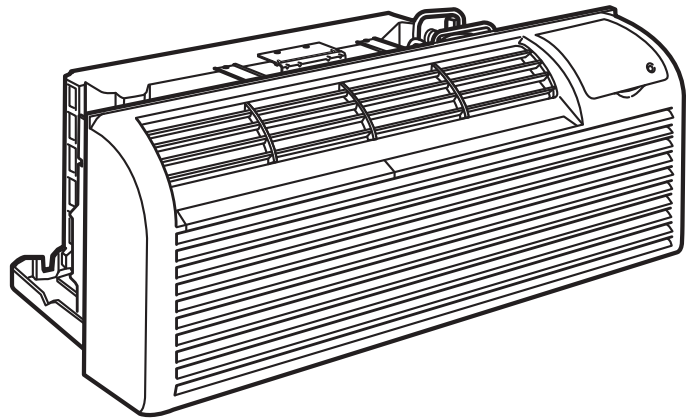


GE Appliances

# Technical Service Guide

September 2010

## Zoneline Air Conditioners 6100 Series



31-9202



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 normally operating R-410A system with the same condensing temperature of 120°F and 45°F evaporator saturation temperature will have a high side pressure of approximately 525 psi and a low side pressure of approximately 250 psi.

## **IMPORTANT SAFETY NOTICE**

The information in this service guide is intended for use by individuals possessing an adequate background of air conditioning experience. Any attempt to repair an air conditioning 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 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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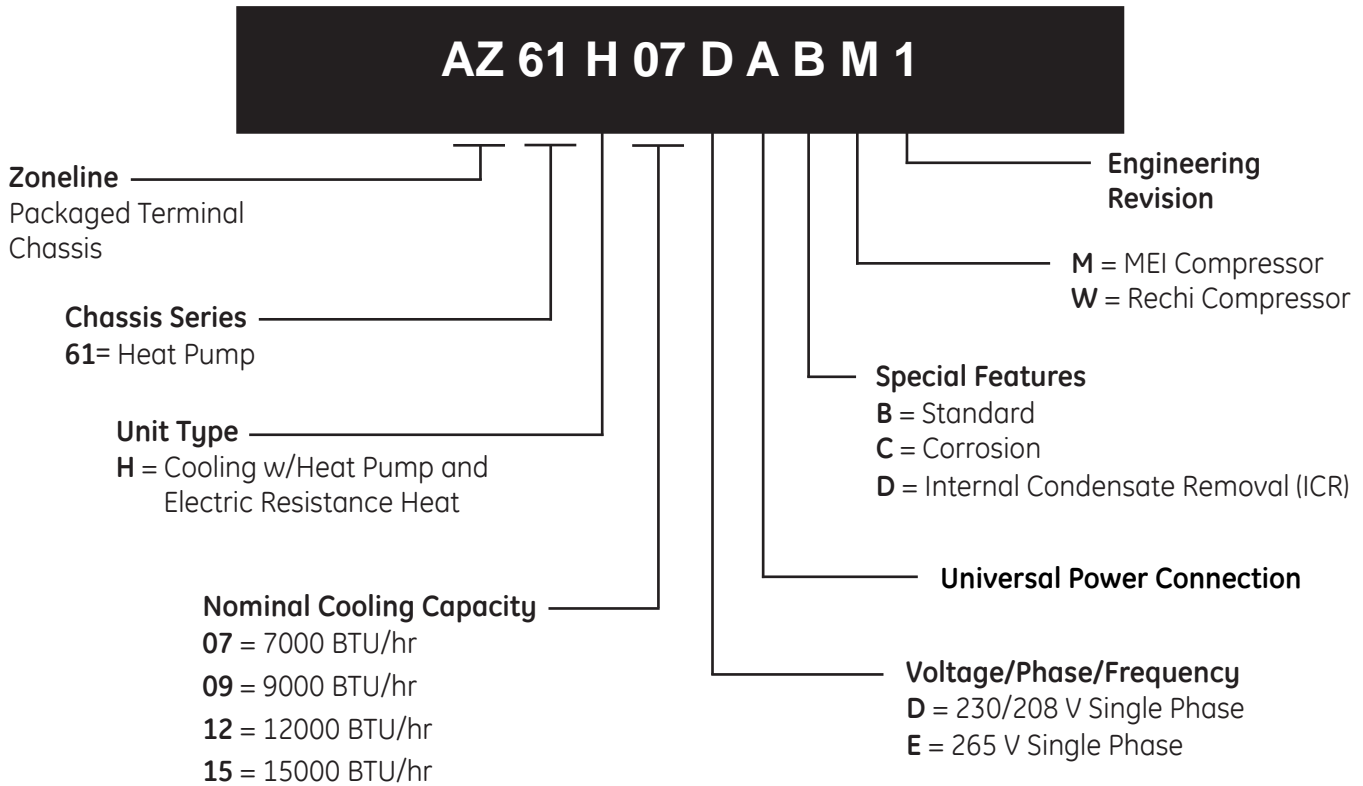
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# Nomenclature

## Model Number



Nomenclature Tag

The nomenclature tag is located on the front of the chassis and can be easily accessed by removing the front cabinet (grille). 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: **ST**123456S = 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

# Zoneline 6100 Series

	<b>208/230-Volt</b>	<b>265-Volt</b>
<b>Standard</b>	AZ61 H07 DAB AZ61 H09 DAB AZ61 H12 DAB AZ61 H15 DAB	AZ61 H07 EAB AZ61 H09 EAB AZ61 H12 EAB AZ61 H15 EAB
<b>ICR</b>	AZ61 H07 DAD AZ61 H09 DAD AZ61 H12 DAD AZ61 H15 DAD	AZ61 H07 EAD AZ61 H09 EAD AZ61 H12 EAD AZ61 H15 EAD
<b>Corrosion Protection</b>	AZ61 H07 DAC AZ61 H09 DAC AZ61 H12 DAC AZ61 H15 DAC	AZ61 H07 EAC AZ61 H09 EAC AZ61 H12 EAC AZ61 H15 EAC
<b>7K</b>	AZ61 H07 DAB AZ61 H07 DAC AZ61 H07 DAD	AZ61 H07 EAB AZ61 H07 EAC AZ61 H07 EAD
<b>9K</b>	AZ61 H09 DAB AZ61 H09 DAC AZ61 H09 DAD	AZ61 H09 EAB AZ61 H09 EAC AZ61 H09 EAD
<b>12K</b>	AZ61 H12 DAB AZ61 H12 DAC AZ61 H12 DAD	AZ61 H12 EAB AZ61 H12 EAC AZ61 H12 EAD
<b>15K</b>	AZ61 H15 DAB AZ61 H15 DAC AZ61 H15 DAD	AZ61 H15 EAB AZ61 H15 EAC AZ61 H15 EAD

# Zoneline Features and Specifications

## Features

Refrigerant Type	R-410A
Universal heater – UPC*	Standard
Highly featured microcomputer controls	Standard
Tactile touch pad controls with LED	Standard
Automatic power recovery	Standard
Solid-state thermostat	Standard
Cool and Heat only settings	Hi/Low/Auto
Sleep function	Standard
7-step electronic temperature limiting	Standard
Automatic emergency heat	Standard
Automatic indoor coil frost control	Standard
Heat source – heat pump and electric resistance heat	Standard
Heat pump with supplemental resistance heat	Standard
Heat pump defrost system	Reverse cycle
Electric resistance heat lock-out	Standard
Freeze Sentinel™	Standard
Heat sentinel	Standard
Up-front interchangeable air filters	Standard
Easy clean air discharge area	Standard
Reversible indoor air louvers 40°/50°	Standard
3-position concealed manual vent control	Standard
Fan motors – permanently lubricated	2
2-speed outdoor fan – automatically selected by main board programming	Standard
Indoor cross-flow blower	Standard
Indoor fan speed selections	Hi/Low
Fan only setting – 2-speed	Hi/Low
Fan cycle control	“Smart Fan”
Constant run fan	Selectable
Transfer fan connections	Standard
Rotary compressor	Standard
Automatic compressor restart delay	Standard
Remote control capability with wall mounted thermostat	Standard
Central desk control capability with load shedding option	Standard
Internal condensate removal (ICR)	Optional
Corrosion protection	Optional
Ducted installation capability	RAK6052

\*UPC - Universal Power Cord Connection.  
265-volt units must be connected in a manner to meet National Electrical Code and all local codes.

## Specifications

230/208V Models	Deluxe series – heat pump units**			
	6100 series units			
	AZ61H07D	AZ61H09D	AZ61H12D	AZ61H15D
<b>Capacity</b>				
Cooling BTUH	7,200/7,000	9,400/9,200	11,800/11,600	14,800/14,600
EER (BTU/Watt)	13.2/13.2	12.7/12.7	12.1/12.1	11.2/11.2
Dehumidification Pts/Hr	1.7	2.7	3.5	4.5
<b>Features</b>				
Refrigerant type	R-410A	R-410A	R-410A	R-410A
CFM, indoor fan high	340	360	370	370
CFM, indoor fan low	194	212	284	290
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
<b>Power/Ratings</b>				
Power factor	91%	92%	92%	91%/92%
Sensible heat ratio @ 230 volts	85%	75%	70%	65%
Cooling Watts	545/530	740/725	975/960	1,325/1,305
Cooling Amperes, F.L.	2.6/2.8	3.5/3.8	4.6/5.0	6.3/6.8
Amperes, L.R.	19.0	21.0	29.5	31.0
Reverse cycle heat BTUH	6,400/6,200	8,300/8,100	10,600/10,400	14,000/13,900
COP	4.0/4.0	3.8/3.8	3.7/3.7	3.3/3.3
Heating Watts	470/455	645/630	850/835	1,245/1,235
Heating Amperes	2.2/2.4	3.1/3.3	4.1/4.5	5.8/6.3
<b>Weight (Net/Ship)</b>	94.1/107.1	101.4/114.4	102.1/115.1	100.8/113.8
<b>Sound Transmission Class (STC)</b>	29	29	29	29
<b>265V Models</b>	<b>AZ61H07E</b>	<b>AZ61H09E</b>	<b>AZ61H12E</b>	<b>AZ61H15E</b>
<b>Capacity</b>				
Cooling BTUH	7,200	9,400	11,800	14,800
EER (BTU/Watt)	13.2	12.7	12.1	11.2
Dehumidification Pts/Hr	1.7	2.7	3.5	4.5
<b>Features</b>				
Refrigerant type	R-410A	R-410A	R-410A	R-410A
CFM, indoor fan high	340	360	370	370
CFM, indoor fan low	194	211	284	290
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
<b>Power/Ratings</b>				
Power factor	94%	90%	92%	93%
Sensible heat ratio @ 265 volts	85%	75%	70%	65%
Cooling Watts	545	740	975	1,325
Cooling Amperes, F.L.	2.2	3.1	4.0	5.4
Amperes, L.R.	12.0	16.5	23.5	26.0
Reverse cycle heat BTUH	6,400	8,300	10,600	14,000
COP	4.0	3.8	3.7	3.3
Heating Watts	470	645	850	1,245
Heating Amperes	2.0	2.7	3.6	5.0
<b>Weight (Net/Ship)*</b>	94.6/107.6	103.6/116.6	103.6/116.6	104.3/117.3
<b>Sound Transmission Class (STC)</b>	29	29	29	29

\*ICR adds 3 pounds to unit weight

\*\*Corrosion model BTUH and watts may vary.

## Features and Benefits

### Standard Physical Dimensions

GE has maintained the same dimensions for Zonline air conditioners since 1961 – 42 inches wide x 16 inches high x 13 <sup>3</sup>/<sub>4</sub> inches deep. Replacement of older units is made easy.

### Weather-Protected Electrical Components

Vital electrical components are protected from the weather by locating them on the indoor side of the weather barrier.

### Weather-Resistant Super Seal

The properly installed unit in a nondistorted case keeps air leakage to a minimum - 7 cubic feet per minute (CFM), air infiltration with 25 MPH wind. Industry specification is 19 CFM of air infiltration.

### Heater Sizes to Meet Room Requirements

All units are equipped with a universal heater. The resistance heat output is determined by a power connection kit.

### 230/208-Volt - Line Cord Connected Units

- 2.40/2.32 KW with RAK3153 - 15-amp circuit
  - 3.30/3.20 KW with RAK3203 - 20-amp circuit
  - 4.70/4.53 KW with RAK3303\* - 30-amp circuit
- \* Not approved for use on 7000 BTU models.

### 230/208-Volt - Sub-Base Connected Units

- 2.40/2.32 KW with RAK204D15P - 15-amp circuit
  - 3.30/3.20 KW with RAK204D20P - 20-amp circuit
  - 4.70/4.53 KW with RAK204D30P\* - 30-amp circuit
- \* Not approved for use on 7000 BTU models.

### 265-Volt

- 2.40 KW with RAK5172 - 15-amp circuit
- 3.40 KW with RAK5202 - 20-amp circuit
- 4.80 KW with RAK5302 - 30-amp circuit

### Unit Controls

The 6100 Series has touch pads and LCD display for temperature and operation selection.

### Highly Featured Microprocessor Controls

The microprocessor controls are programmed to interface with the temperature sensors to maximize comfort conditions for the room occupant and provide outstanding features.

Thermistors are used to sense small changes in temperature to give excellent room control and allow the microprocessor to monitor and react to changing conditions.

### Electric Resistance Heat Lock-Out

To maximize the savings of the heat pump operation, the Zonline heat pumps do not utilize the resistance heater when the outdoor temperature is above 46°F during normal operation. The resistance heat is used in the Quick Heat Recovery feature.

### Automatic Emergency Heat

This feature automatically uses electric resistance heat if the heat pump output is not sufficient to maintain selected room temperature.

### Reverse Cycle Heat Pump Defrost System

This feature is standard on all Zonline 6100 Series. It enables the heat pump to operate at lower temperatures when other systems switch to more expensive electric resistance heat.

### High Temperature Heat Pump Operation Protection

This feature protects the compressor if heat pump is operated with high outdoor temperatures. The power to the outdoor fan is turned off if the indoor coil gets too hot during heat pump operation to prevent damage to the compressor.

### Quick Heat Recovery – Heat Pump Units

When the unit operation is changed from STOP or COOL to HEAT, the electric resistance heaters are used to warm the room to the thermostat set point. This provides a faster room temperature increase for greater guest comfort.

### Fan Motors – Permanently Lubricated

All units have 2 fan motors for quiet operation and maximum operating efficiency. Motors are permanently lubricated to reduce the need for maintenance, and they are totally enclosed to keep dirt and water out of the motor windings.

### 2-Speed Outdoor Fan

The unit automatically selects the most efficient speed for the outdoor fan. The operating sound level is lower when the outdoor fan can operate in low speed, yet there are situations where it must operate in high speed. The unit changes the fan speed automatically.

### Indoor Fan Speed Selections – HIGH/LOW

The unit may be operated in HIGH HEAT or LOW HEAT or HIGH COOL or LOW COOL.



### Fan-Only Setting – HIGH/LOW

The unit provides the option of selecting either HIGH or LOW speed for fan-only operation.

### Fan-Cycle Switch – SmartFan

The SmartFan allows the unit to operate fan-continuous and fan-cycle in heating and cooling to provide better guest comfort. It eliminates the complaint of cold air draft during heating operation. It also eliminates the need of changing the fan-cycle switch seasonally. SmartFan settings are selected using the auxiliary control panel.

### Compressor Random Restart

In the event of a power failure, all compressors attempting to restart immediately when the power is restored can result in a power surge that can cause another power interruption. The microprocessors in the Zoneline have a random restart logic system that prevents all units from starting at the same time.

### Rotary Compressor

The rotary compressor provides smoother operation for quiet, dependable service. GE has used rotary compressors since 1961.

### Compressor Restart Delay

To prevent compressor damage, Zoneline air conditioners are designed to provide a minimum of 3 minutes of compressor off time to allow refrigerant pressures to equalize before restarting. A minimum of 3 minutes of compressor run time is utilized to prevent room occupant disturbance due to short-cycling of the air conditioner.

### Freeze Sentinel

The Freeze Sentinel detects low room temperature and also turns on the heater to help protect against damage caused by freezing room temperature. The heater turns on at 41°F and warms the indoor thermistor temperature to 46°F and shuts off. The Freeze Sentinel may be turned on or off by using the auxiliary control panel.

### Heat Sentinel

The property owner may choose to activate the Heat Sentinel feature on the Zoneline. If the Heat Sentinel is activated and the room temperature reaches 85°F while the unit is in the STOP setting, the unit will automatically start the air conditioning operation and will shut off when the room temperature reaches 80°F.

This will help dehumidify the air and lower high temperatures, so the guest will not be entering an extremely hot room. The Heat Sentinel may be turned on or off by using the auxiliary control panel.

### Indoor Coil Frost Control



The indoor coil frost control prevents the indoor coil from freezing and causing complaints due to lack of cooling. Frost can form on the indoor coil when the unit is operated in cooling, when outdoor temperatures are low. The unit automatically shuts the

compressor off until the indoor coil temperature warms to the point where frosting will no longer occur.

### Transfer Fan Interface

To operate a relay, 24 VAC terminals are provided, to control a fan mounted in a wall that moves conditioned air into another space. The electrical power for the operation of the transfer fan itself is not provided by the Zoneline. Transfer fans and their controlling relays are field-supplied.

### Electronic Temperature Limiting

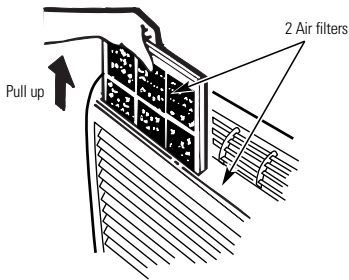
There are 7 independent programmable heating temperature limits and 7 independent programmable cooling temperature limits. This eliminates the need to reset the limits seasonally.

Heating Temperature Limits							Highest Heat
65	70	72	74	76	78	80	85

Lowest Cool	Cooling Temperature Limits						
60	64	66	68	70	72	74	76

### Reversible Indoor Air Louvers

Reversible indoor air louvers allow air to be directed into the room at a 40° or 50° angle to provide better air distribution. The angle is changed by removing the room cabinet, screws holding the louver in place, and rotating the louver section.



### Up-Front Air Filters

There are 2 interchangeable up-front filters that are easy to remove and reinstall. These may be cleaned without opening or removing the room cabinet.

Clean the filters

by brushing, vacuuming or back-flushing under a faucet or shower head.

### Easy Clean Air Discharge Area

The 6100 Series units have an out-of-sight protective screen over the indoor fan. This allows easy cleaning of air discharge area by simply removing room front and wiping clean. There is no screen directly below discharge louver to trap unsightly dirt and debris where it may be seen by room occupant.

### Concealed Manual Vent Control

The 3-position manual vent door control may be closed, partially open, or fully open.



### Vent CFM High Speed

Unit	Full Open	Partial Open
7000	50	40
9000	70	45
12000	75	45
15000	75	45

CFM ratings at 230 volts and 265-volts.

- Greater amounts of air will be introduced if the room has an exhaust fan.
- An open vent door brings unconditioned outdoor air into the room, increasing heating and cooling costs.
- Positive vent door closure prevents accidental opening and unwanted air infiltration.

### Ventilation Filter

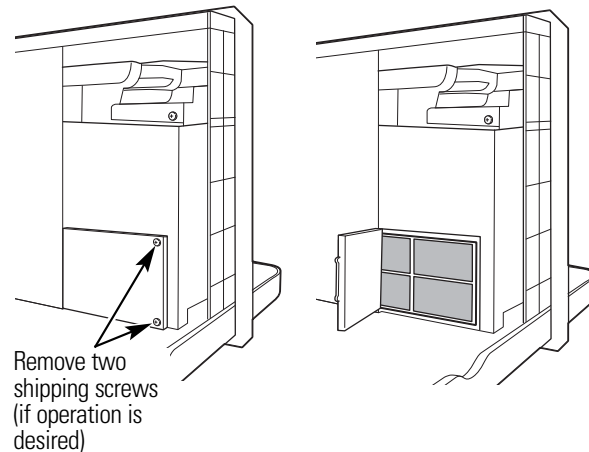
If the vent door is open, access requires the removal of the unit from the wall sleeve. Clean the vent filter twice a year or as required.

Turn the Zonline off and unplug before cleaning.

### To clean the vent filter:

**IMPORTANT:** This filter is not removable. Trying to remove this filter will damage the unit.

1. Use a vacuum to remove debris from the filter.
2. Use a damp rag to wipe down the filter and surrounding area after vacuuming.



### Corrosion Protection

The 6100 Series units may be ordered with special protection to better withstand damage from salt air and salt water in seacoast areas.

Units with corrosion protection will have:

- A second coat of paint applied to the bottom of the compressor.
- The fins on both the indoor and outdoor coils will have special blue colored coating.
- A second spray applied to the base pan that changes the color of the base pan from the standard black finish to a tan finish.
- The letter C included in the model number. (See *Nomenclature*.)

Zonline 6100 Series units with ICR are not available with corrosion protection and should not be installed in seacoast or corrosive environments.

Units installed in corrosive areas should be examined and cleaned more frequently than normal installations.

### Locking Door Kit

RAK8023 — A door with a lock that replaces the standard control cover door to prevent unauthorized changing of control setting is offered as an accessory.

# Technical Data

**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.

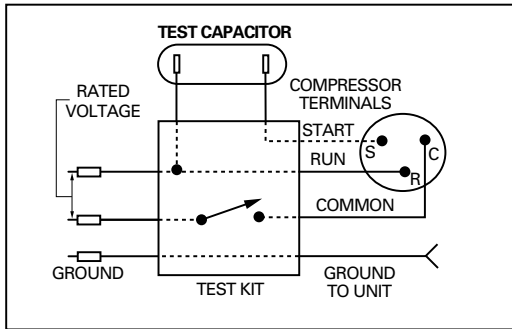
**IMPORTANT SAFETY NOTICE**  
 This information is intended for use by individuals possessing adequate backgrounds of electrical, electronic and mechanical experience. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible for the interpretation of this information, nor can it assume any liability in connection with its use.

**WARNING** DISCONNECT UNIT FROM ELECTRICAL POWER SUPPLY BEFORE MAKING ANY ELECTRICAL CHECKS.  
**MAXIMUM CURRENT LEAKAGE: 0.5 MILLIAMP**  
**MAXIMUM GROUND PATH RESISTANCE: 0.1 OHM**

**TEMPERATURE DIFFERENTIAL - HEATING**  
 Unit must operate for one hour in reverse cycle heating prior to measuring air temperatures. Following are normal limits:

## Run Capacitor Check

1. Replace unit run capacitor with a known good test capacitor which may be 10  $\mu\text{fd}$  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.



## Thermistor Resistance

THERMISTOR RESISTANCE (OHMS)			
Degree F	Room	I.D. Coil	O.D. Coil and Outdoor
10	63260	94900	28030
30	34620	51940	15340
32	32860	49330	14570
50	19970	29960	8850
70	11950	17930	5300
90	7320	10970	3280

## Wiring Compressor Direct Check

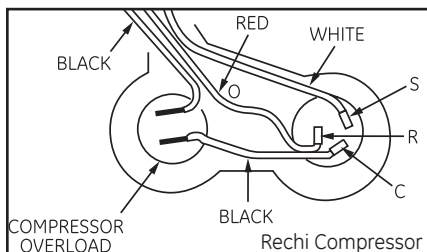
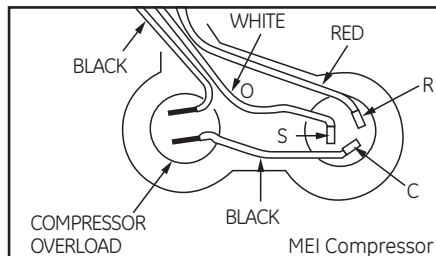
**Caution:** Keep head clear of terminal area when cover is removed. Check windings first. If open or grounded, DO NOT apply power to compressor terminals.

## Filter

Check for cleanliness.

## Condenser

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



## 6100 Series

**Running Current Cooling** - With unit in case and room front installed, operated for 10 minutes on HI-COOL.

**Running Current Heating** - With unit in case and room front installed, operated for 10 minutes on HI-HEAT.

**Temperature Differential Cooling** - Unit must operate for 1 hour with thermostat at coldest setting prior to measuring air temperatures.

**Temperature Differential Heating** - Unit must operate for 1 hour in reverse cycle heating thermostat at prior to measuring air temperatures.

## 7000 BTU

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAP AIR TEMP IN °F	EVAP AIR TEMP OUT °F		AIR TEMP CONDENSER IN °F	COOLING CURRENT		AIR TEMP OUTDOOR COIL IN °F	REVERSE CYCLE HEATING CURRENT		AIR TEMP INDOOR IN °F	INDOOR COIL AIR TEMP OUT IN °F	
				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.
AZ61H07DAB/C/D	208V	187-253	70	50	58	80	2.1	2.3	47	2.0	2.5	70	86	95
			80	58	65	95	2.5	2.7	60	2.1	2.6	75	90	100
	230 V		90	69	71	110	2.8	3.2	75	2.2	2.6	80	95	105
AZ61H07EAB/C/D	265V	238-292	70	50	58	80	1.7	1.9	47	1.7	2.0	70	86	94
			80	58	65	95	2.0	2.3	60	1.7	2.1	75	90	100
			90	69	71	110	2.3	2.6	75	1.8	2.2	80	95	105

## 9000 BTU

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAP AIR TEMP IN °F	EVAP AIR TEMP OUT °F		AIR TEMP CONDENSER IN °F	COOLING CURRENT		AIR TEMP OUTDOOR COIL IN °F	REVERSE CYCLE HEATING CURRENT		AIR TEMP INDOOR IN °F	INDOOR COIL AIR TEMP OUT IN °F	
				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.
AZ61H09DAB/C/D	208V	187-253	70	47	56	80	2.9	3.2	47	2.9	3.5	70	91	104
			80	55	63	95	3.2	3.7	60	3.0	3.7	75	97	109
	230 V		90	63	69	110	3.7	4.3	75	3.3	4.0	80	102	114
AZ61H09EAB/C/D	265V	238-292	70	47	56	80	2.3	2.5	47	2.3	2.7	70	91	104
			80	55	63	95	2.6	2.9	60	2.5	2.9	75	97	109
			90	63	69	110	2.9	3.5	75	2.7	3.3	80	102	114

## 12000 BTU

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAP AIR TEMP IN °F	EVAP AIR TEMP OUT °F		AIR TEMP CONDENSER IN °F	COOLING CURRENT		AIR TEMP OUTDOOR COIL IN °F	REVERSE CYCLE HEATING CURRENT		AIR TEMP INDOOR IN °F	INDOOR COIL AIR TEMP OUT IN °F	
				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.
AZ61H12DAB/C/D	208V	187-253	70	44	53	80	3.9	4.4	47	3.9	4.6	70	92	113
			80	52	61	95	4.4	4.9	60	4.2	5.0	75	102	118
	230 V		90	60	67	110	4.9	5.8	75	4.5	5.4	80	107	124
AZ61H12EAB/C/D	265V	238-292	70	44	53	80	3.0	3.5	47	3.1	3.7	70	93	114
			80	52	61	95	3.5	4.0	60	3.3	4.1	75	102	119
			90	59	67	110	4.6	5.4	75	4.2	5.0	80	107	124

## 15000 BTU

MODEL	RATED VOLTAGE	VOLTAGE LIMITS	EVAP AIR TEMP IN °F	EVAP AIR TEMP OUT °F		AIR TEMP CONDENSER IN °F	COOLING CURRENT		AIR TEMP OUTDOOR COIL IN °F	REVERSE CYCLE HEATING CURRENT		AIR TEMP INDOOR IN °F	INDOOR COIL AIR TEMP OUT IN °F	
				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.		MIN.	MAX.
AZ61H15DAB/ C/D	208V	187-253	70	42	51	80	5.0	5.7	47	5.6	6.7	70	105	120
			80	50	59	95	5.9	6.7	60	6.0	7.2	75	110	126
	230 V		90	60	65	110	6.8	8.0	75	6.6	8.2	80	114	130
AZ61H15EAB/ C/D	265V	238-292	70	42	51	80	4.1	4.6	47	4.6	5.4	70	105	121
			80	50	59	95	4.7	5.4	60	4.8	5.8	75	110	126
			90	60	65	110	5.4	6.3	75	5.2	6.4	80	115	131

## Sealed System

MODEL	COMPRESSOR	REFRIGERANT R410A	CAPILLARY OD x ID x LENGTH (PC)
AZ61H07D AZ61H07E	MEI	21.0 oz.	.106" x .047" x 15.75" (2) .106" x .051" x 31.50" (1) .106" x .051" x 15.75" (1)
AZ61H09D AZ61H09E	RECHI	31.5 oz.	.106" x .047" x 15.75" (2) .106" x .051" x 5.91" (1) .106" x .051" x 21.65" (1) .106" x .055" x 13.78" (2)
AZ61H12D AZ61H12E	RECHI	33.5 oz.	.106" x .047" x 15.75" (2) .106" x .055" x 13.78" (2) .106" x .055" x 17.72" (1) .106" x .055" x 6.69" (1)
AZ61H15DAB	MEI	33 oz.	.106" x .055" x 15.75" (2) .106" x .055" x 13.78" (2) .106" x .063" x 19.69" (2)
AZ61H15DAC	MEI	31 oz.	.106" x .055" x 15.75" (2) .106" x .055" x 5.91" (1) .106" x .055" x 12.99" (1) .106" x .063" x 19.69" (2)
AZ61H15DAD	MEI	34 oz.	.106" x .055" x 15.75" (2) .106" x .055" x 13.78" (2) .106" x .063" x 19.69" (2)
AZ61H15E	MRI	31 oz.	.106" x .055" x 15.75" (2) .106" x .055" x 5.91" (1) .106" x .055" x 12.99" (1) .106" x .063" x 19.69" (2)

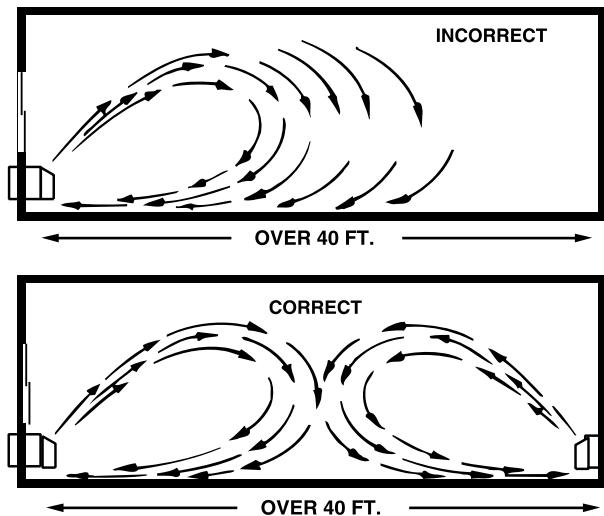
# Application and Sizing

## Sizing Guidelines

The following guidelines will aid in determining the proper size unit for the space (room) allowed. These are intended only as a guide, in order to assist in diagnosing an oversized/undersized application (cooling/humidity problem). For the reasons listed above, it is strongly recommended that a professional engineer be retained to match the Zonline with the building structure.

### Supply Air Throw

One Zonline unit should not be required to do a job obviously requiring 2 or more units. Units should be located around large rooms according to calculated loads or in such fashion as to achieve balanced air distribution in all parts of the room. The single unit, in the *INCORRECT* illustration below, obviously cannot condition the entire room. Add a second unit as shown in the *CORRECT* illustration.



### Undersizing

If an air conditioner is undersized (cooling capacity is less than required for a specific application), the unit will typically not be able to cool the space down to the desired temperature (thermostat set point).

### Oversizing

If an air conditioner is oversized (cooling capacity is greater than required for the specific application), the unit will typically cool the space down to the desired temperature (thermostat set point) too quickly. The result can lead to compressor short cycling or a room with excessive moisture/humidity (unit does not run long enough to provide good dehumidification).

### Heating

Undersizing can result in the unit not being able to maintain the desired temperature level within the conditioned space.

### Wall Coverings

Use of nonpermeable wall covering (some paint, some wallpapers, and other types of coverings), which severely restricts passage of air or water vapor, can cause a severe moisture problem. Typical results could be staining of room surfaces, wall damage, as well as mold and mildew growth in hot/humid climates.

### Air Infiltration

Excessive air infiltration can magnify problems associated with undersizing or oversizing of an air conditioner unit and can be the root cause of insufficient cooling, dehumidification, or heating. Some sources of air infiltration include vents, gaps around windows and doors, and improperly sealed floors, ceilings, and wall joints.

## Cooling Capacity

Using the charts on this page, follow the guidelines listed below:

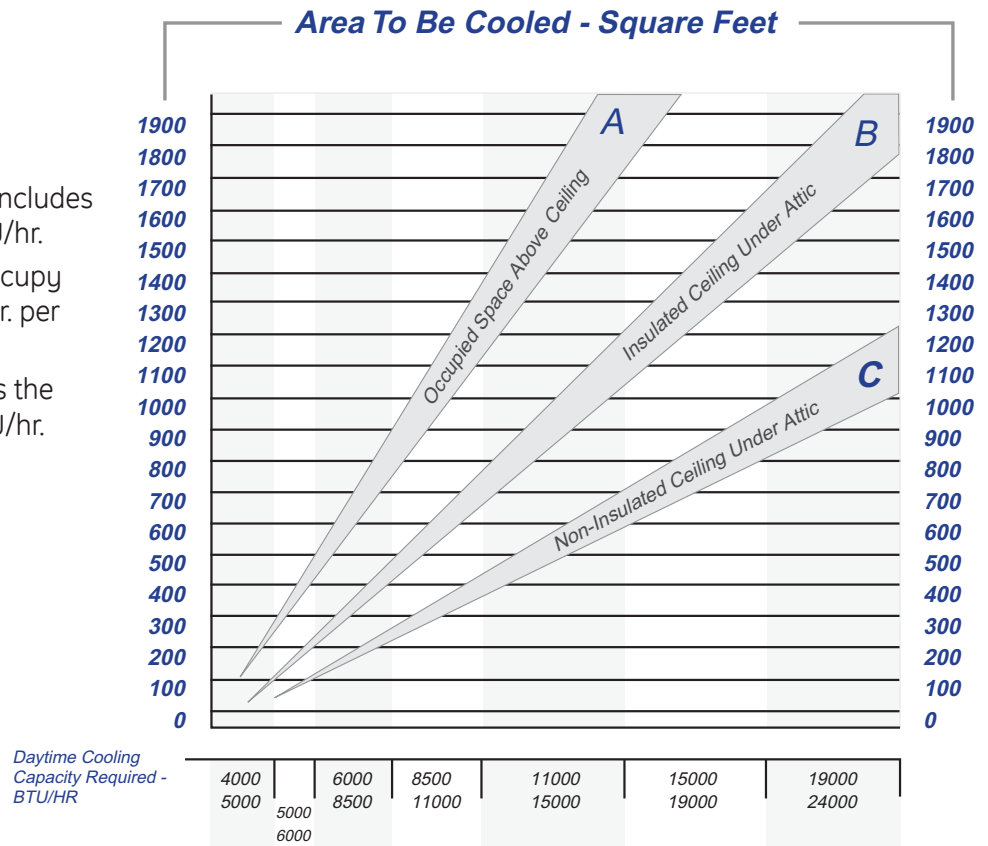
1. Use the *Floor Area Table* to determine the square footage of the area being cooled. If the desired area to be cooled consists of 2 adjacent areas, such as living room or hall, determine each space separately and then add the 2 totals.
2. Locate the square footage on the left side of the *Area To Be Cooled - Square Feet* chart. Using this number as a reference point, draw a horizontal line across the chart. Select the correct room air conditioner capacity from one of the three diagonal bands in the chart.

**Note:** The bands help compensate for variations in cooling applications. The bands indicate a range of BTU/hr capacities normally required to cool such an area. Also, note the possible adders/subtractors, at the bottom of *Area To Be Cooled* chart.

### Floor Area Table

	8'	10'	14'	18'	22'	26'	30'	34'	38'
10'	80	100	140	180	220	260	300	340	380
12'	96	120	168	216	264	312	360	408	456
14'	112	140	196	252	308	364	420	476	532
16'	128	160	224	288	352	416	480	544	608
18'	144	180	252	324	396	468	540	612	684
20'	160	200	280	360	440	520	600	680	760
22'	176	220	308	396	484	572	660	748	836
24'	192	240	336	432	528	624	720	816	912
26'	208	260	364	468	572	676	780	884	988
28'	224	280	392	504	616	728	840	952	1064
30'	240	300	420	540	660	780	900	1020	1140
32'	256	320	448	576	704	832	960	1088	1216
34'	272	340	476	612	748	884	1020	1156	1292
36'	288	360	504	648	792	936	1080	1224	1368
38'	304	380	532	684	836	988	1140	1292	1444
40'	320	400	560	720	880	1040	1200	1360	1520
42'	336	420	588	756	924	1092	1260	1428	1596
44'	352	440	616	792	968	1144	1320	1496	1672
46'	368	460	644	828	1012	1196	1380	1564	1748
48'	384	480	672	864	1056	1248	1440	1632	1824
50'	400	500	700	900	1100	1300	1500	1700	1900

- If the area to be cooled includes a kitchen, ADD 4000 BTU/hr.
- If more than 2 people occupy the area ADD 600 BTU/hr. per person.
- If only 1 person occupies the area, SUBTRACT 600 BTU/hr.



## Power Connection

### 230/208-Volt Line Cord Connected Units

Line cord kits consist of a self-aligning nine-pin molded connector, that plugs into a mating connector on the Zoneline chassis, and an insulated line cord with an electrical plug on the end. The configuration of the electrical plug conforms to NEC standards for the circuit amperage, and the position of the wires in the nine-pin connector determines the heater wattage and current requirements when it is plugged into the Zoneline chassis.

The power connection kit is selected by the amperage of the circuit, where it will be installed. Each line cord kit has an integral Leakage Current Detection and Interruption (LCDI) or Arc Fault Current Interrupter (AFCI) device as required by the National Electrical Code (NEC) and Underwriters Laboratory (UL) for line cord connected air conditioners manufactured on or after August 1, 2004. The line cord power connection kits are shown in the table below.

### 230/208-Volt Line Cord Connected Units

Line Cord Kit	Electric Heat (BTU/hr)	Electric Heater (KW)	Electric Heat (Amps)	Min. Circuit Protection (Amps)
RAK3153A	8100/7900	2.40/2.32	11.0/11.6	15
RAK3203A	11200/10900	3.30/3.20	15.1/16.0	20
RAK3303*	16000/15400	4.70/4.53	21.2/22.4	30

\*Not approved for use on 7000 BTU models.

Electric heat amps include electric heater and fan motor current draw.

### 230/208-Volt — Permanently Connected Units

Permanently connected units do not require the LCDI or AFCI device. Permanent connection is usually made through the use of a sub-base. Each 230/208-volt sub-base consists of a sub-base with an appropriate receptacle for minimum circuit amperage, a chaseway to route the power connector from the sub-base to the chassis, wiring to connect the sub-base to building wiring, and a short line cord with a self-aligning nine-pin connector to connect to the chassis and plug into the receptacle in the sub-base.

### 230/208-Volt Sub-Base Connected Units

Sub-Base	Electric Heat (BTU/hr)	Electric Heater (KW)	Electric Heat (Amps)	Min. Circuit Protection (Amps)
RAK204D15P	8100/7900	2.40/2.32	11.0/11.6	15
RAK204D20P	11200/10900	3.30/3.20	15.1/16.0	20
RAK204D30P*	16000/15400	4.70/4.53	21.2/22.4	30

\*Not approved for use on 7000 BTU models.

Electric heat amps include electric heater and fan motor current draw.

Permanent, or direct-wired, installation of a 230/208-volt unit requires a junction box kit, RAK4002A, that attaches to the chassis to form an enclosed junction box. The short sub-base line cord may not be used without the sub-base. For 6100 Series 230/208-volt units, where a permanent installation using flexible conduit is desired, the RAK4002A forms an enclosed junction box on the chassis.

The RAK4002A has a 7/8-in. diameter hole to allow conduit to be connected to the junction box. A line cord kit (See *Receptacles/Sub-Bases*) must be purchased and modified to allow direct connection to the building wiring.

The line cord kit should be cut about 8 inches away from the 9-pin connector. Strip the insulation off the end of each conductor to expose wires for field connection. These wires are then connected to the building wiring by field-supplied connectors.

### 230/208-Volt — Direct Connection Kits

Branch Circuit and Unit Amperage Rating	Power Supply Accessory	Power Supply Kit
15	RAK4002A	RAK4157
20	RAK4002A	RAK4207
30	RAK4002A	RAK4307*

\*Not approved for use on 7000 BTU models.



## 265- or 277-Volt Unit Installation — Permanently Connected Units

National Electric Code (Article 440 Section G) requires permanent connection for units connected to power sources over 250 volts; therefore these units must be permanently connected (direct wired) with field-supplied connectors. Units connected using a sub-base meet the requirement for permanent connection since all wiring is internal wiring between the sub-base and the chassis. Since 265-volt units may not be line cord connected, an LCDI device is not required.

### 265-Volt Sub-Base Connected Units

Sub-Base	Power Connection Kit	Electric Heat (BTU/hr)	Electric Heater (KW)	Electric Heat (Amps)	Min. Circuit Protection (Amps)
RAK204E15	RAK5172	8100	2.40	9.9	15
RAK204E20	RAK5202	11600	3.40	13.3	20
RAK204E30	RAK5302	16300	4.80	18.6	30

Electric heat amps include electric heater and fan motor current draw.

Each 265-volt sub-base kit consists of a sub-base with appropriate receptacle for minimum circuit amperage, a chaseway to route the power connector from the sub-base to the chassis, and wiring to connect the sub-base to the building.

## 265-Volt — Direct Connection Kits

**Note:** The 265-volt power connection kit must be ordered separately. All wiring must conform to local electrical regulations and codes. If an electrical sub-base is not used, order the following required kit for 265-volt direct connection.

Branch Circuit and Unit Amperage Rating	Power Supply Kit
15	RAK5157
20	RAK5207
30	RAK5307*

\*Not approved for use on 7000 BTU models.

**Note:** Order Kit RAK4002CW to enable a quick disconnect inside the junction box.

## Receptacles/Sub-Bases



**Tandem**  
230/208V 15 Amp  
NEMA6-15R



**Perpendicular**  
230/208V 20 Amp  
NEMA6-20R



**Large tandem**  
230/208V 30 Amp  
NEMA6-30R\*



**265V 15 Amp**  
NEMA7-15R



**265V 20 Amp**  
NEMA7-20R;  
receptacle used  
On 265V sub-base  
GE0720-3



**265V 30 Amp**  
NEMA7-30R;  
receptacle used  
On 265V sub-base  
GE073

Sub-Bases							
	RAK204U	RAK204D15P	RAK204D20P	RAK204D30P*	RAK204E15	RAK204E20	RAK204E30
Voltage	N/A	230/208	230/208	230/208	265	265	265
Amps	N/A	15	20	30	15	20	30
Receptacle	N/A	NEMA6-15R	NEMA6-20R	NEMA6-30R	NEMA7-15R	NEMA7-20R	NEMA7-30R

230/208 Volt sub-bases include appropriate power cord kit.

265 Volt units are to be direct connected. Cordset through enclosed chaseway into interior sub-base receptacle meets the NEC requirements.

\* Not approved for use on 7000 BTU models.

### Power connection kits are required on all Zonline® chassis (see chart below).

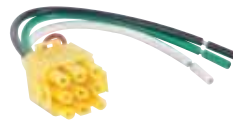
The correct kit for the installation is determined by the voltage and amperage of the electrical circuit and the means of connecting the unit to the building wiring. If the unit is to be plugged into a receptacle, a line cord kit would be used; if the unit is to be permanently connected, a permanent connection kit would be used. 265 volt cord set units must be installed in compliance with National Electrical Code®.

#### Power connection kits

Required on all models.  
See specification sheet  
for heater KW and branch  
circuit ampacity



RAK3153A/3203A  
230/208 volt line cord  
connection kit



RAK4157/4207/4307  
230/208 volt universal  
power supply kit



RAK5157/5207/5307  
265 volt universal power  
supply kit

230/208 Volt Line Cord Connected Units				265 Volt Permanent Connected Units**(Cord set)		
LCDI Power Connection Kit	RAK3153A	RAK3203A	RAK3303A*	RAK5172	RAK5202	RAK5302*
Heater KW	2.40/2.32	3.30/3.20	4.70/4.53	2.40	3.40	4.80
Watts	2400/2320	3300/3200	4700/4530	2400	3400	4800
BTUH	8100/7900	11200/10900	16000/15400	8100	11600	16300
Amps	11.0/11.6	15.1/16.0	21.2/22.4	9.9	13.3	18.6
Min. circuit amps	15	20	30	15	20	30
Recommended protective device	15 Amp time delay fuse or breaker	20 Amp time delay fuse or breaker	30 Amp time delay fuse or breaker	15 Amp time delay fuse	20 Amp time delay fuse	30 Amp time delay fuse

\* Not approved for use on 7000 BTU models.

\*\* To be used with sub-base

230/208 Volt Direct Connection Kit**				265 Volt Direct Connection Kit**		
	RAK4157	RAK4207	RAK4307*	RAK5157	RAK5207	RAK5307*
Heater KW	2.40/2.32	3.30/3.20	4.70/4.53	2.40	3.40	4.80
Watts	2400/2320	3300/3200	4700/4530	2400	3400	4800
BTUH	8100/7900	11200/10900	16000/15400	8100	11600	16300
Amps	11.0/11.6	15.1/16.0	21.2/22.4	9.9	13.3	18.6
Min. circuit amps	15	20	30	15	20	30
Recommended protective device	15 Amp time delay fuse or breaker	20 Amp time delay fuse or breaker	30 Amp time delay fuse or breaker	15 Amp time delay fuse	20 Amp time delay fuse	30 Amp time delay fuse

\* Not approved for use on 7000 BTU models.

\*\* To be used with sub-base or connection to building wiring

\* Not approved for use on 7000 BTU models.

\*\* To be used with sub-base or connection to building wiring

## Power Connection Kits

The 9-pin plug on the power connection kit is not designed to be used as a disconnect device. If the power connector kit is a line cord type, remove its plug from the wall receptacle. If the kit is a direct-connect type, the power must be shut off at the circuit breakers or by removal of the branch circuit fuses. Only then should the power connector kit be separated from the receptacle on the chassis.

Two general types of kits are used. One for connection to a wall receptacle and 1 for direct connect to the building branch circuit. One end of the kit plugs into a receptacle on the chassis.

The National Electrical Code requires all units with a power supply of over 250 volts be permanently direct connected. The 265-volt models may use the power cord with a plug-in conjunction with the appropriate sub-base kit. The sub-base kits have a properly rated receptacle that matches the plug on the power cord. The kits, when installed according to the instructions, meet UL requirements and the intent of the NEC because the power cord is enclosed between the unit chassis and the sub-base receptacle.

## Resistance Heaters

The universal heater assembly has 3 individual heater elements as defined below:

### 230/208-Volt Models

- One heater rated at 1.00 KW
- One heater rated at 1.4 KW
- One heater rated at 2.3 KW

### 265-Volt Models

- One heater rated at 1.00 KW
- One heater rated at 1.4 KW
- One heater rated at 2.4 KW

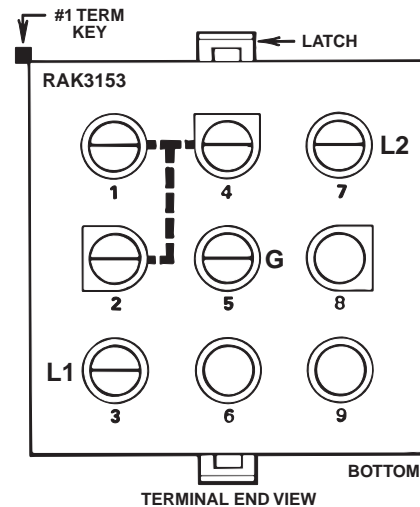
The power cord used determines which element is energized and how much heat is provided.

By using the correct power connector that matches the voltage and current rating of the building branch circuit, different amounts of heat can be obtained from the same heater.

The following diagrams illustrate the heating capacity of 230/208 volt and 265-volt units when they are connected to 15-, 20-, or 30-amp branch circuits.

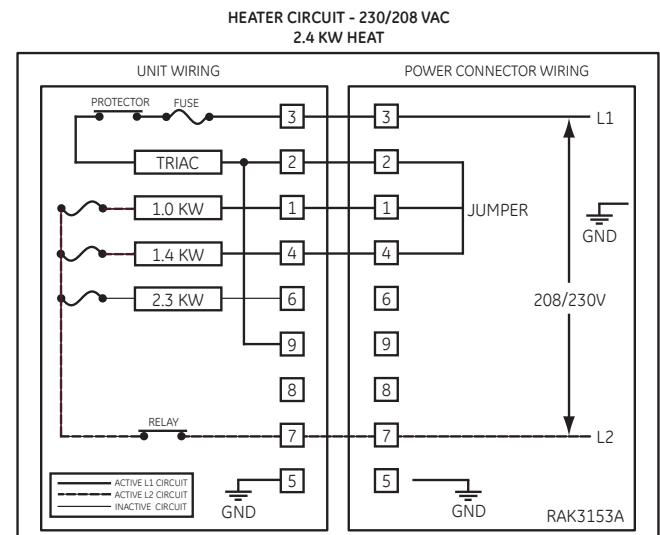
### Power Connector Plug 15-AMP - 230/208 VAC, 2.40/2.32 KW Heat (RAK3153A)

The L1 side of the line is connected to terminal #3 and L2 is connected to terminal #7. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2 and #2 and #4.



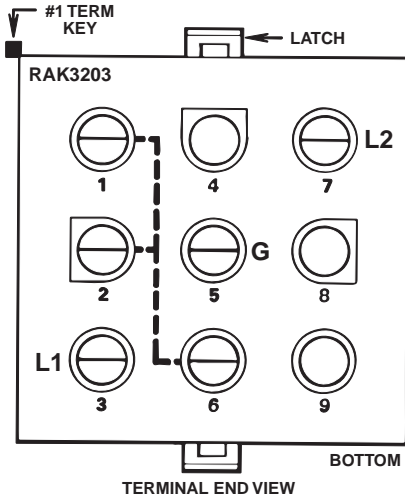
### Heater Circuit Schematic 15-AMP - 230/208 VAC, 2.40/2.32 KW Heat (RAK 3153A)

When the relay contacts close, the circuits to the 1.0 KW and 1.4 KW heaters are completed from L1 through the jumpers between terminals #1 to #2, #2 to #4, and back to L2 through terminal #7. This makes a total of 2.40/2.32 KW of heat available to heat the room.



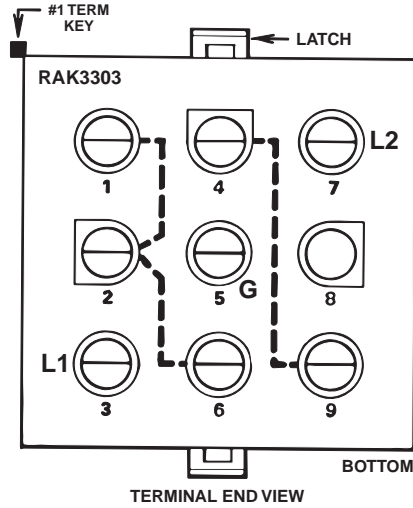
**Power Connector Plug 20-AMP - 230/208 VAC,  
3.30/3.20 KW Heat (RAK3203A)**

The L1 side of the line is connected to terminal #3, and L2 is connected to terminal #7. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2 and #2 and #6.



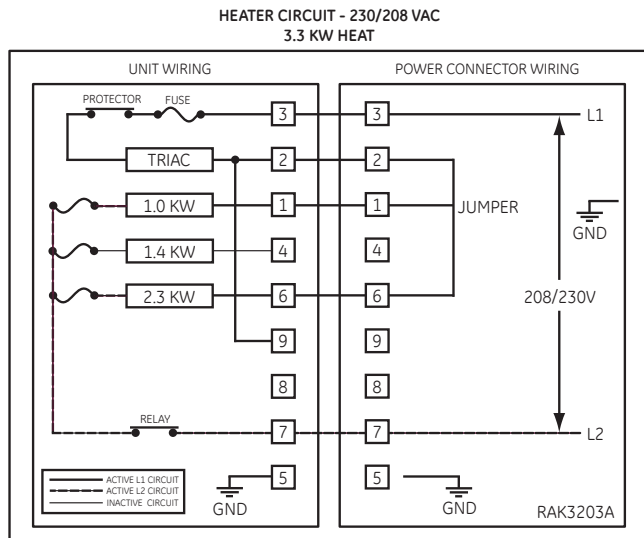
**Power Connector Plug 30-AMP - 230/208 VAC,  
4.70/4.53 KW Heat (RAK3303A)**

The L1 side of the line is connected to terminal #3, and L2 is connected to terminal #7. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2, #2 and #6, and #4 and #9.



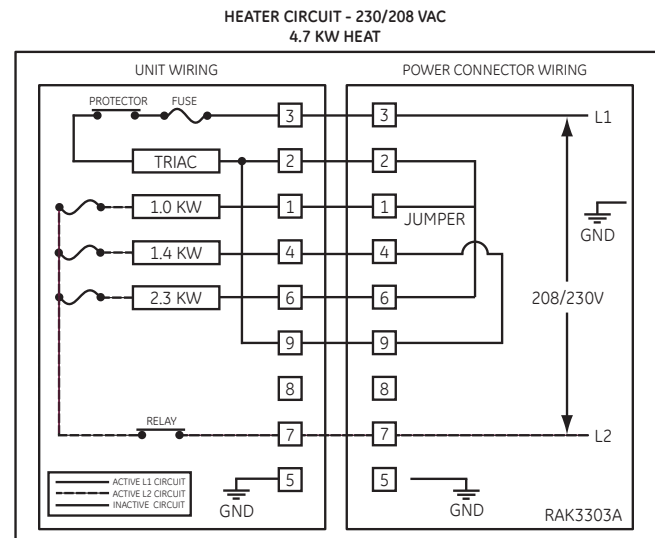
**Heater Circuit Schematic 20-AMP - 230/208 VAC,  
3.30/3.20 KW Heat (RAK3203A).**

When the relay contacts close, the circuits to the 1.0 KW and 2.3 KW heaters are completed from L1 through the jumpers between terminals #1 and #2, #2 and #6, and back to L2 through terminal #7. This makes a total of 3.30/3.20 KW of heat available to heat the room.



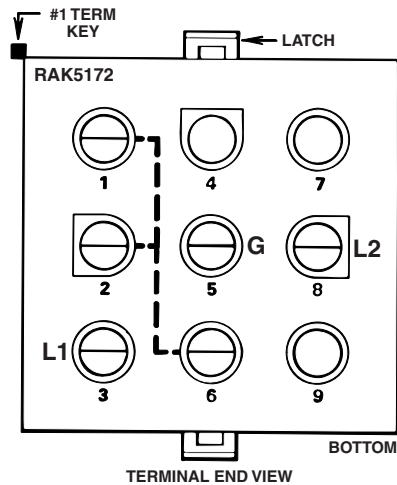
**Heater Circuit Schematic 30-AMP - 230/208 VAC,  
4.70/4.53 KW Heat (RAK3303A)**

When the relay contacts close, the circuits to the 1.0KW, 1.4 KW, and 2.3 KW heaters are completed from L1 through the jumpers between terminals #1 and #2, #2 and #6, #4 and #9, and back to L2 through terminal #7. This makes a total of 4.70/4.53 KW of heat available to heat the room.



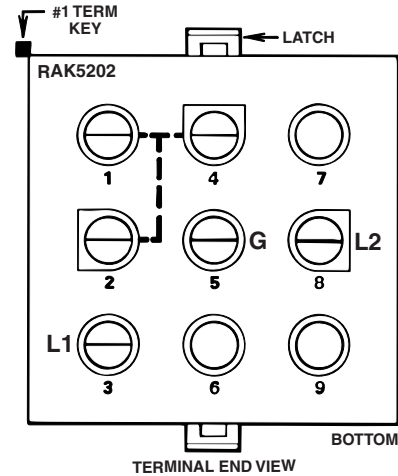
**Power Connector Plug 15-Amp - 265 VAC,  
2.4 KW Heat (RAK5172)**

The L1 side of the line is connected to terminal #3, and L2 is connected to terminal #8. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2 and #2 and #6.



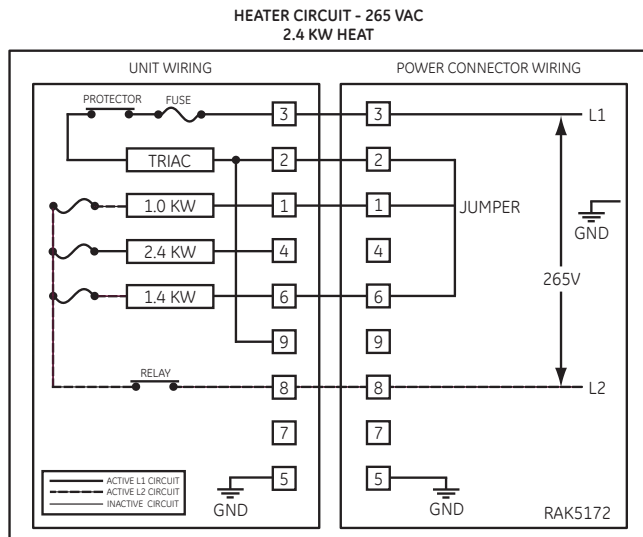
**Power Connector Plug 20-Amp - 265 VAC,  
3.4 KW Heat (RAK5202)**

The L1 side of the line is connected to terminal #3, and L2 is connected to terminal #8. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2 and #2 and #4.



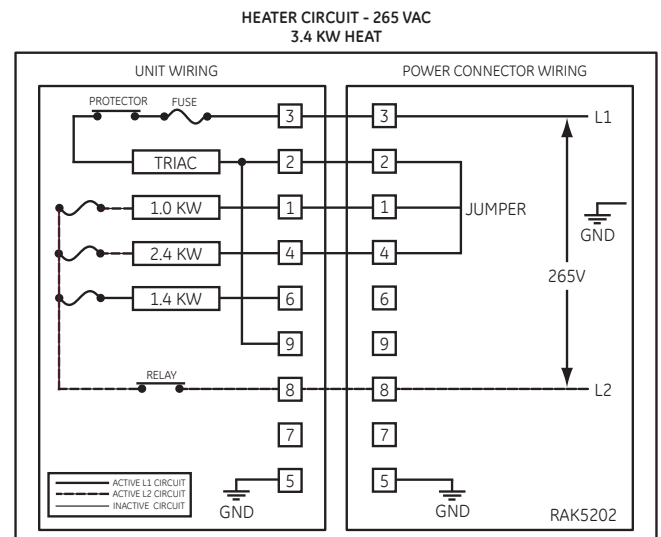
**Heater Circuit Schematic 15-Amp - 265 VAC,  
2.4 KW Heat (RAK5172)**

When the relay contacts close, the circuits to the 1.4 KW and 1 KW heaters are completed from L1 through the jumper wires between terminals #1 and #2, #2 and #6, and back to L2 through terminal #8. This makes a total of 2.4 KW of heat available to heat the room.



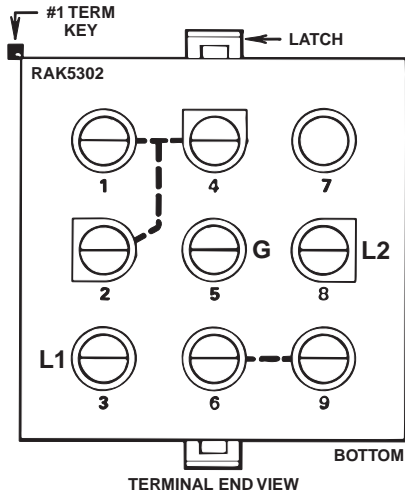
**Heater Circuit Schematic 20-Amp - 265 VAC,  
3.4 KW Heat (RAK5202)**

When the relay contacts close, the circuits to the 2.4 KW and 1 KW heaters are completed from L1 through the jumper wires between terminals #1 and #2, #2 and #4, and back to L2 through terminal #8. This makes a total of 3.4 KW of heat available to heat the room.



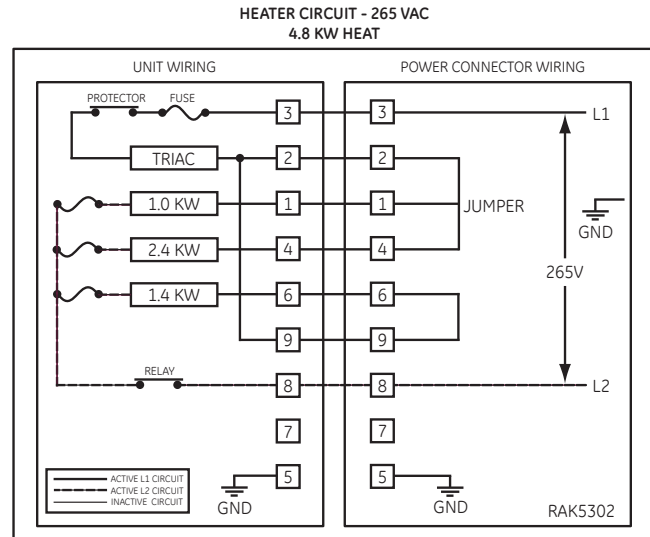
**Power Connector Plug 30-Amp - 265 VAC,  
4.8 KW Heat (RAK5302)**

The L1 side of the line is connected to terminal #3, and L2 is connected to terminal #8. The ground wire is connected to terminal #5. There are jumper wires between terminals #1 and #2, #2 and #4, and #6 and #9.



**Heater Circuit Schematic 30-Amp - 265 VAC,  
4.8 KW Heat (RAK5302)**

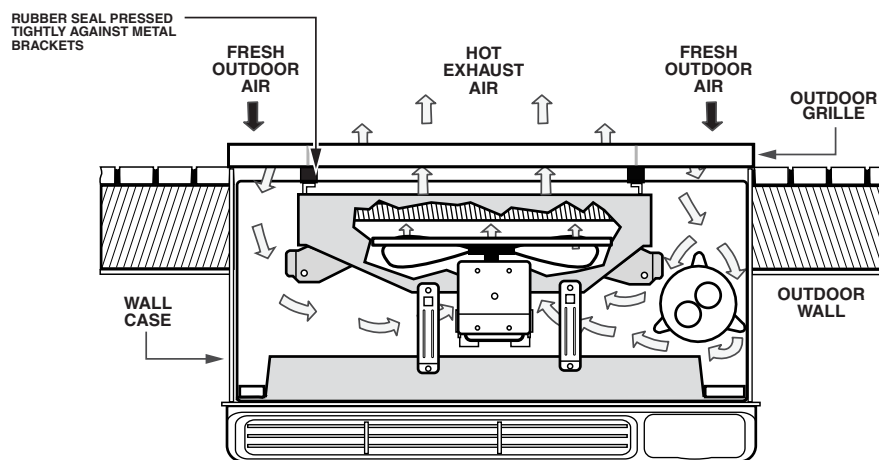
When the relay contacts close, the circuits to the 1 KW, 2.4 KW, and 1.4 KW heaters are completed from L1 through the jumper wires between terminals #1 and #2, #2 and #4, #6 and #9, and back to L2 through terminal #8. This makes a total of 4.8 KW of heat available to heat the room.



# Airflow

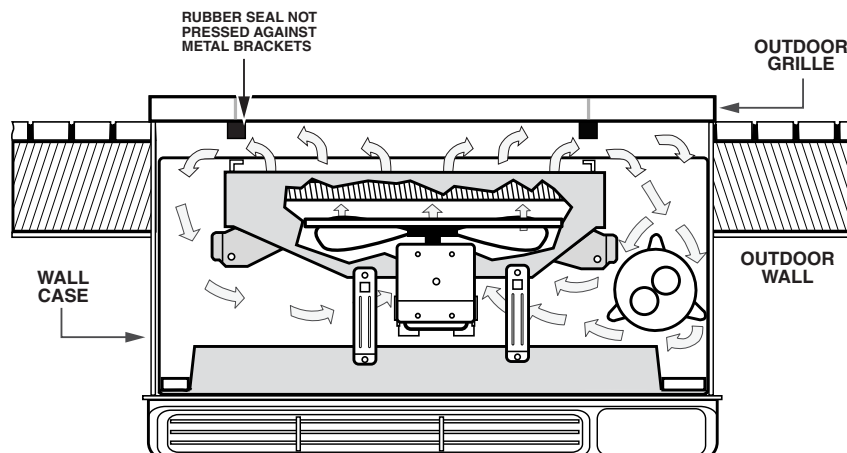
## Proper Outdoor Coil Airflow

When properly installed in the correct wall case, the rubber seals on the inside of the outdoor grille should fit tightly against the metal brackets on the outdoor coil. This will prevent condenser hot exhaust air from being recirculated through the coil, and will allow fresh outdoor air to enter from each of the rear sides of the outdoor grille. The outdoor fan motor and grille work together to provide proper airflow. The fan motor draws air in through each side of the outdoor grille, and the air is then blown out through the condenser coil, and discharged to the outside. When sliding the chassis back into the case, it is very important to slide the chassis all the way into the case for proper airflow. It is also important to have the proper outdoor grille installed on the case.



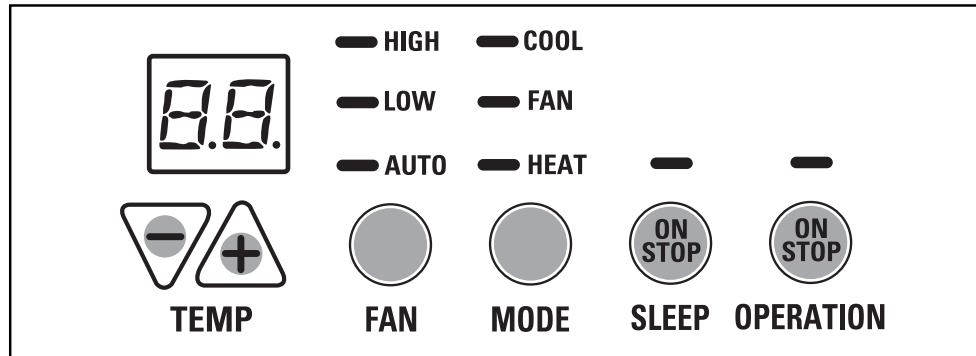
## Improper Outdoor Coil Airflow (Recirculating Hot Exhaust Air)

When improperly installed, the rubber seals on the inside of the outdoor grille do not fit against the metal brackets on the outdoor coil. This allows hot outdoor coil exhaust air to recirculate across the compressor and outdoor coil. When this condition occurs, the compressor overheats and eventually cycles off on the compressor overload protector (compressor shuts off). After the compressor cools, it restarts and the cycle repeats itself. If this installation problem is not corrected, damage to the compressor can occur.



# Control Features

## User Controls



### TEMP CONTROL    FAN, MODE & SLEEP OPERATION

1

2



## Controls

### 1 Temp Control

The temp control is used to maintain the room temperature. The compressor will cycle on and off to keep the room at the same level of comfort.

Press the ▲ pad to raise the temperature.

Press the ▼ pad to lower the temperature.

**NOTE:** The display shows the set temperature, not the room temperature.

### 2 Sleep

Press to set the air conditioner to run for 8 hours before it automatically returns to the previous setting.

When in the cooling mode and the sleep timer is set, the set temperature will automatically increase 2°F after the second hour then 1°F each hour over the next two hours. Also, the fan speed will change to low. When in the heating mode, the set temperature will decrease in the same manner.

To cancel the sleep mode, press the **MODE** pad or the **SLEEP** pad a second time.

### 2 Fan, Mode and Operation Control

**FAN**—Sets the fan operation for **HIGH**, **LOW** or **AUTO** speed. When set at **AUTO**, it automatically switches between **LOW** and **HIGH** as room temperature changes.

**MODE—COOL**—For cooling

**FAN**—For fan-only operation

**HEAT**—For heating

**OPERATION—ON/STOP**—Turns the unit on or off. Power remains connected to the Zoneline. The Freeze/Heat Sentinel features still function if active. See the *Freezer/Heat Sentinel* section on page 6.

**NOTE:** The temperature display will flash to indicate a possible unit malfunction. Set operation control to **STOP** and then restart the unit. If the flashing light reappears within 30 minutes, call for service.

### Quick Heat Recovery

Activates each time the thermostat is switched from **STOP** or **COOL** mode to **HEAT** mode. Electric heaters are energized until the thermostat set point is reached. On heat pump models, the heat pump operation will resume at the next call for heat.

### About Your Heat Pump (6100 Series only)

Heat pumps can save money by removing heat from the outside air—even when the outside temperature is below freezing—and releasing that heat indoors.

To get the best performance from your heat pump, don't change the room thermostat 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 and stops after the compressor cycles off.

When the outdoor temperature is lower than 25°F, heat is provided by the electric heater in the air conditioner instead of by the heat pump.

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



## Remote Thermostat

The unit can be controlled by an externally mounted, remote thermostat.

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

## Central Desk Control

Some customers may want to control the unit from a remote location with a central controlling device. The general term given to systems such as this is Central Desk Control (CDC). The most common installation of this type of system is a switch mounted at the registration desk. Upon guest check-in, a button is pushed or a switch is moved to allow the air conditioner to operate. Likewise, when the guest checks out, the device is put into the OFF position, so the unit will **not** operate while the room is vacant.

It is not necessary that the controlling device be located at a central desk to control the unit operation. In some resort areas, devices are connected to sliding glass doors. Opening the door causes a contact to close, turning the air conditioner off. This prevents the waste of energy by not allowing the air conditioner to operate when warm humid air is entering the room.

Some systems operate by motion sensors or heat sensing detectors mounted in the room. These types of systems determine occupant presence in the room and control the unit accordingly. If no one is in the room, the device signals the air conditioner to turn off.

There are a wide variety of devices available, each with its own benefits and constraints. While GE does not offer components that are external to the unit for a CDC system, GE Zonelines are compatible with most CDC and energy management systems. Zonelines provide a 24 VAC circuit that powers the CDC system, and no external power is needed.

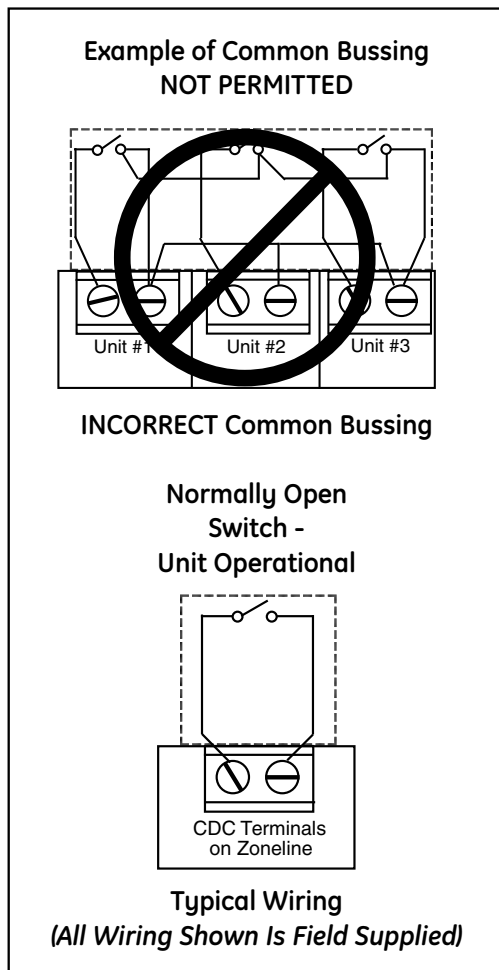
All Zoneline 6100 Series units are compatible with a simple on/off 2-wire Central Desk Control system. Consult with the provider of other energy management systems to be sure they are compatible with the GE Zoneline. Zonelines have standard connectors factory installed to provide a CDC interface that permits the unit to be connected to most energy management systems. The devices connected to the Zoneline units require no power supply or transformers external to the unit.

**Important CDC Comments (All Series Applicable)**

1. When the switching device closes the circuit of the CDC conductors, unit operation stops.
2. Do not use a common buss (at the unit or at the switch panel) in the wiring. Both wires comprising the circuit must connect to the unit connectors and to the controlling switch. Running 1 wire from 1 unit to another unit is common bussing and may damage internal components or cause erratic operation of the system.

3. A 24-volt transformer is contained in the Zoneline. No external voltage may be applied to the unit through the CDC terminals. (Voltage on the CDC conductors is 24 volts AC.)
4. Recommended wire size must be followed as a minimum requirement.

<b>Wire Size #AWG</b>	<b>Maximum Allowable Length</b>
#22	600 Ft.
#20	900 Ft.
#18	1500 Ft.
#16	2000 Ft.



Freeze Sentinel™ remains operational when the unit is connected to a CDC system. Even if the unit is turned OFF at the central location, if the sensor at the unit detects the low temperature, the electric resistance heaters and the fan will automatically turn on. Connecting the Zoneline to a CDC system does not eliminate the ability to connect the unit to a remote thermostat. Once the circuit is opened and control of the unit is removed from the CDC system, the selected controls - either the unit-mounted control or the remote thermostat - govern the operation of the unit.

**CDC Terminal Location and Typical Wiring**

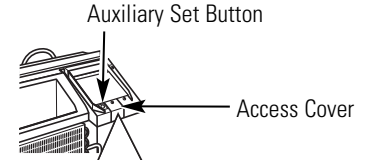
See the following section, *Auxiliary Controls*, for location of CDC terminals on unit.

**Auxiliary Controls—Aux Set Button**

The auxiliary set controls are located behind the room cabinet, below the control panel.

Remove the room cabinet. See the *To Remove the Room Cabinet* section.

The owner is responsible for ensuring the auxiliary controls are set to the desired function. There are 9 different modes that can be set using the auxiliary set button. To change modes, press **AUX SET** ("AU" appears on the display). Press the mode button on the control pad until the first digit in the display shows the number corresponding to the mode you are choosing and the correct HEAT/COOL LED is lit. Press the up or down arrow (shown in the second digit of the display) to make the mode setting selection where applicable. Press the **AUX SET** button to confirm the selection.



Press "AUX SET"	First Digit	Second Digit
Press "Mode"	Smart Fan	- Cycle / - Continue
Load Shedding	- Off / - On	
Sentinel		
Constant Fan		
Temperature Limit		
Class 2 Mode		
Duct Mode		
All I2R Mode (AZ61 Only)	- Off / - On	
Boost Heat (AZ61 Only)		

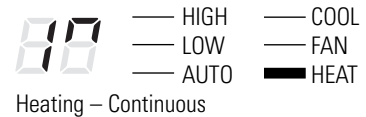
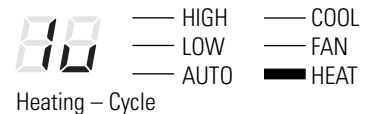
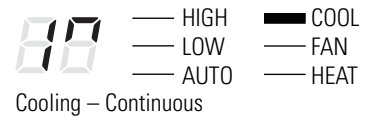
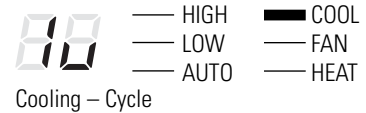
  

COOL	HEAT
0: 60F-85F	0: 60F-65F
1: 64F-85F	1: 60F-70F
2: 66F-85F	2: 60F-72F
3: 67F-85F	3: 60F-74F
4: 70F-85F	4: 60F-76F
5: 72F-85F	5: 60F-78F
6: 74F-85F	6: 60F-80F
7: 76F-85F	7: 60F-85F

**MODE 1 Smart Fan—Cooling/Heating**

The default setting for Mode 1 is as follows:  
 Cooling: Continuous (ON)  
 Heating: Cycle (OFF)

Press **MODE** until a 1 appears in the first digit of the display for **Smart Fan** cool mode. The **COOL** LED light on the main control will be on. To change to heat mode, press **MODE** again. The **HEAT** LED light on the main control will be lit. Press the down arrow to set the indoor fan to cycle on/off when the unit is heating or cooling "□." Press the up arrow to set the indoor fan to run continuously "▣." This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.



**MODE 2 Load Shedding (Central Desk Control)**

The default setting for Mode 2 is OFF.

This feature is active only if the unit is connected to a CDC and the CDC has control. Press **MODE** until a 2 appears in the first digit of the display for **Load Shedding** mode. Press the down arrow for OFF "□" or the up arrow for ON "▣." This is shown in the second digit of the display. When this mode is on, only the indoor fan can be turned ON or OFF with the unit controls. When this mode is off, all operation is disabled except Heat/Freeze Sentinel (Mode 3). Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.



### MODE 3 *Freeze Sentinel/Heat Sentinel*

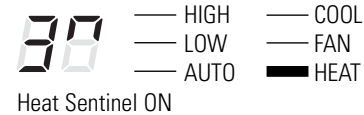
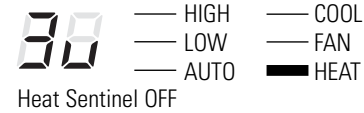
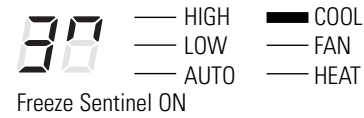
In the default setting for Mode 3, *Heat Sentinel* is off, *Freeze Sentinel* is on.

Press **MODE** until a 3 appears in the first digit of the display for *Freeze Sentinel* mode. The **COOL** LED light on the main control will be on. Press **MODE** again to change to the *Heat Sentinel*. The **HEAT** LED light on the main control will be on. Press the down arrow for OFF "⏏" or the up arrow for ON "⏏." This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.

When *Freeze Sentinel* is activated, it automatically provides heat without user interface. This helps to prevent plumbing damage by turning the heater and indoor fan ON at 41°F and OFF at 46°F.

When *Heat Sentinel* is activated, it automatically provides cooling without user interface. This helps to prevent an excessively hot room by turning the air conditioner ON at 85°F and OFF at 80°F.

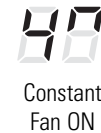
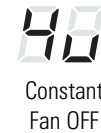
**NOTE:** These functions are active whenever the unit is plugged in, even if the unit is in the STOP position.



### MODE 4 *Constant ON Fan*

The default setting for Mode 4 is OFF.

Press **MODE** until a 4 appears in the first digit of the display to set the fan to run continuously at high speed, even if the unit is in the STOP position. Press the down arrow for OFF "⏏" or the up arrow for ON "⏏." This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.



### MODE 5 *Temperature Limiting*

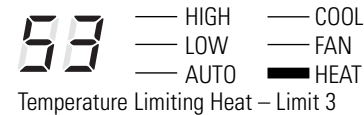
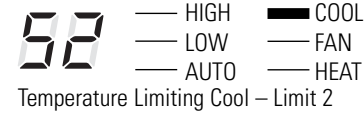
The default setting for Mode 5 is as follows:

Cool: 0 (60°F to 85°F)

Heat: 7 (60°F to 85°F)

Press **MODE** until a 5 appears in the first digit of the display for *Temperature Limiting* cool mode. The **COOL** LED light on the main control will be lit. To change to heat mode, press **MODE** again and the **HEAT** LED light on the main control will be lit. To set the temperature limits, press the up or down arrow keys. The second digit of the display will be between 0 and 7 depending on the limit you want to set. The chart shows the limits available. Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.

Temperature limits—Cool	Temperature limits—Heat
0 = 60°F to 85°F	0 = 60°F to 65°F
1 = 64°F to 85°F	1 = 60°F to 70°F
2 = 66°F to 85°F	2 = 60°F to 72°F
3 = 68°F to 85°F	3 = 60°F to 74°F
4 = 70°F to 85°F	4 = 60°F to 76°F
5 = 72°F to 85°F	5 = 60°F to 78°F
6 = 74°F to 85°F	6 = 60°F to 80°F
7 = 76°F to 85°F	7 = 60°F to 85°F

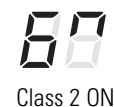


### MODE 6 *Remote Thermostat – Class 2*

The default setting for Mode 6 is OFF.

Setting this mode to ON will allow the unit to operate with a Class 2 Remote Control Wall Thermostat. Press **MODE** until a 6 appears in the first digit of the display for **Class 2** mode. Press the down arrow to turn the option OFF "⏏." Press the up arrow to turn this option ON "⏏." This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.

**Note:** When the unit is switched to "Mode 6 On" (remote thermostat operation) the unit control is inoperative. Display and all LEDs are out, pads do not function. Pressing the "Aux Set" will re-energize display.



**MODE 7** *Duct Mode*

The default setting for Mode 7 is OFF.

This setting is used when the unit is installed using a duct adapter kit. If the unit is ducted, the Duct Mode needs to be set to ON. This increases the fan speed to ensure proper circulation.

Press **MODE** until a 7 appears in the first digit of the display. Press the up or down arrow keys to set this switch to OFF "⏏" or ON "⏏". This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode.

For Model AZ6100, press **MODE** to continue setting other functions. Pressing **MODE** on Model AZ4100 will return you to **AUX SET** mode and an "AU" will appear in the display.



Duct Mode OFF



Duct Mode ON

MODELS				Indoor Fan Speed				
				HIGH - Duct	LOW - Duct	HIGH - Normal	LOW - Normal	
				Cooling/ Fan Only	Cooling/ Fan Only	Cooling/ Fan Only	Cooling/ Fan Only	
41	07K	AZ41E07DAB AZ41E07DAC	AZ41E07EAB AZ41E07EAC	1100	960	850	710	
		AZ41E07DAP	AZ41E07EAP	1140	1040	900	800	
	09K	AZ41E09DAB AZ41E09DAC	AZ41E09EAB AZ41E09EAC	1230	990	980	740	
		AZ41E09DAP	AZ41E09EAP	1320	1100	1080	860	
	12K	AZ41E12DAB AZ41E12DAC	AZ41E12EAB AZ41E12EAC	1380	1180	1140	940	
		AZ41E12DAP	AZ41E12EAP	1380	1180	1200	1050	
	15K	AZ41E15DAB AZ41E15DAC	AZ41E15EAB AZ41E15EAC	1380	1180	1140	940	
	61	07K	AZ61H07DAB AZ61H07DAC AZ61E07DAD	AZ61H07EAB AZ61H07EAC AZ61E07EAD	1220	930	970	680
09K			AZ61H09DAB AZ61H09DAC AZ61H09DAD	AZ61H09EAB AZ61H09EAC AZ61H09EAD	1270	950	1020	700
			12K	AZ61H12DAB AZ61H12DAC AZ61H12DAD	AZ61H12EAB AZ61H12EAC AZ61H12EAD	1380	1180	1140
15K		AZ61H15DAB AZ61H15DAC AZ61H15DAD		AZ61H15EAB AZ61H15EAC AZ61H15EAD	1380	1180	1140	940

## MODE 8 All-Electric Heat

The default setting for Mode 8 is OFF.

This electric heat option functions only on the 6100 model. When this option is ON "□," heat pump operation is locked out, causing the unit to provide only electric resistance heat.

To set *All-Electric Heat* option, press **MODE** until an 8 appears in the first digit of the display. Press the up or down arrow keys to set this switch to OFF "□" or ON "□." This is shown in the second digit of the display.

Press **AUX SET** to confirm your selection and exit **AUX SET** mode, or press **MODE** to continue setting other functions.



All-Electric  
Heat OFF



All-Electric  
Heat ON

## MODE 9 Heat Boost

The default setting for Mode 9 is OFF.

When *Heat Boost* is ON and outer temperatures are between 25°F and 46°F, heat pump only operation is locked out. This setting is used to provide supplementary heat to the heat pump operation by electric resistance heat in conditions where the heat pump-only operation is not sufficient to maintain a consistent, comfortable room temperature. **NOTE:** Temperature Boost option should not be used with remote thermostat operation. This will cause the unit to switch to resistance heat when the outdoor temperature is 46°F.

To set Heat Boost, press **MODE** until a 9 appears in the first digit of the display. Press the up or down arrow keys to set this switch to OFF "□" or ON "□." This is shown in the second digit of the display. Press **AUX SET** to confirm your selection and exit **AUX SET** mode.



Heat Boost OFF

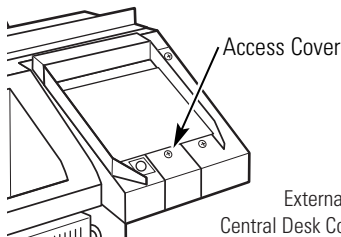


Heat Boost ON

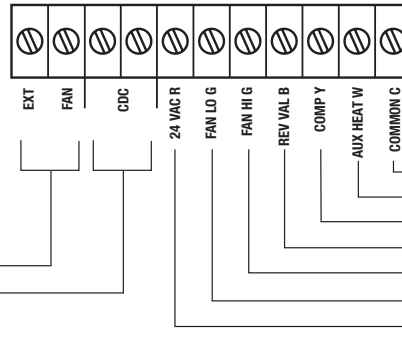
## Auxiliary Controls—Terminal Connections

The auxiliary controls are located behind the room cabinet beneath the access cover.

- 1 Turn off and unplug the unit.
- 2 Remove the room cabinet. See the *To Remove the Room Cabinet* section.
- 3 Remove the screw from the access cover.
- 4 To make wiring connections, insert the wires into the bottom of the terminals and tighten screws securely.
- 5 After all desired connections have been made, replace the access cover and room cabinet.



External Fan  
Central Desk Control



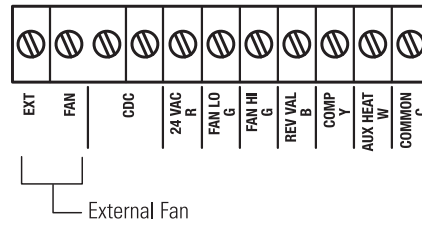
The owner is responsible for making all connections and setting the appropriate **AUX SET** mode.

### ⚠ CAUTION:

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

### External Fan (Obtained locally)

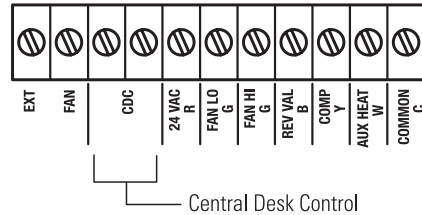
When connected, an auxiliary or external fan can be controlled with the indoor fan motor on the Zonline. Connections provide 24 V AC to energize a remote relay, turning on the external fan.



### Central Desk Control


When connected, the unit can be turned ON or OFF with a switch located at the Central Control Panel. A separate wire pair must be run from each separate controlling switch to each individual Zonline.

Refer to MODE 2 on page 27 for fan settings.



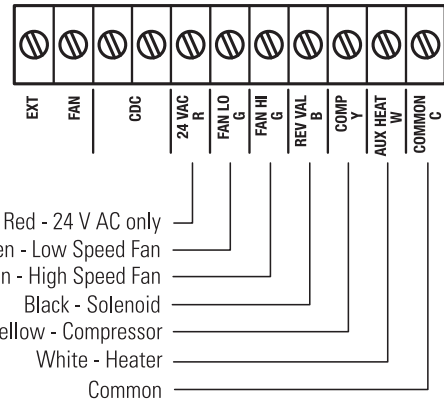
### Remote Thermostat

When connected to a remote thermostat, the indoor air temperature sensing is shifted from the unit to the remote thermostat. For this reason, the units will operate slightly differently when connected to a remote thermostat. The following chart shows the unit operation when connected to a remote thermostat.

**NOTE:** The Class 2 Mode setting (Mode 6) must be set to ON "  " for the unit to operate with a Class 2 Remote Wall Thermostat. (See the installation instructions supplied with the remote thermostat and Mode instructions on page 28.)



Class 2 Shown ON



**IMPORTANT:** The Zonline thermostat connections provide 24 V AC only.

If using a digital/electronic wall thermostat, you must set it to the 24 V AC setting. See the Installation Instructions for the wall thermostat.

### ⚠ CAUTION:

Damage to a wall thermostat or to the Zonline electronics can result from improper connections. Special care must be used in connecting the wires. No line voltage connections should be made to any circuit. Isolate all wires in building from line voltage.

Feature	6100 Series Heat Pump with Electric Heat
Indoor Frost Control	Yes
Freeze Sentinel	Yes
Auto Fan Speed	No
Electronic Temperature Limiting	No
Switch to Resistance Heat Based On Indoor Temperature	Determined by Remote Thermostat
Switch to Resistance Heat Based On Outdoor Temperature	Yes
Reverse Cycle Defrost	Yes
Simultaneous Resistance Heat with Heat Pump	No
Resistance Heat Lockout	Yes
"Smart Fan" Fan Cycle	Fan ON/Auto Set On Remote Thermostat
Central Desk Control	Yes

## Remote Thermostat Control

In some installations, control of the operation of the unit at a location remote from the unit itself may be desired. A unit mounted high in the wall or over a door, where the unit-mounted controls are inaccessible, can be connected to a wall-mounted thermostat. Other installations may use remote thermostat control for design or performance enhancement. The unit is connected to the thermostat by low-voltage wiring, that permits the operation of the unit to be selected and the temperature sensed at the thermostat.

**Important:** Remote thermostat wiring should not be run through wall case. Thermostat wiring should exit the wall below the unit and enter the unit between room cabinet and chassis. Wire molding may be used to hide thermostat wiring. If a sub-base is used, the thermostat wiring may be concealed by the sub-base. Thermostat wiring should not be run parallel to line voltage wires since induced current may cause erratic operation.

All Zonline 6100 Series units are adaptable to class 2 remote low-voltage thermostats. The only additional field-supplied components are the remote thermostat and wiring necessary to connect it.

The controls on the unit are not operational when the remote control function is used.

### Resistance Heat Models

The Zonline 6100 resistance heat units may be connected to a single-stage thermostat designed for use with cooling and electric heat systems. GE offers 3 thermostats compatible with the 6100 Series unit.



**RAK163A1** — a mechanical manual changeover thermostat requiring four connection wires.



**RAK164D1** — a solid-state digital manual changeover thermostat requiring five connection wires.



**RAK164P1** — a solid-state digital programmable auto-changeover thermostat requiring five connection wires.

The class 2 Mode function (Mode #6 on the auxiliary controls) must be set to the ON mode to enable remote thermostat control.

Refer to installation instructions packaged with the chassis.

Compatibility of other thermostats considered for use with the GE Zonline is the responsibility of the customer. The control voltage on the remote control conductors is 24 volts AC. The AC voltage may not be compatible with some solid-state thermostats.

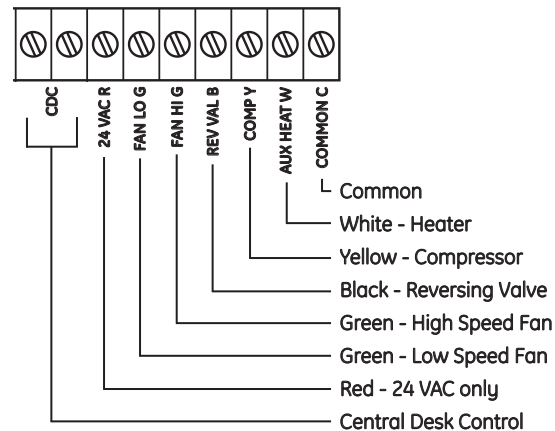
The fan speed for the 6100 Series in remote thermostat operation is selected by the connection of the fan wire from the thermostat to either the HIGH or LOW terminal on the unit. See the sketch of the unit terminals for the location of the HIGH and LOW fan-speed terminals. Operating the unit in low fan-speed reduces the operating sound level of the unit.

Freeze Sentinel™ remains operational if the unit is connected to a remote thermostat. The unit may be connected to a Central Desk Control (CDC) system and controlled with a remote thermostat when the CDC system has the unit in operation.

### Field Wiring Terminal

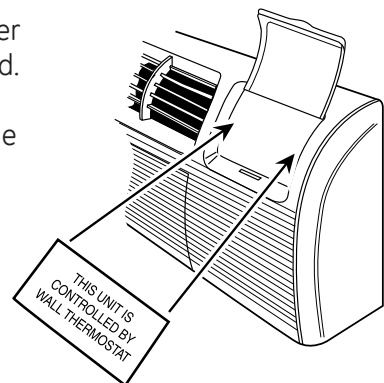
CDC - Central Desk Control  
R - 24 VAC only  
G - Fan Hi Speed  
G - Fan Lo Speed

B - Reversing Valve  
Y - Compressor  
W - Aux Heater  
C - Common



### RAK806 Universal Control Cover Label

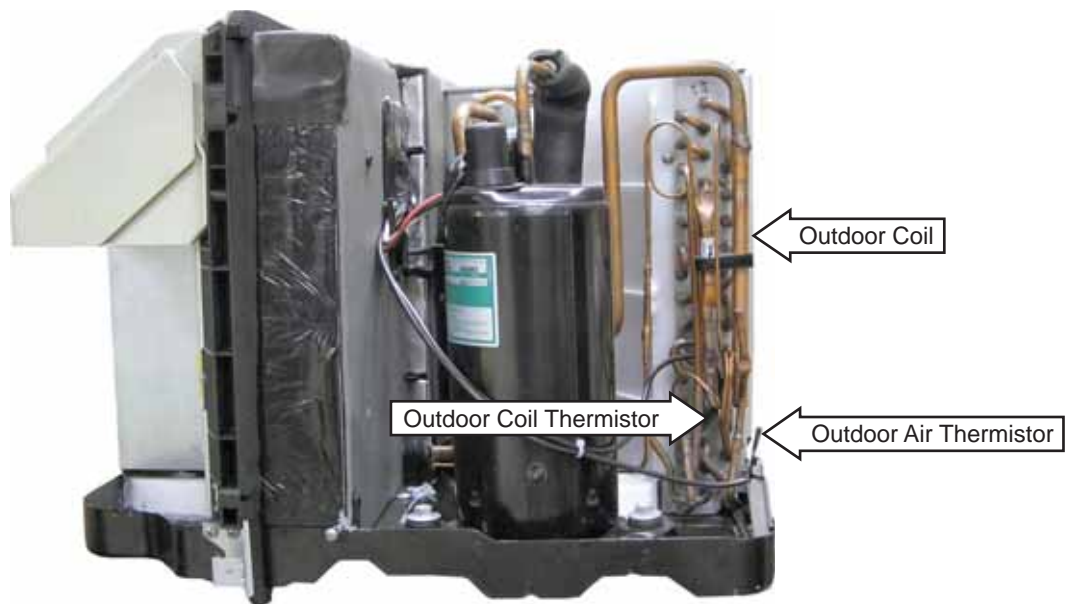
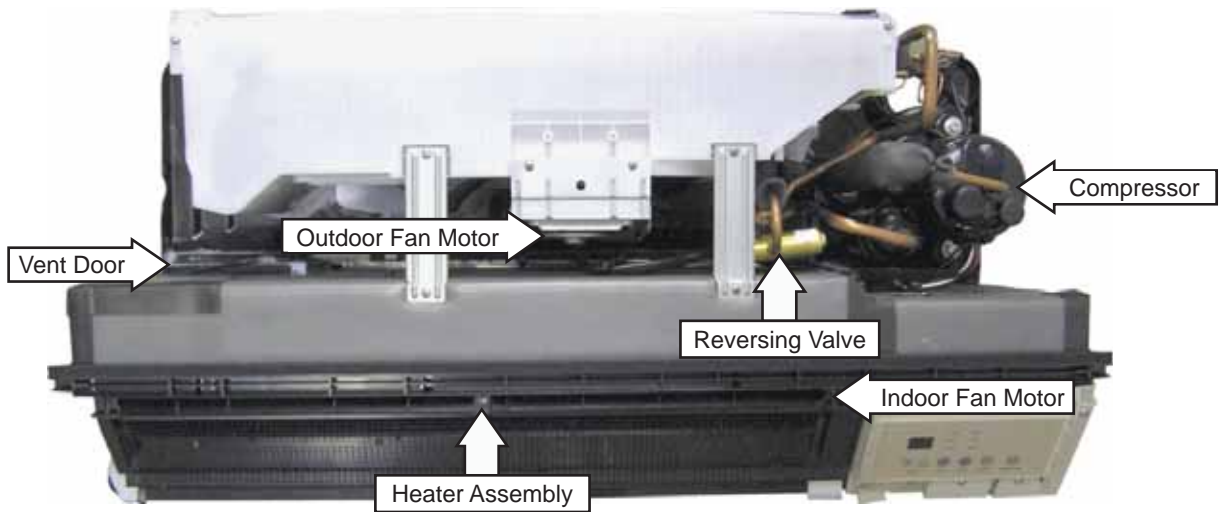
When a Zonline unit is using a remote thermostat control, the RAK806 universal control cover label is recommended. The RAK806 is only available in a package of 10 labels. The label is placed over the control panel directing the user to the wall thermostat for operation of the Zonline unit.





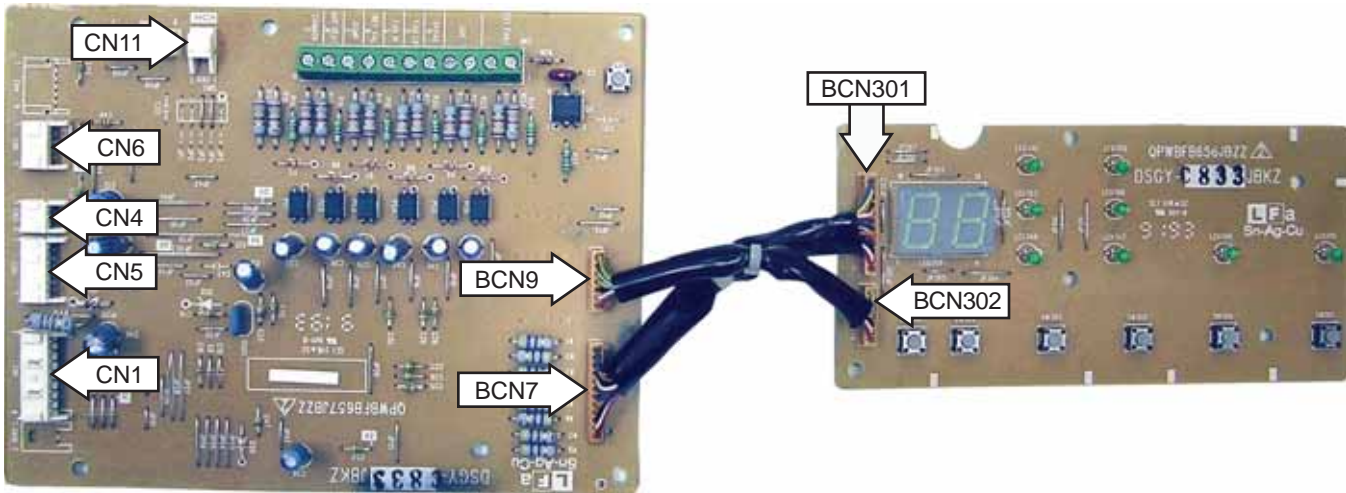
# Component Locator Views

Front View



# Circuit Boards Connector Locator Views

## Main Board and Operation Board



**CN1** - Room Air, Indoor Coil, Outdoor Coil, and Outdoor Air Thermistors

**CN4** - BCN101 on Drive Board

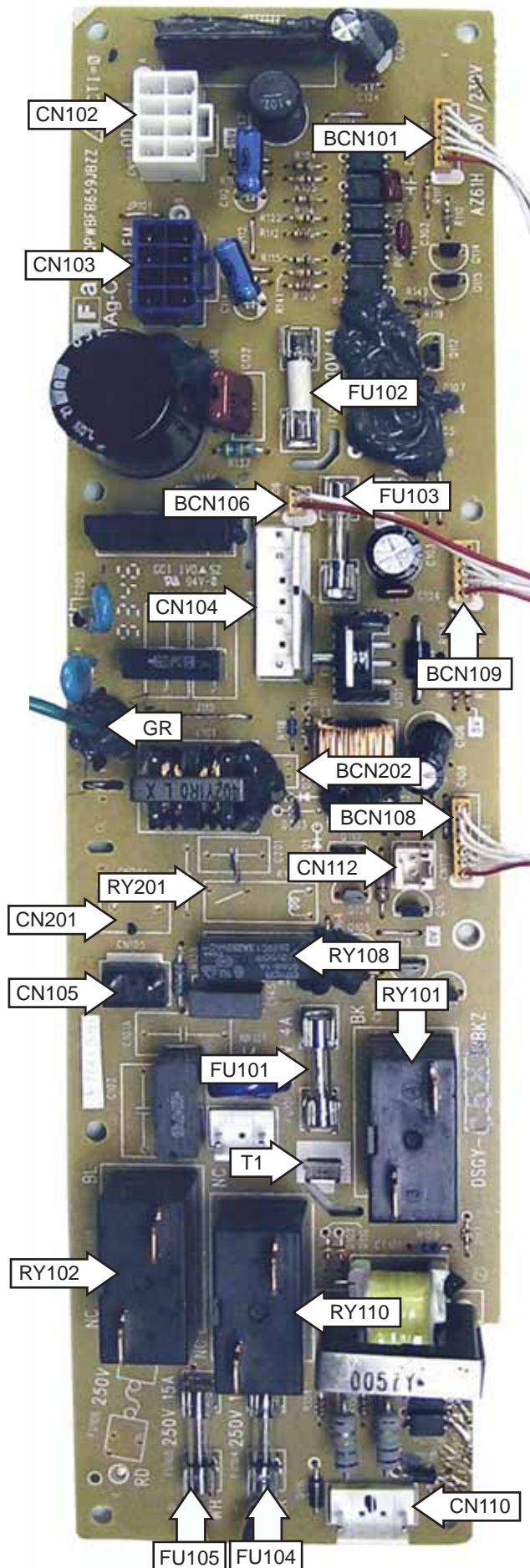
**CN5** - BCN108 on Drive Board

**CN6** - BCN109 on Drive Board

**CN11** -Transformer, 24 VAC

**Note:** Main board connections BCN7 and BCN9 and operation board connections BCN301 and BCN302 are permanently attached.

## Drive Board



- CN102 - Outdoor Fan
- CN103 - Indoor Fan
- CN104 - Transformer
- CN105 - Reversing Valve
- CN110 - Heater Power Check Circuit
- CN112 - Triac
- CN201 - ICR Pump
- RY101 - Compressor
- RY102 - Heater Circuit (1.4 and 2.4 KW Heaters)
- RY108 - Reversing Valve
- RY110 - Heater Circuit (1 KW Heater)
- RY201 - ICR Pump Relay (Pump Equipped Models)
- GR - Ground
- T1 - L1
- FU101 - Transformer Primary (250 Volt - 4 Amp)
- FU102 - 15 VDC to Fan Motors (500 VAC/400 VDC - 1 Amp)
- FU103 - Transformer Secondary (125 Volt - .5 Amp)
- FU104 - 1 KW Heater Fuse (250 Volt - 15 Amp)
- FU105 - 1.4 KW Heater Fuse (250 Volt - 15 Amp)
- FU106 - 2.4 KW Heater Fuse (250 Volt - 15 Amp)

### Note:

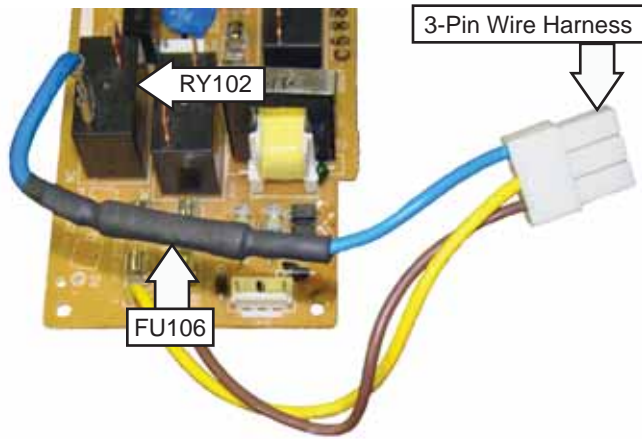
- Harnesses BCN101, BCN106, BCN108, and BCN109 are permanently attached to the drive board. **Do Not** attempt to remove.
- Harness BCN202 (ICR pump) when removed deletes ICR pump operation.
- Fuses FU101, FU102, FU103, FU104, FU105 are replaceable.
- On Zoneline 230 VAC units, FU106 is replaceable only as an in-line fuse assembly.



FU106 Fuse Assembly

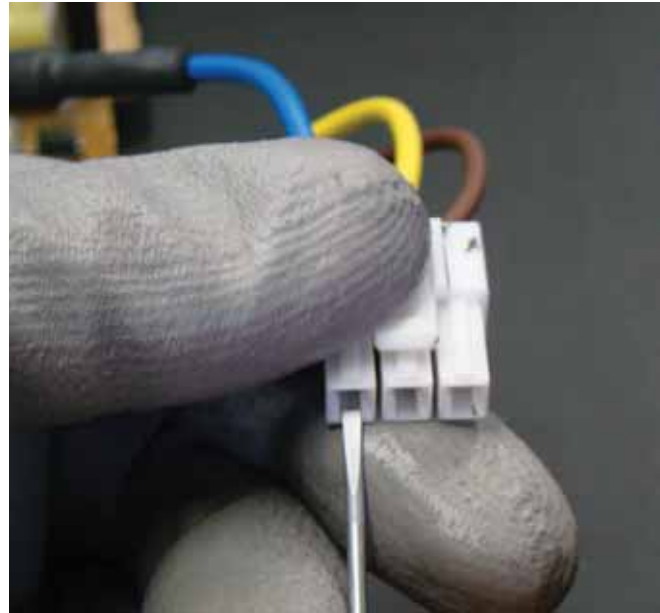
**To replace FU106 in-line fuse assembly:**

1. Disconnect the in-line fuse from RY102.
2. Disconnect the 3-pin wire harness.

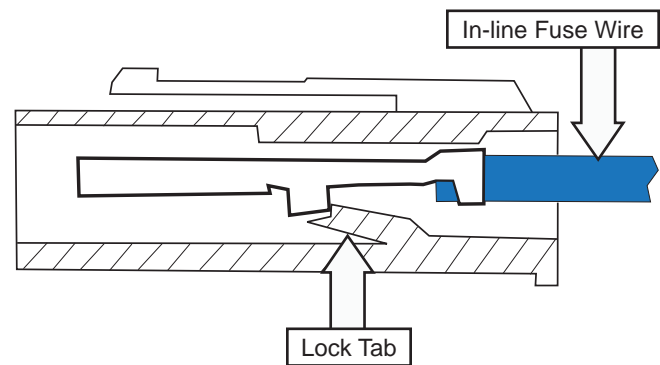


**Note:** 230 VAC drive board shown.

3. Insert a small jewelers, flat blade screwdriver into the fuse link section of the disconnected 3-pin wire connector.



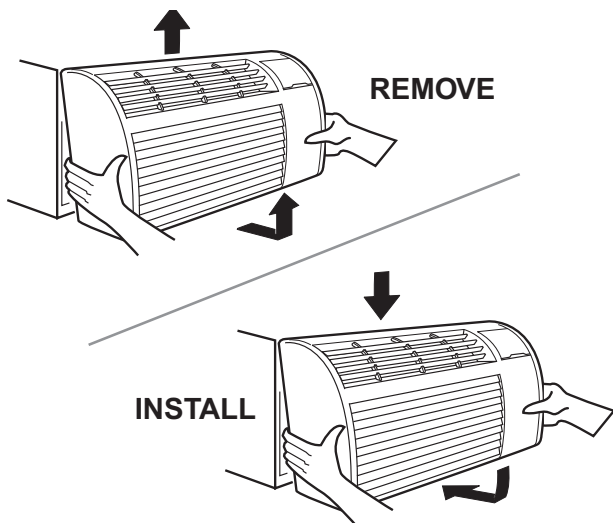
4. Press down the tab that locks the in-line fuse wire to the 3-pin wire connector, and pull out the wire.



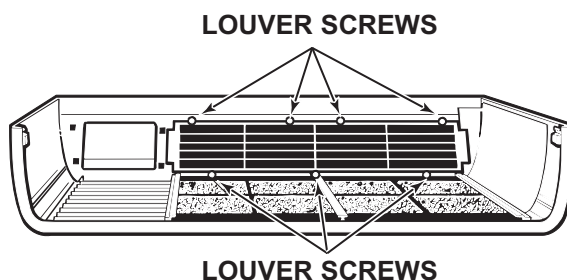
# Components

## Room Cabinet

The room cabinet houses the reversible discharge louvers and the air filters. The room cabinet snaps in place at the top and bottom of the chassis.

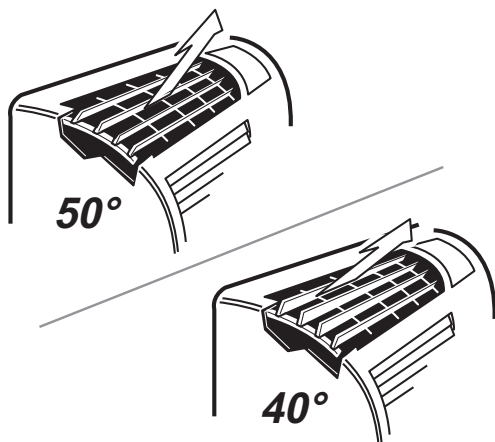


To adjust air direction, remove the room cabinet (grille). Remove the 7 louver screws that hold the louvers in place. Flip the louver section 180°. Replace the screws and the room cabinet.



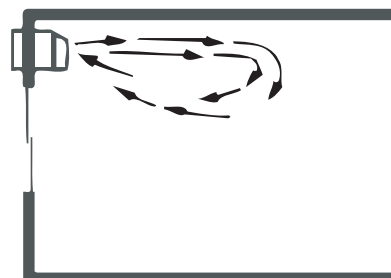
## Louvers

Zoneline air conditioners discharge air from the top of the unit through reversible, 2-position discharge louvers. The unit is shipped from the factory with the discharge louvers at an angle of 40° off vertical. In the alternate position, the louvers will be at an angle of 50° off vertical.



## High Wall Mount Applications

For units mounted high in the wall, the discharge louvers should be at a setting that provides the most horizontal air discharge. Recommended installation is at least 3 inches below the ceiling. In installations where units are close to the ceiling, the most horizontal discharge angle can be obtained by removing the discharge grille from the room cabinet.



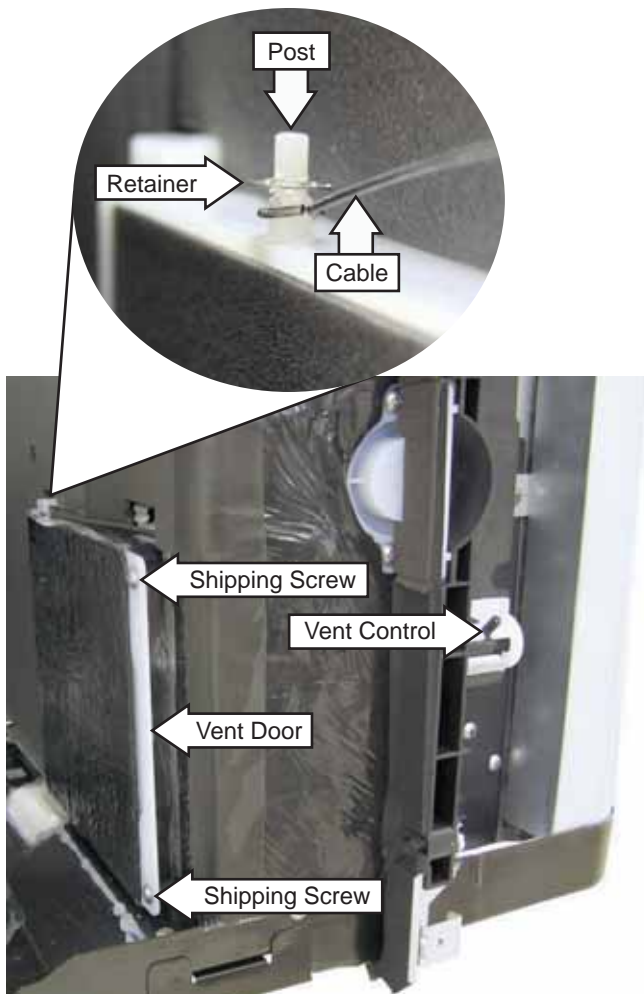
## Vent Door and Cable

The vent door is manually operated by a vent control, which is located at the upper left side of the unit behind the front cabinet. A cable connects the vent control to the vent door. The door is factory-set and locked in the closed position by 2 shipping screws.

Only the air inside the room is circulated and filtered when the door is in the closed position. When set to the OPEN position, some outdoor air (up to 75 cfm) will be drawn into the room. This will reduce the heating or cooling efficiency. A replaceable screen in the vent inlet prevents unwanted matter from entering the plenum.

The vent door assembly is attached to the air conditioner with 5 Phillips-head screws. To replace the vent door, it is necessary to remove the 2 Phillips-head shipping screws. The vent control cable is attached to the door post and held in place with a cable wire retainer.

**Note:** It may be necessary to use a stubby Phillips-head screwdriver to remove the 5 Phillips-head screws.



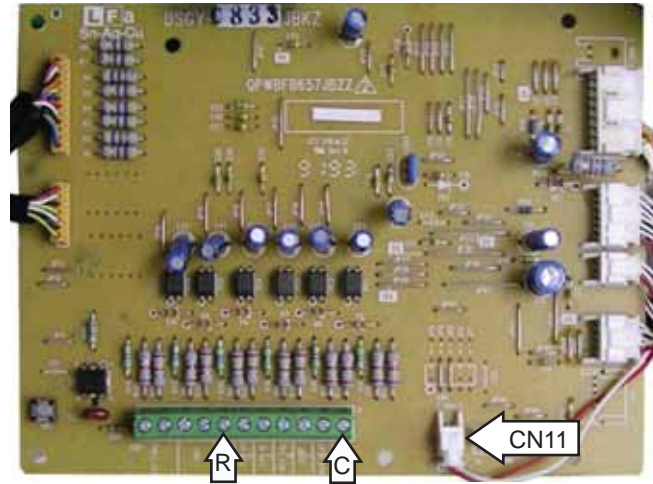
## Control Assembly

The user controls are located behind a door in the top-right of the room cabinet. The room cabinet must be removed to remove the control panel and access the control assembly.

The control assembly consists of a main board and a permanently attached operation board.

The control assembly is attached to the inside of the control panel with 9 Phillips-head screws and 5 plastic locking tabs.

To check power to the main board from the low voltage transformer, check for 24 VAC at the CN11 connecting wire. The main board should read 24 VAC between R and C. (See photo.)

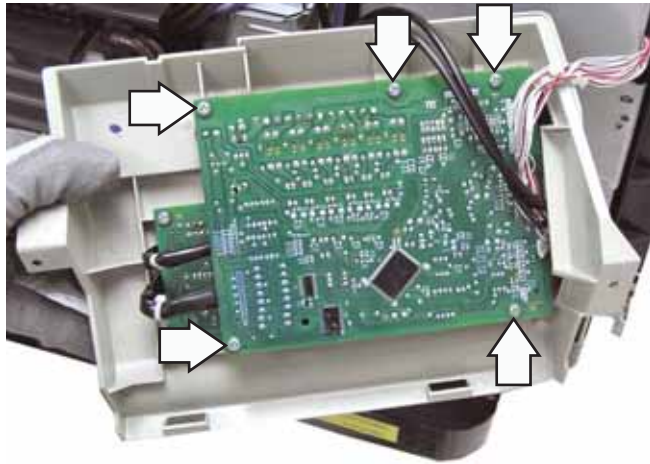


To remove the control assembly:

1. Remove the room cabinet. (See *Room Cabinet*.)
2. Remove the 2 Phillips-head screws that attach the control panel to the air conditioner. Lift the control panel from the 2 top tabs.



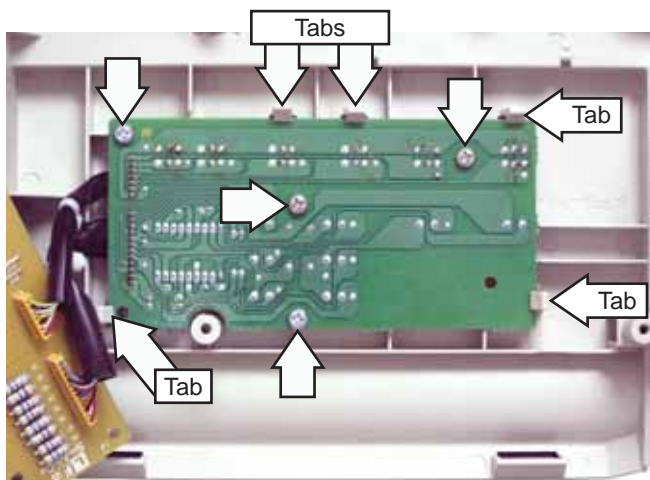
- Turn the control panel over and remove the 5 Phillips-head screws that attach the main board to the inside of the control panel.



- Turn the main board over and disconnect CN1, CN4, CN5, CN6, and CN11 from the main board.

**Note:** Main board connections BCN7 and BCN9, and operation board connections CN301 and CN302 are permanently attached. **DO NOT** attempt to remove.

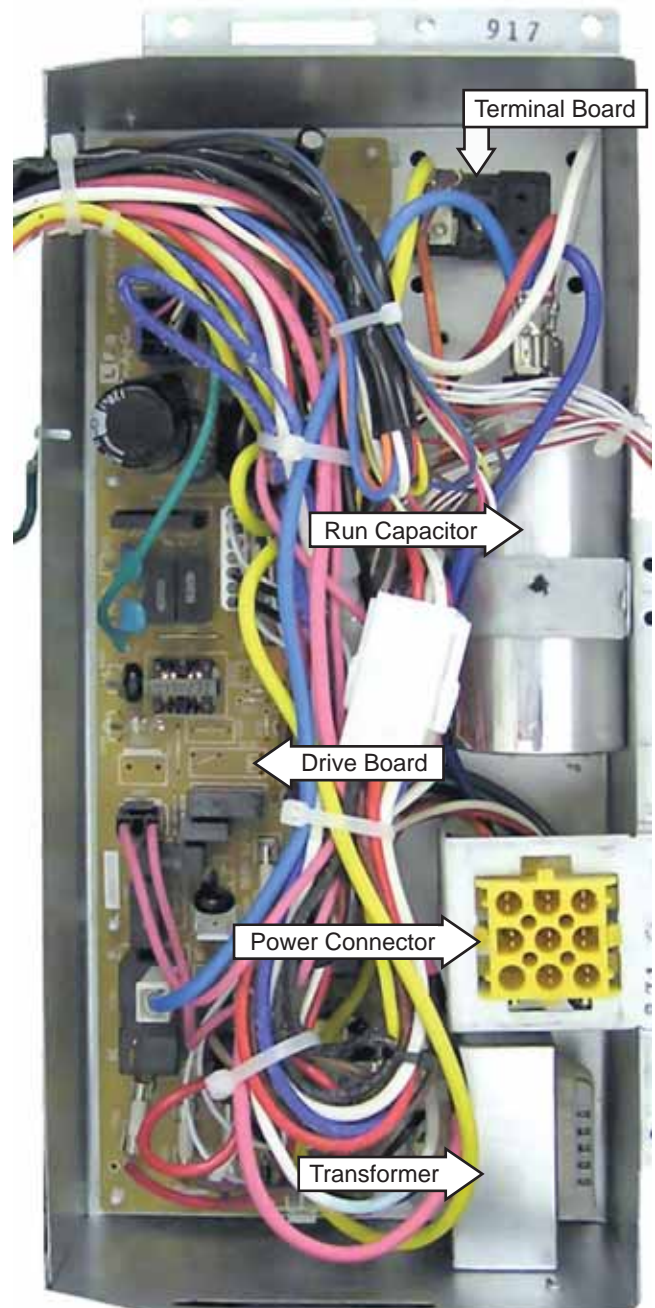
- Remove the 4 Phillips-head screws, then carefully release the 5 tabs that attach the operation board to the inside of the control panel.



## Control Box Components

The control box houses the compressor run capacitor, transformer, main power connector, terminal board, and drive board.

### Control Box Component View

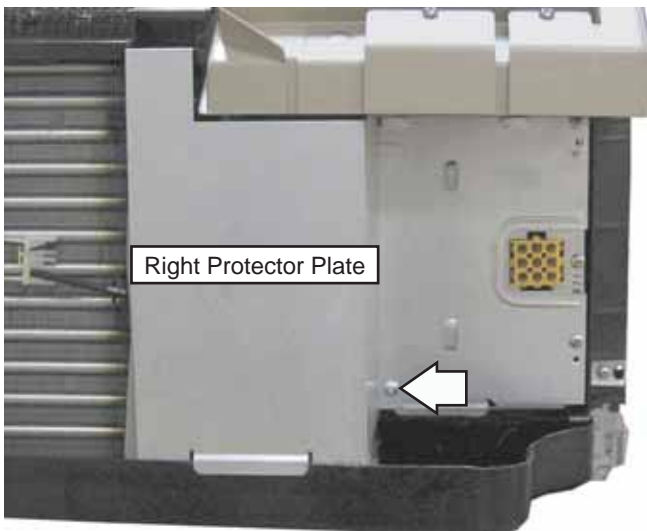


**Note:** 265 VAC drive board shown.

The control box is located on the right corner of the unit. The room cabinet and the right protector plate must be removed to access the control box.

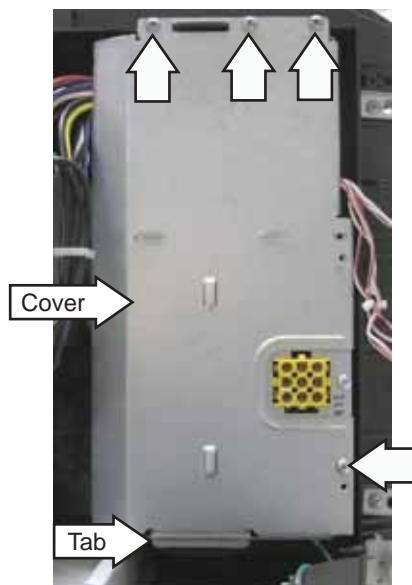
## To access the control box components:

1. Remove the room cabinet. (See *Room Cabinet*.)
2. Remove the 2 Phillips-head screws that attach the control panel to the air conditioner. (See *Control Assembly*.)
3. Lift the control panel from the 2 top tabs. (See *Control Assembly*.) Position the control panel to the right.
4. Remove the Phillips-head screw, then lift and remove the right protector plate.



5. Remove the 4 Phillips-head screws that hold the control box cover in place. Remove the control box cover.

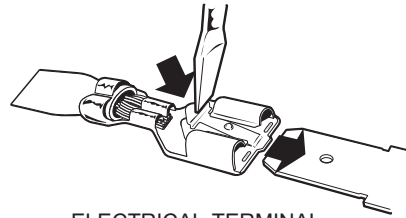
### Control Box



**Note:** When reinstalling the control box cover, place the bottom tab of the cover in the slot of the control box housing BEFORE securing screws.

## Wire Terminals

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, press the clip, using a small blade screwdriver and pull the wire off the terminal as shown.



ELECTRICAL TERMINAL  
RELEASE/LOCKING TAB

## Run Capacitor

The compressor run capacitor is attached to the control box with a strap and a Phillips-head screw. To access the capacitor, it is necessary to remove the control box cover.

The back of the strap is inserted into a slot in the control box. The capacitor is properly installed when the rim of the capacitor is positioned in the indent in the control box.

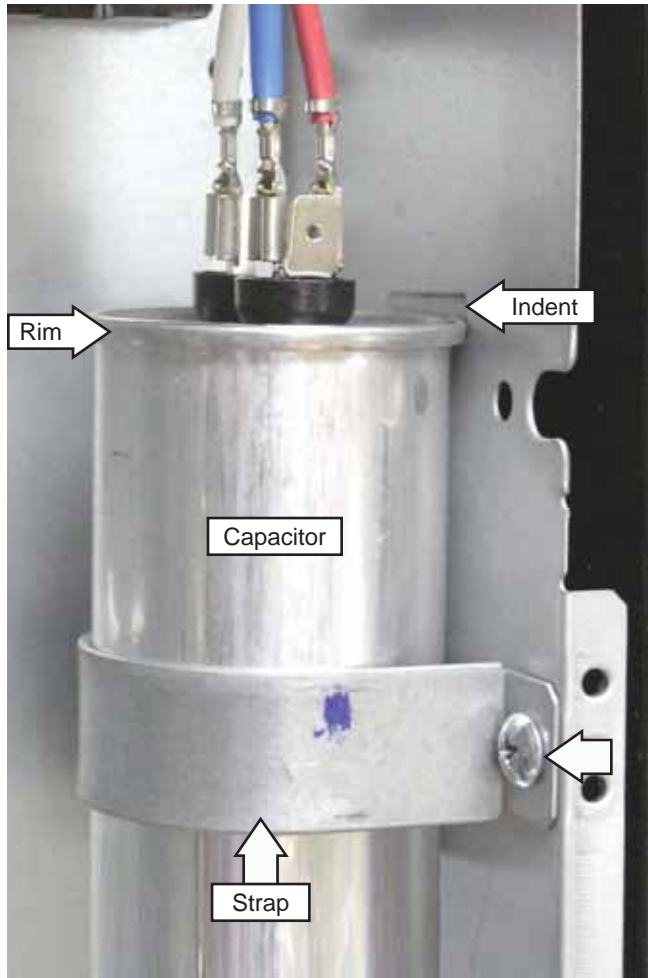
**WARNING:** The capacitor must be discharged. Discharge the capacitor between the 2 connectors using a pair of long-nose pliers with an insulated handle.



(Continued next page)



**Note:** When disconnecting wires from the capacitor, note wire locations.



## Main Power Connector

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

## Transformer

The transformer supplies 24 VAC to the control board at location CN11 from BCN106 on the drive board. Check for line voltage on the power supply board at CN104 between pins 5 and 7 and for 24 VAC at pins 1 and 2.

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

- CN104 pin 5 to pin 7 is approximately 100  $\Omega$  (230/208 VAC primary).
- CN104 pin 1 to pin 2 is approximately 1.31  $\Omega$  (24 VAC secondary).

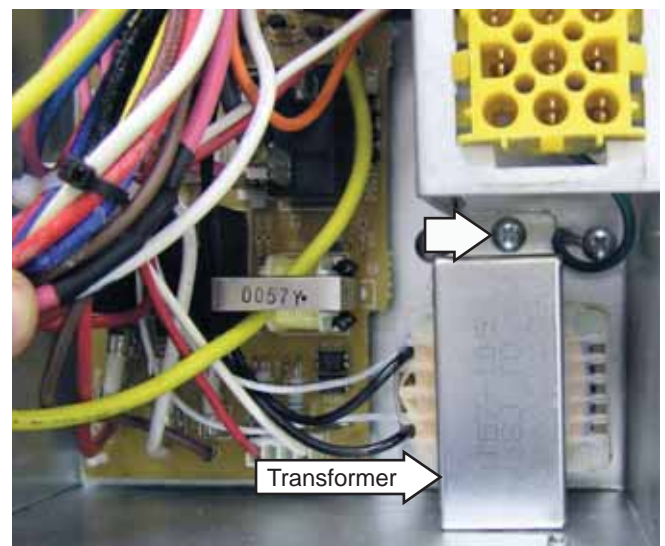
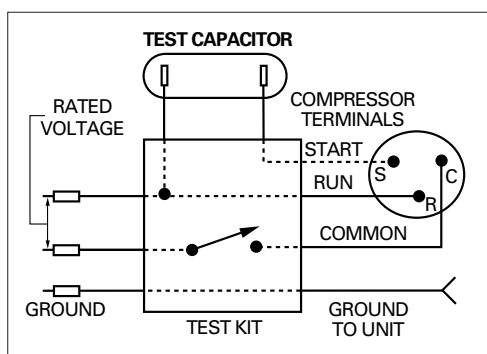
The transformer is attached to the control box with 2 tabs and a Phillips-head screw.

### To remove the transformer:

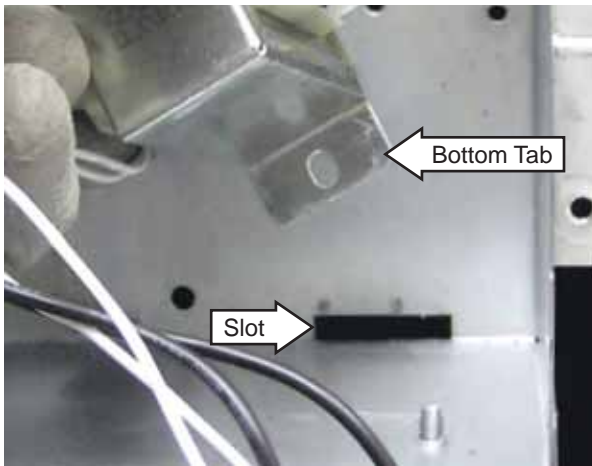
1. Remove the control box cover. (See *Control Box Components*, steps 1 thru 5.)
2. Disconnect the wire harness from drive board location CN104.
3. Remove the Phillips-head screw from the top tab of the transformer.

## Run Capacitor Check

1. Replace unit run capacitor with a known good test capacitor, that may be 10  $\mu\text{fd}$  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.



4. Lift the transformer and maneuver it out from the control box.

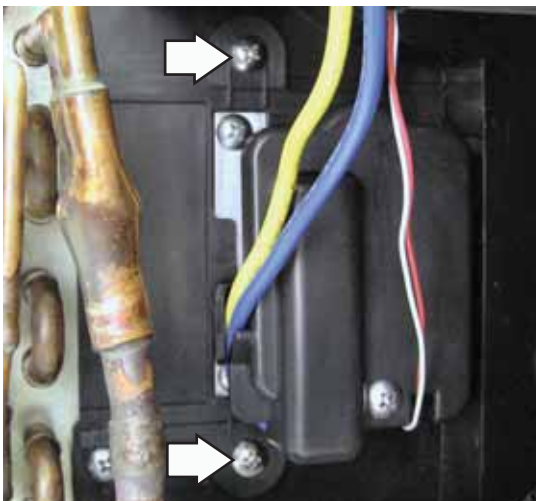


### Triac Assembly

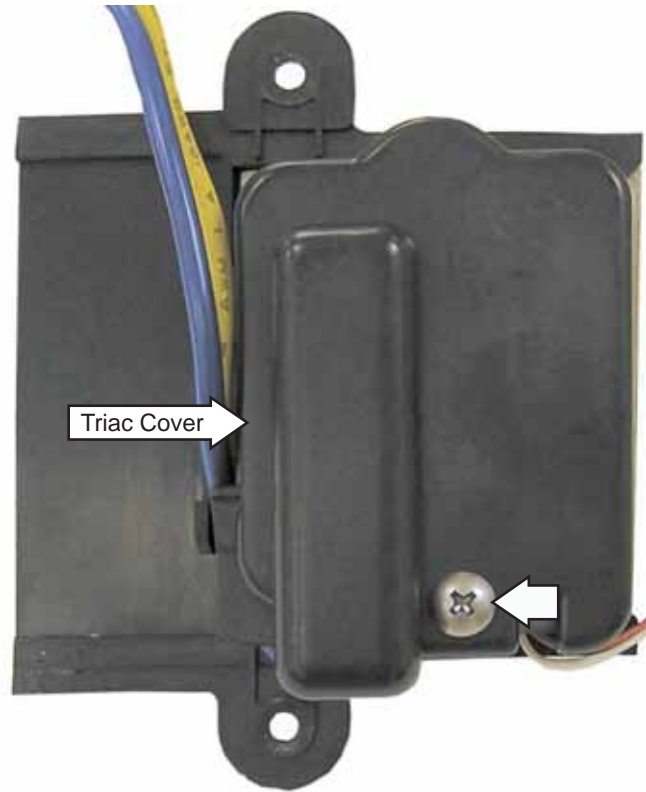
The triac limits in-rush current when the heater first turns on. A faulty triac could be the source of a no heat complaint. The triac assembly consists of a triac with a permanently attached heat sink, triac cover, and housing. The triac assembly is attached to the lower right side of the air plenum.

#### To remove the triac:

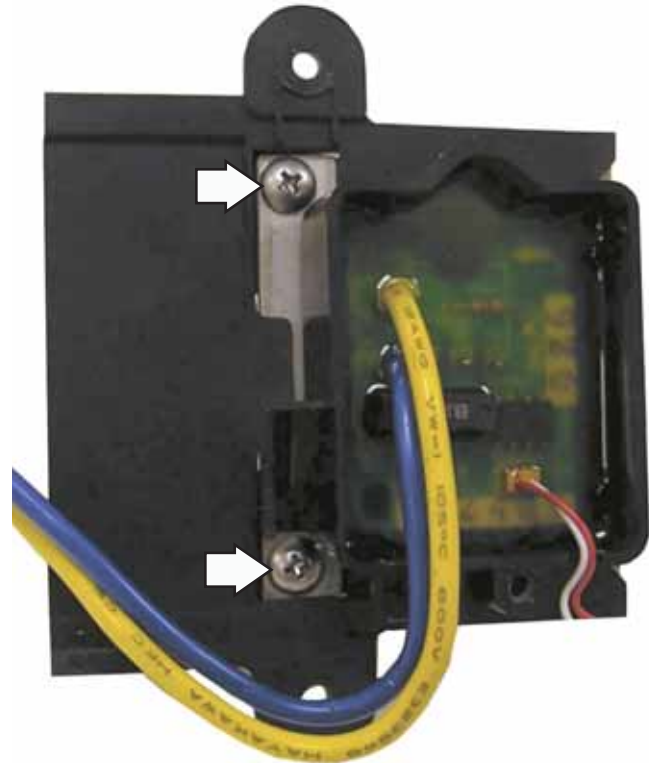
1. Remove the control box cover. (See *Control Box Components*, steps 1 thru 5.)
2. Disconnect the wire harness CN112 and the T1 wire from the drive board.
3. Disconnect the harness that connects the triac yellow wire, through the CT101 (current sensor), to the terminal board.
4. Disconnect the harness that connects the triac blue wire to the heater protectors.
5. Remove the 2 Phillips-head screws that attach the triac housing to the air plenum.



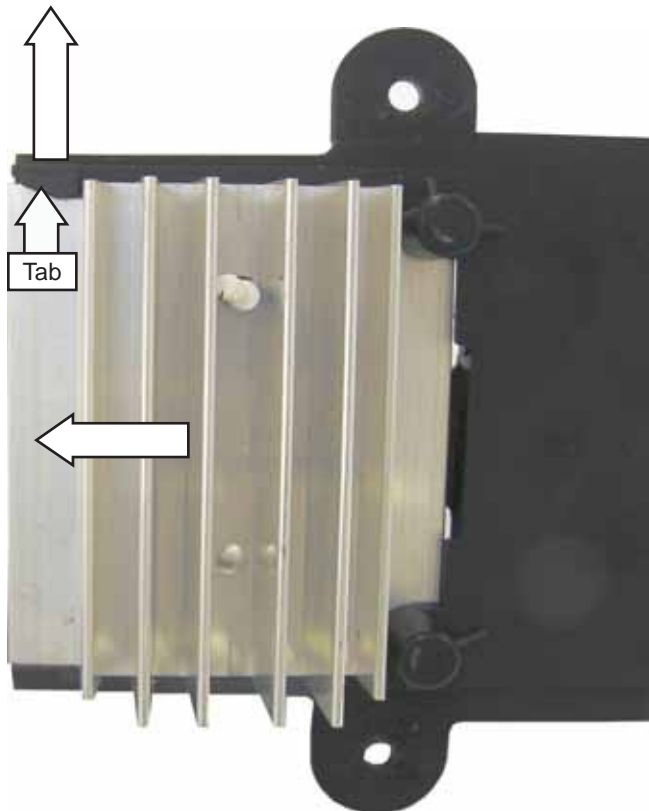
6. Slide the triac housing to the left and maneuver the triac housing out from the air plenum.
7. Remove the Phillips-head screw and triac cover from the triac.



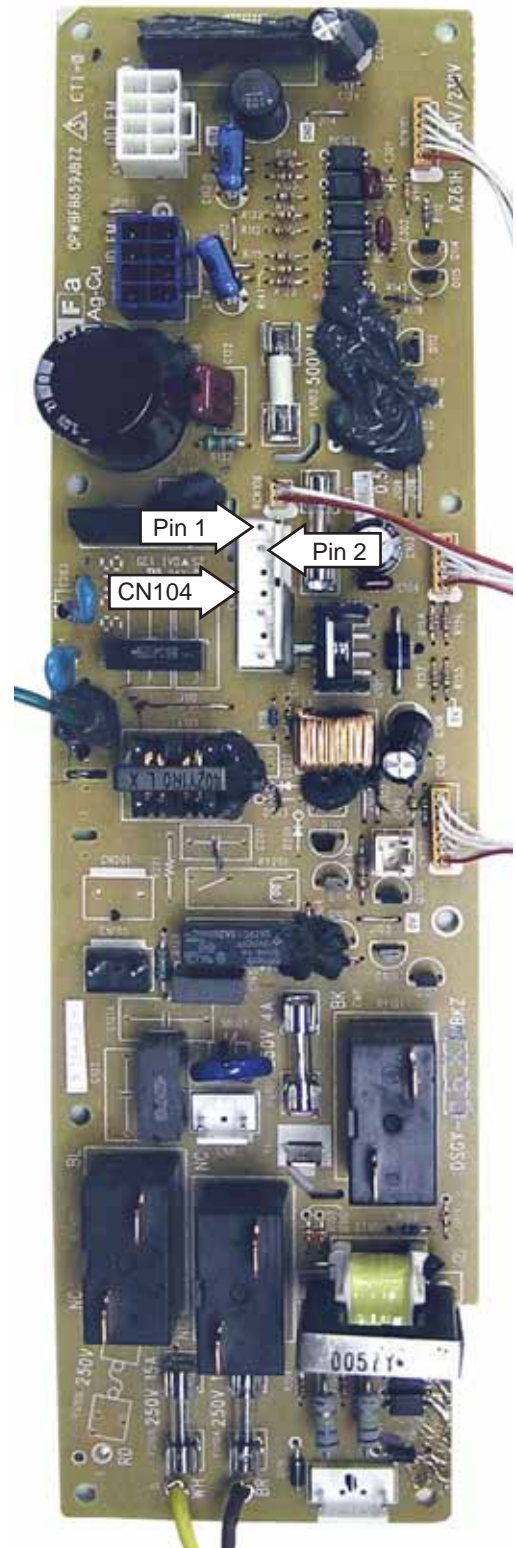
8. Remove the 2 Phillips-head screws from the triac housing.



9. Turn the triac housing over (as shown below), then lift the tab up and slide the triac to the left and out of the housing.



Check for 24 VAC on the drive board at CN104 between pin 1 and pin 2.



**Note:** When installing the triac assembly, insert the right side of the heat sink into the slot in the air plenum before replacing the 2 Phillips-head screws.

### 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, FU103, FU104, and FU105) malfunctions, the board must be replaced as a complete assembly.

### To remove the drive board:

1. Disconnect CN1, CN3, CN5, CN6, and CN11 from the main board. (See *Control Assembly*, follow steps 1-4.)
2. Remove the control box cover. (See *Control Box Components*.)

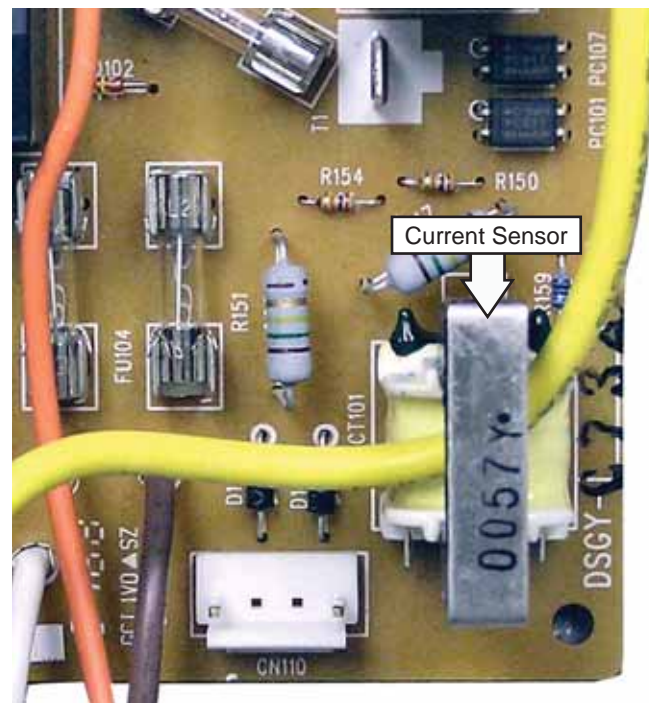
**Note:** It may be helpful to observe the appearance of the bundled wiring inside the control box. (See *Control Box Components*.) In the following steps, it will become necessary to cut off plastic wire ties that fasten wiring together. Bundle wiring before installing the control box cover.



**Note:** 265 VAC drive board shown.

3. Disconnect the wire harnesses at locations CN102, CN103, CN104, CN105, CN110, and CN112.
4. Disconnect the wire harnesses at locations CN201 and CN202, if present.
5. Disconnect the red wire from T1.
6. Disconnect the black wire (BK terminal) and the gray wire (GY terminal) from RY101.
7. Disconnect the blue wire (BL terminal) from RY102.
8. Disconnect the yellow wire from the terminal board. Remove the yellow wire from the opening in the current sensor.

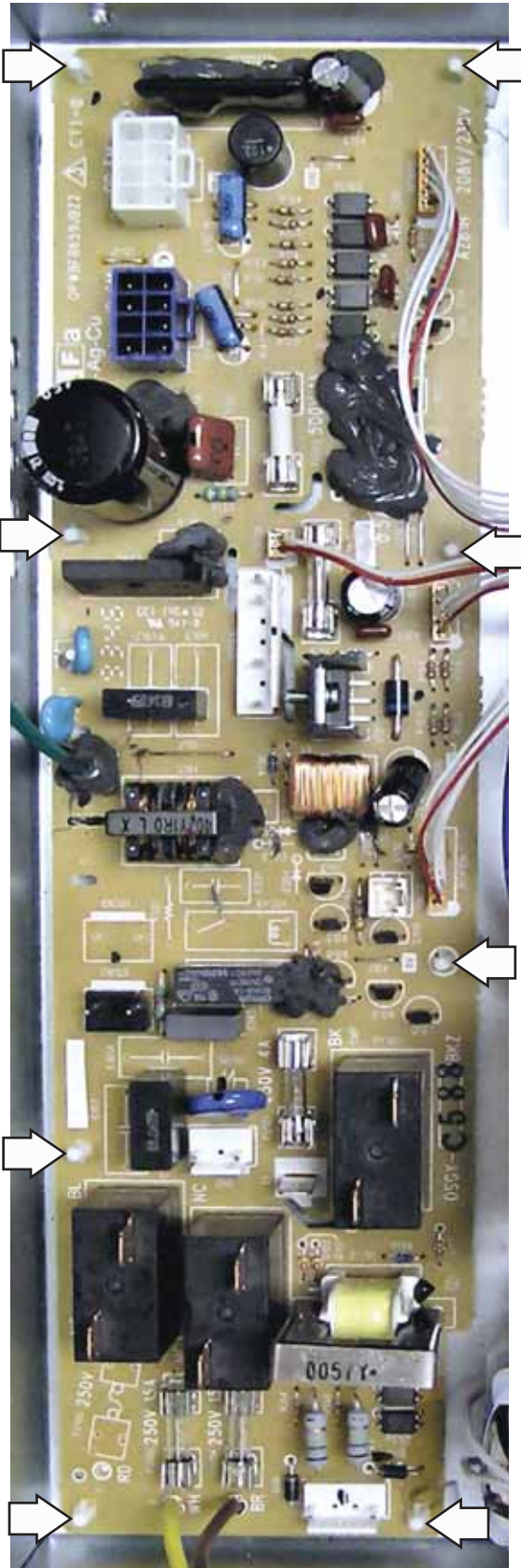
**IMPORTANT NOTE:** When replacing the drive board, it is necessary to loop the yellow wire from the triac through the opening in the current sensor (as shown below) before connecting it to the terminal board. If the yellow wire is not routed through the current sensor, the drive board will limit the amount of current to the heaters, resulting in an insufficient heat complaint.



9. Disconnect the 3-pin heater wire harness.

**Note:** The drive board is attached to the control box with 8 retainers that lock the board in place using compression tabs.

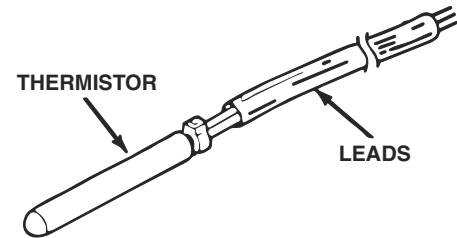
10. Compress the 8 tabs and pull the drive board from the control box.



## Thermistors

The 6100 series electric heat models use 4 thermistors:

- Room Air Temperature
- Indoor Coil Temperature
- Outdoor Air Temperature
- Outdoor Coil Temperature



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

### Thermistor Chart

SENSOR RESISTANCE (OHMS)			
Degree F	Room	I.D. Coil	O.D. Coil and Outdoor
10	63260	94900	28030
30	34620	51940	15340
32	32860	49330	14570
50	19970	29960	8850
70	11950	17930	5300
90	7320	10970	3280

### Thermistor Location

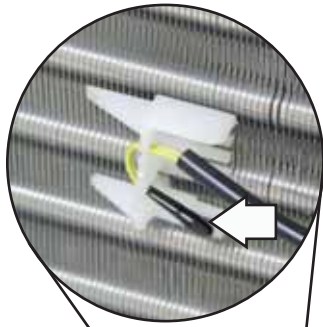
#### Room Air Thermistor

The indoor air thermistor is located in front of the indoor coil, where it detects the temperature of the room air being returned to the unit. It is held in position away from the coil by a plastic fastener that is pushed between the coil plate fins. The room air thermistor is connected to the control board at CN1 (yellow wires).

### Indoor Coil Thermistor

The indoor coil thermistor is mounted in a copper tube that is brazed to an end turn at the right side of the indoor coil. The indoor coil thermistor is connected to the main board at CN1 (orange wires).

### Room Air Thermistor



### Indoor Coil Thermistor



**Note:** Photo shown with right protector plate removed.

### Outdoor Air Thermistor

The outdoor air thermistor is attached to a standoff bracket with a plastic wire tie. The bracket is attached to the right rear corner of the basepan with a Phillips-head screw. The outdoor air thermistor is connected to the main board at CN1 (blue wires).

### Outdoor Coil Thermistor

The outdoor coil thermistor is mounted in a copper tube that is brazed near an end turn at the right side of the outdoor coil. The outdoor coil thermistor is connected to the main board at CN1 (black wires).



Outdoor Air Thermistor



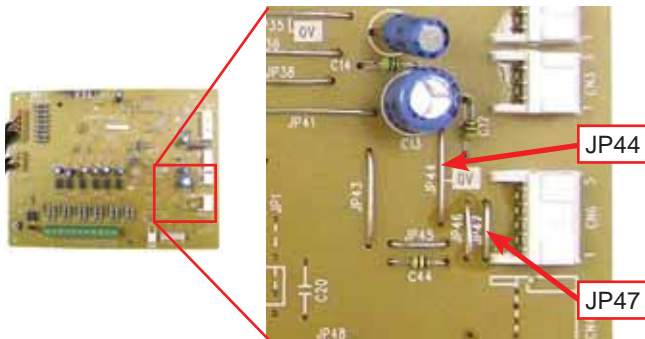
Outdoor Coil Thermistor

## Indoor Fan Motor

The indoor fan motor is a thermally protected DC motor, located in a housing that is attached to the right side of the air plenum, behind the protector plate.

No fan operation

1. Perform logic board test to determine if the main board is sending out a fan "ON" signal.
  - a. Measure voltage between JP44 and JP46. Indoor Fan "On" signal should read between 2.1 and 2.4 VDC.



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

### Caution:

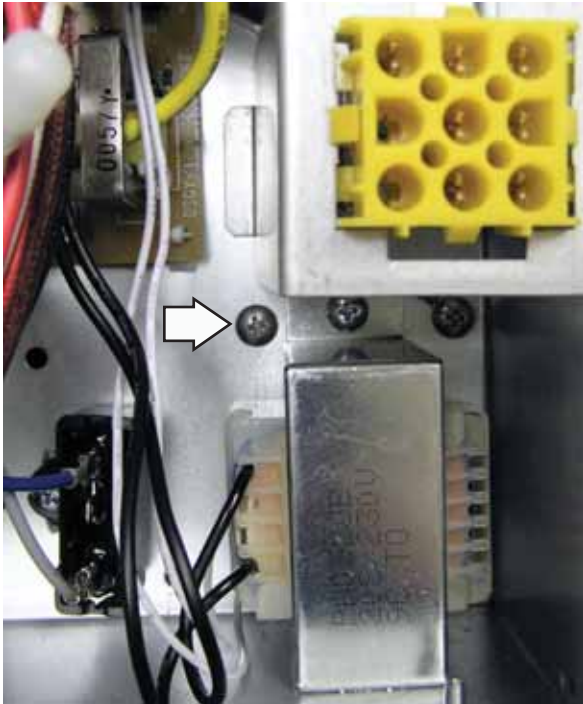
- To prevent motor controller damage, power must be off for 2 minutes before disconnecting or reconnecting the fan connector CN103.
- Possible damage to the motor controller may occur if voltage checks are made on any of the other motor wires, blue, yellow, and orange.
- Connectors CN103 and CN102 cannot be reversed for testing purposes.

### To remove the indoor fan motor:

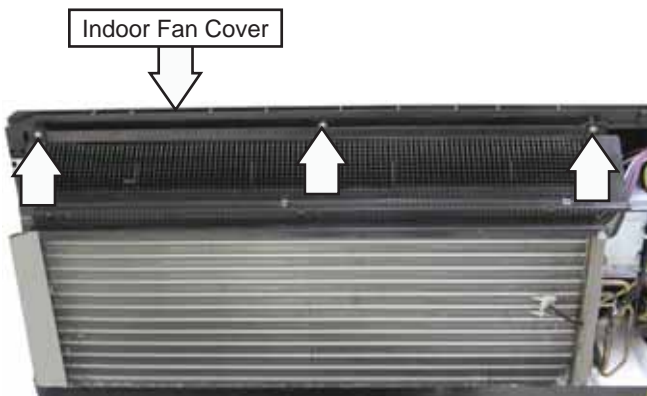
1. Remove the room cabinet. (See *Room Cabinet*.)
2. Remove the 2 Phillips-head screws that attach the control panel to the air conditioner. (See *Control Assembly*.)
3. Lift the control panel from the 2 top tabs. (See *Control Assembly*.) Position the control panel to the right.
4. Remove the Phillips-head screw, then lift and remove the right protector plate.
5. Remove the control box cover. (See *Control Box Components*.)
6. Remove the wiring from the retainer located on the motor housing.
7. Disconnect the wire harness from CN103 on the drive board. Cut off cable ties that bundle fan motor wiring.



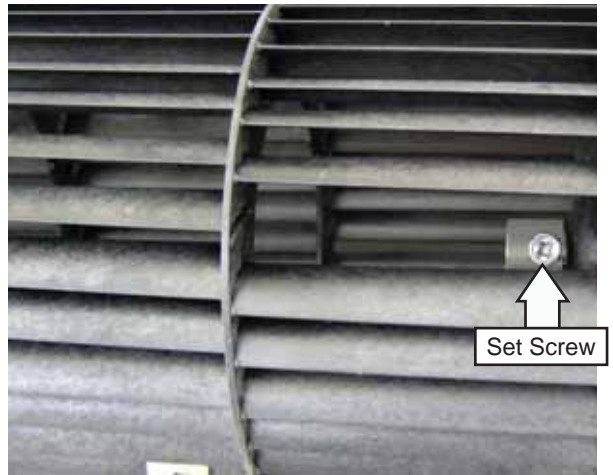
8. Remove the Phillips-head screw that attaches the control box to the air plenum.
9. Lift control box from the tab located at the top, and position box to the right.



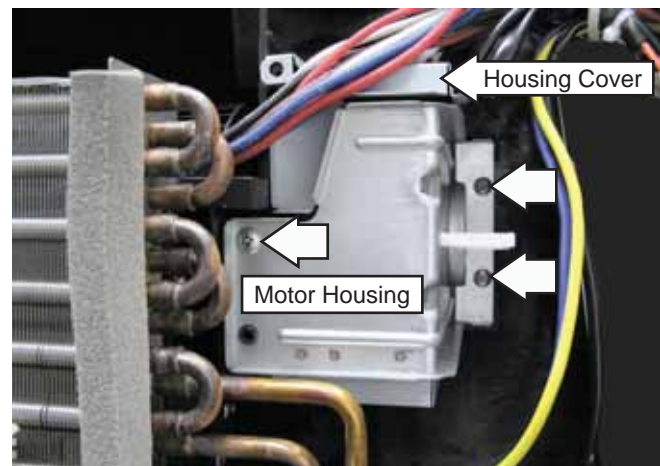
10. Remove the 3 Phillips-head screws that attach the indoor fan cover to the air plenum.
11. Tilt the top of the indoor fan cover out and remove it from the air plenum.



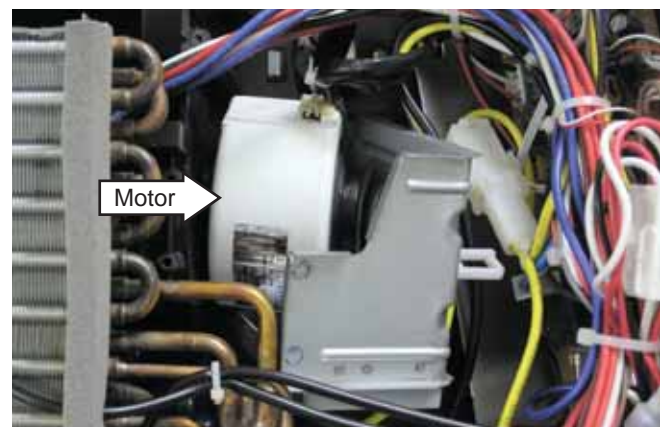
12. Locate the blower setscrew through the opening in the right side of the blower wheel, then loosen the 7-mm. setscrew approximately 3 turns.



13. Pull and maneuver the motor housing cover out from the air plenum.
14. Remove the 3 Phillips-head screws that attach the motor housing to the air plenum.



15. Remove the motor housing from the air plenum and pull the motor to the right, then maneuver the motor out of the air conditioner.





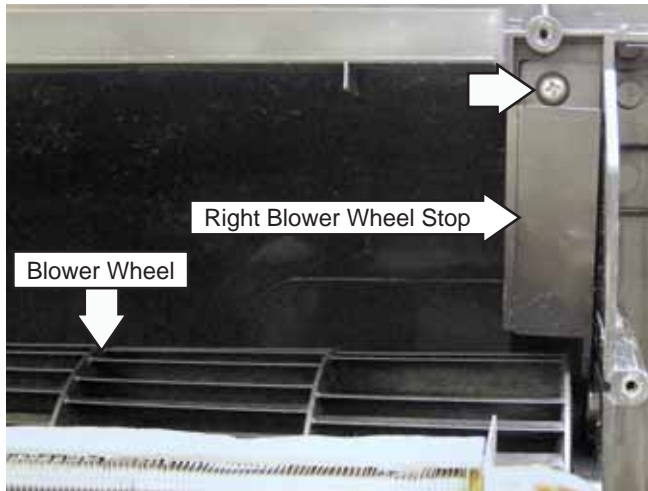
## Tangential Blower

The Zoneline utilizes a tangential blower that provides wide, uniform air delivery.

The tangential blower has a unique cylindrical shape, that causes the air to move and respond with equal power, but with less noise than traditional fans.

### To remove the tangential blower:

1. Remove, but do not disconnect, the indoor fan motor. (See *Indoor Fan Motor*.) Carefully position the fan motor aside.
2. Remove, but do not disconnect, the heater assembly. (See *Heater Assembly*.) Carefully position the heater assembly aside.
3. Remove the Phillips-head screw from the right blower wheel stop, then pull the stop from the air plenum.



5. Carefully lift the evaporator to clear the base pan. Gently swing the left side of the evaporator out approximately 45 degrees.



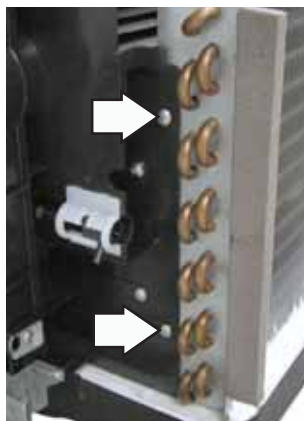
6. Grasp the right side of the blower wheel and lift the blower wheel out of the air plenum.



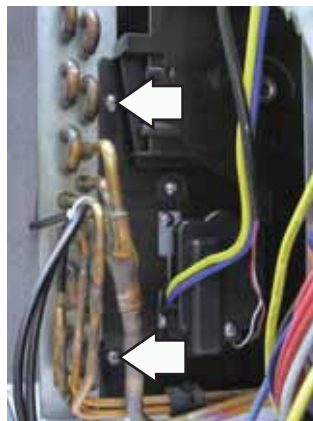
**Note:** In the following step, the left and right protector plates have been removed.

4. Remove the 2 Phillips-head screws from both the left and right side of the evaporator.

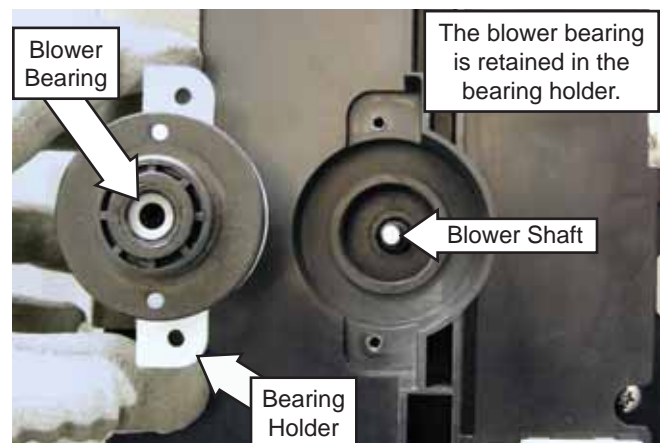
Left side of evaporator



Right side of evaporator

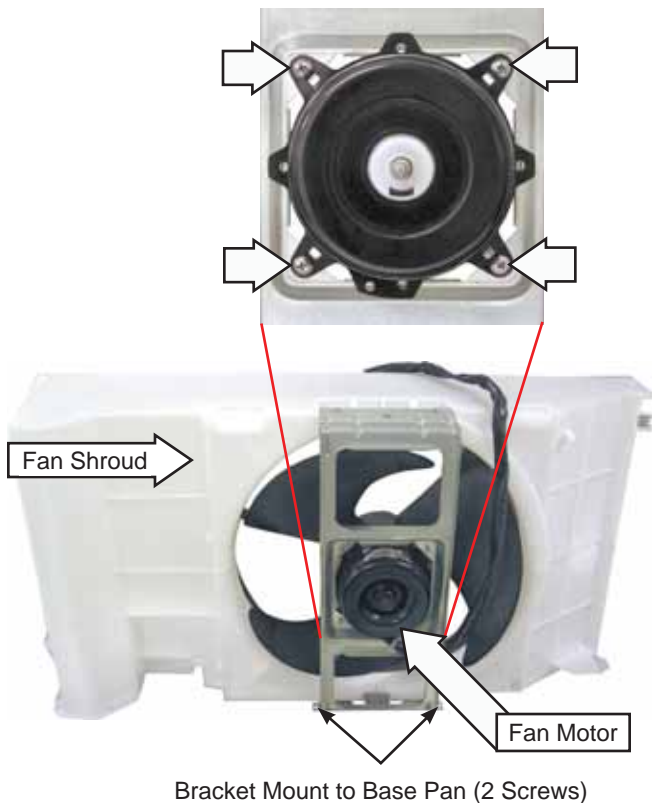


**Caution:** To prevent damage when installing the blower, carefully insert the blower shaft through the opening in the left side of the plenum and into the blower bearing. When properly seated, the blower will have a 1/2-inch clearance from the plenum wall.



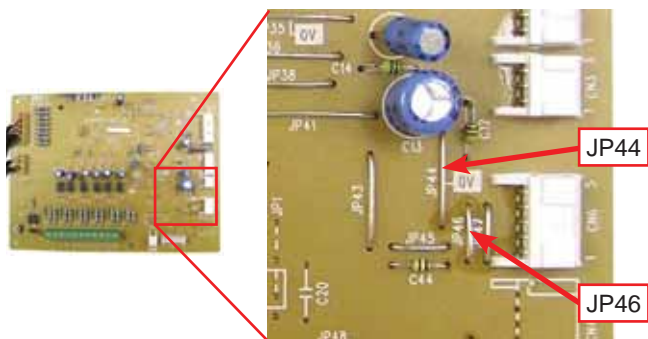
## Outdoor Fan Motor

The outdoor fan motor is a thermally-protected motor, mounted in the center of a metal bracket. The metal bracket is mounted on the fan shroud and chassis. An 8-mm hex nut attaches the fan blade to the motor shaft. Four Phillips-head screws hold the fan motor to the mounting bracket.



### No fan operation

1. Perform logic test to determine if the main board is sending out a fan "ON" signal.
  - a. Measure voltage between JP44 and JP46. Outdoor Fan "On" signal should read between 2.1 and 2.4 VDC.



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

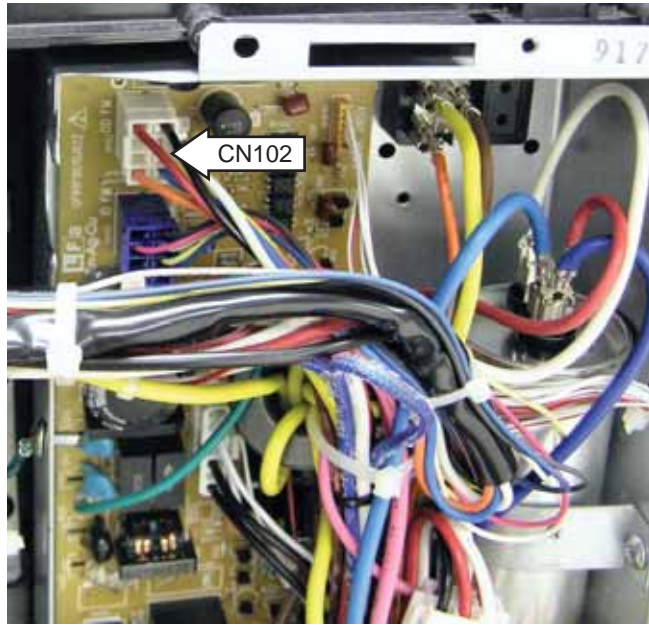
### Caution:

- To prevent motor controller damage, power must be off for 2 minutes before disconnecting or reconnecting the fan connector CN102.
- Possible damage to the motor controller may occur if voltage checks are made on any of the other motor wires, blue, yellow, and orange.
- Connectors CN103 and CN102 cannot be reversed for testing purposes.

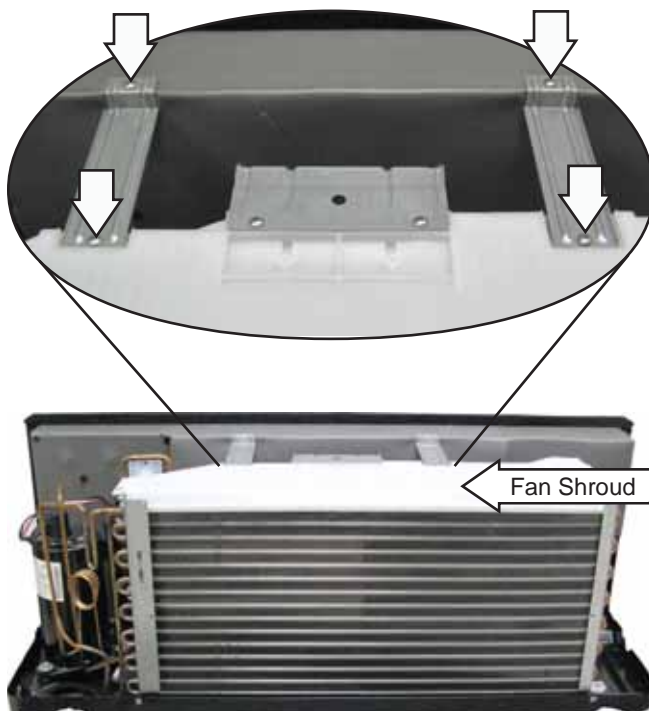
### To remove the outdoor fan motor and shroud:

1. Remove the room cabinet. (See *Room Cabinet*.) Remove the chassis from the case.
2. Remove the 2 Phillips-head screws that attach the control panel to the air conditioner. (See *Control Assembly*.)

3. Lift the control panel from the 2 top tabs. (See *Control Assembly*.) Position the control panel to the right.
4. Remove the control box cover. (See *Control Box Components*.)
5. Disconnect the outdoor fan wiring at CN102 on the drive board and remove all associated wire ties. (See *Control Box Components*.)



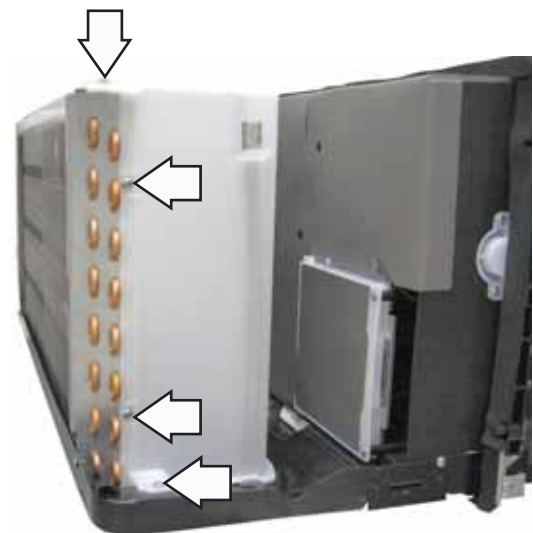
6. Remove the 4 Phillips-head screws from the 2 top brackets that hold the fan shroud in place. Remove the brackets.



7. Remove the 2 Phillips-head screws that hold the fan bracket to the bottom of the chassis.
8. Remove the 4 Phillips-head screws from the compressor side of the fan shroud.



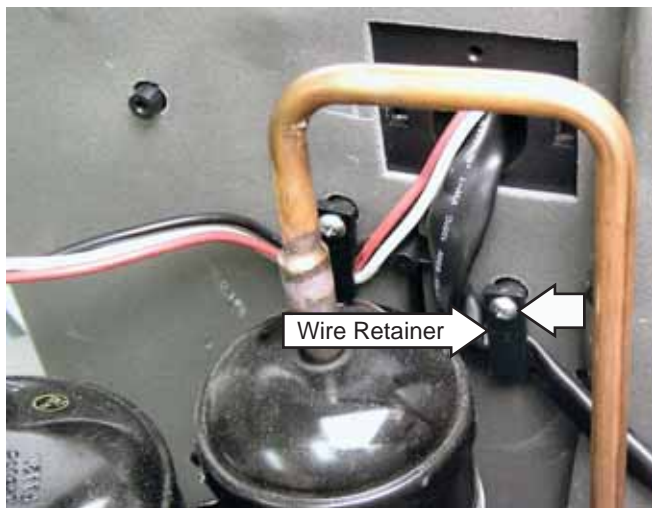
9. Remove the 4 Phillips-head screws from the vent side of the fan shroud.



10. Using a flat blade screwdriver, pry and remove the wire cover from the rear of the air plenum.



11. Remove the Phillips-head screw and the wire retainer. Pull the fan motor wires through the opening.

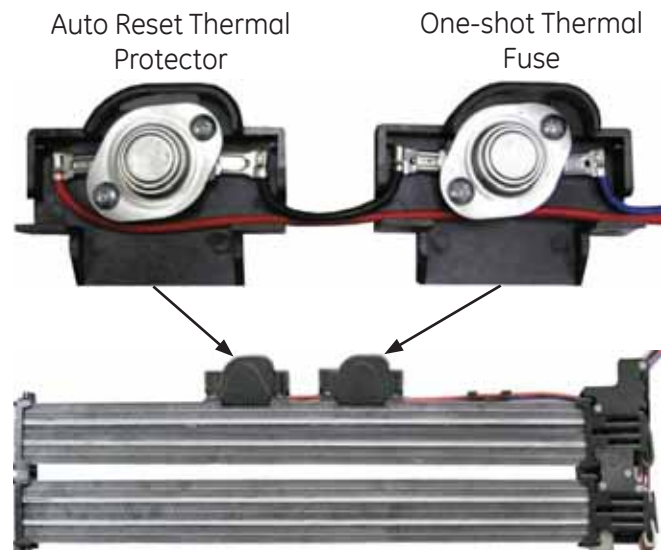


12. Lift the outdoor fan motor and shroud from the base pan.



### Heater Assembly

The heater assembly consists of three 230/208 VAC or 265 VAC resistance heating elements, a L110°C (230°F) one-shot thermal fuse, and an L80-17°C (176-63°F) auto reset thermal protector. The one-shot thermal fuse is used as a backup in case the auto reset thermal protector fails (stuck closed). The heater assembly is located inside the air plenum behind the indoor coil. The heaters and protectors are removed as an assembly.

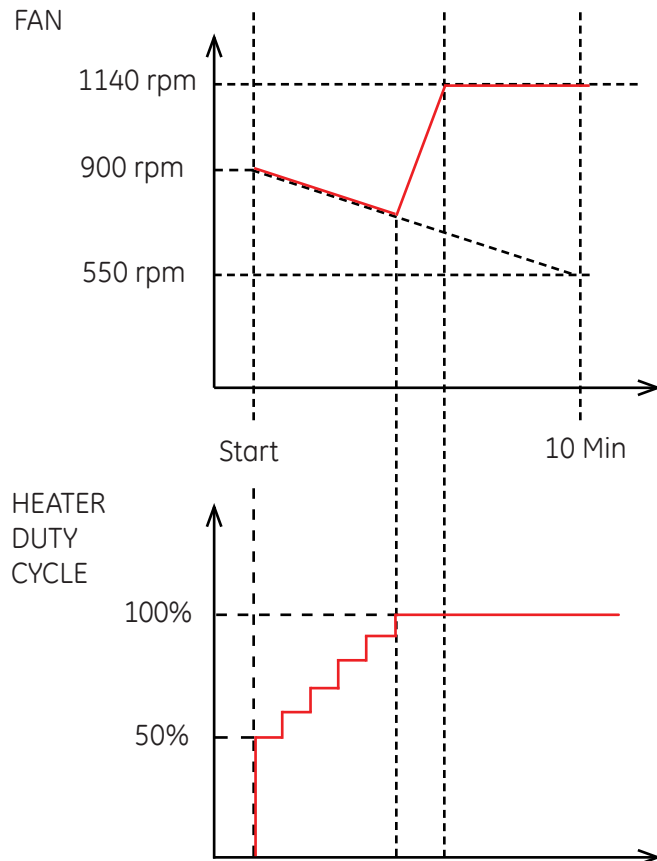


### Heater StartUp Control

The heater is formed from a ceramic type PTC (Power Temperature Coefficient) electrical resistance material, which will generate heat in response to the flow of electric current passing through it.

To prevent damage to the heater, a duty cycle is utilized. When the unit is ON, the fan will start up at 900 rpm when at Hi speed, and at 800 rpm when at Low speed, with the heater at 50% duty cycle.

The fan speed will gradually decrease to 550 rpm at 10 min, but the control will monitor the current value and increase the heater duty from 50% to 100%. Once this has completed, the fan speed will increase to the set fan speed.



**Note:**

- 10 minutes is the longest ramp-Up case and won't produce the 550 rpm in all cases.
- Typical ramp-up time is 2-3 minutes, based on starting temperatures of the heater. The colder the heater the longer the ramp up time.
- The ramp-up mode is meant to reduce the inrush current at heater startup to improve heater life.
- Accurate heater amperage can only be achieved after ramp up mode is completed.
- Ramp-up mode is completed when no additional rise in heater amperage draw is detected.
- A dirty filter will cause the heater to throttle down prematurely, thus producing insufficient heat output.

**Heater Test**

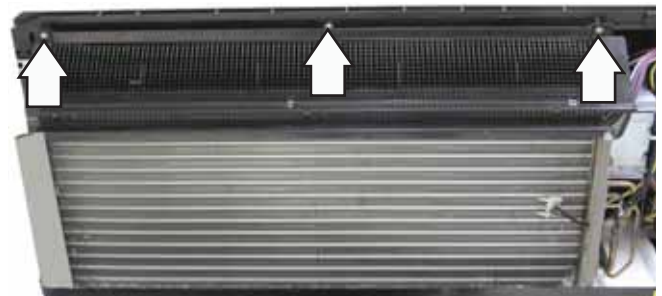
With power disconnected and the heater wire harness unplugged, check for resistance of each individual heater:

HEATER	CHECKPOINT HEATER CONNECTOR	HEATER RESISTANCE (OHMS)	
		208V/230V	265V
1.0 KW	PIN NO. 1-4, BK-BR	195 ± 35%	200 ± 35%
1.4 KW	PIN NO. 2-5, RD-YL	200 ± 35%	205 ± 35%
2.4 KW	PIN No. 3-6, WH-BL	75 ± 35%	85 ± 35%

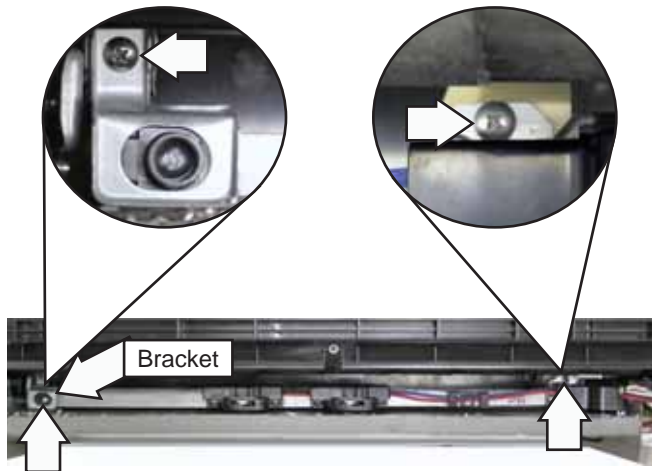
**Note:** Heater resistance test temperature at 68°F.

**To remove the heater assembly:**

1. Remove the room cabinet. (See *Room Cabinet*.)
2. Remove the 2 Phillips-head screws that attach the control panel to the air conditioner. (See *Control Assembly*.)
3. Lift the control panel from the 2 top tabs. (See *Control Assembly*.) Position the control panel to the right.
4. Remove the control box cover. (See *Control Box Components*.)
5. Cut off cable ties that bundle heater wiring inside control box. Disconnect heater wiring harness (6-pin) and fuse and thermal protector harness (red and blue wires).
6. Remove the 3 Phillips-head screws that attach the indoor fan cover to the air plenum.
7. Tilt the top of the indoor fan cover out and remove it from the air plenum.



- Remove the left side Phillips-head screw and bracket and the right side Phillips-head screw that attach the heater to the air plenum.



- Lift the heater assembly.



### Compressor and Capacitor

The Zonline compressor is a rotary type that operates on 230/208 VAC or 265 VAC. After the board has cycled the compressor off, it will not attempt to restart for approximately 3 minutes, 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. If the unit is in heating mode, it will supply resistance heat to maintain the room temperature.

The compressor run capacitor is located under the main board housing inside the control box. To test, substitute a known good capacitor.

### Filter/Dryer

Install a filter/dryer whenever servicing the sealed system.

### R-410A Refrigerant

The Zonline utilizes R-410A refrigerant. Additional information on the characteristics, recovery and recharging procedures for R-410A can be found in Service Guide Publication 31-9192.



<b>R-410A</b>
<b>⚠ CAUTION</b>
High pressure refrigerant. Must service with R-410A and equipment designed for R-410A.

## Reversing Valve

The reversing valve operates on 230/208 VAC or 265 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 move the reversing valve, and the unit will operate as an air conditioner. When the solenoid is de-energized, the reversing valve will move in the opposite direction, and the unit will function as a heat pump.

To check the reversing valve solenoid, disconnect the reversing valve wire harness on the driver board at location CN105. Check for a resistance of less than 1  $\Omega$  on the disconnected wires.



## Condensate Disposal Systems

### Slinger Ring Systems

Packaged terminal units employ various means of dispersing the condensate water against the outdoor coil. One of the most popular and most effective means is the use of a slinger ring. A slinger ring is a ring around the circumference of the outdoor fan. The design of the unit positions the slinger ring very close to the bottom of the base pan, so water in the base pan is lifted by the rotating ring. Water picked up by the slinger ring will be dispersed into the airstream and deposited on the hot outdoor coil where it evaporates.

All Zoneline Series packaged terminal air conditioners and packaged terminal heat pumps utilize a slinger ring for cooling condensate disposal.

### Drain Kit

Although the Zoneline units are designed to dissipate most of the condensate generated during normal cooling operation, there may be times when abnormal operating conditions cause more condensate than the unit can dissipate. If condensate dripping from the wall case is objectionable, an external drain system, such as Part # RAD10, should be installed. See the Installation Instructions for the drain kit.

### ICR Pump

During heat pump operation, the ICR system utilizes a small pump to lift the water from the base pan and pump it into a collector tray positioned above the indoor coil.

The water drains from the collector tray and drips onto the warm indoor coil where it is evaporated into the room atmosphere. If an excess amount of water is pumped to the indoor side, it is routed back to the outdoor portion of the base pan.

The ICR system has proven to be an effective means of minimizing the amount of heat pump condensate dripping from the unit. However, if the restrictions of a particular installation will allow absolutely no dripping of condensate water from the wall case, the installation of an external drain system is recommended.

## Accessory List

Kit Number	Description
RAA63	Replacement filters (10 pairs per box)
RAB71A	Steel Wall Case – 13-3/4" deep
RAB7116	Steel Wall Case – 16" deep
RAB7124	Steel Wall Case – 24" deep
RAB7128	Steel Wall Case – 28" deep
RAB7131	Steel Wall Case – 31" deep
RAB77	Molded Wall Case
RAD10	Interior/Exterior Drain kit
RAF453	Room Front (included with chassis)
RAG60	Stamped aluminum exterior rear grille
RAG61	Architectural Exterior Grille, Beige Molded High-Impact Plastic
RAG62	Architectural Exterior Grille, Maple Molded High-Impact Plastic
RAG63	Architectural Exterior Grille, Bittersweet Chocolate Molded High-Impact Plastic
RAG67	Aluminum Architectural Grille (Custom Colors Available by Special Order)
RAK40	Condenser Air Deflector Kit
RAK148D1	Wall Thermostat For Heat Pump Models - Electronic Digital
RAK148P1	Wall Thermostat For Heat Pump Models – Electronic Digital Programmable
RAK164D1	Wall Thermostat For Resistance Heat Models – Electronic Digital
RAK164P1	Wall Thermostat For Resistance Heat Models – Electronic Digital Programmable
RAK201	Sub-Base Cover Plate with Knockouts
RAK204D15P	Sub-Base - 208/230-Volt with NEMA 6-20R 15/20 Amp Receptacle – Power Cord and Chaseway included
RAK204D20P	Sub-Base - 208/230-Volt with NEMA 6-20R 15/20 Amp Receptacle – Power Cord and Chaseway included
RAK204D30P	Sub-Base - 208/230-Volt with NEMA 6-30R 30 Amp Receptacle – Power Cord and Chaseway included
RAK204E15	Sub-Base – 265-Volt with NEMA 7-15R 15 Amp Receptacle – Chaseway included
RAK204E20	Sub-Base – 265-Volt with NEMA 7-20R 20 Amp Receptacle – Chaseway included
RAK204E30	Sub-Base – 265-Volt with NEMA 7-30R 30 Amp Receptacle – Chaseway included
RAK204U	Sub-Base – non-electrical Chaseway not included
RAK205CW	Chaseway for Sub-Base
RAK3153A	Universal Power Cord – 15-Amp 230/208 V – 2.40/2.32 kW heat
RAK3203A	Universal Power Cord – 20-Amp 230/208 V – 3.3/3.2 kW heat
RAK3303A	Universal Power Cord – 30-Amp 230/208 V – 4.7/4.53 kW heat
RAK4002A	Direct-Connect Junction Box – 230/208-volt units
RAK4002CW	Wiring Harness w/Inline Connector - Adapt Line Cord to Direct Connection
RAK4157	208/230V Universal power supply, 15 Amp
RAK4207	208/230V Universal power supply, 20 Amp
RAK4307	208/230V Universal power supply, 30 Amp
RAK5157	265/275V Universal power supply, 15 Amp
RAK5207	265/275V Universal power supply, 20 Amp
RAK5307	265/275V Universal power supply, 30 Amp



<b>Kit Number</b>	<b>Description</b>
RAK5172	Universal Connection Kit – 265V – 15 Amp – Use w/RAK204E15 Sub-Base – 2.40 kW heat
RAK5202	Universal Connection Kit – 265V – 20 Amp – Use w/RAK204E20 Sub-Base – 3.40 kW heat
RAK5302	Universal Connection Kit – 265V – 30 Amp – Use w/RAK204E30 Sub-Base – 4.80 kW heat
RAK601	Duct Extension – Insulated – 44” long – includes Register and Trim Flange
RAK602	Register and Trim Flange (Included with RAK601)
RAK6052	Duct adapter for New Installation (or older non-GE duct adapter installation)
RAK7012	Duct Adapter for replacement of A-B with rounded-front AZ chassis
RAK7022	Duct Transition for replacement of AZC with rounded-front AZ chassis
RAK8023	Locking door kit
RAK806	Control Panel Cover (for use with remote thermostat)
RAK901L	Wall Case Insulation Kit

# Troubleshooting

## Forced Function Diagnostics

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 forced operation mode the unit must be in the STOP mode.

1. Disconnect the unit from power.
2. Press and hold the “+” and “-” while reapplying power.
3. A 0 will appear on the display screen. This is position “0”

**Press the FAN or the MODE button to step to the next function.**

**0 --- Off.**

**1 --- Cooling ON.** Pressing “+” or “-” toggles fan speed. Reversing valve is energized.

**2 --- Fan Only.** Pressing “+” or “-” toggles speed.

**To check fan RPM press SLEEP pad.**

- A flashing HEAT light means the board and motor are communicating.
- SLEEP LED indicates Outdoor fan is being checked.
- OPERATION LED indicates Indoor fan being checked.
- Pressing the SLEEP pad toggles between indoor and outdoor fans.
- Two digits flashing alternately indicates RPM more than 100 RPM. (For example, display flashing 14 then 40 is 1440 RPM.)
- Press FAN to change between HI and LOW fan speeds.

**3 --- OFF.** No function

**4 --- PTC Heater ON.** No fan.

**5 --- FAN Only.** Pressing “+” or “-” toggles fan speed.

**6 --- OFF.** No function.

**7 --- Heat Pump operation.** Pressing “+” or “-” toggles fan speed. Reversing valve not energized.

**8 --- Fan Only.** Pressing “+” or “-” toggles fan speed.

**WARNING: After test 8, DO NOT change settings in the next test. This will change programming and possibly damage the board or other components.**

**When tests are complete press the OPERATION button to exit the mode.**

## QUICK CHECKS

### **COMPRESSOR**

With cover and board accessed, power off. Discharge capacitor and check resistance across 2 terminals of capacitor. This will measure START and RUN windings of compressor. No need to remove wires. Check on 200 ohms scale or such. Should read 3 to 10 ohms. Checking from either wire on terminal of capacitor to the BLACK wire on RY101 will check the overload and COMMON. Be sure to check each to ground, an open circuit should be seen at each terminal. If no shorts or grounds appear on compressor windings, remove BLACK and GREY wire from on RY101. Safely jump the BLACK and GREY wires. Re-apply power and ONLY the compressor should run.

### **FAN MOTORS**

Measure the DC voltage from black to red leads, for either fan at the following pins: ID fan connector CN103 1-6 OD fan connector CN102 1-5 DC voltage should be (line voltage x 1.4) 290-390 vdc

No voltage, check FU102 for open or replace drive board.

Check motor resistance black to red in both polarities:

OL in one direction and 13-15 megohm in the opposite direction. Incorrect resistance, replace motor and drive board.

### **THERMISTORS**

Unplug CN1 from the main board. Read between pins 1 and 2 for the ROOM THERMISTOR, pins 3 and 4 for the INDOOR COIL THERMISTOR, pins 5 and 6 for the OUTDOOR COIL and between pins 7 and 8 for the OUTDDOR AIR. Compare to resistance chart on mini-manual.

### **HEATERS**

The individual HEATERS in the heater assembly can be checked by disconnecting the six pin heater connector plug and reading the resistance to the heater between pins 1 and 4, 2 and 5 and 3 and 6. Compare to resistance chart on Mini-manual.

The THERMAL FUSE and PROTECTOR can be checked by disconnecting the 2 wire (red & blue wires) connector to the heater assembly. Check resistance between pins 1 and 2 to the heater. Should read zero ohms with both components intact. A reading of infinite ohms would indicate either an open fuse or protector.

**QUICK CHECKS**  
**DEAD UNIT**

Check for proper voltage at receptacle?  
Remove cover. Check for CDC and Aux Mode 2 setting.  
If on wall thermostat make sure Aux Mode 6 is on.  
If unit is on CDC remove 1 lead to disable CDC.

If not on wall thermostat, Set all Aux Modes to off.  
If still DEAD, check for 24VAC at terminals R to C.  
If voltage present continue troubleshooting to boards.  
If no voltage present suspect bad LV transformer or wiring.

**QUICK CHECKS**  
**REMOTE  
THERMOSTAT**

If ON electronic thermostat does it light up?  
24VAC at "R" to "C"?  
Is Aux Mode 6 in the on position?  
Does unit operate on controls if Aux Mode 6 turned off?

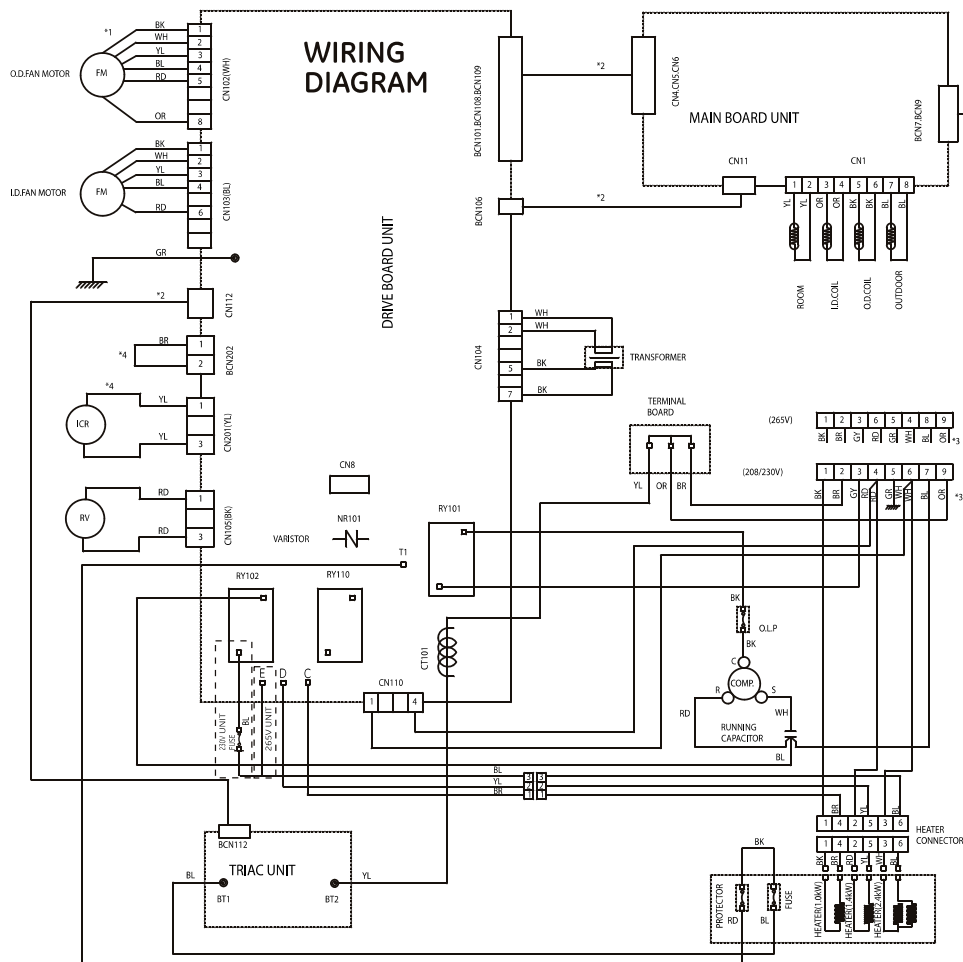
Remove leads to thermostat, at unit.  
Jump "R" to "Gh" on terminal board.  
Fan should run, if not troubleshoot to driver board.  
Reconnect leads to unit and remove leads at thermostat.  
Jump the wires that were on "R" and "G" on thermostat.  
If unit runs at terminal board but not at wall wiring problem.  
If unit runs both ways, thermostat is defective.

# Schematics and Wiring Diagrams

## 6100 Series Typical Wiring Diagram

Refer to the mini-manual attached to the unit.

**Note:** Refer to Yellow Universal Connector



**NOTE:**

- \*1: The lead wires are multicolored with black tube.
  - \*2: The joint wires are white except that the first one is red.
  - \*3: The 7k BTU models don't have this wire.
  - \*4: AZ61H series don't have these wires, except for AZ61H07DAD, AZ61H09DAD, AZ61H12DAD, AZ61H15DAD, AZ61H07EAD, AZ61H09EAD, AZ61H12EAD, AZ61H15EAD.
- 2. COLOR:**
- |           |            |
|-----------|------------|
| BK: BLACK | OR: ORANGE |
| BL: BLUE  | RE: RED    |
| BR: BROWN | WH: WHITE  |
| GR: GREEN | YL: YELLOW |
| GY: GRAY  |            |
- 3. THERMISTOR SENSOR RESISTANCE:**

SENSOR RESISTANCE(ohm)			
degF	ROOM	I.D. COIL	O.D. COIL & OUTDOOR
10	63260	94900	28030
30	34620	51940	15340
32	32860	49330	14570
50	19970	29960	8850
70	11950	17930	5300
90	7320	10970	3280

**4. TRANSFORMER WINDING RESISTANCE:**

MODEL NAME	PRIMARY COIL RESISTANCE(ohm) BK-BK	SECONDARY COIL RESISTANCE(ohm) WH-WH
208/230V PA052JB	100 ± 10%	1.31 ± 10%
265V PA053JB	127 ± 10%	1.27 ± 10%

**5. This diagram applied to AZ61H series.**

**6. Heater resistance:**

TEST TEMPERATURE IS 68degF.

HEATER	CHECK POINT HEATER CONNECTOR	HEATER RESISTANCE(ohm)	
		208V/230V	265V
1.0kW	PIN NO.1-4 BK-BR	195 ± 35%	200 ± 35%
1.4kW	PIN NO.2-5 RD-YL	200 ± 35%	205 ± 35%
2.4kW	PIN NO.3-6 WH-BL	75 ± 35%	85 ± 35%

**7. DC MOTOR VOLTAGE:**

- (1) CN103: PIN 1-2 (BK-WH) DC15V; PIN 1-6 (BK-RD): The DC voltage is AC power supply voltage x 1.4
- (2) CN102: PIN 1-2 (BK-WH) DC15V; PIN 1-5 (BK-RD): The DC voltage is AC power supply voltage x 1.4

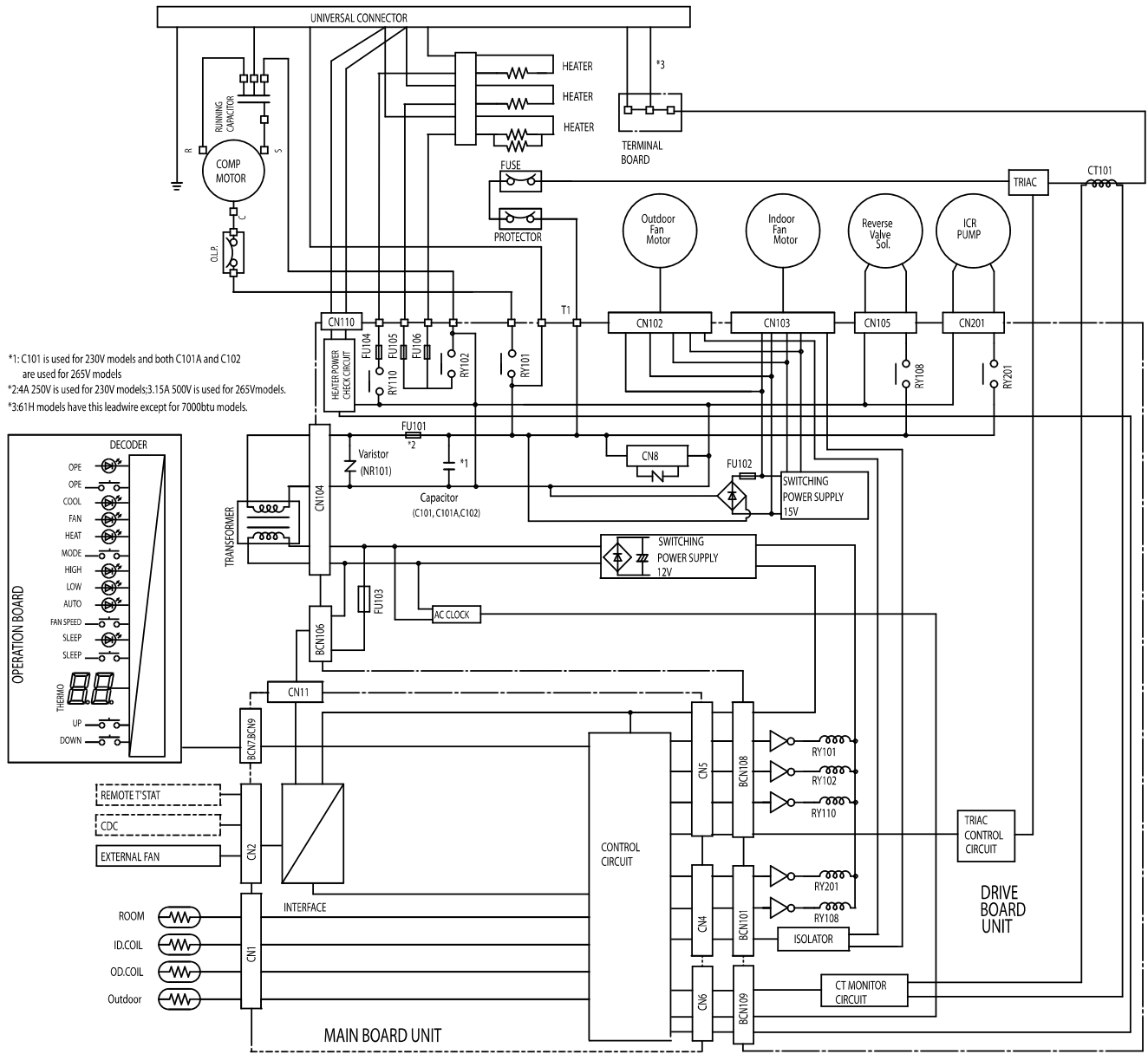
**NOTICE:**

Turn off the power supply for 2 minutes before disconnecting motor connector (CN102, CN103), or motor damage may occur.

# 6100 Series Typical Schematic

Refer to the mini-manual attached to the unit.

**Note:** Refer to Yellow Universal Connector



\*1: C101 is used for 230V models and both C101A and C102 are used for 265V models.  
 \*2: 4A 250V is used for 230V models; 3.15A 500V is used for 265V models.  
 \*3: 61H models have this leadwire except for 7000btu models.

# 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](http://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.

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

## *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 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.
- 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 to personal property 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**