Zoneline without the filter in place. If a filter becomes torn or damaged, it should be replaced immediately.

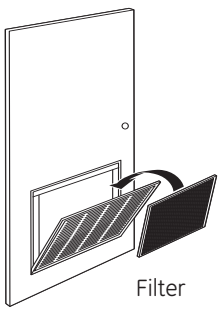
Operating without the filter in place, or with a damaged filter, will allow dirt and dust to reach the indoor coil and reduce the cooling, heating, airflow and efficiency of the unit.

Replacement filters should be purchased from your local retailer where air conditioner and furnace accessories are sold.

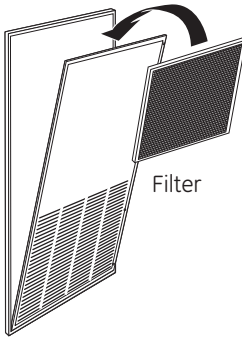
Filter size required is 20” x 20” x 1”.

To remove and replace the filter:





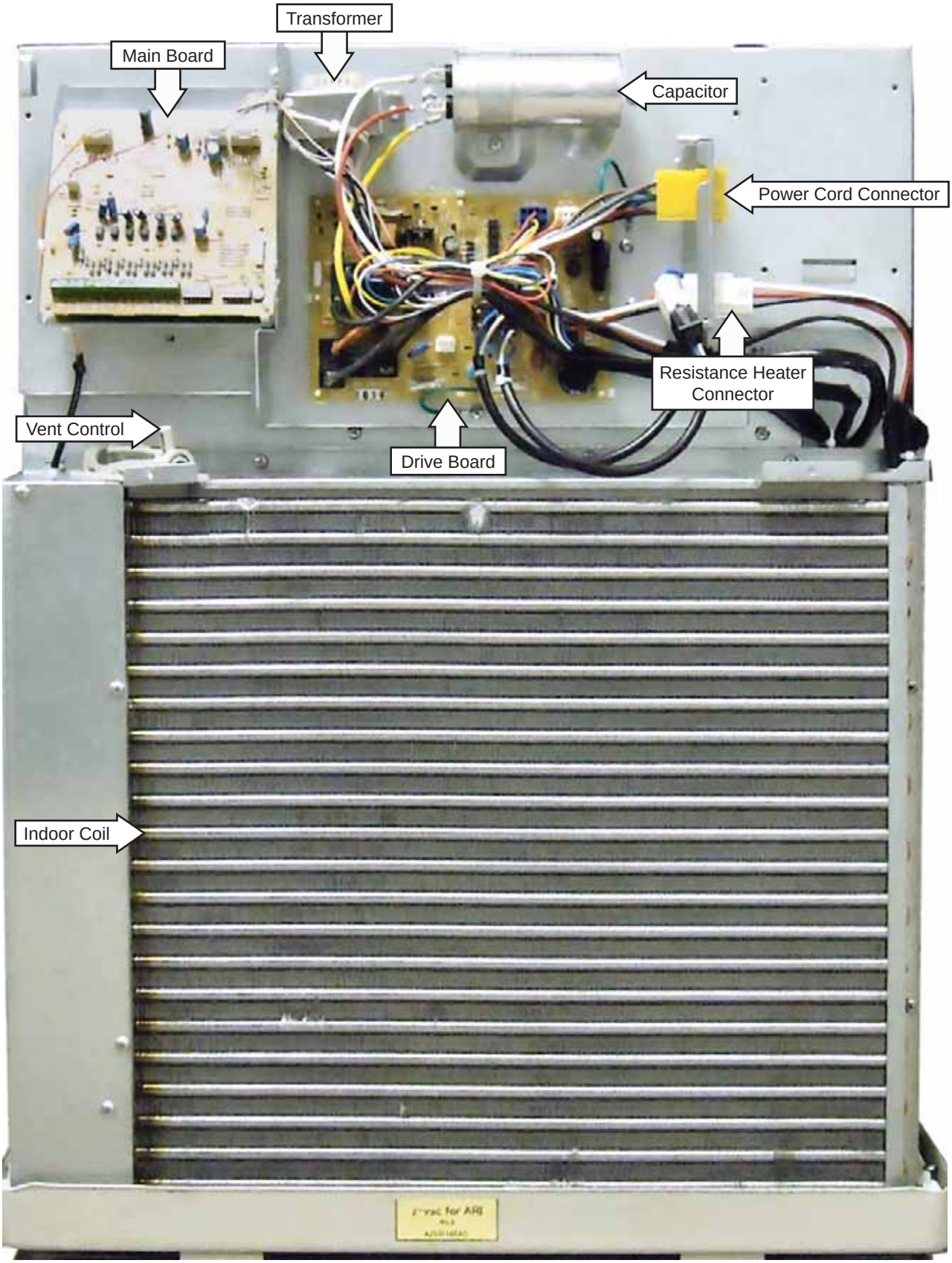
Return air grille



Access-panel with return air grille

Component Locator Views

Front View



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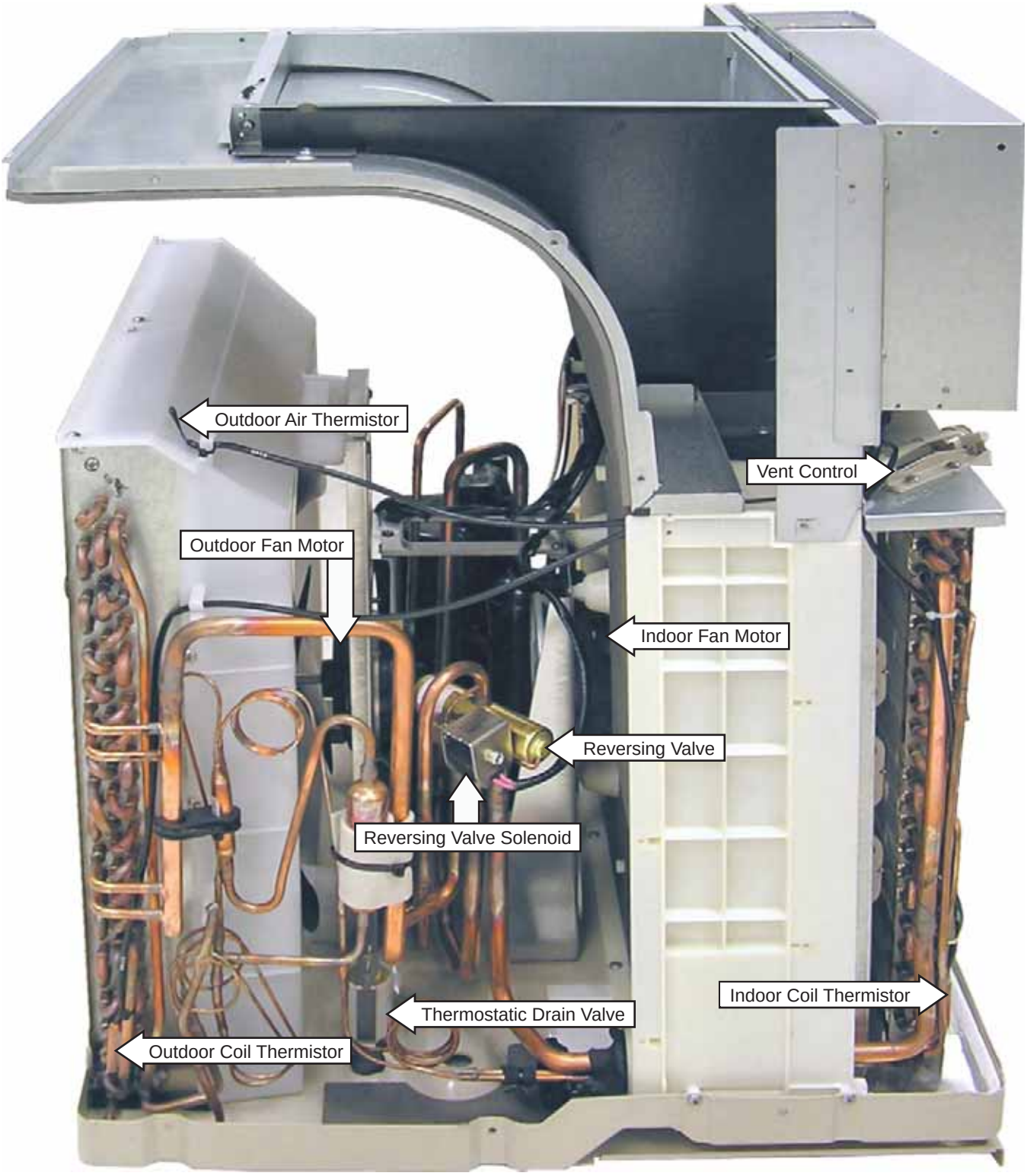
Left Side View



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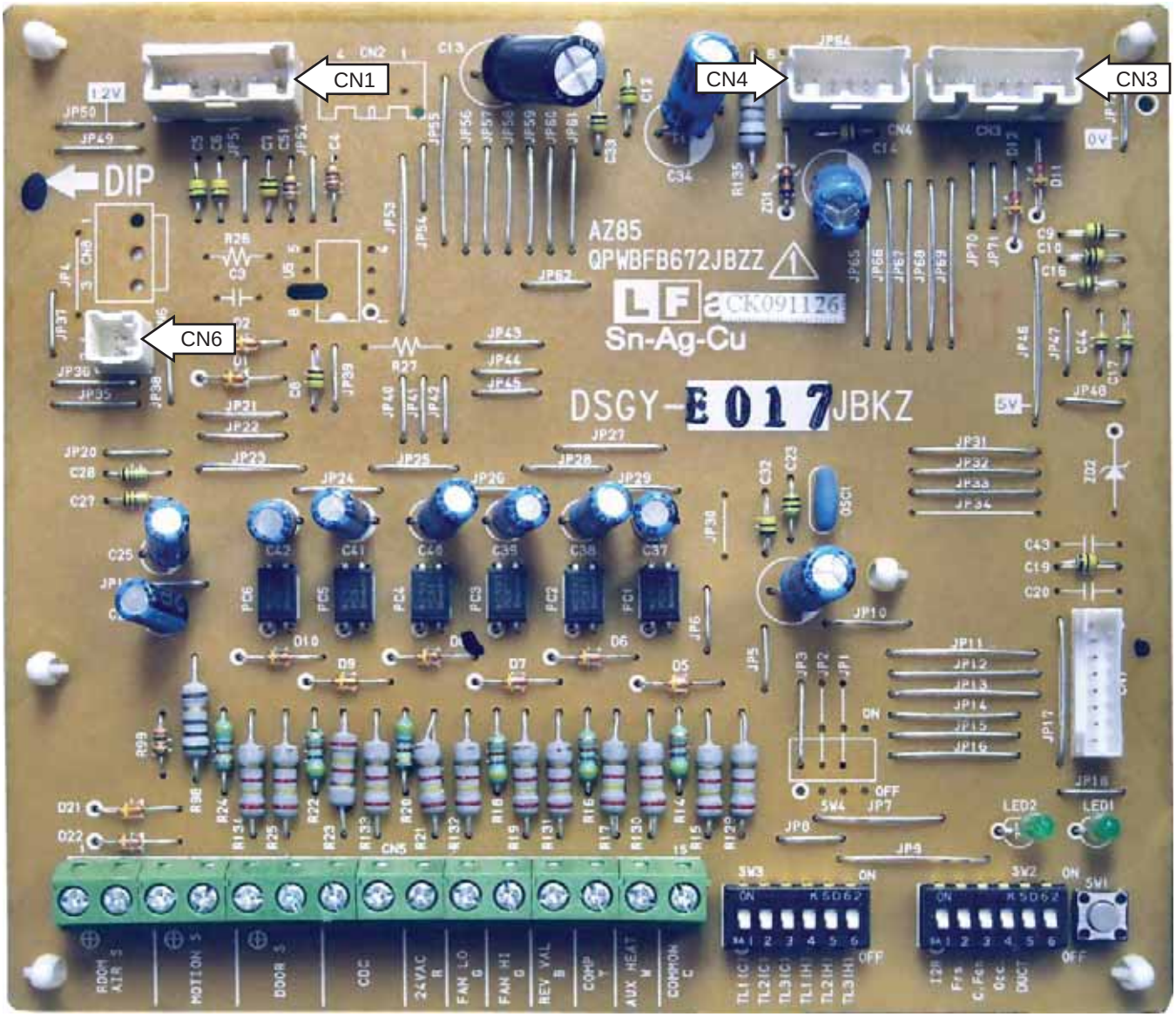
Right Side View

Circuit Boards Locator Views

Main Board



CN1 - Indoor Coil, Outdoor Coil, and Outside Air Thermistors

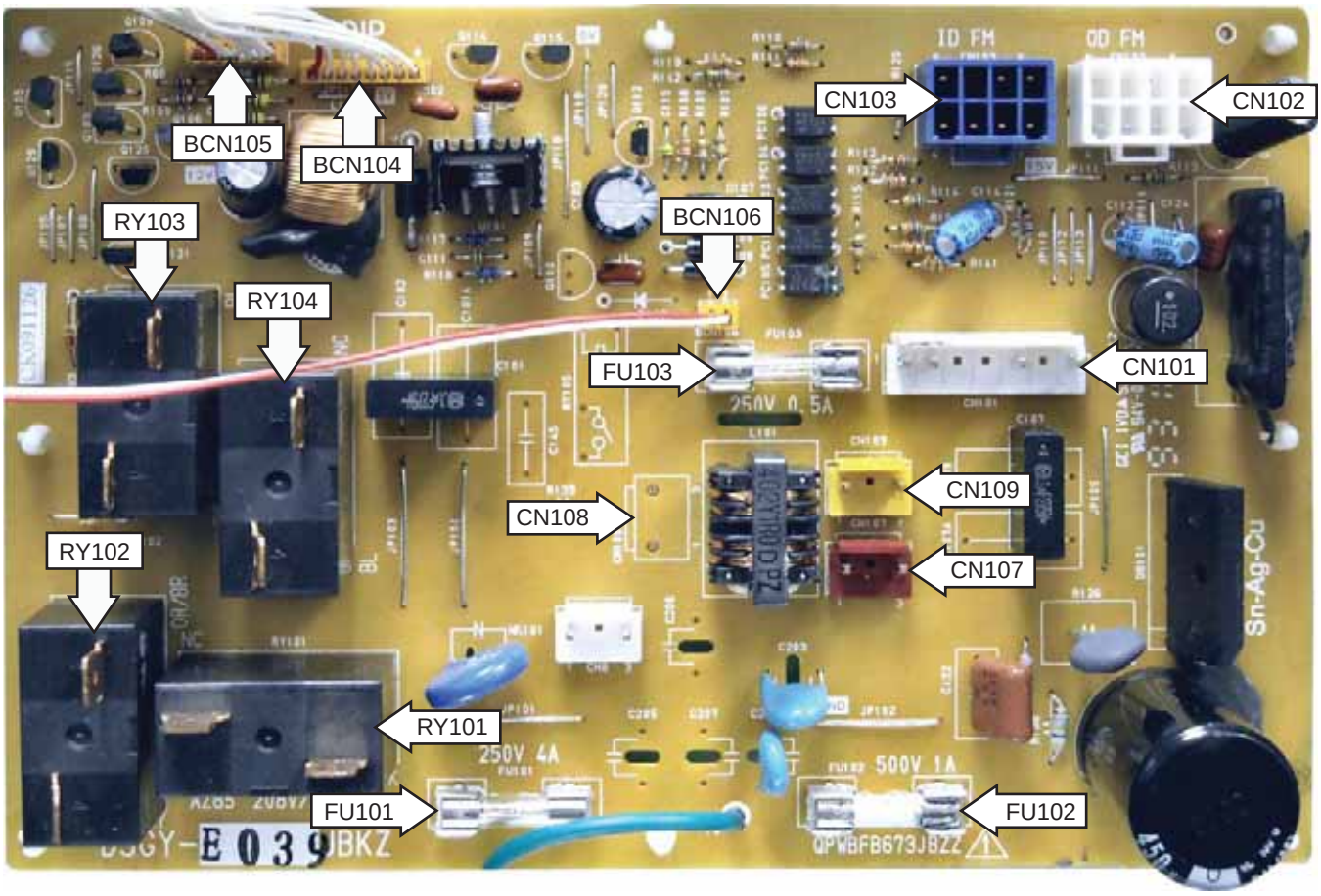
CN3 - Main Board to Drive Board Connector

CN4 - Main Board to Drive Board Connector

CN6 - Power from Drive Board

(*Continued next page*)

Drive Board



CN101 - Transformer

CN102 - Outdoor Fan

CN103 - Indoor Fan

CN107 - On/Off Switch

CN108 - Reversing Valve Solenoid (Heat Pump Models)

CN109 - On/Off Switch

RY101 - Compressor

RY102 - Compressor L1 Line Break

RY103 - Heater Circuit (L2)

RY104 - Compressor (L2)

FU101 - Transformer Primary (250 Volt - 4 Amp)

FU102 - Fan Motors (500 Volt - 1 Amp)

FU103 - Transformer Secondary - (250 Volt - .5 Amp)

Note:

- Harnesses BCN104, BCN105, and BCN106 are permanently attached to the drive board. Do Not attempt to remove.
- Fuses FU101, FU102, and FU103 are replaceable.

Slide-Out Chassis

Front Panel Removal

WARNING: The case ground bolt, located at the front of chassis, must be installed to ensure proper grounding of the unit. Two case ground screws, one located at the bottom of each cabinet side panel, must be installed to ensure proper grounding of the unit.

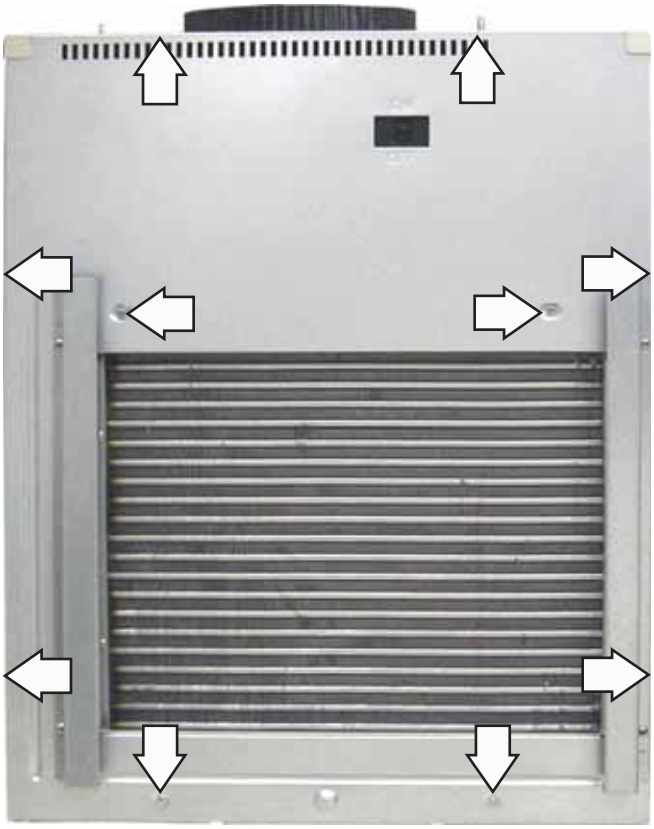
The front panel is attached to the slide-out chassis with 8 Phillips-head screws and 2 tabs that are inserted into slots in the cabinet top plate.

To remove the slide-out chassis from the front:

1. Remove the air filter and four 1/4-in. hex-head screws from the front of the front panel.

Note: The upper two 1/4-in. hex-head screws utilize star washers.

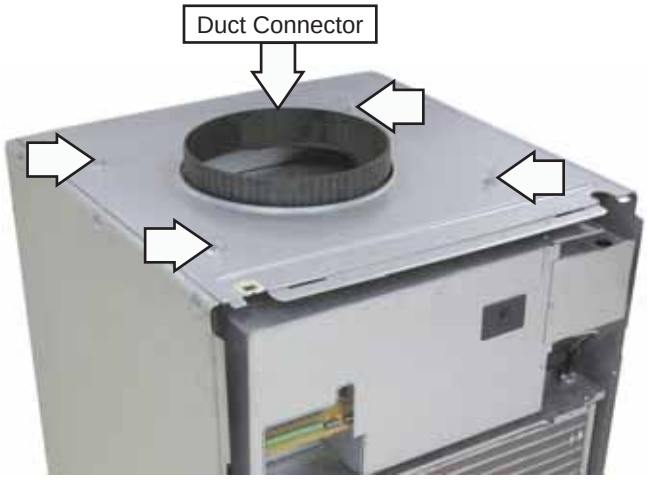
2. Remove the 2 Phillips-head shipping screws (if present), from each side of the front panel.
3. Remove the 2 Phillips-head screws from the top of the front panel.
4. Lift the front panel from the cabinet top plate.



5. Remove the 5/16-in. hex-head case ground bolt fastening the chassis to the base of the cabinet.
6. Remove the Phillips-head case ground screw from the bottom of each cabinet side panel.

Note: In the following step, it is necessary to raise the duct connector firmly to the underside of the cabinet top.

7. Turn the 4 Phillips-head screws on the cabinet top plate counterclockwise until tight.



(*Continued next page*)

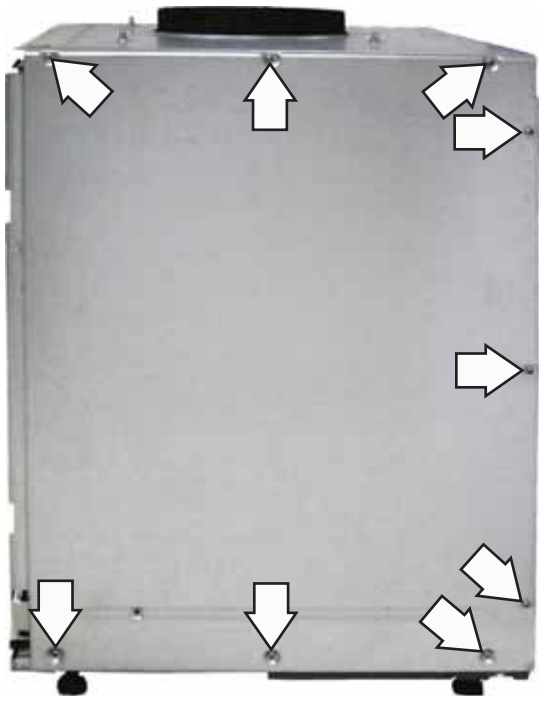
8. Slide the chassis out from the front of the cabinet.

Side Removal

Note: If the slide-out chassis cannot be removed from the front, perform steps 1 through 6 of To remove the slide-out chassis from the front, then proceed with side removal.

To remove the slide-out chassis from the side:

1. Remove 9 Phillips-head screws and the cabinet side plate.



2. Pull the chassis out of the front of the cabinet approximately 2 inches.

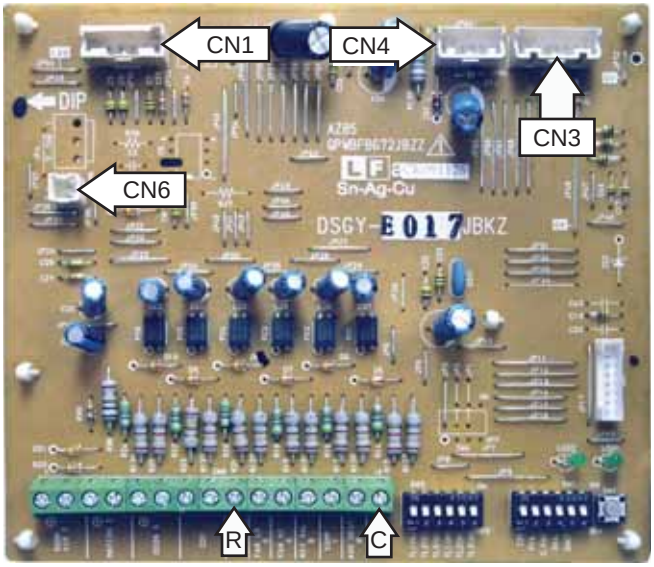
3. Slide the chassis out from the side of the cabinet.

Main Board

The main board is located behind the electronics cover. The front panel must be removed to remove the electronics cover and access the main board.

The main board is attached to a metal bracket with 6 compression pins.

To check power to the main board from the low voltage transformer, check for 24 VAC at the CN6 connecting wire. The main board should read 24 VAC between R and C (see photo).



CN1 - Sensors

CN3 - Drive Board

CN4 - Drive Board

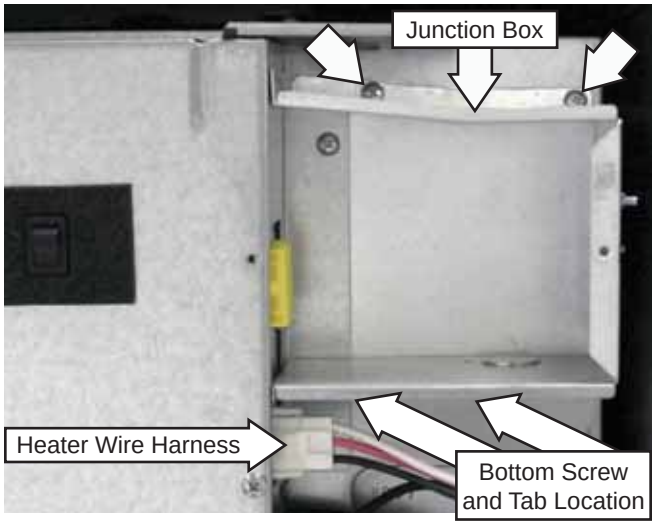
CN6 - Main Power Board

To remove the main board:

1. Remove the front panel. (See *Slide-Out Chassis*.)
2. Unplug the power cord (if installed) at the universal power connector.

Note: In the following step, the junction box is attached to the front bulkhead with 3 Phillips-head screws and a bottom tab that is inserted into a slot.

3. Remove the 3 Phillips-head screws, then lift the junction box from the bulkhead and place it aside.
4. Unplug the heater wire harness.



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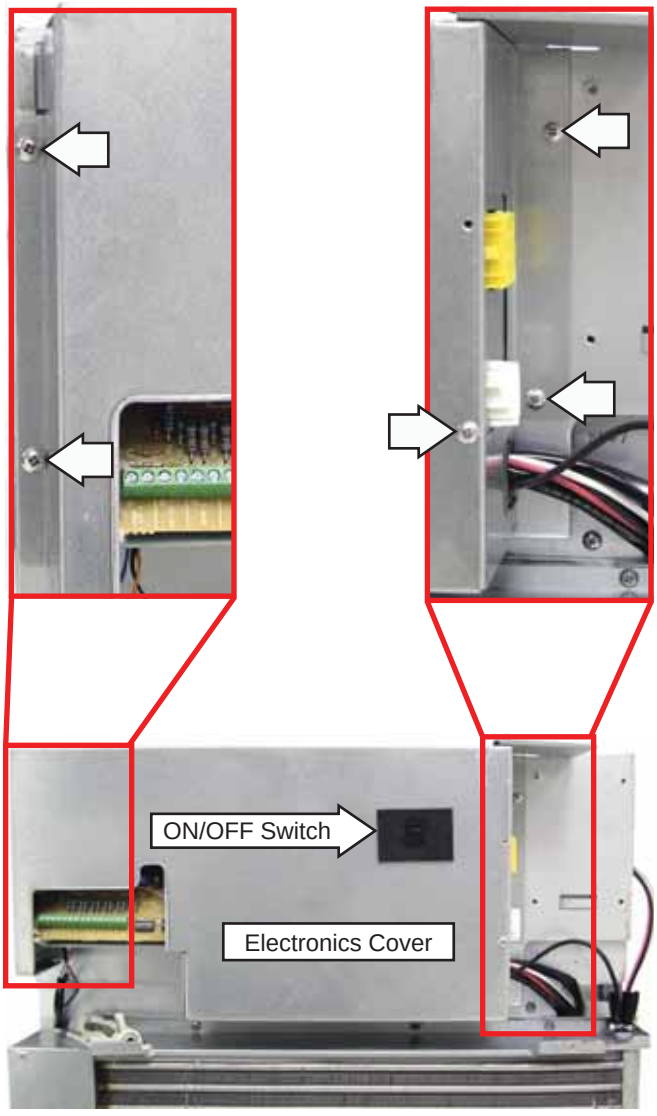
Note:

- In the following step, the electronics cover is attached to the front bulkhead with 5 Phillips-head screws and 2 tabs. One tab is located on the top and the other tab is located on the left side of the cover. Both tabs are inserted into slots in the front bulkhead.
- The ON/OFF switch is attached to the electronics cover and is connected to the main board.

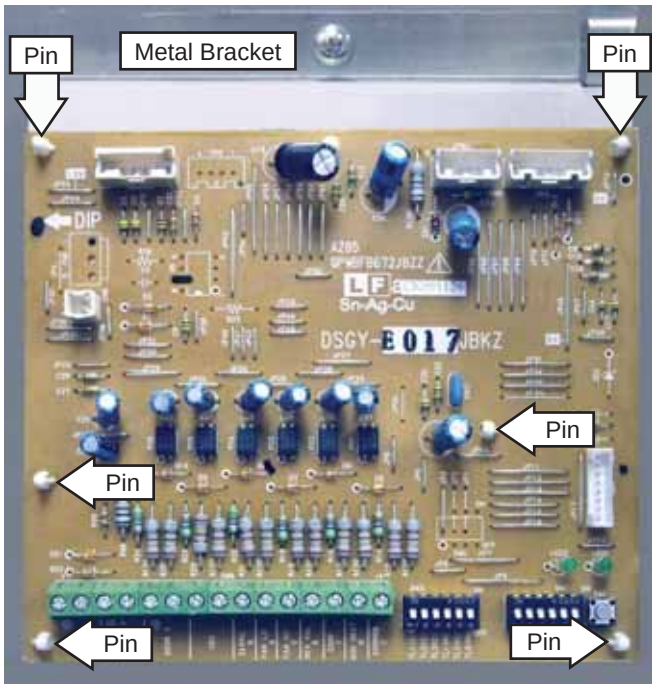
5. Remove the 5 Phillips-head screws, then slide the cover to the right.



6. Disconnect the ON/OFF switch wire harness from the switch or the main board connectors CN107 and CN109.

7. Disconnect wire harnesses located at CN1, CN3, CN4, and CN6.

8. Compress the 6 compression pins, then pull main board from the bracket.



Drive Board

The main power connector receptacle receives line voltage from the cord or direct connection kit and supplies power to the drive board.

The drive board contains all of the circuits and logic which control the relays for the heater, compressor, and fan motors. The only components on the board that are replaceable are the fuses. None of the relays and other electronic components mounted on the circuit board are replaceable in the field. If a component on the board (except for fuses FU101, FU102, and FU103) malfunctions, the board must be replaced as a complete assembly.

Check for 24 VAC on the drive board at CN101 between pin 1 and pin 2.

If the 4-amp fuse (FU102), has failed, check the fan motors for a problem.

The drive board is located behind the electronics cover. The front panel must be removed to remove the electronics cover and access the drive board.

The drive board is attached to the front bulkhead with 8 compression pins.

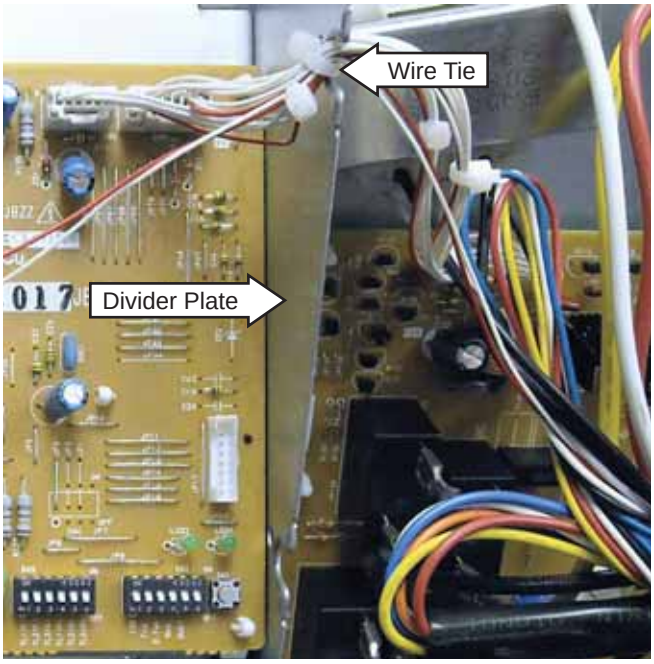
(Continued next page)

To remove the drive board:

1. Remove the electronics cover. (See *Main Board*.)

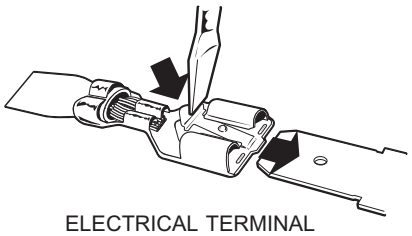
Note: It may be helpful to observe the appearance of bundled wiring behind the electronics cover. In the following steps, it will become necessary to cut off a plastic wire tie that attaches wiring to the divider plate. Replace the plastic wire tie before installing the electronics cover.

2. Carefully cut off the plastic wire tie that attaches main board wiring to the divider plate.



3. Disconnect wire harnesses from CN101, CN102, CN103, CN107, CN108, and CN109.

Note: Most of the electrical components in the unit share wire terminals that use a small clip that holds the wire firmly to an electrical terminal. To remove the wire from the terminal, depress the clip using a small blade screwdriver, and pull the wire off the terminal as shown.

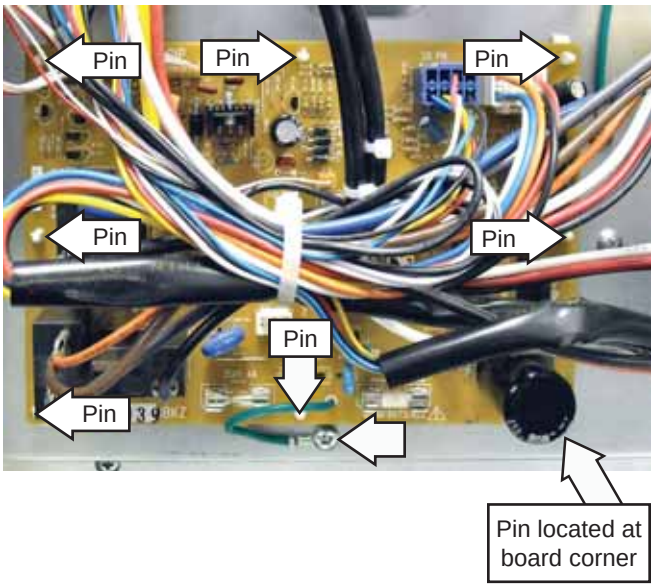


ELECTRICAL TERMINAL
RELEASE/LOCKING TAB

4. Mark and disconnect the wiring from relays RY101, RY102, RY103, and RY104.

5. Remove the Phillips-head screw and drive board ground wire from the front bulkhead.

6. Release the 8 compression pins, then pull the drive board from the front bulkhead.

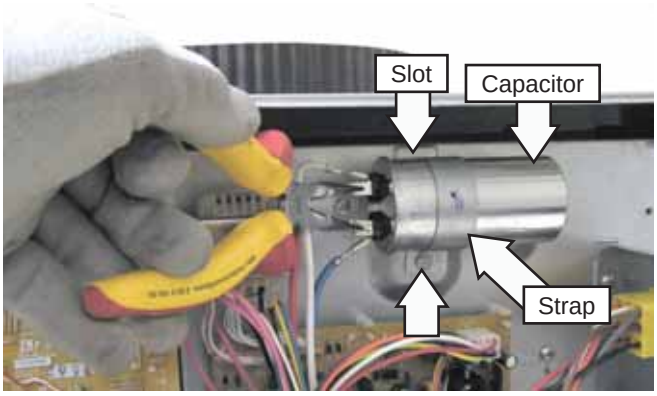


Capacitor

The compressor run capacitor is attached to the front bulkhead with a strap and a Phillips-head screw. The control cover must be removed to access the capacitor. (See *Main Board*.)

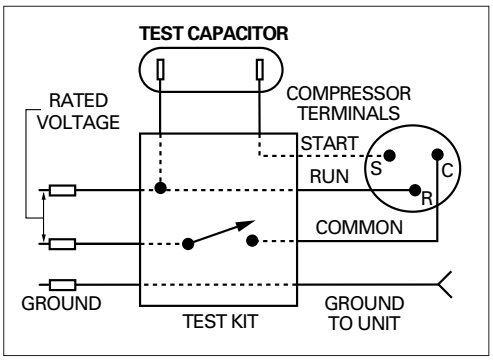
The top of the strap is inserted into a slot in the front bulkhead.

WARNING: The capacitor must be discharged. Discharge the capacitor between the 2 connectors using a pair of long-nose pliers with an insulated-handle.



Run Capacitor Check

1. Replace unit run capacitor with a known good test capacitor, which may be 10 μfd higher than specified, and attempt to start the compressor.
2. If the compressor starts, install a new run capacitor that has a rating specified for the unit.



Transformer

The transformer supplies 24 VAC to the drive board at location CN101. Check for line voltage on the power supply board at CN101 between pins 5 and 7.

With power disconnected, check for winding resistances at the following locations:

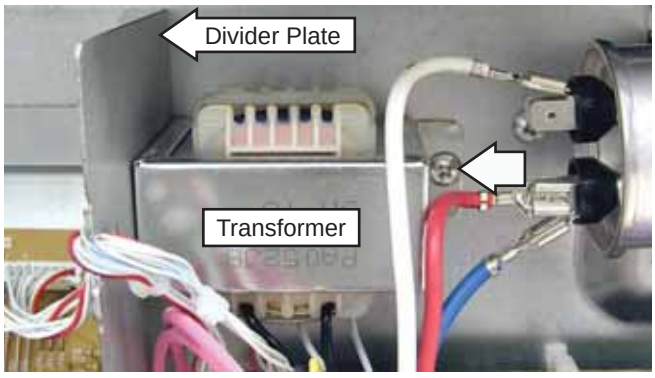
- CN101 pin 5 to pin 7 is approximately 100 Ω (230/208 VAC primary).
- CN101 pin 1 to pin 2 is approximately 1.5 Ω (24 VAC secondary).

The transformer is attached to the front bulkhead with a Phillips-head screw. The control cover must be removed to access the transformer. (See *Main Board*.)

The left side of the transformer is inserted into a slot located behind the divider plate.

To remove the transformer:

1. Remove the electronics cover. (See *Main Board*.)
2. Disconnect the wire harness from the drive board location CN101.
3. Remove the Phillips-head screw from the right side of the transformer.
4. Slide the transformer to the right, then maneuver it out from the front bulkhead.



Resistance Heater Assembly

The heater assembly consists of three 265 VAC or 230/208 VAC resistance heating coils fastened together in a single assembly. The heaters are located behind the indoor coil and are protected against overheating by 2 thermal protectors. An L185-30 thermal protector is used as a temperature regulator. A one-shot L248 thermal protector is used as a backup in case the temperature regulating thermal protector fails (stuck closed).

Heat Pump models will utilize electric resistance heat upon initial heat mode startup or when a power outage has occurred with the unit in heat mode. The electric heaters will be energized until the room temperature reaches the thermostat setting. Once the thermostat temperature setting is attained, the unit will cycle off and automatically switch over to heat pump operation. The heat pump will provide all heating requirements for subsequent cycles unless one of the following conditions occurs:

- The dip switch has been placed in the I2R (ALL ELECTRIC HEAT) position. When the dip switch is placed in the up position, heat pump operation will be locked out. Only electric resistance heat will be available.
- A temperature differential of approximately 2°F (temperature differential varies by thermostat manufacturer) is detected between the thermostat set point and the room air temperature. If a differential of approximately 2°F is detected, due to thermostat adjustment or falling room air temperature, the electric heaters will be energized (heat pump off) until the thermostat is satisfied. Once the thermostat has been satisfied, the unit will automatically revert to heat pump operation for subsequent cycles.
- If the outdoor temperature falls below 25°F, the unit will automatically switch from heat pump operation to resistance heat operation. A 7°F hysteresis loop will be in effect; therefore, the unit will operate in resistance heat mode until an outdoor temperature of 32°F or higher is detected.

Electric resistance heat and heat pump operation will never occur at the same time.

Models without heat pump feature will meet heating requirements by using electric resistance heating coils.

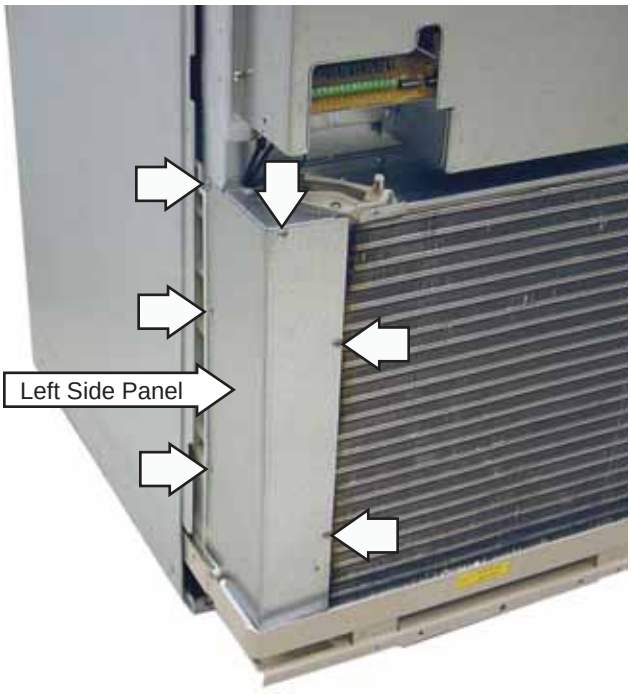
To Test Heaters and Thermal Protectors:

Thermal protectors are wired in series with each other and with each heating coil. The following test verifies that both protectors have continuity and the heater coil tested has the proper resistance value. Test for the following resistance values between the black wire on RY103 to each of the 3 wires in the heater assembly harness. An open reading will require accessing the heater assembly for further diagnosis.

Heater Resistance Values		
RY103 black to heater connector pin 1	230/208 VAC: 50 Ω 265 VAC: 66Ω	Upper Coil
RY103 black to heater connector pin 2	230/208 VAC: 32 Ω 265VAC: 42 Ω	Lower Coil
RY103 black to heater connector pin 3	230/208 VAC: 20 Ω 265VAC: 26 Ω	Middle Coil

To remove the resistance heaters:

1. Remove the front panel and slide the chassis forward approximately 5 inches. (See *Slide-Out Chassis*.)
2. Remove the 6 Phillips-head screws and the corner sheet metal panel fastened to the left side of the indoor coil.



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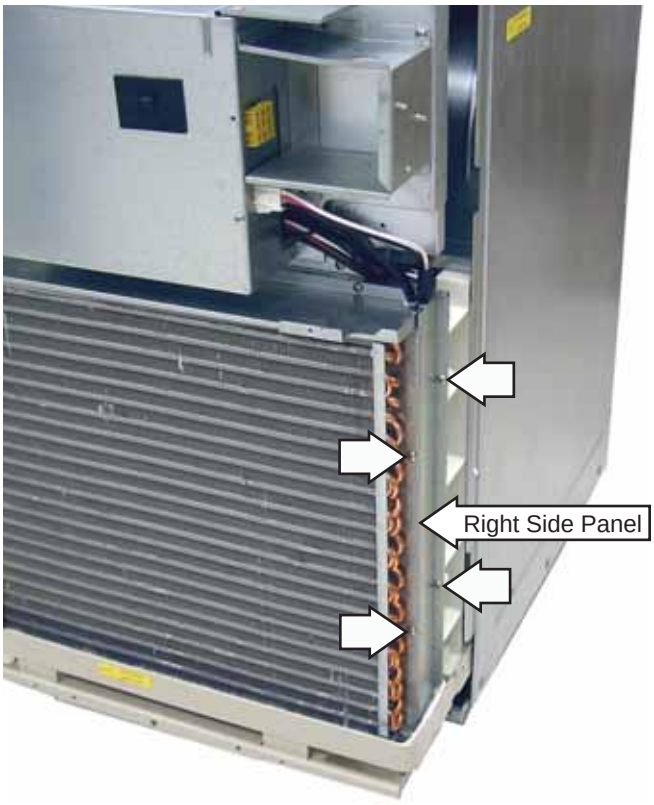
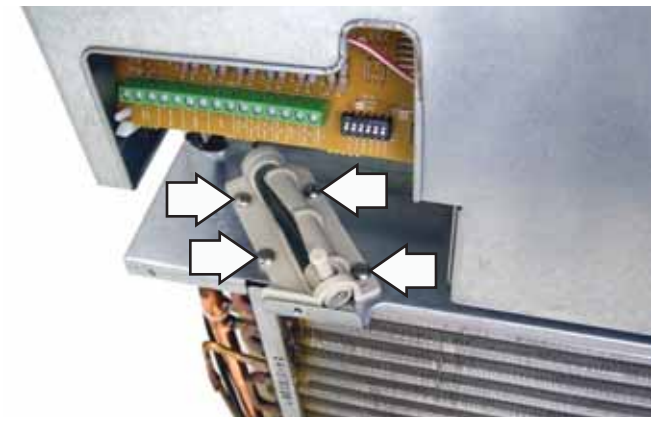
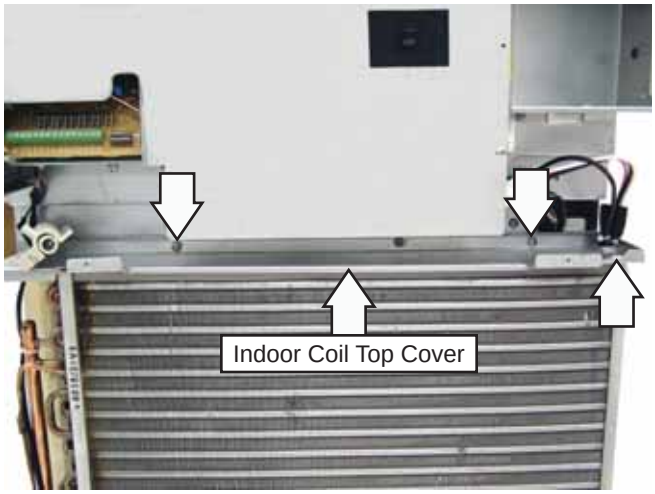
3. Remove the 4 Phillips-head screws and the corner sheet metal panel fastened to the right side of the indoor coil.
4. Disconnect the heater wire harness.



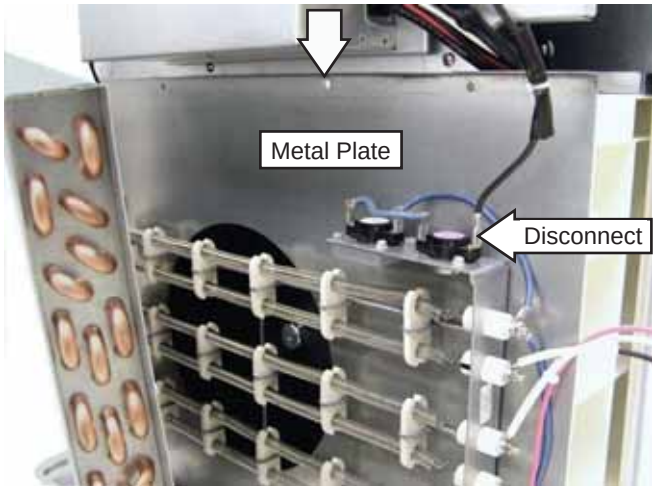
5. Remove the 4 Phillips-head screws that attach the ventilation control to the indoor coil top panel.



6. Remove the 3 Phillips-head screws and the indoor coil top panel.



7. Carefully lift, then swing out the evaporator assembly to access the heater assembly.
8. Disconnect the black wire from the one-shot thermal protector.
9. Remove the Phillips-head machine screw from the metal plate.
10. Lift, then slide the metal plate and heater assembly out the right side of the unit.



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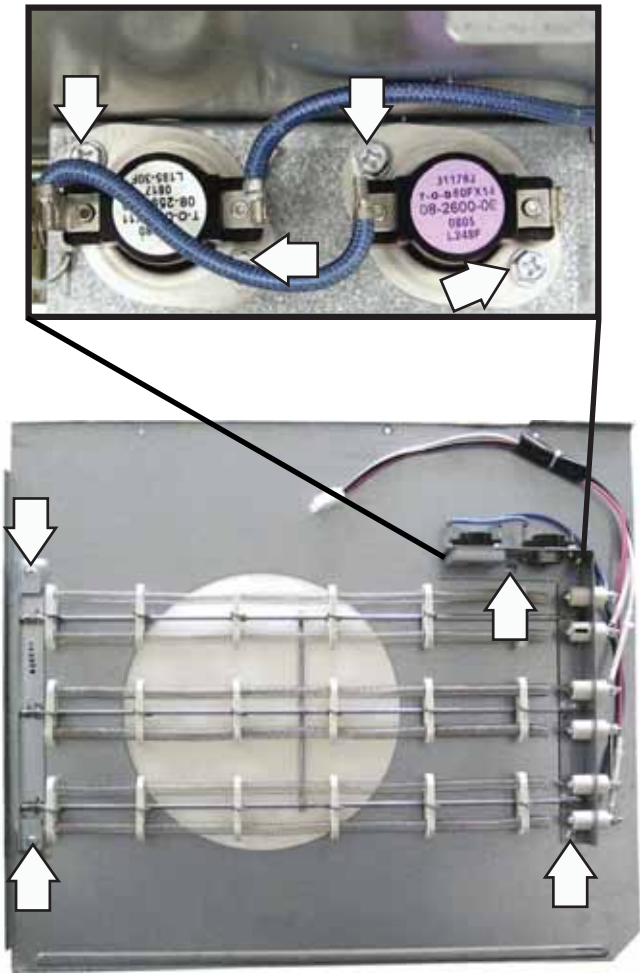
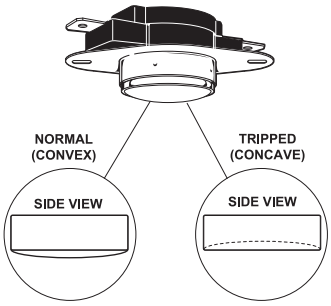
11. Mark and disconnect wires from the heater.
12. Remove the two 1/4-in. hex-head screws that attach each protector to the heater frame.
13. Remove the 4 Phillips-head screws that attach the heater to the metal plate.



Caution: Do not touch or press the round face of the one-shot protector. The round portion of the one-shot protector is curved out (convex). If the round face is pushed in (concave), the protector contacts open and the contacts will not reset. Pushing in on the round face destroys the protector.



Indoor Fan Motor

The indoor fan is a permanently lubricated, variable speed DC motor. Indoor fan speed is selected in the following manner:

When the green thermostat wire is connected to the high-speed fan (G) terminal:

- DUCT SWITCH UP = HIGH FAN SPEED
- DUCT SWITCH DOWN = MEDIUM FAN SPEED

When the green thermostat wire is connected to the low-speed fan (G) terminal:

- DUCT SWITCH UP = MEDIUM FAN SPEED
- DUCT SWITCH DOWN = LOW FAN SPEED

The indoor fan and outdoor fan will operate simultaneously under normal operating conditions. To energize the fans, press the *FAN* button on the thermostat. When fan ON mode is selected, the fans will run continuously, independent of the compressor or heaters. Selecting AUTO on the thermostat will cause the fans to automatically cycle on and off with the compressor or heaters. The fans will always run when the compressor or heaters are operating. They will start before compressor or heater operation, and will stop after compressor or heater operation has ended. The fans can also be set to run continually, regardless of thermostat setting, by placing the CONST FAN dip switch in the (UP) position. (See *Controls-Dip Switches*.)

Note: If the indoor fan is inoperative, see No Fan Operation on page 42.

(*Continued next page*)

To remove the indoor fan motor:

1. Remove the unit from the cabinet. (See *Slide-Out Chassis*.)

2. Remove the electronics cover. (See *Main Board*.)

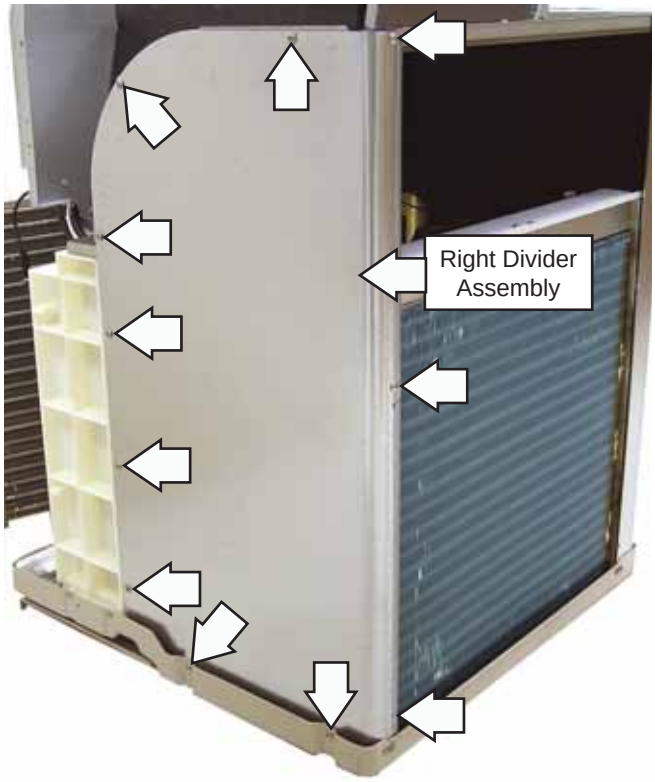
Note: It may be helpful to observe the appearance of the bundled wiring behind the electronics cover. (See *Drive Board*.) In the following steps, it will become necessary to cut off plastic wire ties that fasten wiring together. Bundle wiring before installing the electronics cover.

3. Remove the resistance heaters. (See *Main Board*.)

4. Loosen the Phillips-head setscrew securing the blower wheel. Pull the blower wheel off the motor shaft.

Note: Position blower wheel setscrew on the flat side of the motor shaft when assembling.

5. Remove the 11 Phillips-head screws and the divider assembly from the left and right side of the unit.



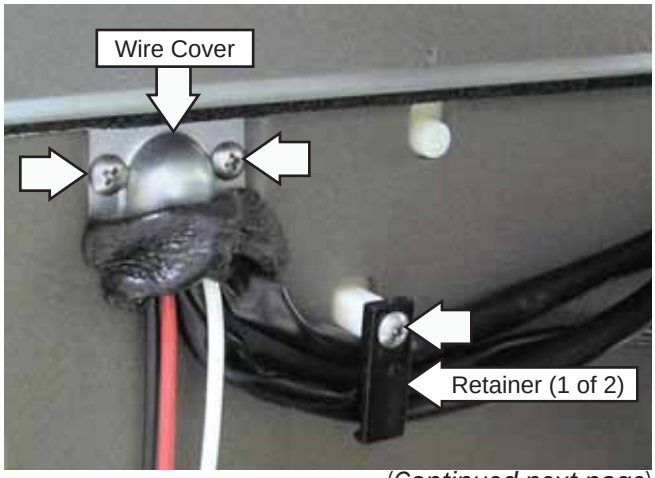
6. Disconnect the indoor fan wire connector (CN103) from the drive board. (See *Circuit Boards Locator Views*.)

7. Cut off plastic wire ties that retain indoor fan motor wiring.

8. Remove the Phillips-head screw that attaches each of the 2 wire retainers to the back of the indoor fan housing.

9. Remove the seal, 2 Phillips-head screws, and the wire cover.

10. Pull the fan motor wires through the opening.



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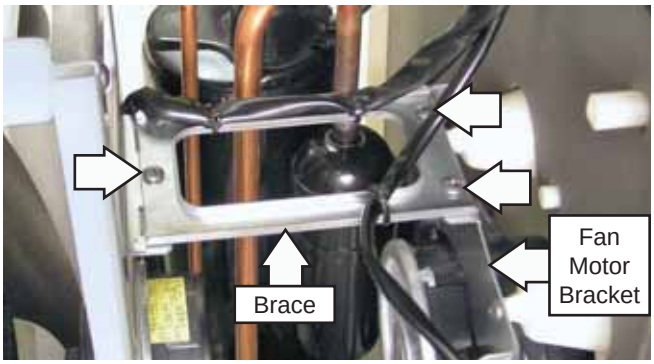
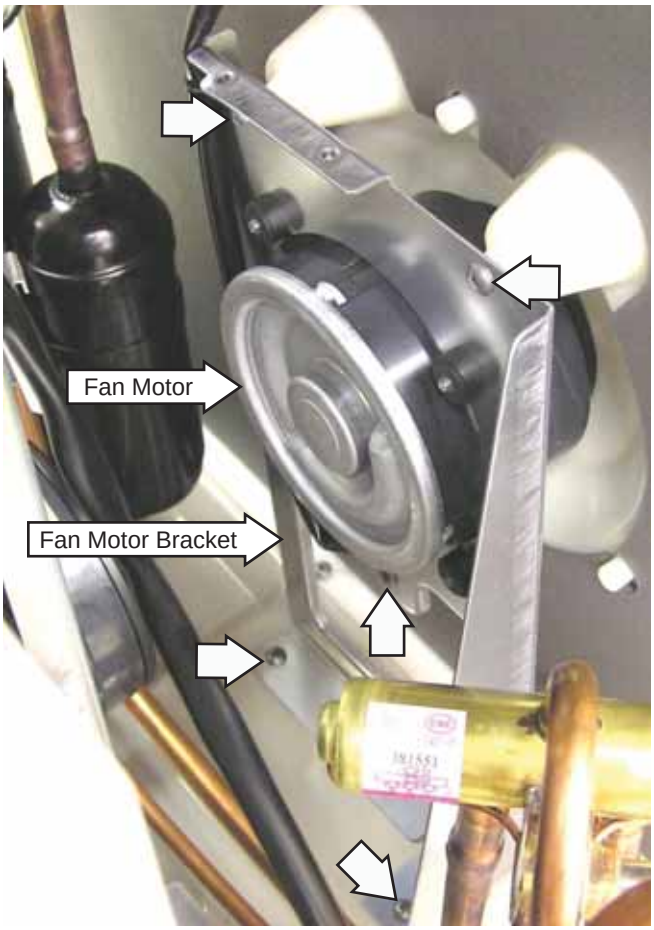
11. Remove the 3 Phillips-head screws and the brace from the indoor fan motor bracket.

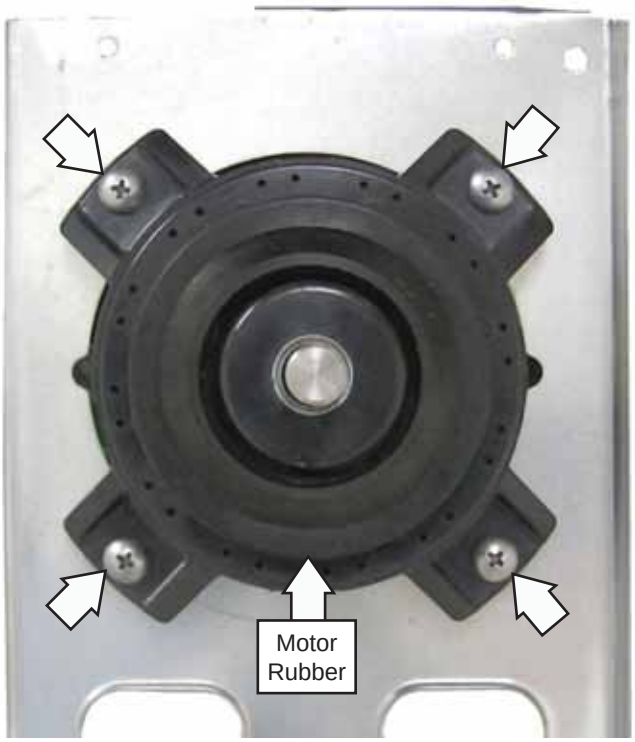


12. Remove the 3 Phillips-head screws that attach the fan motor bracket to the fan housing.

13. Remove the 2 Phillips-head screws that attach the fan motor bracket to the basepan, then maneuver the fan motor and bracket out from the unit.



14. Remove the 4 Phillips-head screws, motor, and motor rubber from the fan motor bracket.



Outdoor Fan Motor

The outdoor fan motor is a permanently lubricated, variable speed DC motor, using an internal speed control in the motor.

The indoor fan and outdoor fan will operate simultaneously under normal operating conditions. However, if the heat pump is operated when high outdoor temperatures are present, the indoor coil may overheat. Should the indoor coil temperature reach 131°F, the main board will shut the outdoor fan off. A 5°F hysteresis loop will restore outdoor fan operation when the indoor coil temperature lowers to 126°F.

To energize the fans, press the *FAN* button on the thermostat. When fan ON mode is selected, the fans will run continuously, independent of the compressor or heaters. Selecting AUTO on the thermostat will cause the fans to automatically cycle on and off with the compressor or heaters. The fans will always run when the compressor or heaters are operating. They will start before compressor or heater operation, and will stop after compressor or heater operation has ended. The fans can also be set to run continually, regardless of thermostat setting, by placing the CONST FAN dip switch in the UP position (See *Controls-Dip Switches*.)

Note: If the outdoor fan is inoperative, see No Fan Operation on page 42.

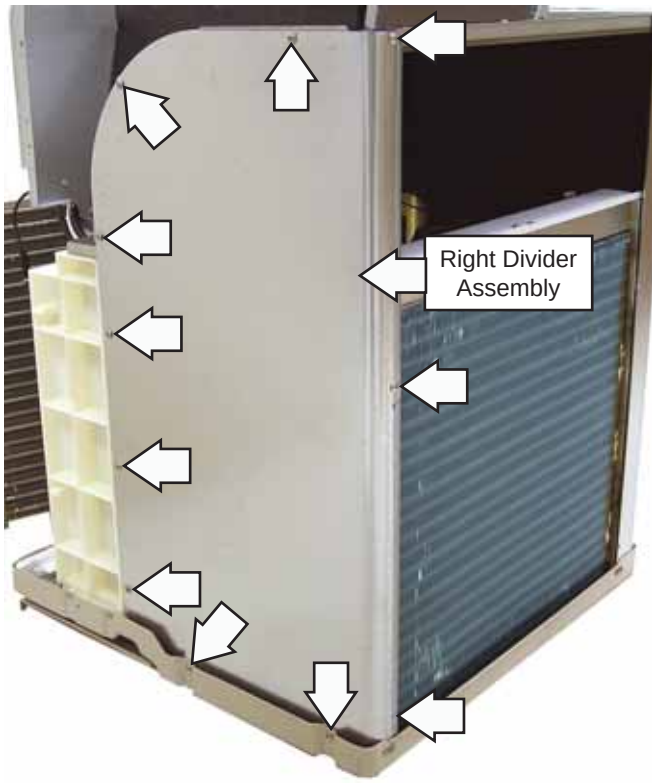
To remove the outdoor fan motor:

1. Remove the unit from the cabinet. (See *Slide-Out Chassis*.)

2. Remove the electronics cover. (See *Main Board*.)

Note: It may be helpful to observe the appearance of the bundled wiring behind the electronics cover. (See *Drive Board*.) In following steps, it will become necessary to cut off plastic wire ties that fasten wiring together. Bundle wiring before installing the electronics cover.

3. Remove the 11 Phillips-head screws and the divider assembly from the left and right side of the unit.



(*Continued next page*)

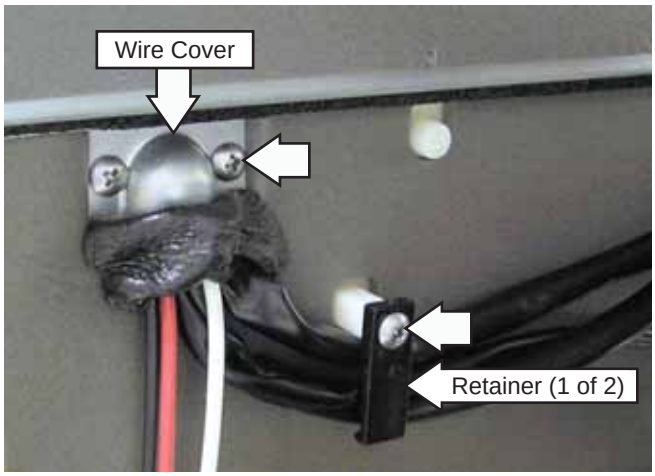
4. Disconnect the outdoor fan wire connector (CN102) from the drive board. (See *Circuit Boards Locator Views*.)

5. Cut off plastic wire ties that retain outdoor fan motor wiring.

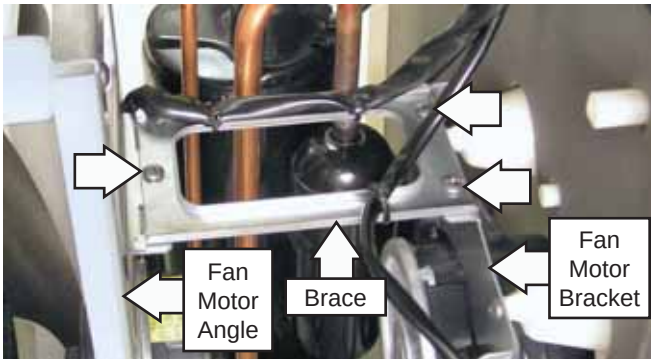
6. Remove the Phillips-head screw that attaches each of the 2 wire retainers to the back of the indoor fan housing.

7. Remove the seal, 2 Phillips-head screws, and the wire cover.

8. Pull the fan motor wires through the opening.

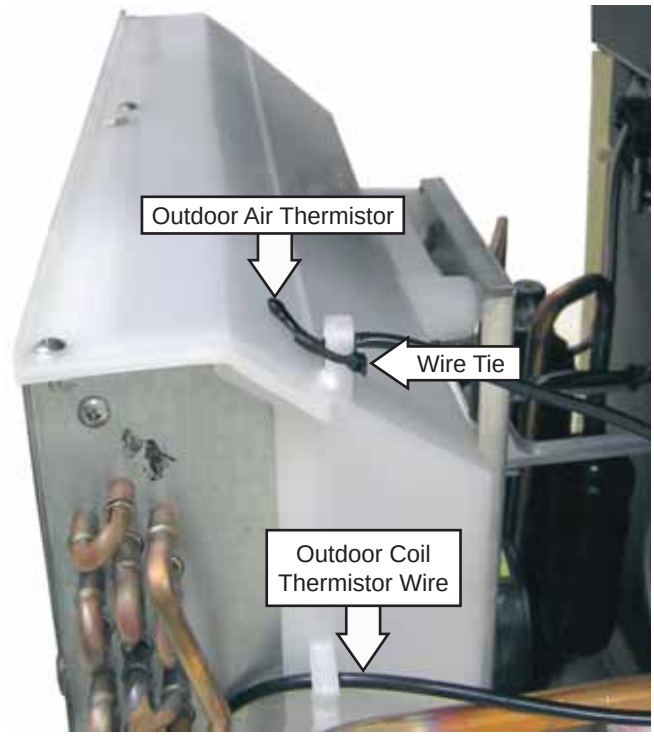


9. Remove the 3 Phillips-head screws and the brace from the indoor fan motor bracket and outdoor fan motor angle.

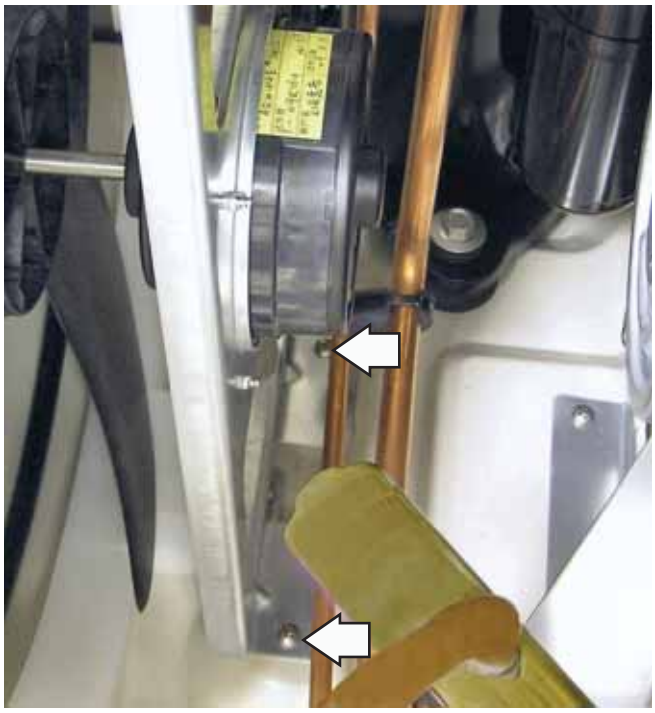


10. Remove the plastic wire tie that attaches the outdoor air thermistor to the top of the fan shroud.

11. Remove the outdoor coil thermistor wire from the retainer located on the left side of the fan shroud.

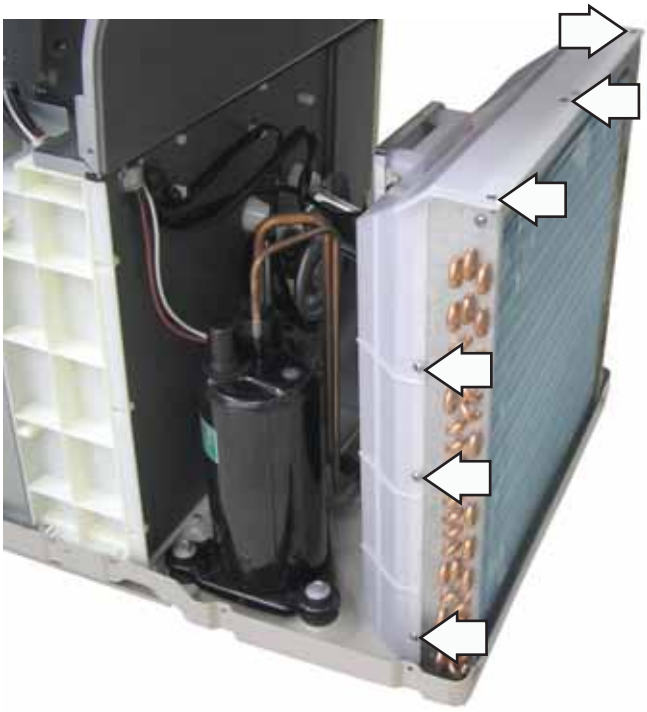


12. Remove the 2 Phillips-head screws that attach the motor angle to the basepan.

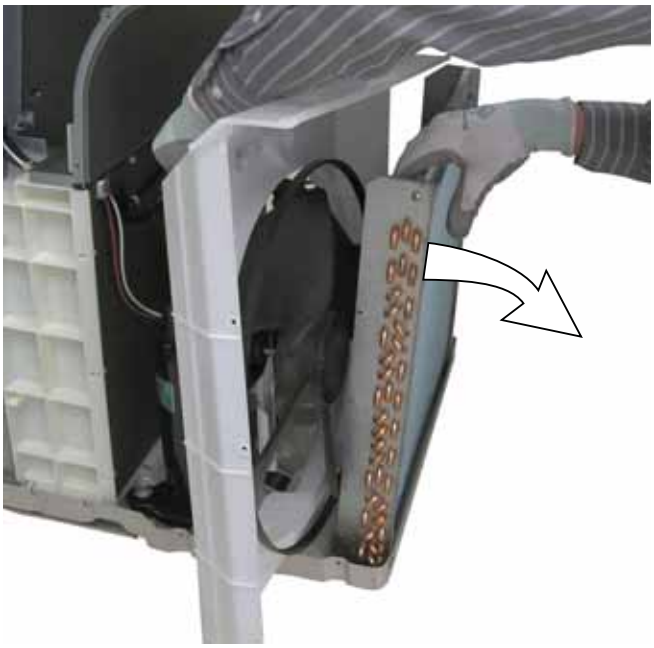


(*Continued next page*)

13. Remove the 9 Phillips-head screws (3 on each side and 3 on top) that attach the fan shroud to the outdoor coil.



14. Carefully lift the fan shroud, motor angle, and fan motor as an assembly. Gently tilt the condenser out enough to remove the assembly from the right side of the unit.



15. Remove the 8-mm nut and the fan from the motor shaft.

16. Remove the 4 Phillips-head screws and the fan motor from the fan motor angle.

No Fan Operation

1. Read the DC voltage at the main board wire jumpers JP68 and JP72 (indoor fan motor), or JP65 and JP72 (outdoor fan motor). Use the black meter lead on JP72.

   a. No DC voltage from main board - replace main board.

   b. Voltage OK - 2 - 2.5 VDC - proceed to drive board and motor testing in following steps.

2. Test DC motor voltage output from drive board (1.4x AC input).

   I.D. Motor - CN103, red to black

   O.D. Motor - CN102, red to black

   a. No DC voltage - check FU102 - open, check both motor resistances red to black.

   b. Shorted red to black - replace FU102 and shorted motor.

   c. FU102 OK - replace drive board.

3. Single motor not operating.

   a. Substitute new motor to the fan connector on the drive board.

   b. Fan motor operates - replace defective fan motor.

   c. No operation - replace drive board.

4. Single motor short cycles (30 seconds ON - 60 seconds OFF).

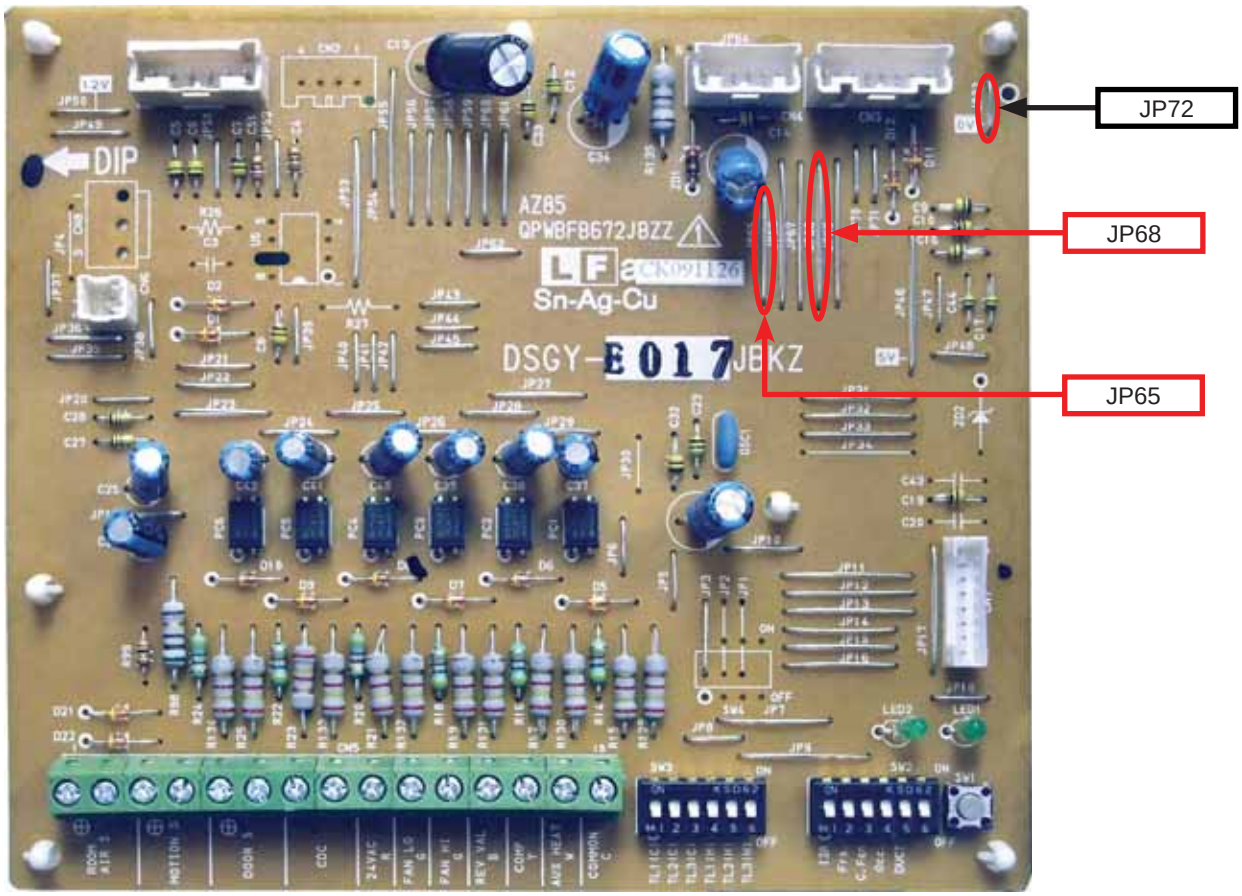
   a. Substitute new motor to the fan connector on the drive board.

   b. Fan motor operates - replace defective fan motor.

   c. Same operation - replace drive board.

5. Both fans short cycle.

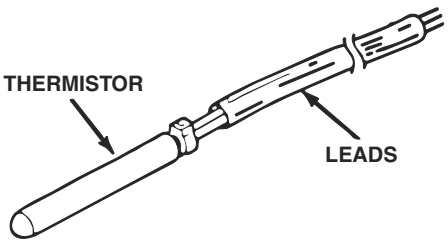
   a. Replace drive board.



Thermistors

The main board uses input from 3 thermistors. These thermistors are located on the indoor coil, outdoor coil, and outdoor fan shroud. (See *Component Locator Views*.) The main board monitors the thermistors to determine the temperature in these areas and uses this information to make operating decisions.

For information regarding the optional room air sensor (kit), refer to the Room Air Sensor section. (See *Features and Operation.*)



The thermistors can be checked to determine if they are good. Below is a chart showing thermistor resistance values at various temperatures.

Thermistor Chart

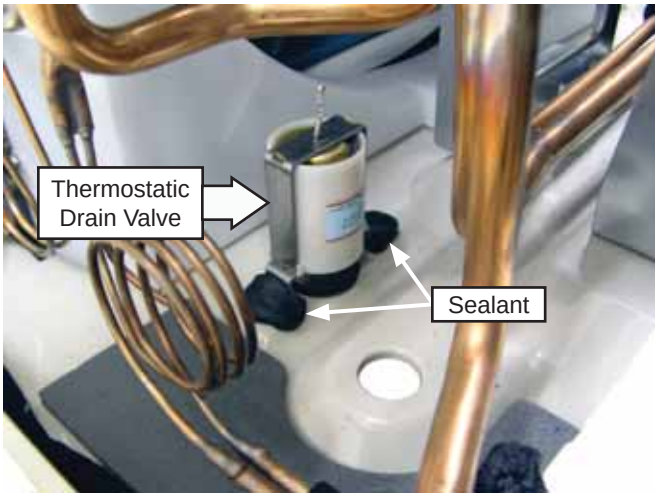
Thermistor Resistance (Ohms)			
Temperature	I.D. COIL	O.D. Coil	Outdoor
10°F	94900	27930	27930
30°F	51940	15420	15420
32°F	49330	14580	14580
50°F	29960	8860	8860
70°F	17930	5280	5280
90°F	10970	3320	3320

Thermostatic Drain Valve

During the cooling season, the thermostatic drain valve remains closed to allow water to accumulate in the base pan. The water is then picked up by the outdoor fan blade and blown into the condenser, providing more efficient cooling. During heat pump season the thermostatic drain opens to allow water to drain from the base pan prior to freezing. This prevents the outdoor fan blade from scraping against ice that could freeze in the bottom of the base pan. The thermostatic drain valve is operated by a self-contained thermostat. The thermostat begins to open the drain valve at approximately 58°F and will be fully open at approximately 45°F.

To remove the thermostatic drain valve:

1. Remove the unit from the cabinet. (See *Slide-Out Chassis*.)
2. Remove the left divider assembly.
3. Remove the sealant covering the screws.



4. Remove the 2 Phillips-head screws that attach the thermostatic drain valve to the base pan.

Compressor

The Zoneline compressor is a rotary type that operates on 265/230/208 VAC. After the compressor has cycled off, it will not attempt to restart for 3 minutes +/-10 seconds, regardless of the state of the thermostat. This will allow internal pressure to equalize and prevent the compressor from stalling by trying to start against high pressure in the sealed system.

Current flow into the compressor is monitored by the main board to determine if the compressor is running or locked. If the run signal is sent and a locked condition is detected for 4 seconds, the run signal will stop and a 3-minute count will begin. After the 3-minute count, the run signal is sent again. If the compressor starts, the count is reset and the unit functions normally. If the compressor does not start after 4 consecutive attempts, the control will determine that a compressor failure has occurred and a beeping alarm will sound. The alarm will continue until the compressor failure condition is reset by turning the unit off at the ON/OFF switch or by removing power to the unit.

The compressor overload is internal to the compressor for 18000 BTU models and is located under the relay/overload cover for 9000 and 12000 BTU models. Should the overload trip (open) it will open the common line to the compressor, stopping compressor operation.

A copper process tube is provided for access to the low-pressure side of the refrigeration system.

The compressor capacitor is located behind the control cover. (See *Capacitor*.)

Compressor Resistance Values

Compressor Size	Winding C to R	Winding C to S
9000 BTU 230/208 VAC	3.4 Ω	5.8 Ω
12000 BTU 230/208 VAC	2.3 Ω	2.1 Ω
18000 BTU 230/208 VAC	2 Ω	2.2 Ω

Reversing Valve

The reversing valve operates on 265/230/208 VAC and is used to switch the direction of refrigerant flow. The reversing valve controls the direction of the refrigerant flow. When the reversing valve solenoid is energized, it will close the reversing valve and the unit will operate as an air conditioner. When the solenoid is de-energized, the reversing valve will open, and the unit will function as a heat pump.

To confirm that the reversing valve and reversing valve solenoid are functioning properly, the main board continually monitors the indoor coil thermistor and outdoor coil thermistor. Should the system operate in the reverse of the selected mode due to a reversing valve or reversing valve solenoid malfunction, the board will detect improper thermistor readings, determine that the unit is not operating properly, and terminate compressor operation.

Note: Some thermostats can be programmed to energize the reversing valve in heat mode or cool mode. If the thermostat is not programmed correctly, the unit will heat when the thermostat is set to cool and will cool when the thermostat is set to heat. Refer to the instructions provided with the thermostat for thermostat programming procedures. For additional information, refer to the Remote Thermostat Control section. (See *Features and Operation.*)

To remove the reversing valve solenoid:

1. Remove the unit from the cabinet. (See *Slide-Out Chassis*.)
2. Remove the electronics cover. (See *Main Board*).
3. Disconnect the solenoid wire connector (CN108) from the drive board. (See *Circuit Boards Locator Views*.)
4. Remove the left divider assembly. (See *Outdoor Fan Motor*.)
5. Cut off plastic wire ties that retain solenoid wiring.
6. Remove the 2 wire retainers, and the wire cover from the back of the indoor fan housing. (See *Outdoor Fan Motor*.)
7. Pull the solenoid wires through the opening.
8. Remove the 7-mm hex-head screw and the reversing valve solenoid.

Troubleshooting

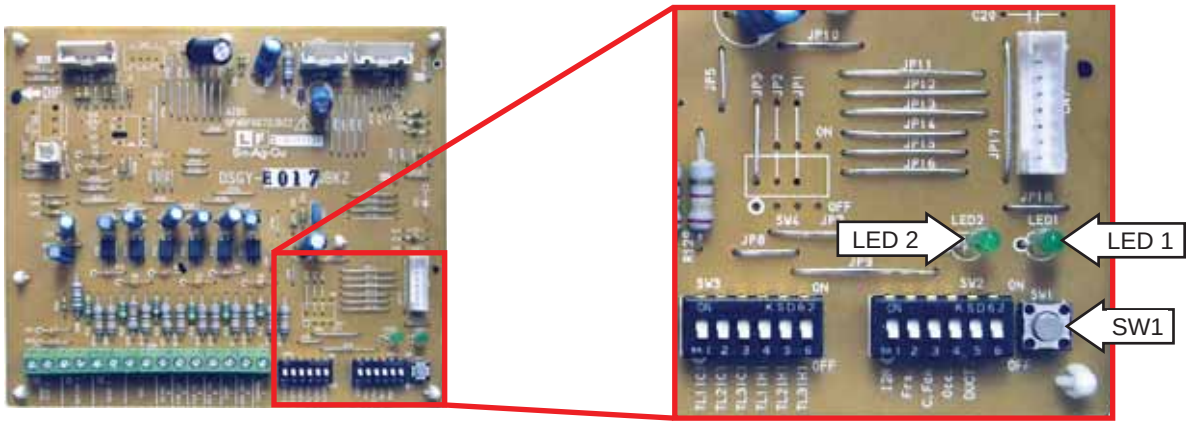
Self-Check and Force Mode

The Zoneline unit incorporates a forced function feature so that components can be operated regardless of ambient conditions to allow testing of various components.

To enter the self-check and force mode:

1. Disconnect the unit from power.
2. Access the main board. (See *Main Board*.)
3. Push SW1 for 5 seconds and at the same time put the power on.
4. Then change step by step by pushing SW1.

Reset power to exit the self-check and force mode.



85H SERIES

STEP	LED1	LED2	COMPRESSOR RY101	RVS	LINE BREAK RY102	HEATERS	I.D Fan	O.D Fan	MODE
0	¤	¤	-	-	-	-	-	-	STOP
1	¤	*	¤	¤	-	-	L	L	Cooling L
2	-	¤	¤	¤	-	-	L	L	Cooling L
3	-	-	¤	¤	-	-	H	H	Cooling H
4	-	-	-	-	¤	-	L	L	Fan L
5	-	-	-	-	¤	¤	H	H	Heater H
6	-	-	-	-	-	¤	H	H	Fan H
7	-	-	¤	-	-	-	H	H	Heater-Pump H

¤ : ON * : BLINK - : OFF RVS = Reversing Valve Solenoid

(*Continued next page*)

85E SERIES

STEP	LED1	LED2	COMPRESSOR RY101	LINE BREAK RY102	HEATERS RY103	I.D Fan	O.D Fan	MODE
0	¤	¤	-	-	-	-	-	STOP
1	¤	*	¤	-	-	L	L	Cooling L
2	-	¤	¤	-	-	L	L	Cooling L
3	-	-	¤	-	-	H	H	Cooling H
4	-	-	-	¤	-	L	L	Fan L
5	-	-	-	¤	¤	H	H	Heater H
6	-	-	-	-	¤	H	H	Fan H
7	-	-	¤	-	-	H	H	Heater-Pump H

¤ : ON * : BLINK - : OFF

85W SERIES

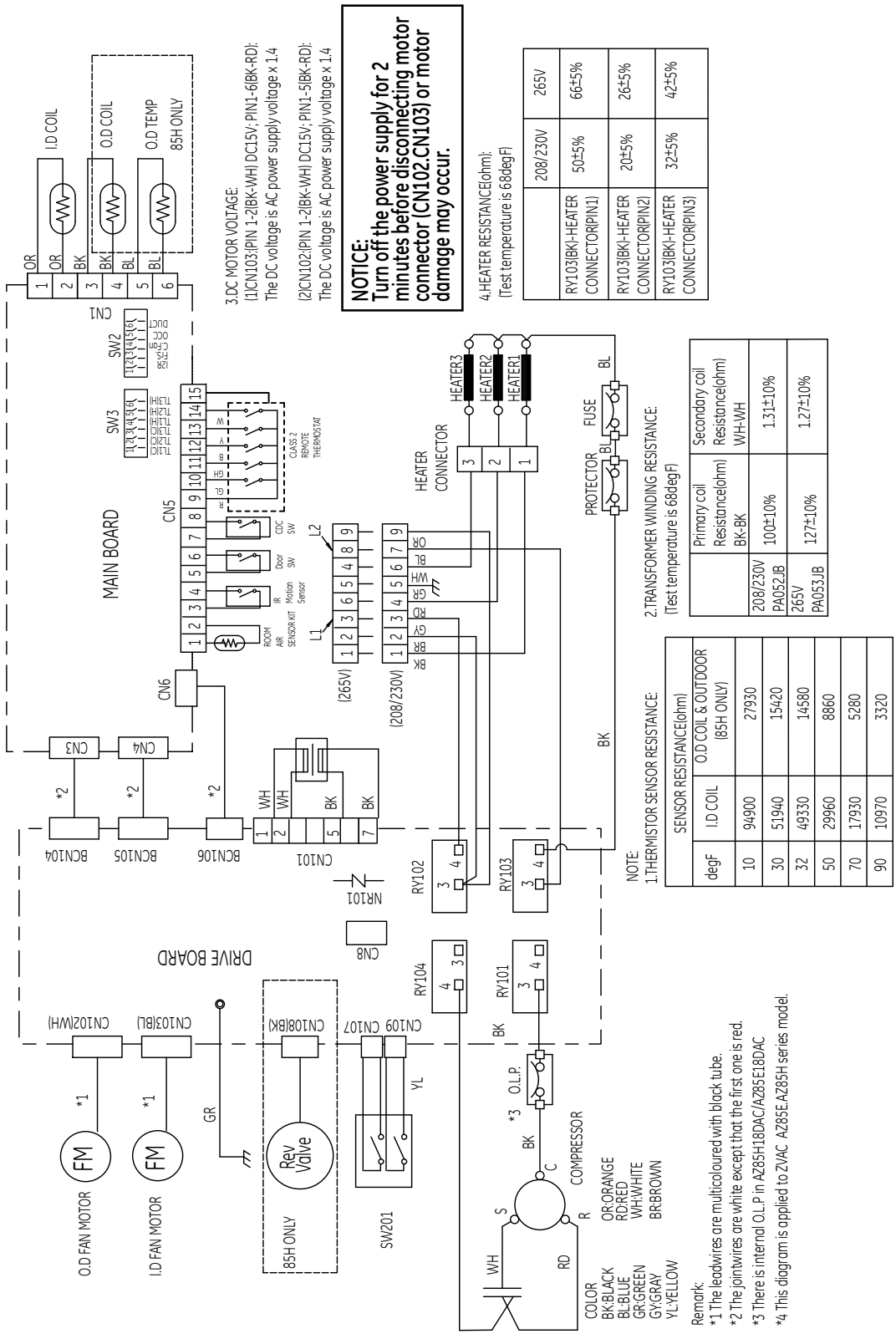
STEP	LED1	LED2	COMPRESSOR RY101	I.D Fan	O.D Fan	MODE
0	¤	¤	-	-	-	STOP
1	¤	*	¤	L	L	Cooling L
2	-	¤	¤	L	L	Cooling L
3	-	-	¤	H	H	Cooling H
4	-	-	-	L	L	Fan L
5	-	-	-	H	H	Heater H
6	-	-	-	H	H	Fan H
7	-	-	¤	H	H	Heater-Pump H

¤ : ON * : BLINK - : OFF

8500 Series Typical Wiring Diagram

Refer to the mini-manual attached to the unit.

Note: Refer to Yellow Universal Connector



	208/230V	265V
RY103(BK)-HEATER CONNECTOR(PIN1)	50±5%	66±5%
RY103(BK)-HEATER CONNECTOR(PIN2)	20±5%	26±5%
RY103(BK)-HEATER CONNECTOR(PIN3)	32±5%	42±5%

	Primary coil Resistance(ohm) BK-BK	Secondary coil Resistance(ohm) WH-WH
208/230V PA052JB	10Ω±10%	1.31±10%
265V PA053JB	127±10%	1.27±10%

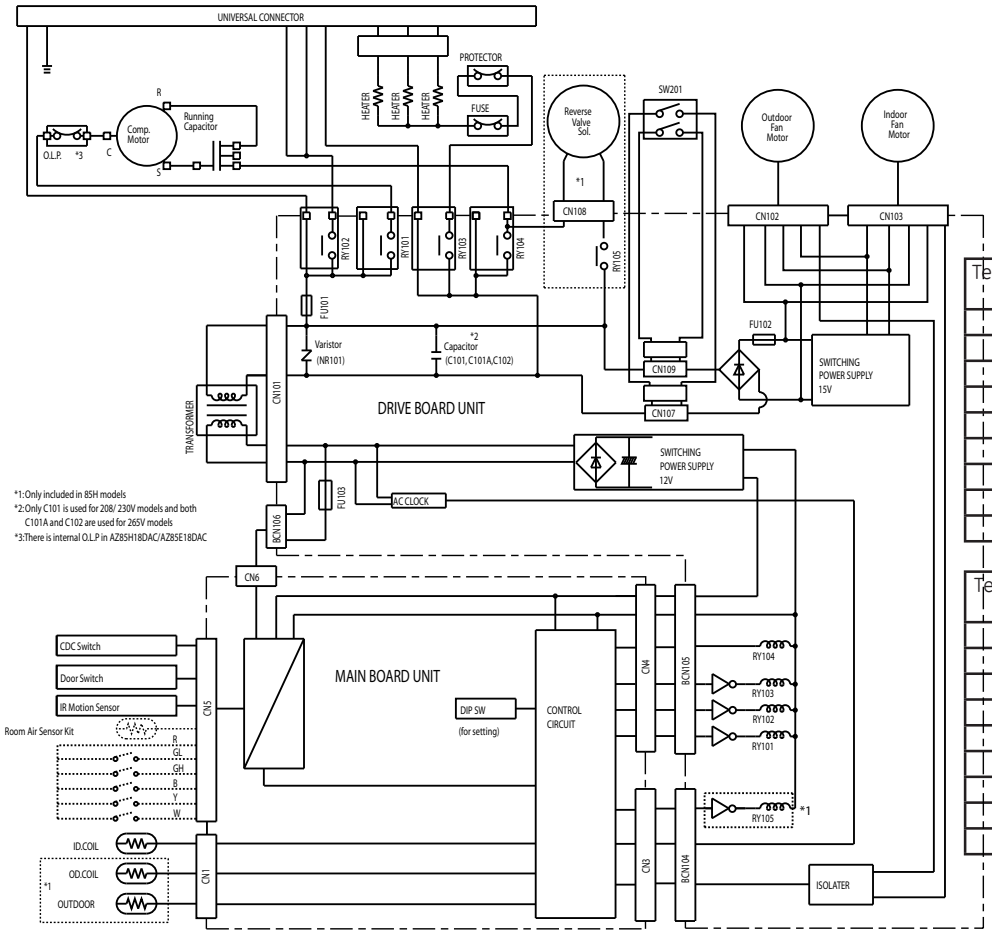
SENSOR RESISTANCE(ohm)		
degF	I.D COIL	O.D COIL & OUTDOOR (85H ONLY)
10	94900	27930
30	51940	15420
32	49330	14580
50	29960	8860
70	17930	5280
90	10970	3320

(*Continued next page*)

8500 Series Typical Schematic

Refer to the mini-manual attached to the unit.

Note: Refer to Yellow Universal Connector



Temperature limiting during COOL mode (all temperatures shown in °F)			
UP	Down	Min.	Max.
NONE	1,2,3	60°	85°
1	2,3	64°	85°
1,2	3	66°	85°
2	1,3	68°	85°
2,3	1	70°	85°
1,2,3	NONE	72°	85°
1,3	2	74°	85°
3	1,2	76°	85°

Temperature limiting during HEAT mode (all temperatures shown in °F)			
UP	Down	Min.	Max.
NONE	4,5,6	60°	85°
4	5,6	60°	80°
4,5	6	60°	78°
5	4,6	60°	76°
5,6	4	60°	74°
4,5,6	NONE	60°	72°
4,6	5	60°	70°
6	4,5	60°	65°

Warranty

All warranty service provided by our Factory Service Centers, or an authorized Customer Care® technician. To schedule service, on-line, visit us at GEAppliances.com, or call 800.GE.CARES (800.432.2737). For service in Canada, contact Gordon Williams Corp. at 1.888.209.0999. Please have serial number and model number available when calling for service.

Staple your receipt here. Proof of the original purchase date is needed to obtain service under the warranty.

For The Period Of:	*GE Will Replace:*
One Year *From the date of the original purchase*	***Any part*** of the Zoneline which fails due to a defect in materials or workmanship. During this ***limited one-year warranty***, GE will also provide, ***free of charge,*** all labor and related service to replace the defective part.
Five Years *From the date of the original purchase*	***Any part of the sealed refrigerating system*** (the compressor, condenser, evaporator and all connecting tubing) which fails due to a defect in materials or workmanship. During this ***four-year limited additional warranty***, GE will also provide, ***free of charge***, all labor and related service to replace the defective part.
Five Years *From the date of the original purchase*	For the ***second through the fifth year*** from the date of original purchase, GE will replace ***certain parts*** that fail due to a defect in materials or workmanship. Parts covered are fan motors, switches, thermostats, electric resistance heater, electric resistance heater protectors, compressor overload, solenoids, circuit boards, auxiliary controls, thermistors, frost controls, ICR pump, capacitors, varistors and indoor blower bearing. During this ***four-year limited additional warranty***, you will be responsible for any labor or on-site service costs.

What GE Will Not Cover:

- **Service trips to your site to teach you how to use the product.**
- **Improper installation, delivery or maintenance.**

  If you have an installation problem, or if the air conditioner is of improper cooling or heating capacity for the intended use, contact your dealer or installer. You are responsible for providing adequate electrical connecting facilities.
- **In commercial locations, labor necessary to move the unit to a location where it is accessible for service by an individual technician.**
- **Failure or damage resulting from corrosion due to installation in an environment containing corrosive chemicals.**
- **Replacement of fuses or resetting of circuit breakers.**
- **Filters.**
- **Failure of the product resulting from modifications to the product or due to unreasonable use including failure to provide reasonable and necessary maintenance.**
- **Failure or damage resulting from corrosion due to installation in a coastal environment, except for models treated with special factory-applied anti-corrosion protection as designated in the model number.**
- **Damage to product caused by improper power supply voltage, accident, fire, floods or acts of God.**
- **Incidental or consequential damage caused by possible defects with this air conditioner.**
- **Damage caused after delivery.**
- **Product not accessible to provide required service.**

EXCLUSION OF IMPLIED WARRANTIES—Your sole and exclusive remedy is product repair as provided in this Limited Warranty. Any implied warranties, including the implied warranties of merchantability or fitness for a particular purpose, are limited to one year or the shortest period allowed by law.

This warranty is extended to the original purchaser and any succeeding owner for products purchased for use within the USA and Canada. If the product is located in an area where service by a GE Authorized Servicer is not available, you may be responsible for a trip charge or you may be required to bring the product to an Authorized GE Service location for service. In Alaska, the warranty excludes the cost of shipping or service calls to your site.

Some states or provinces do not allow the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province. To know what your legal rights are, consult your local, state or provincial consumer affairs office or your state's Attorney General.

Warrantor: General Electric Company. Louisville, KY 40225