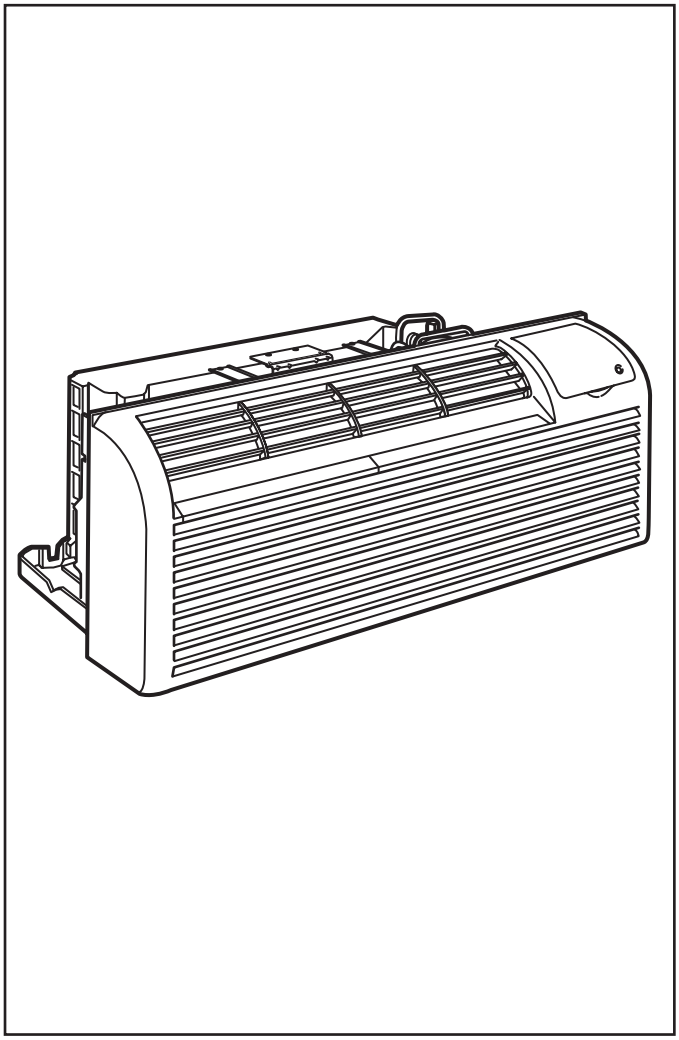
GE Consumer & Industrial

Technical Service Guide

JUNE 2005

Zoneline Generation III Airconditioners

2800 Series
3800 Series



31-9127

GE Appliances
General Electric Company
Louisville, Kentucky 40225

IMPORTANT SAFETY NOTICE

The information in this service guide 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

To avoid personal injury, disconnect power before servicing this product. 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.

GE Consumer & Industrial

Technical Service Guide

Table of Contents

Table of Contents (Cont.)

2800 SERIES

	208/230-Volt	265-Volt
Standard	AZ28 E07 DAB AZ28 E09 DAB AZ28 E12 DAB AZ28 E15 DAB	AZ28 E07 EAB AZ28 E09 EAB AZ28 E12 EAB AZ28 E15 EAB
Dry Air (Heat Pipe)	AZ28 E07 DAP AZ28 E09 DAP AZ28 E12 DAP	AZ28 E07 EAP AZ28 E09 EAP AZ28 E12 EAP
Corrosion Protection	AZ28 E07 DAC AZ28 E09 DAC AZ28 E12 DAC AZ28 E15 DAC	AZ28 E07 EAC AZ28 E09 EAC AZ28 E12 EAC AZ28 E15 EAC
7K	AZ28 E07 DAB AZ28 E07 DAP AZ28 E07 DAC	AZ28 E07 EAB AZ28 E07 EAP AZ28 E07 EAC
9K	AZ28 E09 DAB AZ28 E09 DAP AZ28 E09 DAC	AZ28 E09 EAB AZ28 E09 EAP AZ28 E09 EAC
12K	AZ28 E12 DAB AZ28 E12 DAP AZ28 E12 DAC	AZ28 E12 EAB AZ28 E12 EAP AZ28 E12 EAC
15K	AZ28 E15 DAB AZ28 E15 DAC	AZ28 E15 EAB AZ28 E15 EAC

3800 SERIES

	208/230-Volt	265-Volt
Standard	AZ38 H07 DAB AZ38 H09 DAB AZ38 H12 DAB AZ38 H15 DAB	AZ38 H07 EAB AZ38 H09 EAB AZ38 H12 EAB AZ38 H15 EAB
ICR	AZ38 H07 DAD AZ38 H09 DAD AZ38 H12 DAD AZ38 H15 DAD	AZ38 H07 EAD AZ38 H09 EAD AZ38 H12 EAD AZ38 H15 EAD
Corrosion Protection	AZ38 H07 DAC AZ38 H09 DAC* AZ38 H12 DAC* AZ38 H15 DAC*	AZ38 H07 EAC AZ38 H09 EAC* AZ38 H12 EAC* AZ38 H15 EAC*
7K	AZ38 H07 DAB AZ38 H07 DAC AZ38 H07 DAD	AZ38 H07 EAB AZ38 H07 EAC AZ38 H07 EAD
9K	AZ38 H09 DAB AZ38 H09 DAC* AZ38 H09 DAD	AZ38 H09 EAB AZ38 H09 EAC* AZ38 H09 EAD
12K	AZ38 H12 DAB AZ38 H12 DAC* AZ38 H12 DAD	AZ38 H12 EAB AZ38 H12 EAC* AZ38 H12 EAD
15K	AZ38 H15 DAB AZ38 H15 DAC* AZ38 H15 DAD	AZ38 H15 EAB AZ38 H15 EAC* AZ38 H15 EAD

*Indicates models with DC motors ONLY (3800 Series)

Zoneline Features and Specifications

Features

	AZ 2800	AZ 3800
Enhanced Dehumidification — Dry Air 25	Optional	N/A
Cooling EER Range (230-Volts/265-Volts)	10.2 - 12.7	10.0 - 12.7
Heating COP Range (230-Volts/265-Volts)	N/A	3.2 - 3.6
Heat Source — Electric Resistance Heat	Standard	—
Heat Source — Heat Pump With Selectable Full Time or On Demand Simultaneous/Supplemental Resistance Heat	—	Standard
Staged Heating	—	3 Stage
Universal Heater — UPC*	Standard	Standard
Unit Controls	Rotary Knobs	Rotary Knobs
Highly Featured Microprocessor Controls	Standard	Standard
Electric Resistance Heat Lock-Out (above 46°F)	—	Standard
Automatic Emergency Heat	—	Standard
Heat Pump Defrost System	—	Reverse Cycle
High Temperature Operation Protection	—	Standard
Quick Heat Recovery	—	Standard
Temperature Boost		Selectable
Fan Motors — Permanently Lubricated	2	2
2 Speed Outdoor Fan	Standard	Standard
Indoor Fan Speed Selections – HIGH/LOW	Standard	Standard
Fan Only Setting — HIGH/LOW	Standard	Standard
Fan Cycle Switch	"Smart Fan"	"Smart Fan"
Constant Run Fan	Selectable	Selectable
Rotary Compressor	Standard	Standard
Automatic Compressor Restart Delay	Standard	Standard
Freeze Sentinel™	Standard	Standard
Heat Sentinel	Standard	Standard
Indoor Coil Frost Control	Standard	Standard
Transfer Fan Connections	Standard	Standard
7 Step Electronic Temperature Limiting	Standard	Standard
Remote Control Capability with Wall Mounted Thermostat	Standard	Standard
Central Desk Control Capability	Standard	Standard
Energy Management System Interface with Load Shedding Option	Standard	Standard
Reversible Indoor Air Louvers 40°/50°	Standard	Standard
Up-Front Filters	Standard	Standard
Easy Clean Air Discharge Area	Standard	Standard
Concealed Manual Vent Control	Standard	Standard
Ducted Installation Capability	RAK6052	RAK6052
Corrosion Protection (Standard on Dry Air 25)	Optional	Optional
Internal Condensate Removal (ICR) (Factory Installed Option. Cannot be used in Corrosion Areas.)	N/A	Optional

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

Specifications

	Deluxe series – cooling & electric heat				Dry Air 25		
	2800 series units				Dry Air 25		
230/208V Models	**AZ28E07D**	**AZ28E09D**	**AZ28E12D**	**AZ28E15D**	**AZ28E07DAP**	**AZ28E09DAP**	**AZ28E12DAP**
Capacity							
Cooling BTUH	7,100/6,900	9,000/8,800	11,700/11,500	14,600/14,300	6,800/6,600	8,600/8,400	11,200/11,000
EER (BTU/Watt)	12.7/12.7	12.0/12.0	11.5/11.5	10.2/10.2	12.1/12.1	11.5/11.5	11.0/11.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	2.2	3.4	4.5
Sensible heat ratio @ 230 volts	75%	68%	67%	67%	66%	58%	57%
CFM, indoor fan high	250	270	290	310	210	230	240
CFM, indoor fan low	215	235	240	260	175	200	210
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45	50/40	70/45	75/45
Power/Ratings							
Power factor	86/87	86/86	91/91	89/90	87/87	86/86	91/91
Watts	560/545	750/735	1020	1430/1400	560/545	750/730	1020
Amperes, F.L.	2.8/3.0	3.8/4.1	4.9/5.3	7.0/7.5	2.8/3.0	3.6/3.9	4.9/5.3
Amperes, L.R.	19.0	21.0	31.0	38.0	19.0	21.0	31.0
Weight (Net/Ship)	100/115	101/116	105/120	115/130	100/115	101/116	105/120
Sound Transmission Class (STC)	29	29	29	29	29	29	29

265V Models	**AZ28E07E**	**AZ28E09E**	**AZ28E12E**	**AZ28E15E**	**AZ28E07EAP**	**AZ28E09EAP**	**AZ28E12EAP**
Capacity							
Cooling BTUH	7,100	9,000	11,700	14,600	6,800	8,600	11,200
EER (BTU/Watt)	12.7	12.0	11.5	10.2	12.1	11.5	11.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	2.2	3.4	4.5
Sensible heat ratio @ 265 volts	75%	68%	67%	67%	66%	58%	57%
CFM, indoor fan high	250	270	290	310	210	235	250
CFM, indoor fan low	215	235	240	280	175	200	00
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45	50/40	70/45	75/45
Power/Ratings							
Power factor	87	86	87	90	88	86	87
Watts	560/545	750	1020	1431	560	750	1020
Amperes, F.L.	2.4/3.0	3.3	4.4	6.0	2.4	3.3	4.4
Amperes, L.R.	16.0	18.0	24.0	31.0	16.0	18.0	24.0
Weight (Net/Ship)	100/115	101/116	105/120	115/130	100/115	101/116	105/120
Sound Transmission Class (STC)	29	29	29	29	29	29	29

	Deluxe series – heat pump units			
	3800 series units			
230/208V Models	**AZ38H07D**	**AZ38H09D**	**AZ38H12D**	**AZ38H15D**
Capacity				
Cooling BTUH	7,100/6,900	9,000/8,800	11,700/11,500	14,600/14,300
EER (BTU/Watt)	12.7/12.7	12.0/12.0	11.5/11.5	10.0/10.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5
Sensible heat ratio @ 230 volts	75%	68%	67%	67%
CFM, indoor fan high	250	270	300	310
CFM, indoor fan low	215	235	260	260
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
Power/Ratings				
Power factor	86/87	96	97	94
Watts	560/545	750/735	1020/1000	1460/1430
Amperes, F.L.	2.8/3.0	3.8/4.1	4.9/5.3	7.0/7.5
Amperes, L.R.	19.0	21.0	31.0	38.0
Reverse cycle heat BTUH	6400/6200	8400/8200	10900/10700	13400/13200
COP	3.6	3.6	3.4	3.2
Watts	520/505	685/670	940/925	1230/1210
Amps	2.4/2.6	3.2/3.5	4.3/4.7	5.8/6.3
Weight (Net/Ship)	102/117	109/124	113/128	13/138
Sound Transmission Class (STC)	29	29	29	29

265V Models	**AZ38H07E**	**AZ38H09E**	**AZ38H12E**	**AZ38H15E**
Capacity				
Cooling BTUH	7,100	9,000	11,700	14,600
EER (BTU/Watt)	12.7	12.0	11.5	10.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5
Sensible heat ratio @ 265 volts	75%	68%	67%	67%
CFM, indoor fan high	250	270	300	310
CFM, indoor fan low	215	235	260	260
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
Power/Ratings				
Power factor	96	94	94	96
Watts	560	750	1020	1460
Amperes, F.L.	2.4	3.2	4.4	6.0
Amperes, L.R.	16.0	18.0	24.0	31.0
Reverse cycle heat BTUH	6,400	8,400	10,900	13,400
COP	3.6	3.6	3.4	3.2
Watts	520	685	940	1230
Amps	2.2	2.8	3.9	5.0
Weight (Net/Ship)**	102/117	109/124	113/128	123/138
Sound Transmission Class (STC)	29	29	29	29

**ICR adds 3 pounds to unit weight

Features and Benefits

Standard Physical Dimensions

GE has maintained the same dimensions for Zoneline air conditioners since 1961– 42 inches wide x 16 inches high x 13 3/4 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

Properly installed unit in a non-distorted case keeps air leakage to a minimum. 7 CFM air infiltration with 25 MPH wind on non-Internal Condensate Removal (ICR) units – 10 CFM on units with ICR. 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

- 2.55/2.09 KW with RAK3153 - 15-amp circuit
- 3.45/2.82 KW with RAK3203 – 20-amp circuit
- 5.0/4.09 KW with RAK3303 – 30-amp circuit

230/208-Volt - Sub-Base Connected Units

- 2.55/2.09 KW with RAK204D15P – 15-amp circuit
- 3.45/2.82 KW with RAK204D20P – 20-amp circuit
- 5.0/4.09 KW with RAK204D30P – 30-amp circuit

265-Volt

- 2.55 KW with RAK5172 – 15-amp circuit
- 3.45 KW with RAK5202 – 20-amp circuit
- 5.0 KW with RAK5302 – 30-amp circuit

Unit Controls

The 2800 and 3800 Series have locked-in-place rotary knobs 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 Zoneline 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

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

Reverse Cycle Heat Pump Defrost System

Standard on all Zoneline 3800 Series heat pumps. Enables heat pump to operate at lower temperatures when other systems switch to more expensive electric resistance heat.

High Temperature Heat Pump Operation Protection

Automatically 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 two fan motors for quiet operation and maximum operating efficiency. Motors are permanently lubricated to reduce the need for maintenance, and 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

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 in cooling operation and fan-cycle in heating 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 controlled by two dip switches on 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

Smoother operation for quiet, dependable service. GE has used rotary compressors since 1961.

Compressor Restart Delay

Zoneline air conditioners are designed to provide a minimum of three minutes of compressor off time to allow refrigerant pressures to equalize before restarting to prevent compressor damage. They are also designed to provide a minimum of three minutes of compressor run time to prevent room occupant disturbance due to short-cycling of the air conditioner.

Freeze Sentinel

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

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 in 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.

Indoor Coil Frost Control

Prevents 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

24 VAC terminals are provided to operate a relay, which controls a fan mounted in a wall to move 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

Seven independent programmable heating temperature limits and seven independent programmable cooling temperature limits. Eliminates 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

Energy Management System Interface with Load Shedding Option

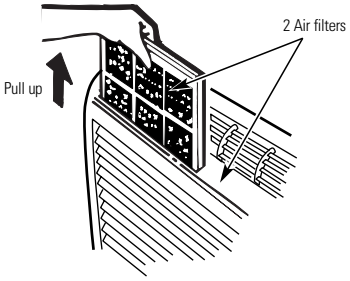
All units have a switch on the auxiliary control panel to allow the indoor fan to continue operating if the unit is connected to an energy management system that shuts off compressor or heater operation. By allowing the indoor fan to run when the heater or compressor is shut off by the energy management system, the guest is less likely to realize the operation of the unit has been altered. This helps reduce peak energy demand loads without disturbing the room occupant.

Reversible Indoor Air Louvers

Allows air to be directed into room at 40° or 50° angle to provide better air distribution. Angle is changed by removing room front and screws holding louver in place, and rotating louver section.

(Continued next page)

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 2800 and 3800 series units have an out-of-sight vertical 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.

Corrosion Protection (Optional)

The 2800 and 3800 Series units may be ordered with special protection to better withstand damage from salt air and salt water in seacoast areas.

Corrosion Protection

Corrosion protection is standard on Dry Air 25 models and optional on non-Dry Air 25 models.

Heat pump 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.

Enhanced Dehumidification

Moisture removal is an important function of an air conditioner. People are more comfortable at higher temperatures when the humidity level is relatively low. Air conditioners operate with less energy consumption when the room temperatures are set higher.

The GE Zoneline 2800 series with the Dry Air 25 heat pipe application removes 25% more moisture than the base 2800 Series unit. This equates to up to 2.7 additional gallons of moisture removed per day.

The GE Zoneline Dry Air 25 chassis is the only PTAC available with the application of the patented Dinh Dehumidifier Heat Pipe under license from Heat Pipe Technology, Inc.

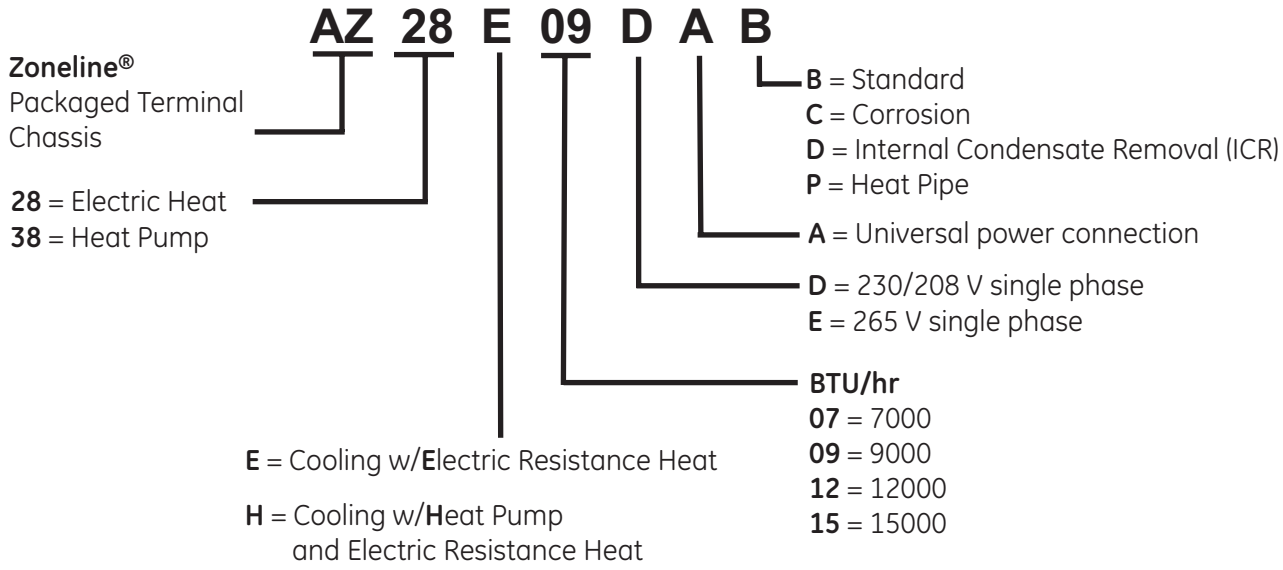
Customers who are using the Dry Air 25 report a fresher-smelling room as a result of the lower humidity levels, as well as lower operating costs.

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.

Nomenclature

Model Number



Model/Serial Tag Location

The model/serial 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: **AH**123456 = January, 2005

A - JAN	2005 - **H**
D - FEB	2004 - G
F - MAR	2003 - F
G - APR	2002 - D
H - MAY	2001 - A
L - JUN	2000 - Z
M - JUL	1999 - V
R - AUG	1998 - T
S - SEP	1997 - S
T - OCT	1996 - R
V - NOV	1995 - M
Z - DEC	1994 - L

The letter designating the year repeats every 12 years.

Example:

T - 1974
T - 1986
T - 1998

The mini-manual is located behind the room cabinet to the left of the control panel.

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.

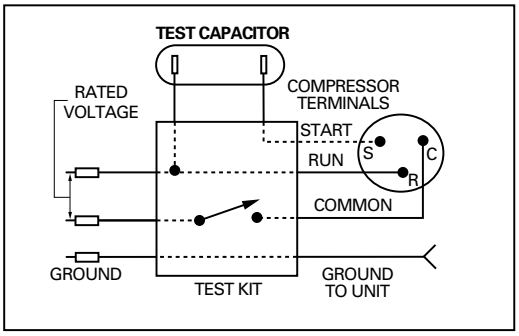
WARNING DISCONNECT UNIT FROM ELECTRICAL POWER SUPPLY BEFORE MAKING ANY ELECTRICAL CHECKS.
MAXIMUM CURRENT LEAKAGE: 0.5 MILLIAMP
MAXIMUM GROUND PATH RESISTANCE: 0.1 OHM

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.

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

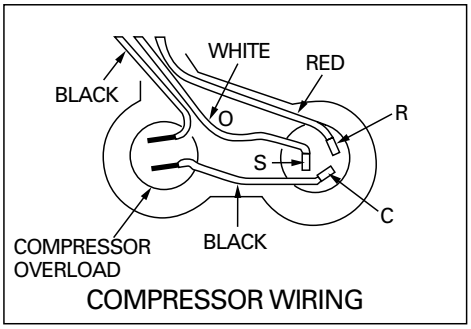
Run Capacitor Check

1. Replace unit run capacitor with a known good test capacitor which may be 10 μfd 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.



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.

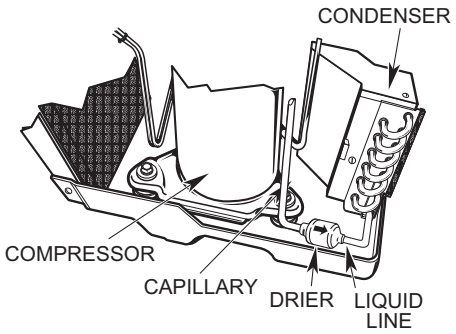


Thermistor Resistance

°F	Room Air (Ω)	Indoor Coil (Ω)	3800 Series	
			Outdoor Coil (Ω)	Outdoor Air (Ω)
10	63260	94900	28030	
30	34620	51940	15340	
32	32890	49330	14570	
50	19970	29960	8850	
70	11950	17930	5300	
90	7320	10970	3280	

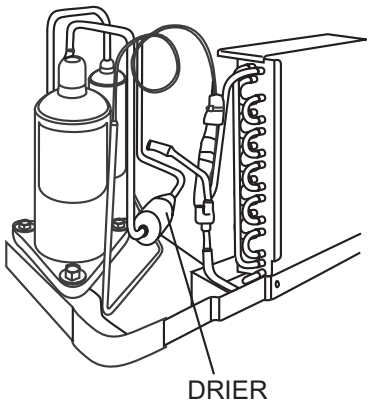
Drier Location 2800 Series

Install a drier in the liquid tube between the condenser and the capillaries.



Drier Location 3800 Series

Install a drier in the horizontal section between the compressor and the reversing valve .



2800 Series

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

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

230/208 VAC, 2800 Series Models

	7000 BTUH Units				9000 BTUH Units				12000 BTUH Units				15000 BTUH Units			
Current/Temperature Check Data - Cooling Current in Amps																
Air Temp Condenser In	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
80°F	2.3	2.8	2.4	2.9	3.1	3.6	3.2	3.7	3.8	4.3	4.0	4.5	4.8	5.3	5.2	5.7
95°F	2.7	3.2	2.8	3.3	3.5	4.0	3.8	4.3	4.4	4.9	4.7	5.2	6.2	6.7	6.8	7.3
110°F	3.2	3.7	3.4	3.9	4.5	5.0	4.8	5.3	5.4	5.9	5.8	6.3	7.7	8.2	8.5	9.0
Temperature Differential Check Data - Evaporator Air Temp Out in °F																
Evaporator Air Temp In	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
70°F	45	50	44	49	40	44	39	43	42	46	41	45	39	43	37	41
80°F	55	60	53	58	57	61	56	60	53	57	53	57	48	52	46	50
90°F	61	66	62	67	64	68	63	67	59	63	61	65	56	61	54	59

265 VAC, 2800 Series Models

	7000 BTUH Units		9000 BTUH Units		12000 BTUH Units		15000 BTUH Units	
Current/Temperature Check Data - Cooling Current in Amps								
Air Temp Condenser In	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
80°F	2.0	2.5	2.7	3.2	3.3	3.8	4.2	4.6
95°F	2.3	2.8	3.1	3.6	3.8	4.3	5.4	5.9
110°F	2.8	3.3	3.9	4.4	4.7	5.2	6.6	7.1
Temperature Differential Check Data - Evaporator Air Temp Out °F								
Evaporator Air Temp In	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
70°F	45	50	40	45	42	46	39	43
80°F	55	60	57	62	53	57	48	52
90°F	61	66	64	69	59	63	56	61

3800 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 one hour with thermostat at coldest setting prior to measuring air temperatures.

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

230/208 VAC, 3800 Series Models

	7000 BTUH Units				9000 BTUH Units				12000 BTUH Units				15000 BTUH Units			
Current/Temperature Check Data																
Air Temp Condenser In	Cooling Current in Amps															
	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
80°F	2.3	2.8	2.4	2.9	3.1	3.6	3.2	3.7	3.8	4.3	4.0	4.5	4.8	5.3	5.2	5.7
95°F	2.7	3.2	2.8	3.3	3.5	4.0	3.8	4.3	4.4	4.9	4.7	5.2	6.2	6.7	6.8	7.3
110°F	3.2	3.7	3.4	3.9	4.5	5.0	4.8	5.3	5.4	5.9	5.8	6.3	7.7	8.2	8.5	9.0
Air Temp Outdoor Coil In	Reverse Cycle Heating Current in Amps															
	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
47°F	2.3	2.8	2.5	3.0	2.9	3.4	3.1	3.6	4.1	4.6	4.3	4.8	5.7	6.2	6.2	6.7
60°F	2.5	3.0	2.7	3.2	3.0	3.5	3.2	3.7	4.2	4.7	4.6	5.1	6.3	6.8	7.0	7.5
75°F	2.7	3.2	3.1	3.6	3.3	3.8	3.7	4.2	4.8	5.3	5.4	5.9	6.9	7.4	7.9	8.4
Temperature Differential Check Data																
Evaporator Air Temp In	Evaporator Air Temp Out °F															
	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
70°F	45	50	44	49	40	44	39	43	42	46	41	45	39	43	37	41
80°F	55	60	53	58	57	61	56	60	53	57	53	57	48	52	46	50
90°F	61	66	62	67	64	68	63	67	59	63	61	65	56	61	54	59
Indoor Air Temp In	Indoor Coil Air Temp Out °F															
	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max	230V Min	230V Max	208V Min	208V Max
70°F	93	98	95	100	90	94	92	96	100	105	100	105	113	118	116	121
75°F	103	108	103	108	98	102	99	103	109	114	113	118	122	127	127	132
80°F	111	116	113	118	105	109	107	111	117	122	124	129	134	139	138	143

265 VAC, 3800 Series Models

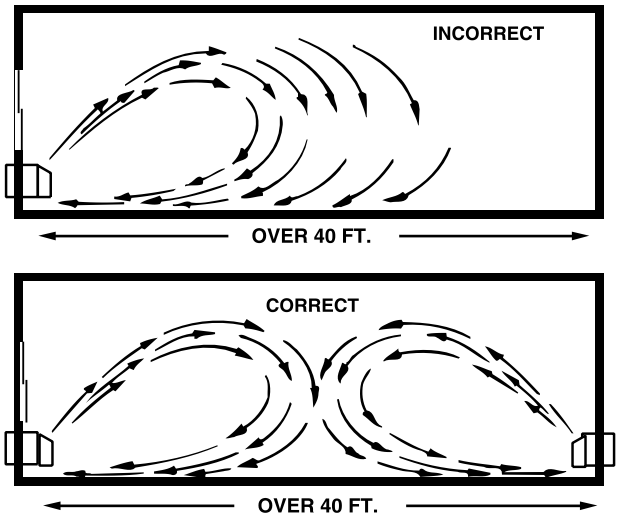
	7000 BTUH Units		9000 BTUH Units		12000 BTUH Units		15000 BTUH Units	
Current/Temperature Check Data								
Air Temp Condenser In	Cooling Current in Amps							
	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
80°F	2.0	2.5	2.7	3.2	3.3	3.8	4.2	4.6
95°F	2.3	2.8	3.1	3.6	3.8	4.3	5.4	5.9
110°F	2.8	3.3	3.9	4.4	4.7	5.2	6.6	7.1
Air Temp Outdoor Coil In	Reverse Cycle Heating Current in Amps							
	2 65V Min	2 65V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
47°F	2.0	2.5	2.5	3.0	3.4	3.9	4.9	5.4
60°F	2.2	2.7	3.6	3.1	3.7	4.2	5.4	5.9
75°F	2.4	2.9	2.9	3.4	4.4	4.9	5.9	6.4
Temperature Differential Check Data								
Evaporator Air Temp In	Evaporator Air Temp Out °F							
	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
70°F	45	50	40	45	42	46	39	43
80°F	55	60	57	62	53	57	48	52
90°F	61	66	64	69	59	63	56	61
Indoor Air Temp In	Indoor Coil Air Temp Out °F							
	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max	265V Min	265V Max
70°F	93	98	90	94	100	105	113	118
75°F	103	108	98	102	109	114	122	127
80°F	111	116	105	109	117	122	134	139

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 over/undersized application (cooling/humidity problem). For the reasons listed above, it is strongly recommended that a professional engineer be retained to match the Zoneline with the building structure.

Supply Air Throw

One Zoneline unit should not be required to do a job obviously requiring two 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.



Under-Sizing

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).

Over-Sizing

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

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

Wall Coverings

Use of non-permeable 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 under-sizing or over-sizing 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, 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 two adjacent areas, such as living room or hall, determine each space separately and then add the two totals.

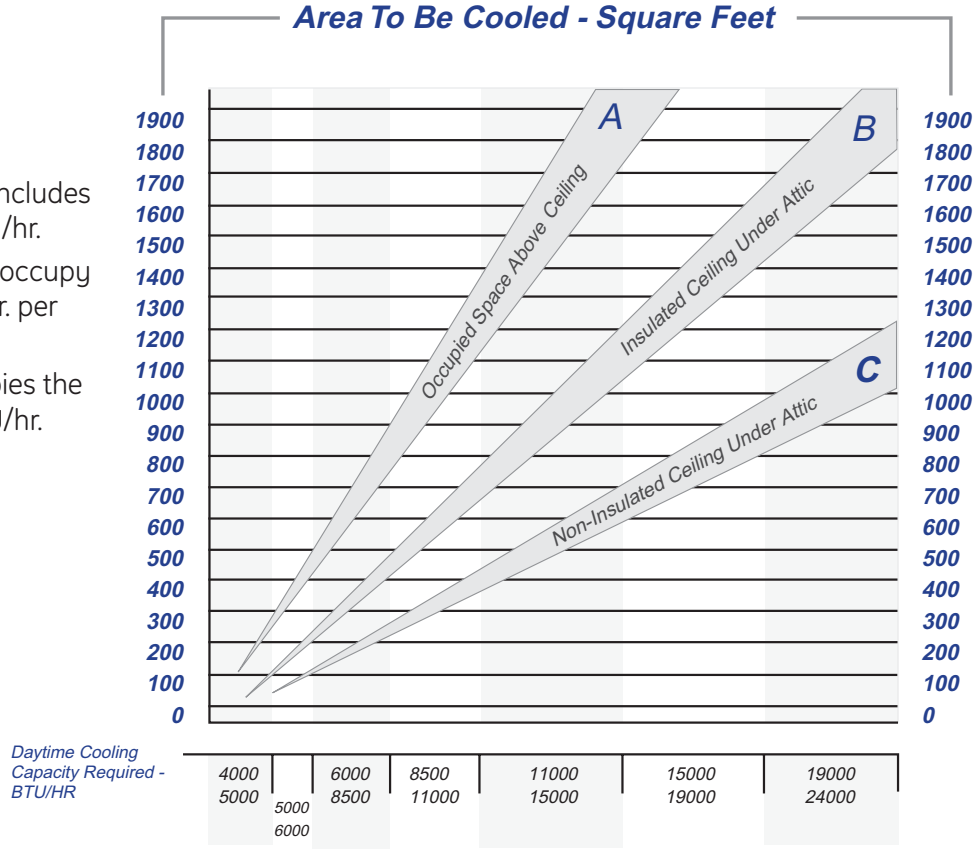
2. Locate the square footage on the left side of the ***Area To Be Cooled - Square Feet*** chart. Using this number as a reference point, draw a horizontal line across the chart. Select the correct room air conditioner capacity from one of the three diagonal bands in the chart.

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 '	1 4'	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 two people occupy the area ADD 600 BTU/hr. per person.
- If only one 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 BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK3153	8600/7100	2550/2090	11.6/10.6	15
RAK3203	11700/9600	3450/2820	15.5/14.1	20
RAK3303	17000/13900	5000/4090	22.3/20.3	30

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 appropriate receptacle for minimum circuit amperage, a chaseway to route 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. Permanent, or direct wired, installation of a 230/208-volt unit requires a junction box kit, RAK4002A, which 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 2800 and 3800 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 $^{7}/_{8}$" diameter hole to allow conduit to be connected to the junction box. A line cord kit (see ***230/208-Volt Line-Cord Connected Units***) 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 Sub-Base Connected Units

Sub-Base	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204D15P	8600/7100	2550/2090	11.6/10.6	15
RAK204D20P	11700/9600	3450/2820	15.5/14.1	20
RAK204D30P	170100/13900	5000/4090	22.3/20.3	30

Electric Heat Amps include electric heater and fan motor current draw.

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 BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204E15	RAK5152	8600	2550	11.6/10.6	15
RAK204E20	RAK5202	11700	3450	15.5/14.1	20
RAK204E30	RAK5302	17000	5000	22.3/20.3	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 wiring.

Note: The 265-volt power connection kit must be ordered separately. All wiring must conform to local electrical regulations and codes.

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	NEMA6-20R	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.

Power connection kits are required on all Zoneline 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®.

RAK3153 and RAK3203
230/208 volt line cord
connection kit

RAK3303
230/208 volt line cord
connection kit

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

230/208 volt	Line cord connected units		
LCDI Power Connection Kit	RAK3153	RAK3203	RAK3303
Heater KW	2.55/2.09	3.45/2.82	5.00/4.09
Watts	2,550/2,090	3,450/2,820	5,000/4,090
BTUH	8,600/7,100	11,700/9,600	17,000/13,900
Amps	11.0/10.0	15.0/13.6	21.7/19.7
Min. circuit amps	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

265 volt Permanent connected units** (Cord set)		
RAK5172	RAK5202	RAK5302
2.55	3.45	5.0
2,560	3,450	5,000
8,600	11,700	17,000
9.6	13.0	18.9
15	20	30
15 Amp time delay fuse	20 amp time delay fuse	30 amp time delay fuse

**To be used with sub-base

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 one 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. 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 three individual heater elements as defined below:

230/265-Volt Models

- One heater rated at 1.00 KW
- One heater rated at 1.55 KW
- One heater rated at 2.45 KW

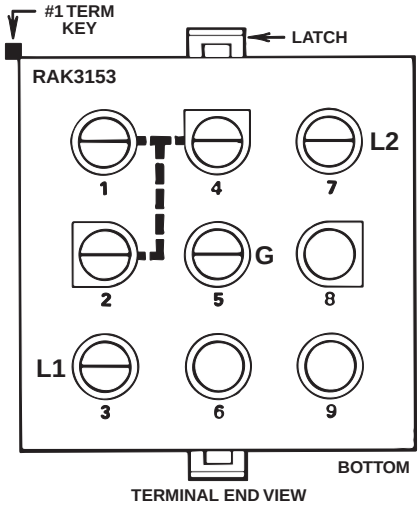
The power cord used, determines which element is energized and how much heat is provided.

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 volt and 265-volt units when they are connected to 15, 20, or 30 amp branch circuits.

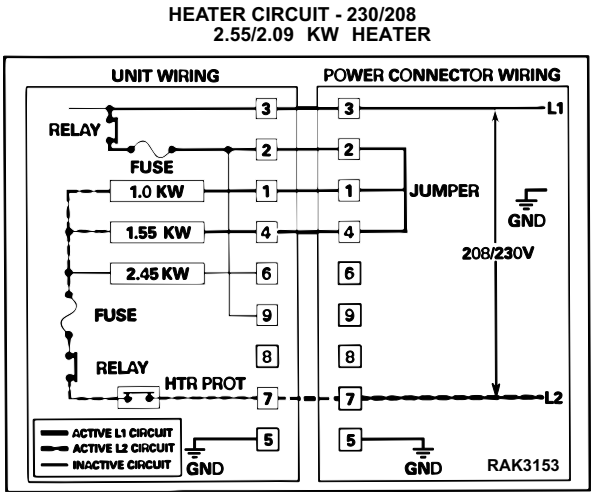
Power Connector Plug 15 AMP - 230/208 VAC, 2.55/2.09 KW Heater (RAK3153)

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.



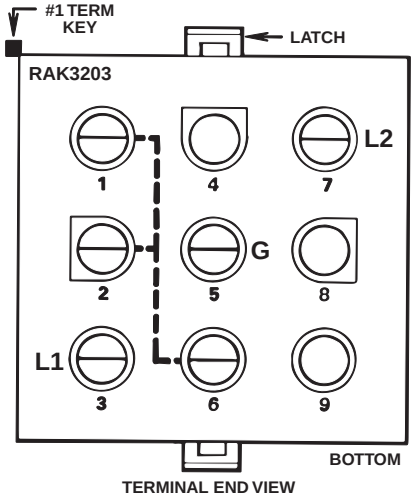
Heater Circuit Schematic 15 AMP - 230/208 VAC, 2.55/2.09 KW Heater (RAK 3153)

When the relay contacts close, the circuits to the 1.0 KW and 1.55 KW heaters are completed from L1 through the jumpers between terminals #1 to #2 and #2 to #4, and back to L2 through terminal #7. This makes the total of 2.55 KW of heat available to heat the room.



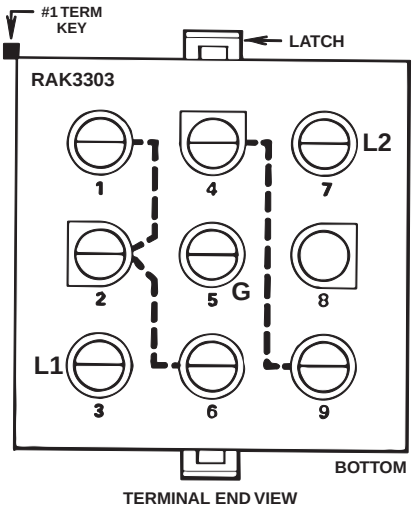
Power Connector Plug 20 AMP - 230/208 VAC, 3.45/2.82 KW Heater (RAK3203)

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, 5.00/4.10 KW Heater (RAK3303)

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 to #9.

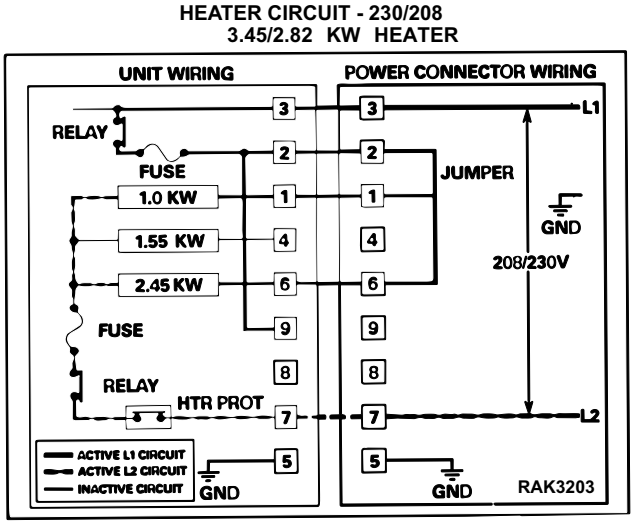


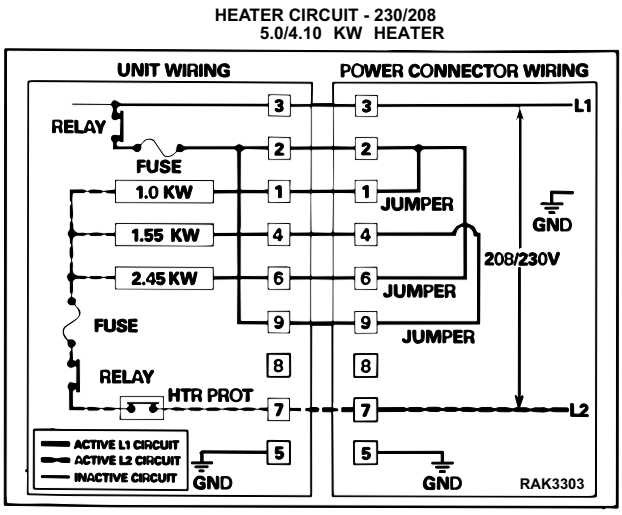
Heater Circuit Schematic 20 AMP - 230/208 VAC, 3.45/2.82 KW Heater (RAK3203).

When the relay contacts close, the circuits to the 1.0 KW and 2.45 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 the total of 3.45 KW of heat available to heat the room.

Heater Circuit Schematic 30 AMP - 230/208 VAC, 5.0/4.10 KW Heater (RAK3303)

When the relay contacts close, the circuits to the 1.0KW, 2.45 KW, and 1.55 KW heaters are completed from L1 through the jumpers between terminals #1 and #2, #2 and #6, and #4 and #9, and back to L2 through terminal #7. This makes the total of 5.0 KW of heat available to heat the room.

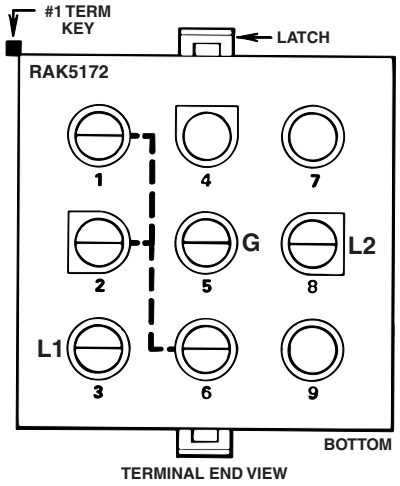




(Continued next page)

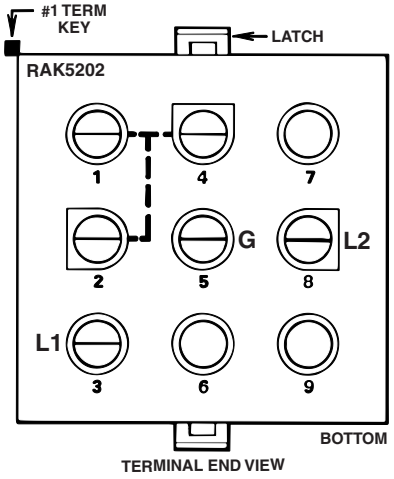
Power Connector Plug 15 Amp - 265 VAC, 2.55 KW Heater (RAK5172)

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.



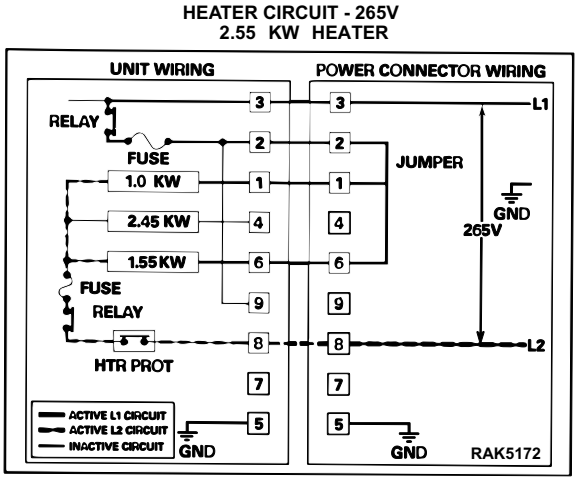
Power Connector Plug 20 Amp – 265 VAC, 3.45 KW Heater (RAK5202)

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.



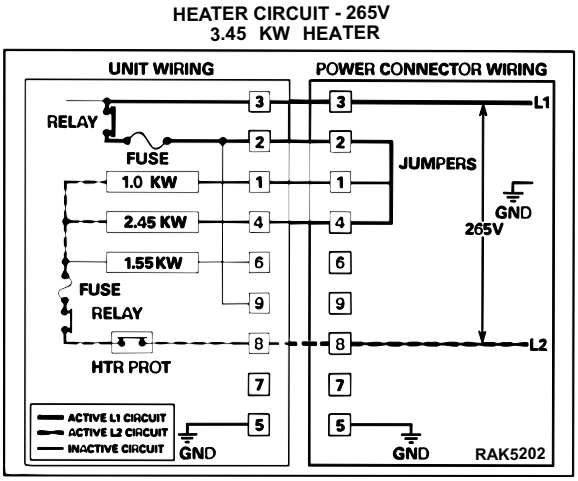
Heater Circuit Schematic 15 Amp - 265 VAC, 2.55 KW Heater (RAK5172)

When the relay contacts close, the circuits to the 1.55 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 2.55 KW of heat available to heat the room.



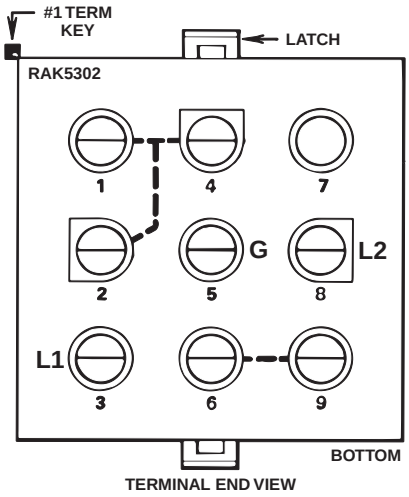
Heater Circuit Schematic 20 Amp - 265 VAC, 3.45 KW Heater (RAK5202)

When the relay contacts close, the circuits to the 2.45 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 3.45 KW of heat available to heat the room.



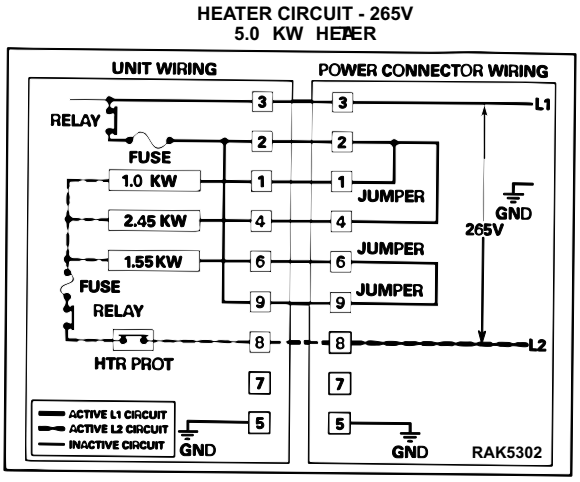
Power Connector Plug 30 Amp - 265 VAC, 5000 Watt Heater (RAK5302)

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, 5.0 KW Heater (RAK5302)

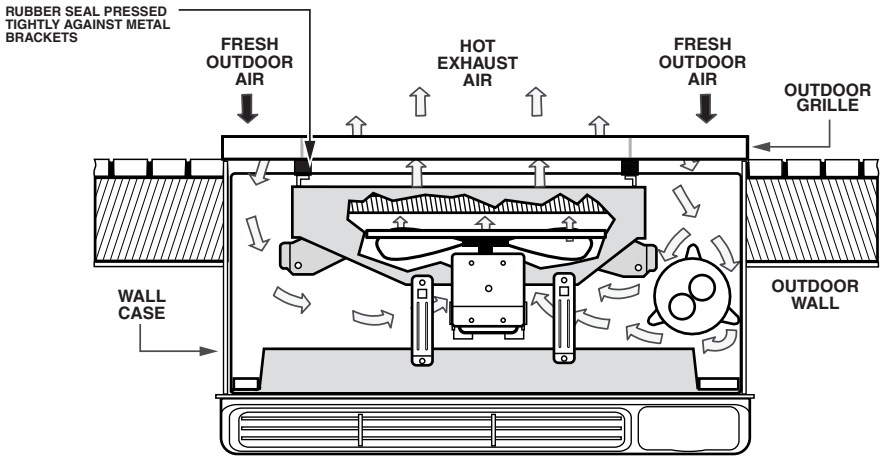
When the relay contacts close, the circuits to the 1 KW, 2.45 KW, and 1.55 KW heaters are completed from L1 through the jumper wires between terminals #1 and #2, #2 and #4, and #6 and #9, and back to L2 through terminal #8. This makes a total of 5.0 KW of heat available to heat the room.



Airflow

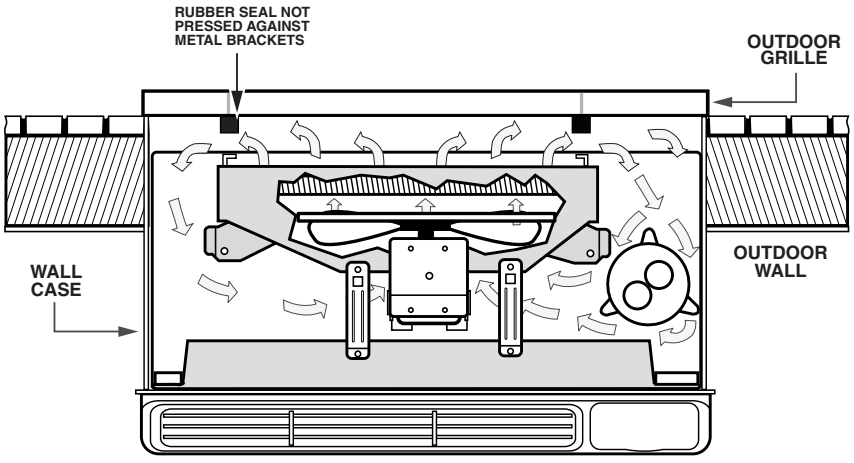
Proper Outdoor Coil Airflow

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)

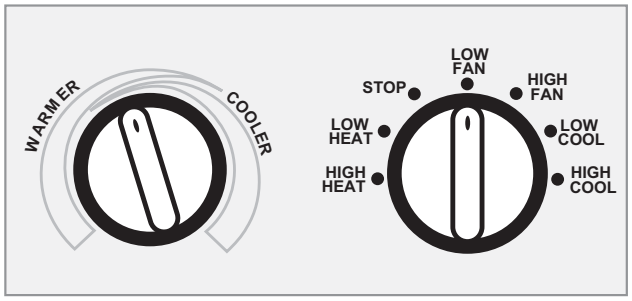
When improperly installed, the rubber seals on the inside of the outdoor grille do not fit against the metal brackets on the outdoor coil. This allows hot outdoor coil exhaust air to recirculate across the compressor and outdoor coil. When this condition occurs, the compressor overheats and eventually cycles off on the compressor overload protector (compressor shut offs). 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

The user controls are located behind a door in the top, right of the room cabinet. They are normally used to control the day to day operation of the unit. The room cabinet does not have to be removed to operate these controls.



The vent door control is located on the left side of the unit. Removal of the room cabinet is required to remove shipping screws and change its setting. The vent door control is factory set at CLOSE (see ***Vent Door and Cable***).

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.

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

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 2800, and 3800 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 of the energy management systems. The devices connected to the Zoneline units require no power supply or transformers external to the unit.

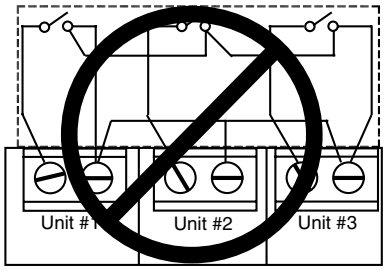
(Continued next page)

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 one wire from one 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.

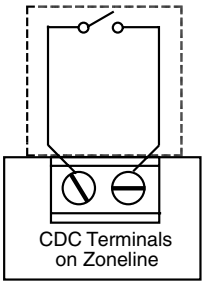
Wire Size #AWG	Maximum Allowable Length
#22	600 Ft.
#20	900 Ft.
#18	1500 Ft.
#16	2000 Ft.

Example of Common Bussing NOT PERMITTED



INCORRECT Common Bussing

Normally Open Switch - Unit Operational



Typical Wiring
(All Wiring Shown Is Field Supplied)

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 following page for location of CDC terminals on unit.

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, for instance, 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 which 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 Zoneline 2800 and 3800 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 Zoneline 2800 resistance heat units may be connected to a single-stage thermostat designed for use with cooling and electric heat systems. GE offers three thermostats compatible with the 2800 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 switch (dip switch #4 on the auxiliary control board) must be set to the ON/UP mode to enable remote thermostat control.

Refer to installation instructions packaged with the chassis.

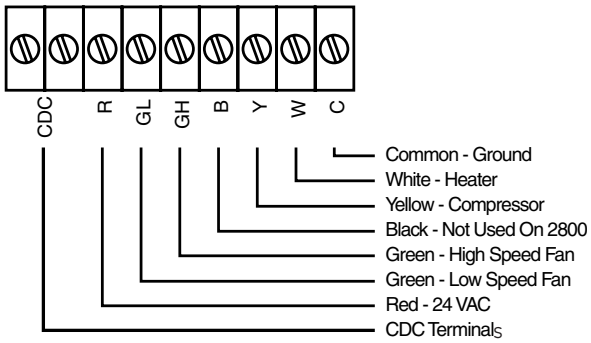
Compatibility of other thermostats considered for use with the GE Zoneline is the responsibility of the customer. The control voltage on the remote control conductors is 24 volts AC. The AC voltage may not be compatible with some solid-state thermostats.

The fan speed for the 2800 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.

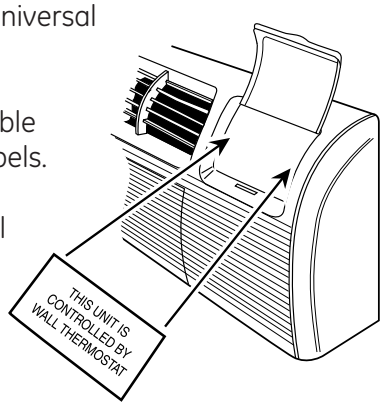
Field Wiring Terminal

R — 24V AC
GL — Low-Speed Fan
GH — High-Speed Fan
B — Not Used on 2800
Y — Compressor
W — Heater
C — Common - Ground



RAK806 Universal Control Cover Label

When a Zoneline 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 Zoneline unit.



(Continued next page)

Heat Pump Models

The Zoneline 3800 series heat pump units may be connected to a single stage cooling/two stage heating thermostat designed for use with heat pump systems. GE offers 3 thermostats compatible with the 3800 series units.

RAK147 — mechanical manual changeover thermostat requiring 6 connection wires.

RAK148D1 — solid state digital manual changeover thermostat requiring 6 connection wires.

RAK148P1 — solid state digital programmable auto-changeover thermostat requiring 6 connection wires.

The control voltage on the remote control conductors is 24 VAC.

The class 2 mode switch, dip switch #4 on the auxiliary control board on the 3800 series, must be set to the ON/UP mode to enable remote thermostat control. Refer to installation instructions packaged with the chassis.

The fan speed for the 3800 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.

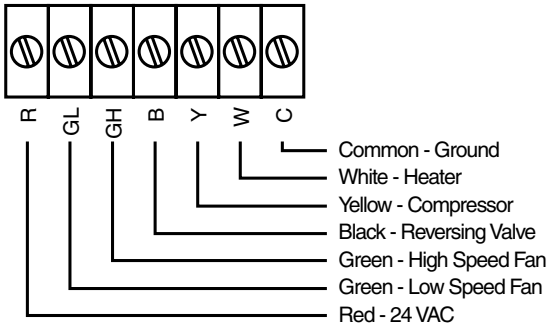
When connected to a remote thermostat, the indoor air temperature sensing is shifted from the unit to the remote thermostat. For this reason, the units will operate slightly different when connected to a remote thermostat. The following chart shows the unit operation when connected to a remote thermostat.

The temperature boost option should not be used with the remote thermostat operation since this will cause the unit to switch to resistance heat when outdoor temperatures are below 46°F.

Feature	Heat Pump
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

Field Wiring Terminal

R — 24V AC
GH — High-Speed Fan
Y — Compressor
C — Common - Ground
GL — Low-Speed Fan
B — Reversing Valve
W — Heater
C — Gnd



Remote Thermostat Control Selection Chart For Zoneline Packaged Terminal Units

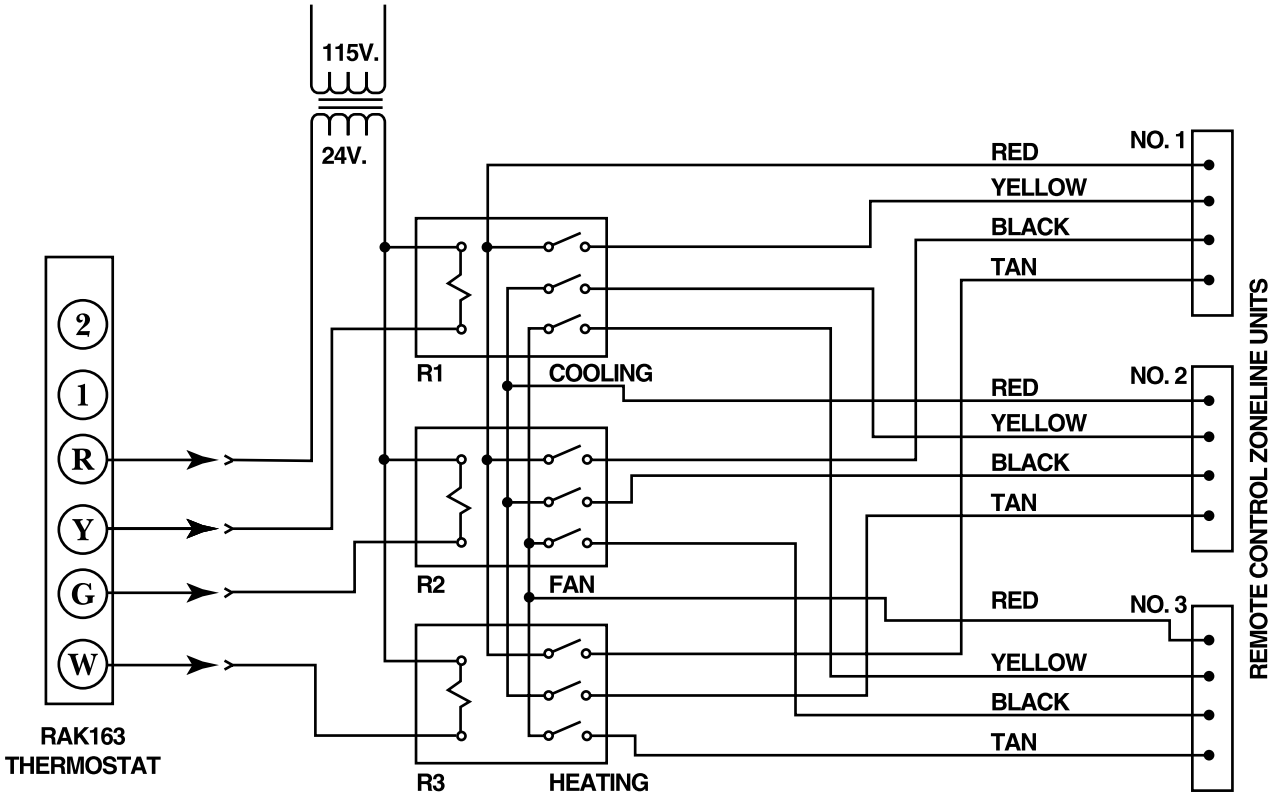
Zoneline Series	Thermostat Model	Type	Function	Low Voltage Conductors
2800	RAK163A1	Mechanical	Cooling and Heating	4
	RAK164D1	Digital		5
	RAK164P1	Digital	Programmable	5
3800	RAK147	Mechanical	Single Stage Cooling – 2 Stage Heating	6
	RAK148D1	Digital		6
	RAK148P1	Digital Programmable		6

Thermostat wire size – up to 60 feet AWG20 – up to 66 feet AWG18

Multiple Units Connected to One Remote Thermostat (2800 Series)

One remote control thermostat may be used to control multiple resistance heat Zoneline units, however the units may not be wired direct. Since each Zoneline unit has an integral transformer, direct wiring can result in a "bucking" or boosting" voltage condition, and is in violation of the National Electric Code. The diagram below shows the correct wiring for such an installation through the use of field supplied isolation relays.

For Use With Mechanical 4-Wire Systems Only



Remote Control (Low Voltage) Wiring

One stage thermostat controlling 3 Zoneline units.
Resistance heat Zoneline 2800 series units.
(Not Applicable on Heat Pump Units.)

Field Supplied Relay Specifications

Number Of Units Controlled	Relay Designation R1, R2, And R3
2	POTTER and BRUMFIELD TYPE KA11AY-24 OR EQUIVALENT
3	POTTER and BRUMFIELD TYPE KA14AY-24* OR EQUIVALENT
4	POTTER and BRUMFIELD TYPE KU17A11-24* OR EQUIVALENT
MORE THAN 4	USE COMBINATION OF RELAYS SPECIFIED ABOVE

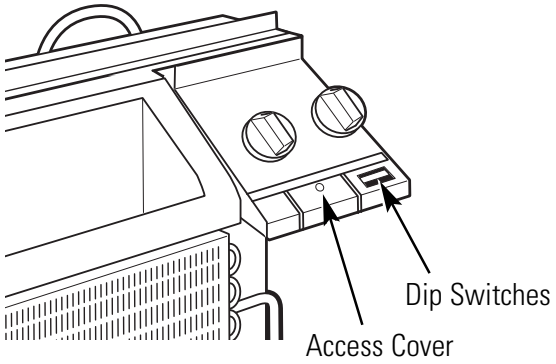
NOTE: Current draw through thermostat contacts should not exceed 1.0 amps.
*Special order, 100 piece minimum order.

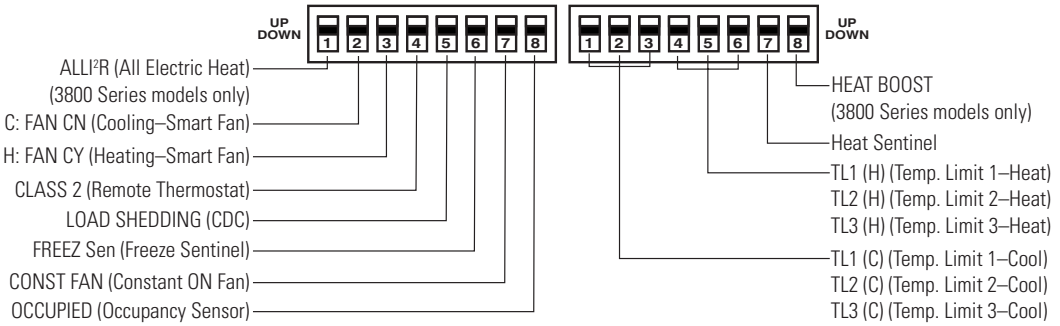
Auxiliary Controls

Dip Switches

Two sets of dip switches are used to control temperature limiting and auxiliary functions. The dip switch controls are located behind the room cabinet, through an opening in the control panel.

Factory settings will be in the DOWN position. (The owner is responsible for checking switches and ensuring they are in the desired position.)





All Electric Heat (3800 Series Only)

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

Cooling—Smart Fan

When this switch is enabled (up position), it allows the indoor fan to cycle on and off with the compressor. When this switch is disabled (DOWN), it allows the indoor fan to run continuously.

Heating—Smart Fan

When this switch is enabled (UP), it allows the indoor fan to run continuously. When this switch is disabled (DOWN), it allows the indoor fan to cycle on and off with the heat pump or heater operation.

Remote Thermostat—Class 2

When this switch is enabled (UP), it allows the unit to operate with a class 2 remote control wall thermostat. The unit controls are disabled.

Load Shedding (Central Desk Control)

This feature is active only if the unit is in CDC mode. When this switch is enabled (UP), the indoor fan can be turned ON or OFF with the unit controls.

Freeze Sentinel

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

Constant ON Fan

When this switch is enabled (UP), it allows the indoor fan to run continuously, at high speed, even if the unit is in the STOP position.

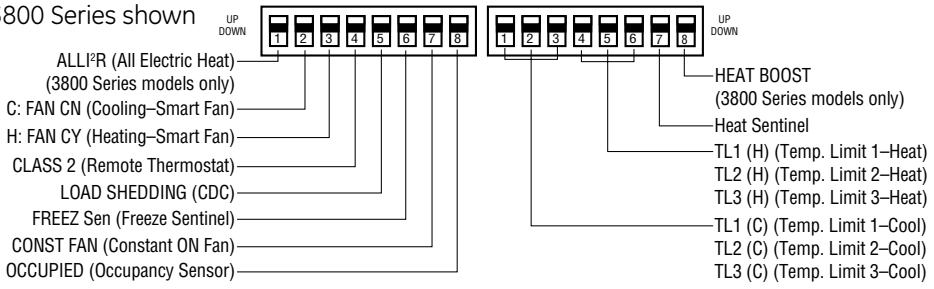
Occupancy Sensor

When this switch is enabled (UP), it allows the unit to utilize an infrared motion sensor and a door switch for occupancy detection. This feature allows an energy management system to be installed and operated in conjunction with the unit.

2800 and 3800 Series

Switches	Description	
Left Switches		
(1)	ALL I2R	Heat pump override — Down — Normal heat pump operation Up — resistance heat only (3800 Series only)
(2)	C:FAN	Fan control for cooling operation — Down — Fan Continuous Up — Fan Cycle
(3)	H:FAN	Fan control for heating operation — Down — Fan Cycle Up — Fan Continuous
(4)	CLASS 2	Remote Thermostat Mode — Down — Unit Control Up — Remote Thermostat
(5)	LOAD SHED	Load Shedding when connected to Central Desk Control System — Down — Fan shuts off with unit Up — Fan under "Smart Fan" settings
(6)	FREEZ S	Freeze Sentinel Override — Down — Freeze Sentinel ON Up — Freeze Sentinel OFF
(7)	CONST FAN	Constant Fan — Down — Fan runs normally Up — Fan runs when unit is in STOP position
(8)	OCCUPIED	Occupancy Sensor Mode — Down – Unit Control Up — Occupancy Sensor Connected
Right Switches		
TL1 – TL3		Cooling temperature limiting (See table at bottom of page)
TL1 – TL3		Heating temperature limiting (See table at bottom of page)
(7)		Heat Sentinel switch — Down — Heat Sentinel OFF Up — Heat sentinel ON
(8)		Heat Boost (3800 series only) — Down — Heat Boost OF Up — Heat Boost ON
		Auxiliary (2800 series only)

3800 Series shown



Cooling and Heating temperature limits are set independently,
Temperature limiting switches are in factory-set down position except as noted.

Cooling Temperature Limits

Switches Up	NONE	1	1, 2	2	2, 3	1, 2, 3	1, 3	3
	60	64	66	68	70	72	74	76

Heating Temperature Limits

Switches Up	3	1, 3	1, 2, 3	2, 3	2	1, 2	1	NONE
	65	70	72	74	76	78	80	85

(Continued next page)

Temperature Limiting

Note: This feature is not available with the Remote Thermostat — Class 2.

Temperature limiting can reduce energy costs by limiting the lowest temperature that can be set for cooling and the highest temperature that can be set for heating. Temperature limiting is controlled by the right-hand set of auxiliary switches, # 1 through #6. The first 3 switches are used to select the cooling limits, and the remaining 3 switches are used to control the heating limits.

Heat Sentinel

When this switch is enabled (UP), it turns on the heat sentinel protection feature. With the switch disabled (down position), the heat sentinel is deactivated. This feature 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. The heat sentinel will remain enabled when the unit has been turned off by the remote CDC. The heat sentinel is functional with a wall thermostat as well.

Heat Boost (3800 Series only)

When this switch is enabled (UP) and outdoor temperatures are between 20°F and 46°F, the heat pump-only operation is locked out. This setting is used to provide supplementary heat to the heat pump operation in conditions where the heat pump-only operation is not sufficient to maintain a consistent, comfortable room temperature.

Note: This is an auxiliary switch for 2800 Series models and must remain in the down position.

Temperature limiting during HEAT mode (all temperatures shown in °F)

UP	DOWN	Minimum	Maximum
NONE	4, 5, 6	60°	85°
4	5, 6	60°	80°
4, 5	6	60°	78°
5	4, 6	60°	76°
5, 6	4	60°	74°
4, 5, 6	NONE	60°	72°
4, 6	5	60°	70°
6	4, 5	60°	65°

Temperature limiting during COOL mode (all temperatures shown in °F)

UP	DOWN	Minimum	Maximum
NONE	1, 2, 3	60°	85°
1	2, 3	64°	85°
1, 2	3	66°	85°
2	1, 3	68°	85°
2, 3	1	70°	85°
1, 2, 3	NONE	72°	85°
1, 3	2	74°	85°
3	1, 2	76°	85°

Auxiliary Controls—Terminal Connections

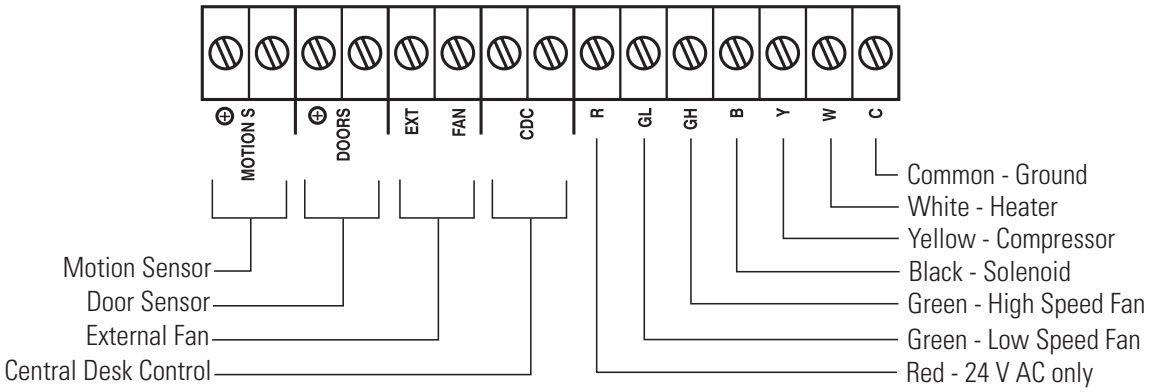
The auxiliary controls are located behind the room cabinet beneath the access cover.

Remove the room cabinet and remove the screw from the access cover.

To make wiring connections, insert the wires into the bottom of the terminals and tighten screws securely.

After all desired connections have been made, replace the access cover and room cabinet. (The owner is responsible for making all connections and setting the appropriate dip switches.)

Caution: Improper wiring may damage the Zoneline 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 Zoneline.



Motion Sensor (Optional)

When connected, the wall mounted motion sensor will detect motion in the room and automatically set back the room temperature. The door and motion sensors work together to automatically set back the room temperature. The appropriate dip switch must be enabled.

Door Sensor (Optional)

When connected, the door sensor will detect when the door in the room was opened or closed. This feature must be used in conjunction with the motion sensor. The door and motion sensors work together to automatically set back the room temperature.

External Fan (Optional)

When connected, an auxiliary or external fan can be controlled with the indoor fan motor on the Zoneline. Connections provide 24 VAC 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 Zoneline.

Remote Thermostat

When connected, the unit will be controlled by a remote thermostat.

Note: The number 4 dip switch must be in the enabled (UP) position to activate the remote thermostat. (See the installation instructions supplied with the remote thermostat).

Important: The Zoneline thermostat connections provide 24 VAC only. If using a digital/electronic wall thermostat, you must set it to the 24 VAC setting. See the Installation Instructions for the wall thermostat.

Caution: Damage to a wall thermostat or to the Zoneline 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.

Freeze Sentinel

The freeze sentinel is enabled by a dip switch and is dependant on the room air thermistor. The FREEZ S dip switch must be down for freeze sentinel operation.

FREEZ S switch DOWN = ON (preset from factory)

FREEZ S switch UP = OFF

The freeze sentinel turns on the resistance heater(s) and indoor fan when the room air thermistor sees 41°F. When the temperature of the room has risen to 46°F, the unit will turn off.

The freeze sentinel will remain enabled when the unit has been turned off by the remote CDC.

Energy Management System

Note: The following conditions must exist for the energy management system to operate:

- OCCUPIED dip switch is up.
- Door sensor kit is installed.
- Motion sensor kit is installed.

The energy management system uses input from the door sensor and motion sensor to establish if the room is occupied or unoccupied. When the energy management system has established that the room is unoccupied, it uses input from the room air thermistor and allows the temperature of the room to lower to 68 °F (heat mode) or raise to 78 °F (cool mode). When the room becomes occupied, the energy management system will return to thermostat-controlled operation and will return the room to the temperature set on the controls.

Door Sensor

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

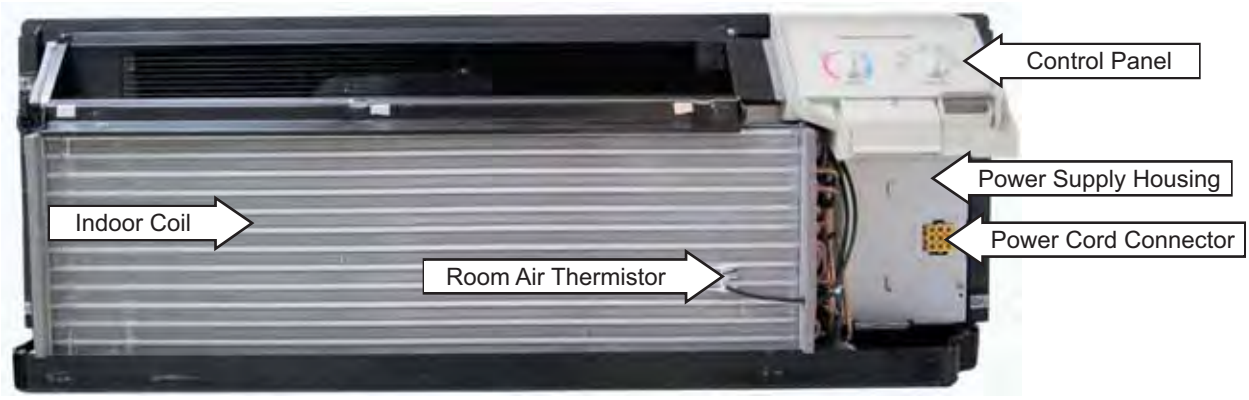
When the energy management system sees the door sensor circuit close (door opened), the energy management system will then check the motion sensor circuit.

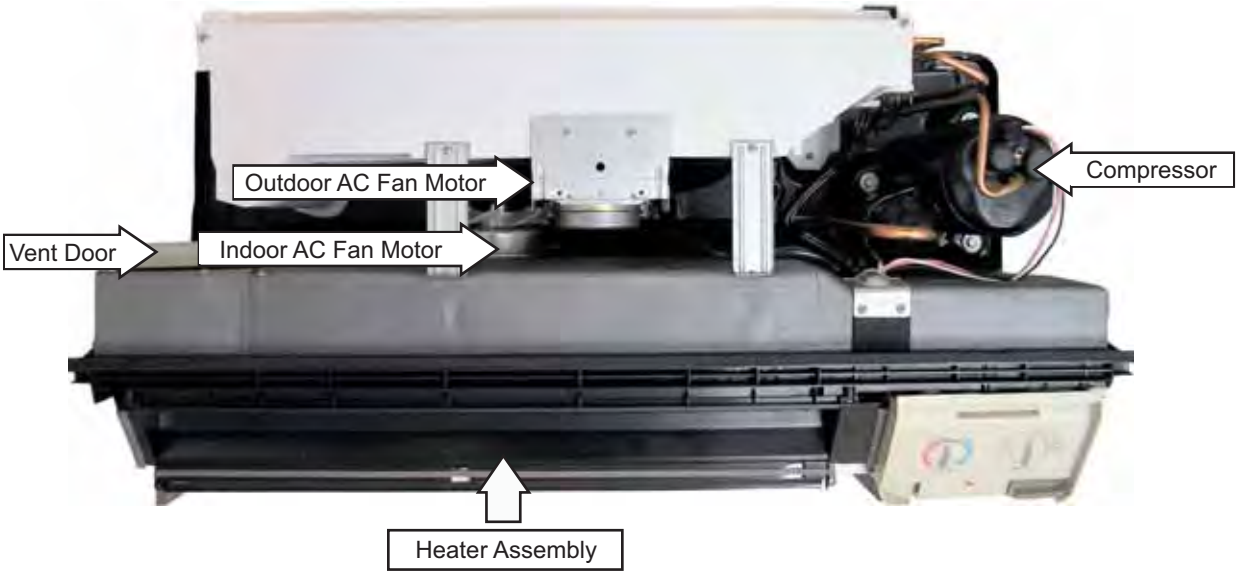
Motion Sensor

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

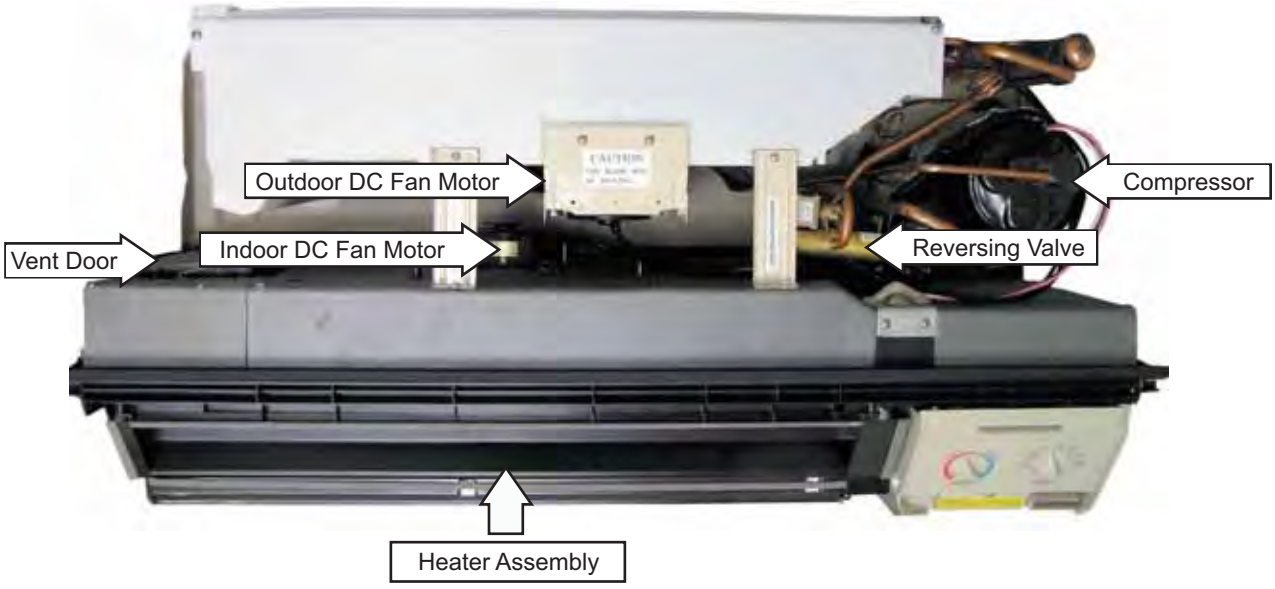
After the energy management system has seen the door sensor circuit closed (door opened), it will check the motion sensor circuit. If the energy management system sees the motion sensor circuit closed (no motion detected by the sensor), it will then check the temperature being reported by the room air sensor. If the energy management system sees the motion sensor circuit open (motion detected by sensor), the unit will continue to be controlled by the user settings.

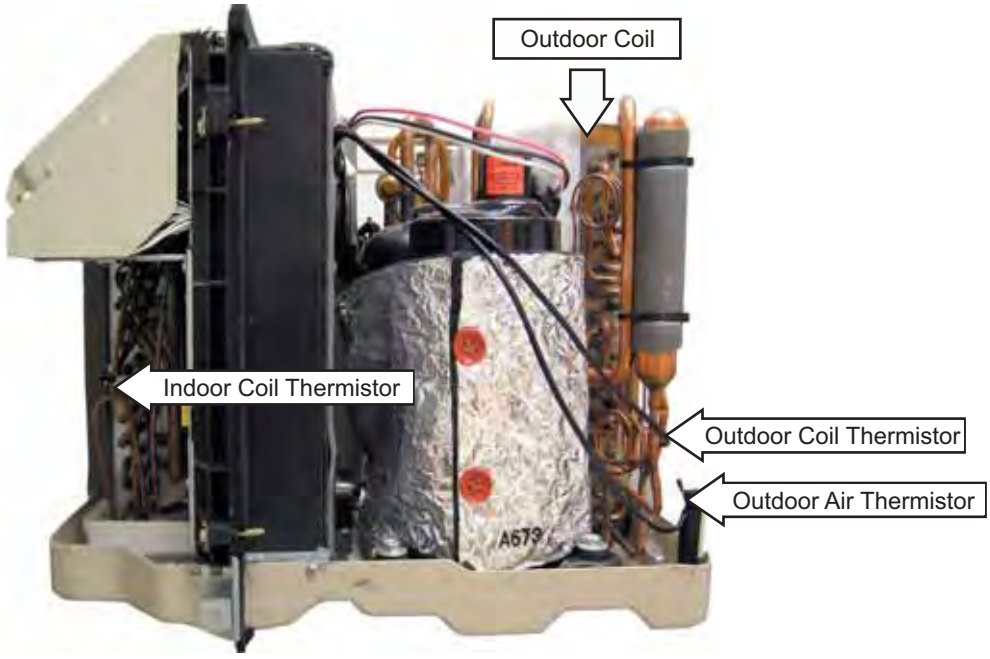
Component Locator View 2800 Series





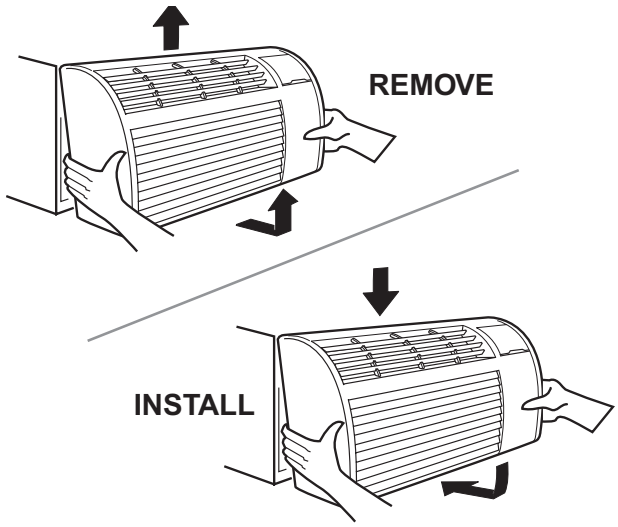
Component Locator View 3800 Series





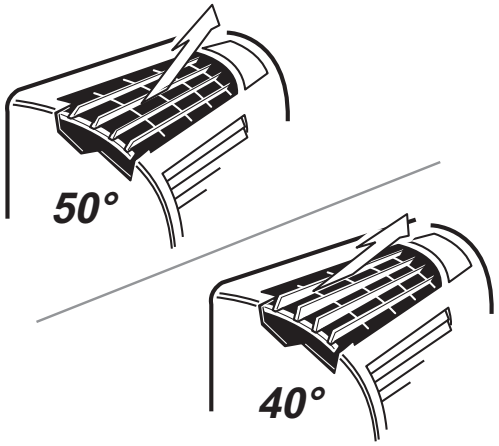
Room Cabinet

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.

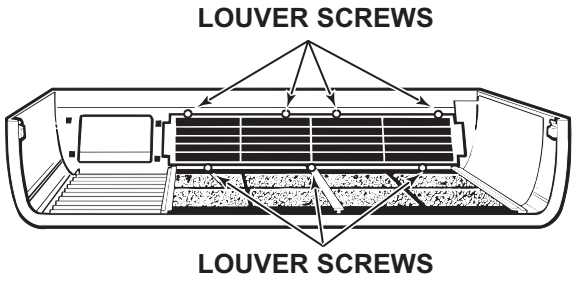


Louvers

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.

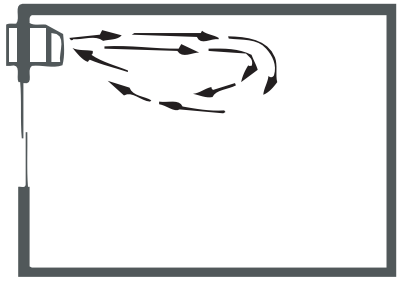


To adjust air direction, remove the room cabinet (grille). Remove the 7 louver screws that hold the louvers in place. Flip the louver section 180°. Replace the screws and the room cabinet.



High Wall Mount Applications

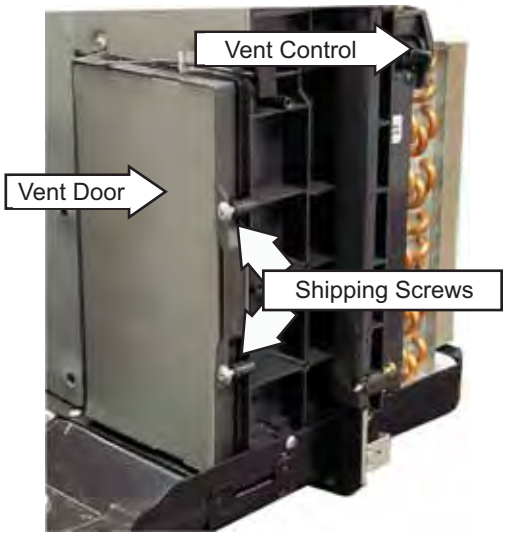
For units mounted high in the wall, the discharge louvers should be at a setting that provides the most horizontal air discharge. Recommended installation is at least 3 inches below the ceiling. In installations where units are close to the ceiling, the most horizontal discharge angle can be obtained 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 CLOSE position by 2 shipping screws.

Only the air inside the room is circulated and filtered when the door is in the CLOSE position. When set to the OPEN position, some outdoor air 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.



To remove the vent door:

Access the vent door by removing the Phillips-head screw securing the cover and removing 2 Phillips-head shipping screws. Remove the cable from the door post. Remove the 7 Phillips-head screws from the vent frame and remove the door.

Note: To access the 3 Phillips-head screws on the hinge side of the door it may be necessary to remove the unit from the case and reposition the outdoor coil and shroud assembly.

Remove the cable wire retainer from the top of the vent door, remove the cable wire from the door post, then raise the cable from the slotted alignment bracket and pull the assembly outward.

Note: When reinstalling the vent door cable, insert the cable in it's original position in the slotted alignment bracket. If necessary, reposition cable in alignment slot for proper operation.

Control Board

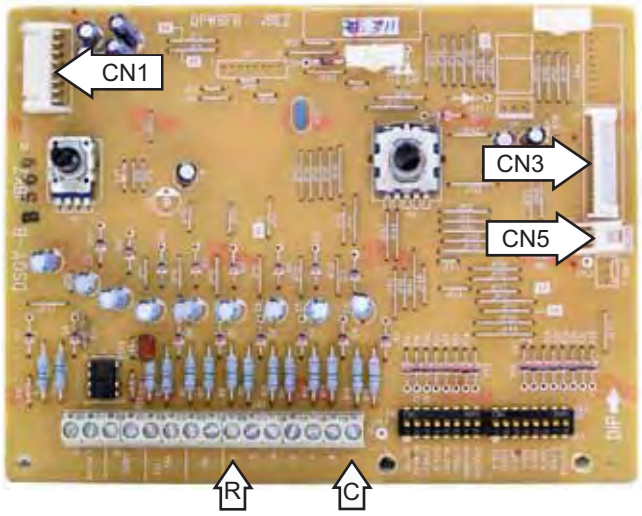
Note: The following information is for units with AC fan motors. Units with DC fan motors have connectors CN4 and CN9 that are not shown on the following photos.

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 board.

The control board is located behind the control panel and mounted inside a triangular metal bracket. The triangular metal bracket is held in place by 3 Phillips-head screws.

The control board is held in place by 2 Phillips-head screws, two 11-mm retainer nuts, and 2 plastic locking tabs.

To check power to the control board from the low voltage transformer, check for 24 VAC at the CN5 connecting wire. The control board should read 24 VAC between R and C (see photo).



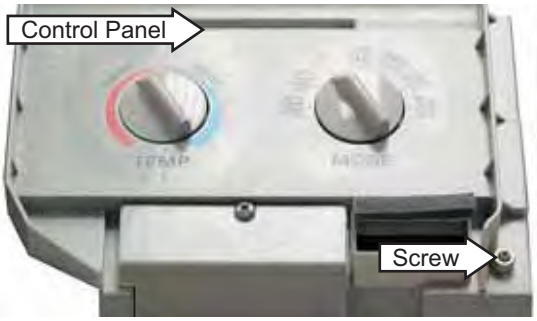
CN1 - Room Air Thermistor and Indoor Coil Thermistor

CN3 - Power Supply Board

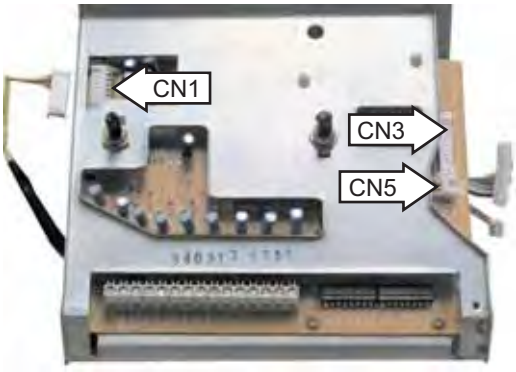
CN5 - Transformer

To remove the control board:

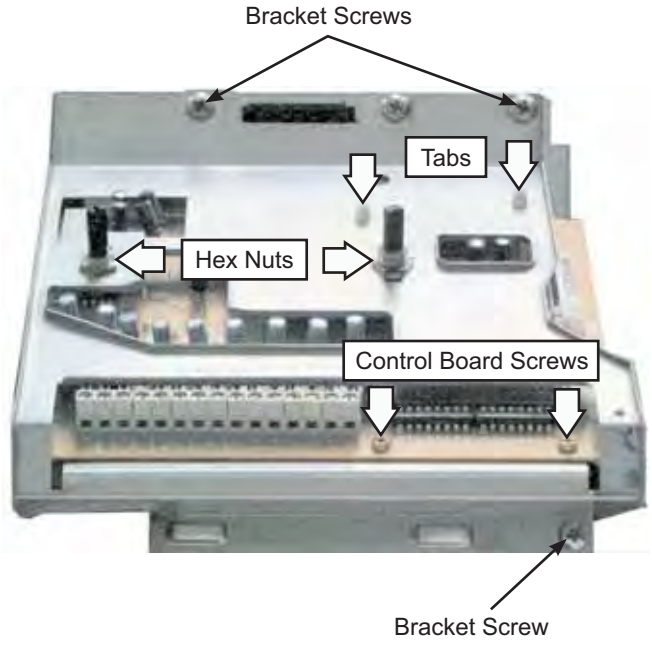
1. Remove the room cabinet (see ***Room Cabinet***).
2. Remove the single Phillips-head screw that holds the control panel and knobs in place. Remove the control panel and knobs.



3. Disconnect CN1, CN3, and CN5 from the control board.



4. Remove the 3 Phillips-head bracket screws that hold the triangular metal bracket in place (see photo). Remove the bracket and control board.



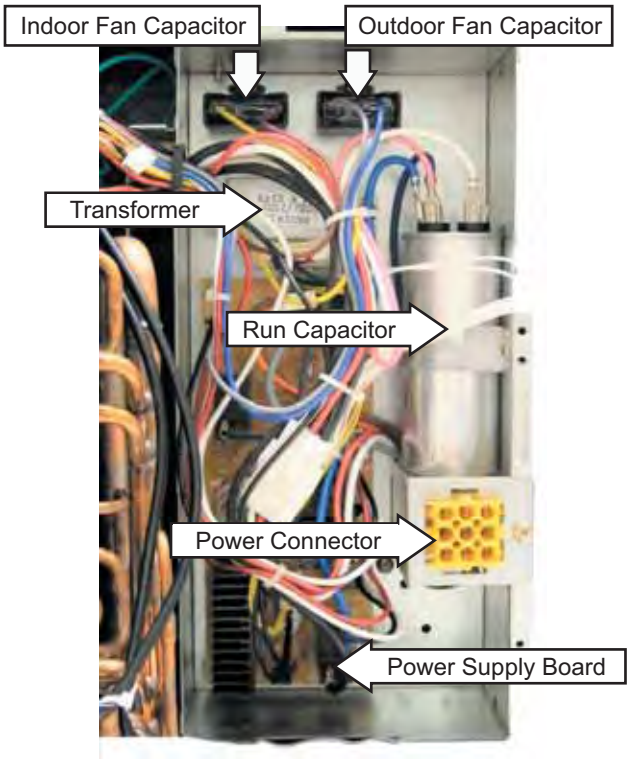
5. Remove the 2 Phillips-head control board screws and two 11-mm hex nuts that hold the control board in place (see photo).
6. Remove the control board from the bracket by squeezing the two plastic locking tabs (see photo) and gently pressing the control board down.

Control Box Components

Note: The following information is for units with AC fan motors. Units with DC fan motors do **not** have capacitors.

The control box houses the indoor fan capacitor, outdoor fan capacitor, compressor capacitor, transformer, main power connector, and power supply board.

Control Box Component View



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

(Continued next page)

To access the control box components:

1. Remove the triangular metal bracket and control board. (See steps 1 through 4 under ***Control Board.***)

2. Remove the 2 Phillips-head screws that hold the control box cover in place. Remove the control box cover.

Control Box

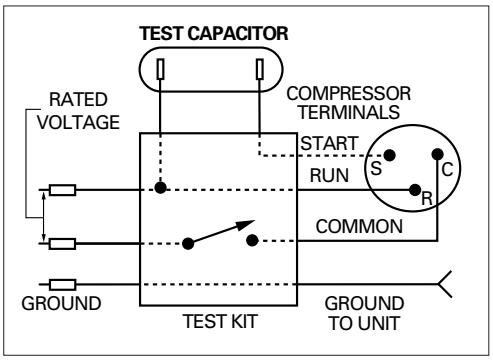
Note: When reinstalling the control box cover, place the bottom tab of the cover in the slot of the control box housing BEFORE securing screws.

Run Capacitor Check

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

1. Replace unit run capacitor with a known good test capacitor which may be 10 μfd higher than specified and attempt to start the compressor.

2. If the compressor starts, install a new run capacitor which has a rating specified for the unit.



Main Power Connector

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

Transformer

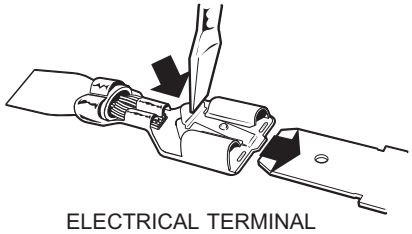
The transformer supplies 24 VAC to the control board at location CN5 and 12 VAC to the power supply board at location CN103. Check for line voltage on the power supply board at CN103 between pins 5 and 7.

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

- CN103 pin 5 to pin 7 is approximately 100 Ω (230/208 VAC primary).
- CN103 pin 1 to pin 2 is approximately 1.0 Ω (12 VAC secondary).
- CN5 pin 1 to pin 2 is approximately 3.0 Ω (24 VAC secondary).

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



ELECTRICAL TERMINAL RELEASE/LOCKING TAB

Power Supply Board

The power supply board contains all of the circuits and logic which control the relays for the heater, compressor, and fan motors. The only component on the board that is replaceable is the fuse. 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 the fuse) malfunctions, the board must be replaced as a complete assembly.

Check for 12 VAC on the power supply board at CN103 between pin 1 and pin 2.

If the 3-amp fuse has failed, check the fan motors for a problem.

CN101 - Indoor Fan

CN102 - Outdoor Fan

CN103 - Transformer*

CN104 - Control Board

RY101 - Compressor

RY102 - Heater L1

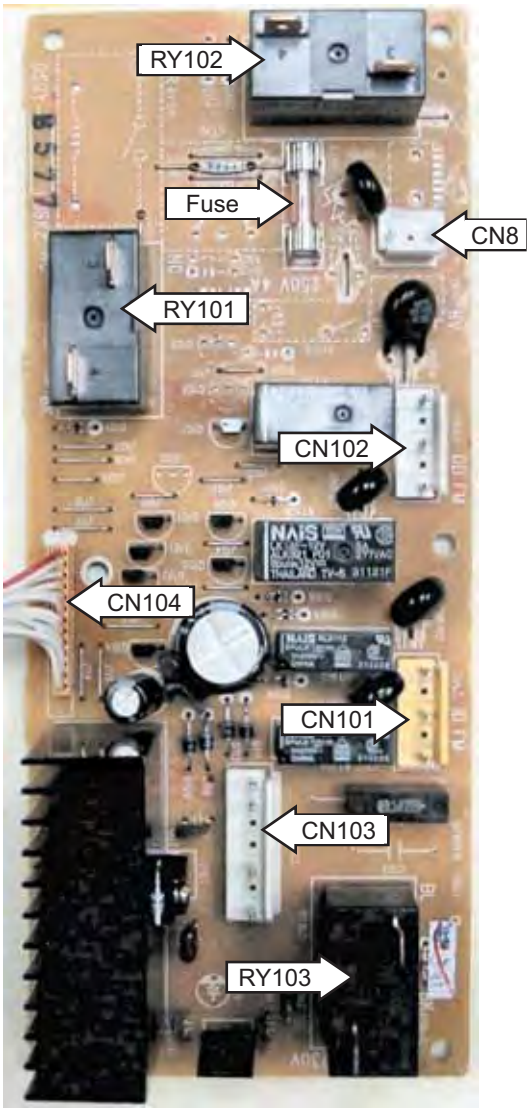
RY103 - Heater L2

RY109 - Supplemental 1K Heater

CN8 - Open Connector/Line Test Point

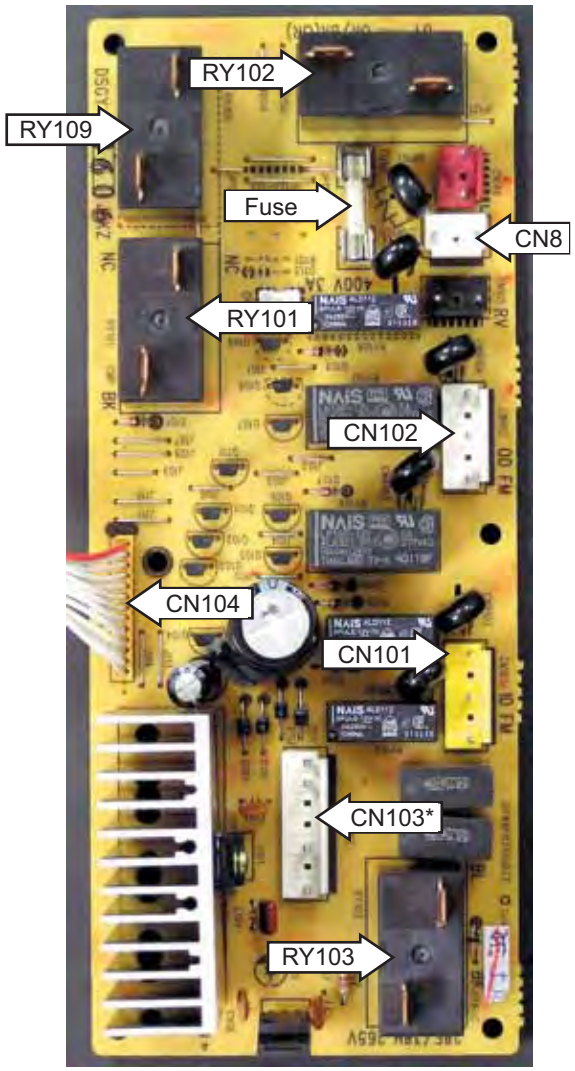
Note: The connector at CN104 is permanently attached to the power supply board.

2800 Series



3800 Series

Non-Corrosive Model Shown (AC Fan Motor)



*Black = in-line input; Yellow wires = 12 VAC transformer input

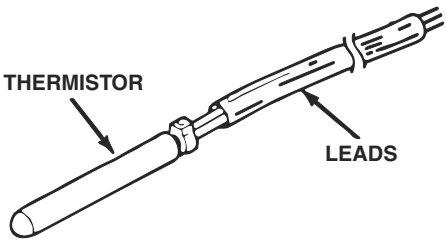
Thermistors

The 2800 series electric heat models use two thermistors:

- Room Air Temperature
- Indoor Coil Temperature

The 3800 series (heat pump models) uses 4 thermistors:

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

°F	Room Air Ω	Indoor Coil Ω	3800 Series	
			Outdoor Coil Ω	Outdoor Air Ω
10	63260	94900	28030	
30	34620	51940	15340	
32	32890	49330	14570	
50	19970	29960	8850	
70	11950	17930	5300	
90	7320	10970	3280	

Thermistor Location

Room Air Thermistor (2800 & 3800 Model Series)

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 (2800 & 3800 Model Series)

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.

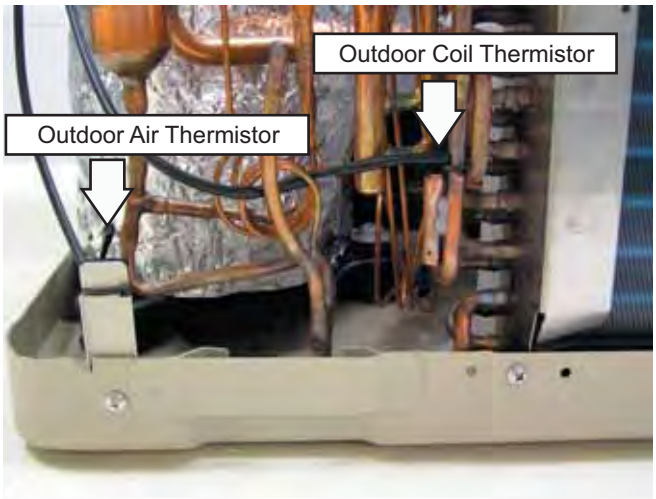
The indoor coil thermistor is connected to the control board at CN1 (orange wires).

Outdoor Air Thermistor (3800 Model Series)

The outdoor air thermistor is located on a metal bracket just behind the compressor. It detects the temperature of the outdoor air being drawn into the unit. The outdoor air thermistor is connected to the control board at CN1 (blue wires).

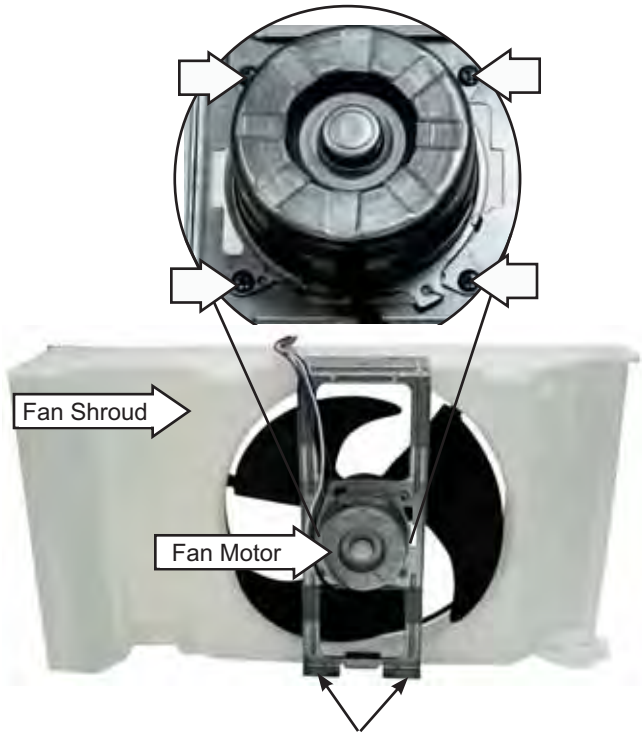
Outdoor Coil Thermistor (3800 Model Series)

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



Outdoor AC Fan Motor (All models except AZ38H09DAC/EAC, AZ38H12DAC/EAC, and AZ38H15DAC/EAC)

The outdoor AC fan motor is a 2-speed thermally-protected motor mounted in the center of metal bracket. The metal bracket is mounted to the fan shroud and chassis. An 8-mm hex-nut holds the fan blade to the motor shaft. Four Phillips-head screws hold the fan motor to the mounting bracket.

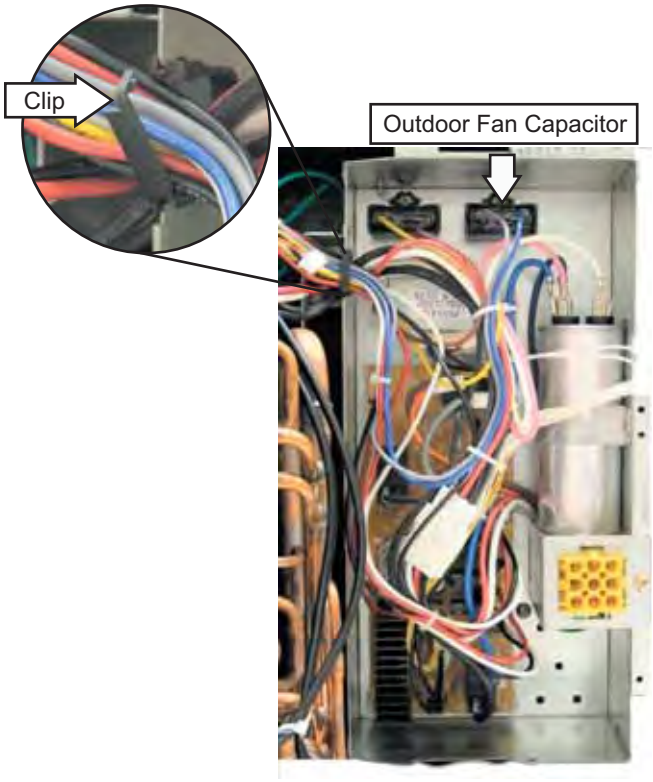


Disconnect the outdoor AC fan wiring at CN102 on the power supply board. Disconnect the gray and blue wires from the outdoor fan motor capacitor. Check for resistance on the fan motor wiring at the following places:

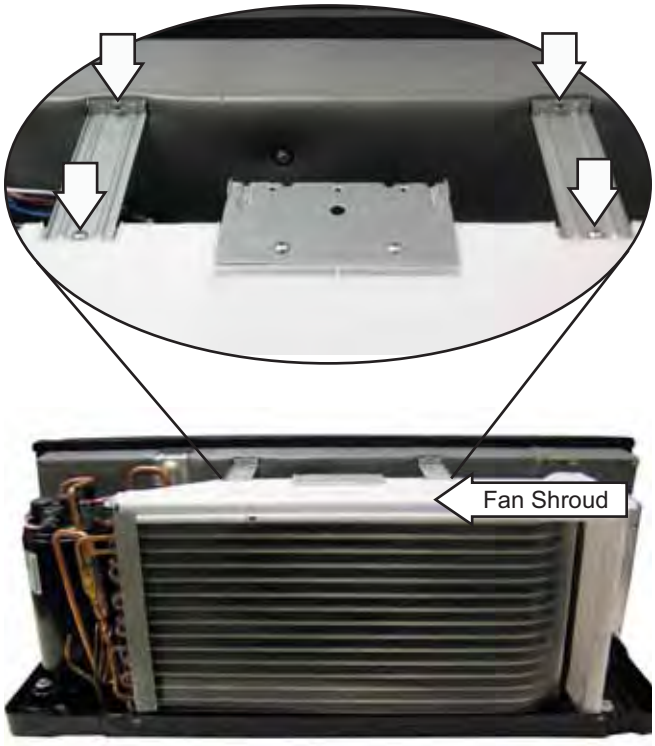
- Black to red = approximately 119 Ω
- Black to white = approximately 154 Ω
- Red to white = approximately 35 Ω

To remove the outdoor AC fan motor and shroud:

1. Remove the room cover (see ***Room Cover***). Remove the chassis from the case.
2. Access the control box (see ***Control Box Components***).
3. Disconnect the gray and blue wires from the outdoor fan motor capacitor.
4. Disconnect the outdoor fan wiring at CN102 on the power supply board.
5. Unsnap the clip at the top left corner of the control box that holds the wiring in place.



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



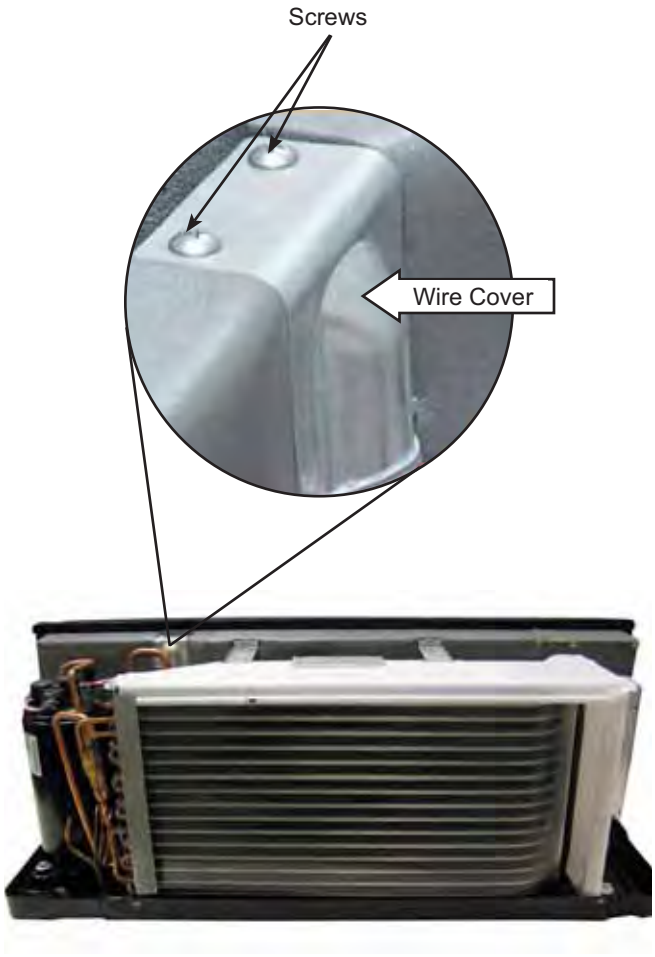
(Continued next page)

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 6 Phillips-head screws from the left side of the fan shroud.

10. Remove the 2 Phillips-head screws that hold the wire cover in place. Remove the wire cover. Pull the fan motor wires through the opening.



11. Lift the outdoor fan motor and shroud from the chassis.

Outdoor DC Fan Motor (Models AZ38H09DAC/EAC, AZ38H12DAC/EAC, and AZ38H15DAC/EAC)

A DC outdoor fan motor is used on the 9000, 12000, and 15000 BTU/hr corrosion protection models. The use of a DC fan motor results in greater efficiency and lower operating costs in high demand applications.

Disconnect the DC outdoor fan wiring at CN108 on the power supply board. Check for resistance on the fan motor wiring at the following places:

Black to red = 0.9 Ω (Reversing the polarity of the test leads, black to red will indicate an open circuit.)

Black to white = approximately 0.4 Ω

Black to orange = approximately 0.7 Ω

Red to white = approximately 1.4 Ω

Blue to black = approximately 1.9 Ω

Blue to white = approximately 2 Ω

Orange to white = approximately 1.3 Ω

Note: To remove the outdoor DC fan motor, follow the instructions for the AC fan motor removal with these exceptions:

- The outdoor DC fan motor does not utilize a run capacitor.
- Disconnect the outdoor fan wiring at CN108 on the power supply board.
- There is no clip at the top left corner of the control box that holds the wiring in place.

Indoor AC Fan Motor (All models except AZ38H09DAC/EAC, AZ38H12DAC/EAC, and AZ38H15DAC/EAC)

The indoor fan motor is a 2-speed thermally protected motor located on the outside of the indoor coil housing, behind the indoor coil.

With wiring disconnected from the power supply board location CN101 and from the fan capacitor, check for resistance on the fan harness wiring.

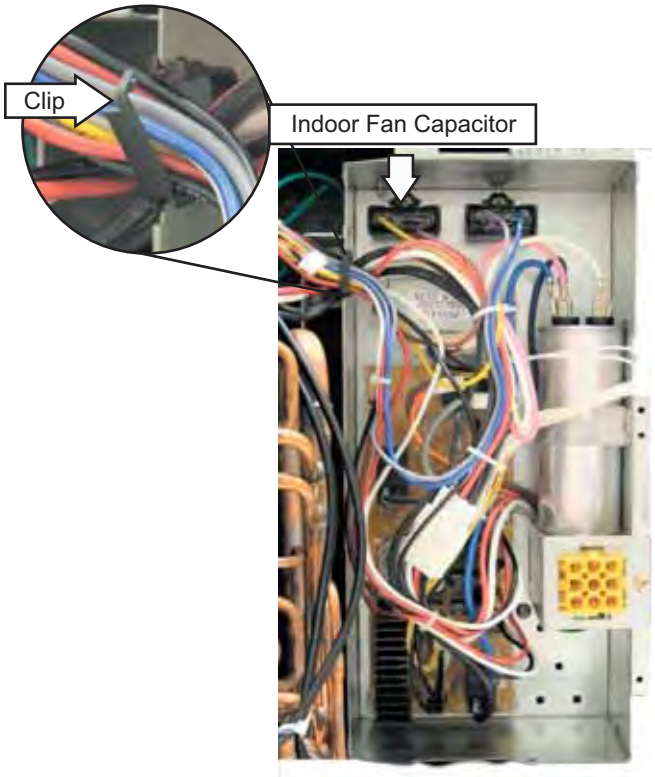
- Black to red = approximately 225 Ω
- Black to white = approximately 270 Ω
- Red to white = approximately 45 Ω

With unit plugged in and operating in cooling mode, disconnect fan motor harness and test for supplied voltage on the fan harness wiring.

- Black to red (high speed) - 230/208 VAC
- Black to white (low speed) - 230/208 VAC

To remove the indoor AC fan motor:

1. Remove the room cabinet (see ***Room Cabinet***). Remove the chassis from the case.
2. Remove the outdoor fan and shroud assembly (see ***Outdoor AC Fan Motor***).
3. Disconnect the yellow and brown wires from the indoor fan motor capacitor. Disconnect the wire harness from CN101 on the power supply board.
4. Unsnap the clip at the top left corner of the control box that holds the wiring in place.
5. Remove all associated wire ties and retainers.



(Continued next page)

6. Remove the 9 Phillips-head screws holding the indoor coil cover in place. Remove the cover.

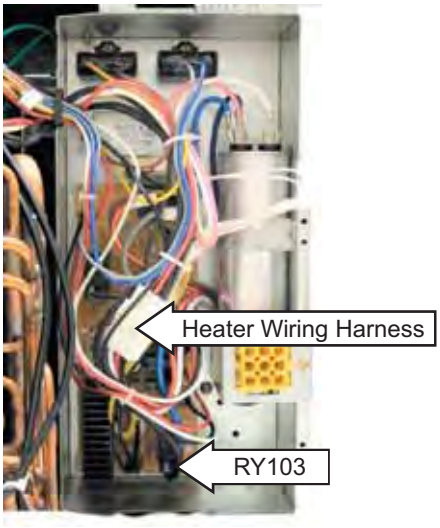
Caution: When reinstalling the indoor coil cover, be sure to use the original short machine screw on the top left of the indoor coil housing. Damage to the indoor coil housing may result if the wrong screw length is used.

7. Remove the 2 ground wires from the top right corner of the heater assembly.

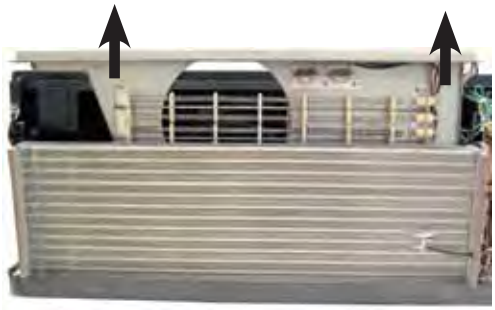
8. Remove the 3 Phillips-head screws that hold the heater assembly in place.

9. Disconnect the heater wiring harness. Disconnect the black wire from the relay at RY103 on the power supply board.

Note: On 3800 series models, an additional 1- or 2-pin wire harness must be disconnected.



10. Lift the heater assembly up and out.

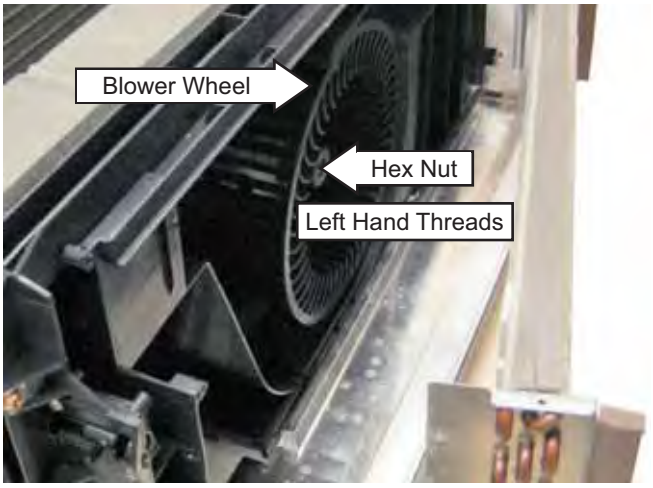


WARNING: The evaporator fins are very sharp. Wear Kevlar gloves when handling the evaporator.

11. Remove the two Phillips-head screws from both the right and the left side of the evaporator. Carefully lift the evaporator to clear the base pan. Gently swing the evaporator out enough to remove the blower wheel.

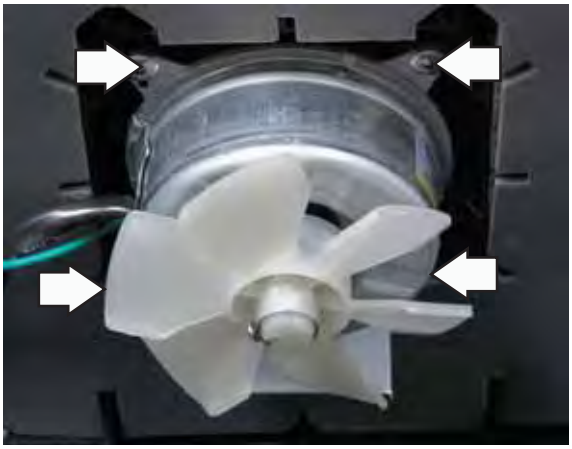
12. Remove the 8-mm blower hex nut that holds the blower wheel in place. Remove the blower wheel.

Important: The 8-mm hex nut has left-hand threads**.**



13. Remove the ground wire from the indoor fan motor.

14. Remove the 4 Phillips-head screws that hold the indoor fan motor in place. Remove the indoor fan motor.



Indoor DC Fan Motor (Models AZ38H09DAC/EAC, AZ38H12DAC/EAC, and AZ38H15DAC/EAC)

A DC indoor fan motor is used on the 9000, 12000, and 15000 BTU/hr corrosion protection models. The use of a DC fan motor results in greater efficiency and lower operating costs in high demand applications.

The indoor DC fan motor is a thermally protected motor located on the outside of the indoor coil housing, behind the indoor coil.

With wiring disconnected from the drive board location CN109, check for resistance on the fan harness wiring.

- Black to red = approximately 0.9 Ω.

Note : Reversing the polarity of the test leads, black to red will indicate an open circuit.

- Black to white = approximately 0.8 Ω
- Red to white = approximately 1.4 Ω
- Blue to black = approximately 1.8 Ω
- Blue to white = approximately 2 Ω

To remove the indoor DC fan motor:

1. Remove the room cabinet (see ***Room Cabinet***). Remove the chassis from the case.
2. Access the control box (see ***Control Box Components***).
3. Disconnect the indoor DC fan wiring from the power board at location CN 109.
4. Remove the 2 Phillips-head screws that hold the wire cover in place. Pull the fan wiring thru the opening.
5. Remove the 9 Phillips-head screws that hold the indoor coil cover in place. Remove the cover.
6. Remove the 3 Phillips-head screws that hold the heater assembly in place.

WARNING: The evaporator fins are very sharp. Wear Kevlar gloves when handling the evaporator.

7. Raise and pivot the heater assembly and the attached wiring clockwise, clearing the plenum, and set the heater assembly aside.

Note: The 8-mm hex nut has left-hand threads.

8. Remove the 8-mm nut that holds the blower wheel to the motor shaft. Remove the blower wheel.
9. Remove the 4 Phillips-head screws that hold the indoor DC fan motor in place. Remove the fan motor.

Heater Assembly

The heater assembly consists of three 230/208 VAC or 265 VAC resistance heating coils, a L248 one-shot protector (fuse), and a L167-30 auto reset protector. The one-shot thermal protector is used as a backup in case the auto reset thermal protector fails (stuck closed). The assembly is located inside the air plenum behind the indoor coil. The heaters and protectors are removed as an assembly.

To access heater assembly, see ***Indoor AC Fan Motor***.

Heater Test 2800 Series

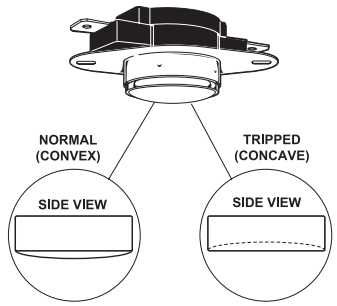
With power disconnected and the heater wire harness unplugged check for resistance of each individual heater:

- RY103 black wire to harness black wire (1 KW heater) = approximately 60 Ω
- RY103 black wire to harness red wire (1.55 KW heater) = approximately 37 Ω
- RY 103 black wire to harness white wire (2.45 KW heater) = approximately 24 Ω

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

Note: Open circuit indicates either open heaters and/or protectors. If all heaters measure open, check for open protectors.

To check the heater protector circuit on the 3800 series, check between the RY103 (black-fabric) to the one- or 2-pin black-fabric connector located in the wire bundle. The value should be less than 1 Ω.



Heater Test 3800 Series

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

- RY109 Brown wire to the 3-wire harness black wire = 51.5 Ω (1 kw)
- RY102 Orange wire to the 3-wire harness red wire = 32.8 Ω (1.55 kw)
- RY102 Orange wire to the 3-wire harness white wire = 20.8 Ω (2.45 kw)

With unit connected to the power supply and in heat mode, check for heater voltage (230/208 VAC) from RY103 black wire to RY102 brown wire (2800) or gray wire (3800). For 3800 models, place #1 dip switch up (I2R) and set thermostat to warmest setting.

Heat Pump models will utilize electric resistance heat upon initial heat mode startup or when a power outage has occurred with the unit in heat mode. The electric heaters will be energized until the room temperature reaches the thermostat setting. Once the thermostat temperature setting is attained, the unit will cycle off and automatically switch over to heat pump operation.

The heat pump will provide all heating requirements for subsequent cycles unless one of the following conditions occurs:

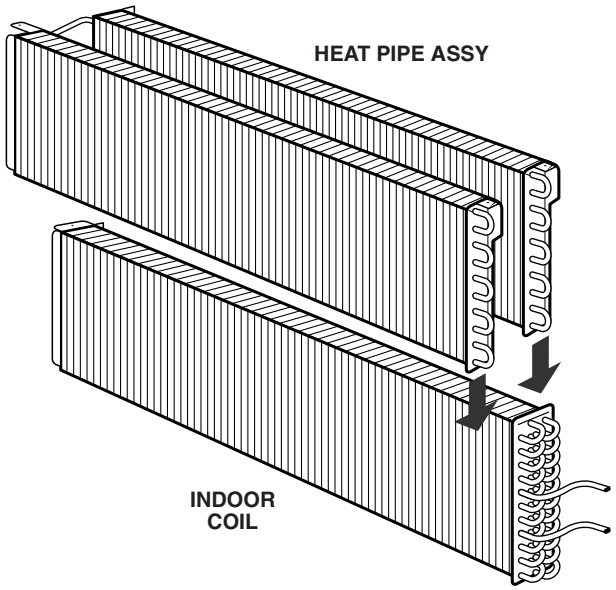
- The #1 dip switch has been placed in the I2R (ALL ELECTRIC HEAT) position. When the dip switch is placed in the up position, heat pump operation will be locked out. Only electric resistance heat will be available.
- A temperature differential of approximately 2°F is detected between the thermostat set point and the room air temperature. If a differential of approximately 2°F is detected, due to thermostat adjustment or falling room air temperature, the electric heaters will be energized (heat pump off) until the thermostat is satisfied. Once the thermostat has been satisfied, the unit will automatically revert to heat pump operation for subsequent cycles.
- If the outdoor temperature falls below 25°F, the unit will automatically switch from heat pump operation to resistance heat operation. A 7°F hysteresis loop will be in effect; therefore, the unit will operate in resistance heat mode until an outdoor temperature of 32°F or higher is detected.

Models without heat pumps meet heating requirements with electric resistance heating coils.

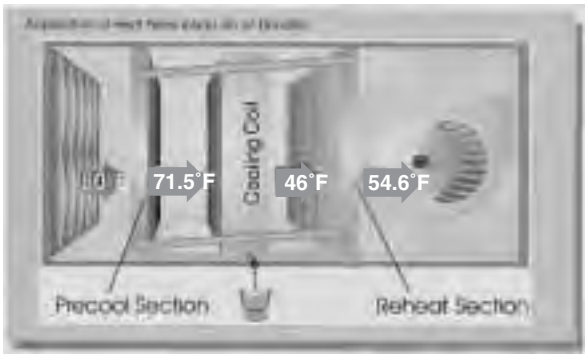
Heat Pipe (Dry Air) - 2800 Series

A Heat Pipe is a simple device that can quickly transfer heat from one point to another without the need of energy input. A heat pipe is nothing more then a refrigerant-filled coil. The coil consists of 3 separate refrigerant filled coils, each referred to as a circuit of the heat pipe coil. Each circuit is filled with approximately 4 oz. of R22.

The heat pipe is arranged in a saddlebag configuration around the indoor coil. The heat pipe coils extend across the entire length of the indoor coil and from top to bottom of the indoor coil.

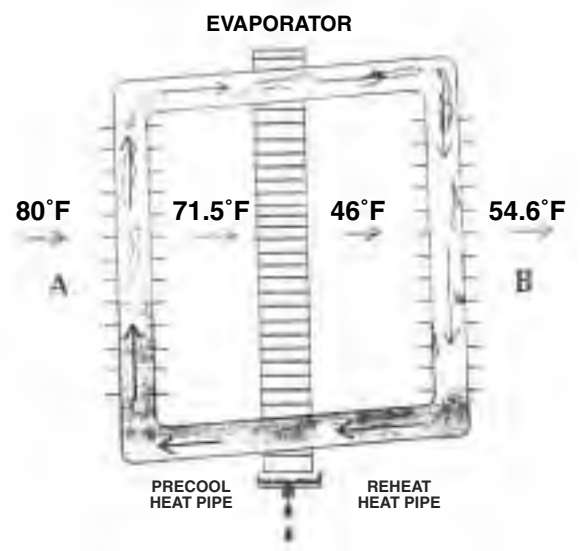


There is a small gap between the heat pipe coils and the evaporator coils. They do not touch one another, as this would allow the transfer of heat between the two surfaces. The heat pipe is not connected to the refrigerant system of the unit. The refrigerant that is in the heat pipe stays within the heat pipe tubing, and the refrigerant within the refrigerating system of the air conditioner stays within that system.

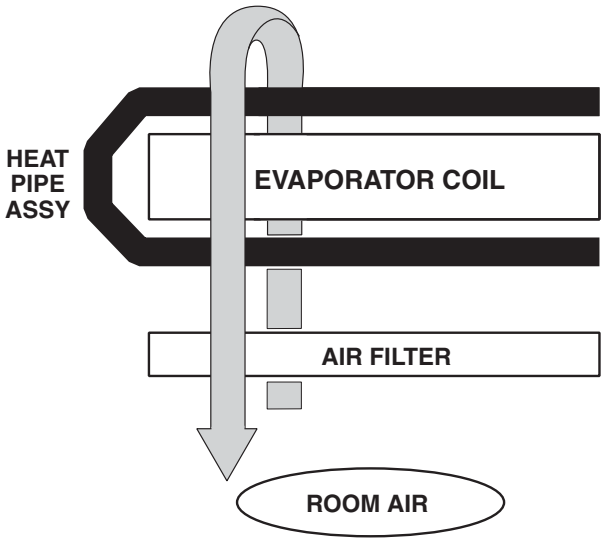


How It Works

When the air enters the unit it passes through the front coil of the heat pipe saddlebag. As the air passes through the heat pipe, the heat in the air causes the refrigerant in the heat pipe to boil or vaporize into a gas.



The gas rises and flows through the connecting tubing to the rear of the heat pipe. At this point, the dry bulb temperature of the air is reduced as it passes through the front coil of the heat pipe. As the precooled air passes through the evaporator it allows the evaporator to operate at a lower temperature and the unit is able to remove a significantly greater amount of moisture from the air.



When the air leaves the evaporator it is over-cooled and greatly dehumidified. As the air passes through the rear coil of the heat pipe, the same amount of heat is transferred to the air as was removed when the air passed through the front coil. This transfer of heat causes the refrigerant in the rear coil of the heat pipe to condense back into a liquid. It then flows downward (by gravity) in the heat pipe connecting tubing and back to the front coil of the heat pipe. The result is a discharge air temperature about the same as the discharge air temperature of a unit without the heat pipe, but the relative humidity is considerably lower.

Heat Pipe - Resistance Heat Operation

Heat Pipe is available only on the 2800 series, which uses resistance heat. Since the refrigerant system is not operating during the heat mode, there is no condensing of moisture occurring. The heater is located after the heat pipe and therefore has no effect on the refrigerant in the heat pipe.

Available Heat Pipe Models

Heat Pipe, also referred to as Dry Air, is available on 6 models in the 2800 series. Models using 230/208 VAC with 7000, 9000 and 12000 BTUs of cooling and 2.55/2.09 KW and 3.45/2.82 KW of heat. Models using 265 VAC with 7000, 9000, and 12000 BTUs of cooling and 1.0, 1.55, and 2.45 KW of heat. Dry Air (heat pipe) models will also have a "P" in the last character of the model number, example, AZ28E07DAP. The Dry Air models have the corrosion protected chassis because these units are designed for coastal applications and in areas that have relatively high humidity.

Diagnosing Potential Heat Pipe Problems

The heat pipe coil is field-repairable. Take off the front cover, the left side of the heat pipe is accessible with the grille off. With the unit running in the cool mode (make sure the indoor fan motor is running) use your hand and feel each pass of the coil. The bottom of each heat pipe coil should be cooler (cool vapor refrigerant) than the top of the heat pipe coil (heated liquid refrigerant) by a few degrees. If there is no temperature difference on the coil being checked (room temperature), chances are that the coil has lost its refrigerant charge.

Compressor and Capacitor

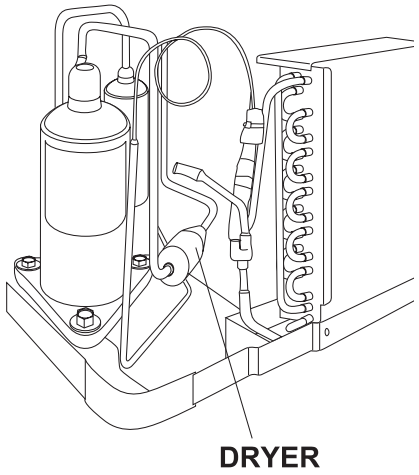
The Zoneline compressor is a rotary type that operates on 230/208 VAC or 265 VAC. After the board has cycled the compressor off, it will not attempt to restart for 3 minutes ± seconds, regardless of the state of the thermostat. This will allow internal pressure to equalize and prevent the compressor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

Current flow into the compressor is monitored by the main board to determine if the compressor is running or locked. If the run signal is sent and a locked condition is detected for 4 seconds, the run signal will stop and a 3-minute count will begin. After the 3-minute count, the run signal is sent again. If the compressor starts, the count is reset and the unit functions normally. If the compressor does not start after 4 consecutive attempts, the control will determine that a compressor failure has occurred. If the unit is in heating mode, it will supply resistance heat to maintain the temperature in the room.

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

Filter/Drier

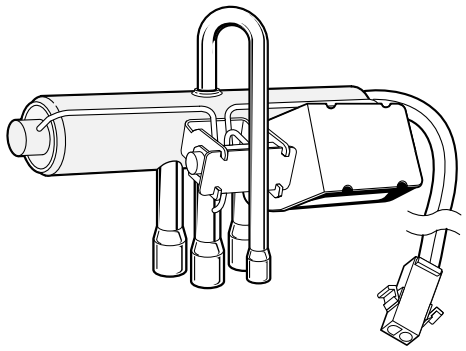
A filter/drier should be installed whenever servicing the cooling system. For heat pump models, install a dryer in the horizontal section of the discharge tube between the compressor and reversing valve.



The filter dryer for electric resistance heat models should be installed in the liquid tube between the condenser and the capillaries.

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

Note: Some thermostats can be programmed to energize the reversing valve in heat mode or cool mode. If the thermostat is not programmed correctly, the unit will heat when the thermostat is set to cool and will cool when the thermostat is set to heat. Refer to the instructions provided with the thermostat for thermostat programming procedures. The reversing valves in these units default to heat.

Disconnect the reversing valve wire harness on the power board at location CN105. Check for a resistance of less than 1 Ω on the disconnected wires.

Heat Pump Operation — Zoneline 3800

The Zoneline heat pumps are designed to help insure a comfortable room. When HEAT is selected, the unit will determine if the room air is warm enough to satisfy the thermostat setting. If the temperature at the unit sensor is below the desired temperature, the electric resistance heater will be utilized to warm the room to the point where the thermostat is satisfied. This feature is designed to allow the temperature of an unoccupied room to be maintained at an energy-saving level without inconveniencing the room occupant. Once the thermostat has been satisfied, the resistance heater will turn off and the heat pump will operate as shown in the Heat Source Logic chart until the thermostat calls for heat again. The unit will operate in this manner if connected to a Central Desk Control which is enabled (CDC switch open).

Heat Source Logic Chart

ROOM TEMPERATURE VS. THERMOSTAT SET POINT	Above 46°F	Between 46°F and 25°F	Below 25°F
Less Than 1.8°F Below	Heat Pump	Heat Pump*	Full Resistance Heat
1.8°F to 2.7°F Below	Heat Pump	Heat Pump + Supplemental Heater	Full Resistance Heat
More than 2.7°F Below	Heat Pump	Full Resistance Heat	Full Resistance Heat

*If the temperature boost switch (dip switch #8) is in the "ON" position the supplemental heater will be used with heat pump operation. Supplemental heater: 1.0 KW @ 230 V; 0.8 KW @ 208V; 1.0 KW @ 265V.

The "Temperature Boost" option utilizes the supplemental heater simultaneously with heat pump operation when the outdoor temperature is below 46°F regardless of the indoor air temperature. The chart above indicates the heat source of the heat pump under various indoor and outdoor conditions. The unit is designed to provide heat pump savings without sacrificing room comfort.

The quick heat recovery feature is not affected by the heat source logic shown in the chart above. The full heat output of the resistance heater is dependent upon circuit amperage and the power connection kit used.

Heat Pump Defrost

Note: Zoneline heat pumps utilize a reverse-cycle demand defrost system to extend heat pump operation and increase savings from extended operation.

The microprocessor determines the need for defrosting based on continuous compressor running time, outdoor air temperature, outdoor coil temperature and the rate of temperature change of the outdoor coil. When defrosting is required, the unit de-energises the reversing valve coil, directing the hot gas into the outdoor coil to melt the frost build-up. Before and after the reverse-cycle defrosting, the unit shuts off the compressor to allow the refrigerant pressures to equalize throughout the system. This eliminates the possibility of a loud reversing noise. During these periods of pressure equalization, the full resistance heat capacity of the unit is activated to help insure room comfort conditions during the defrost cycle. The unit remains in the defrost cycle for a minimum of two minutes up to a maximum of nine minutes. The defrost cycle terminates when the outdoor coil reaches a temperature of 68°F or the maximum time has been reached.

Heat Pump Condensate

Note: Units with ICR may not be installed in seacoast or corrosive environment applications.

The Zoneline 3800 Series heat pumps may be ordered with a factory installed Internal Condensate Removal (ICR) system to minimize the amount of condensate water draining from the unit during heat pump operation. 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 requirements of a particular installation will allow no dripping of condensate water from the wall case, the installation of an internal or external drain system is recommended.

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 air stream 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.

Heat Pump Condensate

During the operation of a unit in the heat-pump mode, the outdoor coil becomes the cold coil and the indoor coil becomes the hot coil due to reversing the flow of the refrigerant. When the temperature of the outdoor coil is below the dew point, condensation will form on the outdoor coil just as it does on the indoor coil during cooling operation. Since the dew point is humidity-related and temperature-related, there may be more condensate on days when the relative humidity is high.

Heat Pump Condensate Disposal

Since the outdoor coil is cold during heat pump operation, the condensate water cannot be deposited on the outdoor coil as the water would cause frost to form on the coil. This frost would block the airflow through the coil. Rather than allow this problem to occur, heat pump units must dispose of the condensate in another manner.

Temperature Activated Drain Valve

The most widely used method of disposing of heat pump condensate is with a temperature activated drain valve. This is a device mounted in the base pan of a heat pump unit with a bellows that expands on temperature rise and contracts with temperature drop.

A shaft with a rubber plug on the end is connected to the bellows. When the outdoor temperature remains above a certain temperature, the bellows expand and the plug fits tightly in a hole in the bottom, or base pan, of the unit. When the plug is blocking the hole, as it should be during cooling operation, the condensate water is contained in the base pan. At temperatures when heating is required, the bellows contract, the rubber plug is retracted from the hole, and the heat pump condensate water is allowed to drain into the wall case. The valve is fully open at 49°F.

Drain Kits

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. Heat pumps also generate condensate that the unit may not be designed to dissipate. For these reasons, if condensate dripping from the wall case is objectionable, an internal or external drain system should be installed.

Internal Condensate Removal (ICR) System

Note: Units with ICR may not be installed in seacoast or corrosive environment applications.

GE has developed an internal condensate removal (ICR) system for packaged terminal heat pumps. This system has been offered as an option on Zoneline packaged terminal heat pumps since 1982, and thousands of them are in use. 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.

Complete Accessory List

Kit Number	Description
RAA63	Spare Filters for AZ2800, AZ3800 and AZ5800 Series units (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 for AZ2800, AZ3800 and AZ5800 Series units (included with chassis)
RAG60	Stamped Aluminum Exterior 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
RAG64	Architectural Exterior Grille w/Flange, Beige Molded High-Impact Plastic
RAG65	Architectural Exterior Grille w/Flange, Maple Molded High-Impact Plastic
RAG66	Architectural Exterior Grille w/Flange, Bittersweet Chocolate Molded High-Impact Plastic
RAG67	Aluminum Architectural Grille (Custom Colors Available by Special Order)
RAK40	Condenser Air Deflector Kit
RAK147	Wall Thermostat For Heat Pump Models– Mechanical
RAK148D1	Wall Thermostat For Heat Pump Models– Electronic Digital
RAK148P1	Wall Thermostat For Heat Pump Models – Electronic Digital Programmable
RAK163A1	Wall Thermostat For Resistance Heat Models – Mechanical
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 –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
RAK3153	Universal Power Cord – 2800/3800/5800 series – 15-Amp 230/208 V – 2.55/2.09 kW heat
RAK3203	Universal Power Cord – 2800/3800/5800 – 20-Amp 230/208 V – 3.45/2.82 kW heat
RAK3303	Universal Power Cord – 2800/3800/5800 – 30-Amp 230/208 V – 5.0/4.09 kW heat
RAK4002A	Direct Connect Junction Box – 230/208-volt units 2800/3800 series
RAK4002CW	Wiring Harness w/ Inline Connector - Adapt Line Cord to Direct Connection
RAK5152	Universal Connection Kit – 265 V – 15 Amp – Use w/RAK204E15 Sub-base – 2.45 kW heat
RAK5202	Universal Connection Kit – 265 V – 20 Amp – Use w/RAK204E20 Sub-base – 3.55 kW heat
RAK5302	Universal Connection Kit – 265 V – 30 Amp – Use w/RAK204E30 Sub-base – 5.0 kW heat
RAK601	Duct extension – Insulated – 44" long – includes Register and Mounting Flange
RAK602	Register and Trim Flange (Included with RAK601)
RAK6052	Duct Adapter for New Installation (or older non-GE Duct Adapter Installation)
RAK7012	Duct Transition for 2500/3500 Replacing Existing Chassis (Original Installation Pre-1988)
RAK7022	Duct Transition for 2500/3500 Replacing Existing Chassis (1988 – 1998 Original Installation)
RAK8023	Locking Door Kit
RAK806	Control Panel Cover (for use with remote thermostat)
RAK901L	Wall Case Insulation Kit

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 wire on RY101 and GREY wire on RY102, safely jump the BLACK and GREY wire. Re-apply power and ONLY the compressor should run.

FAN MOTORS

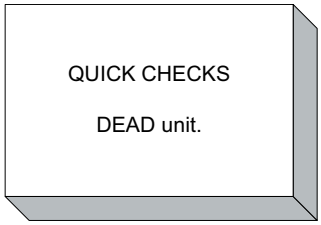
On most units the fan plugs are identical.
If a fan doesn't run and the plugs are the same, temporarily swap plugs on the power board.
REMEMBER, the outdoor fan only runs with the compressor.
Resistance values are similar. Compare the 2 motors.
If motor won't start but runs with help suspect bad capacitor.
NOTE: Some units will have a DC motor, do not swap plugs.
DC motors will not be able to be resistance checked.

THERMISTORS

These may be checked at control board. Connector CN1- just above thermostat. See chart on mini-manual for values. Unless the value is way out of range thermistor is o.k. Remember the thermistors' resistance is calculated into temperatures in the control board to determine operating conditions.

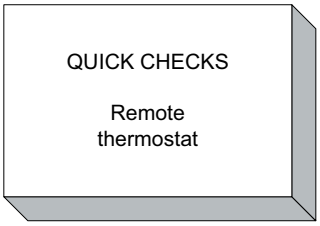
HEATERS
2800 Series

The heater and protectors can be checked after the control board and panel on the power board have been removed. Locate the 3 pin connector with RED, WHITE and BLACK wires. Disconnect and check from each lead of the plug that goes into coil area to BLACK(fabric) wire on RY103.
Otherwise, resistance should be:
WHITE to BLACK approx. 20 ohms
RED to BLACK approx. 30 ohms
BLACK to BLACK 60 ohms
If ALL measure OPEN then suspect an open FUSE or PROTECTOR.
3800 Series
Resistance readings will be similar in the 3800 just the points to measure are different.
BLACK to BROWN on RY109 approx. 60 ohms
RED to
WHITE to



Check for proper voltage at recepticle?
Remove cover. Check for CDC and position of "dip" switches.
If on wall thermostat make sure #4 switch is up.
If unit is on CDC remove 1 lead to disable CDC.

If not on wall thermostat. Move all switches to down position.
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.



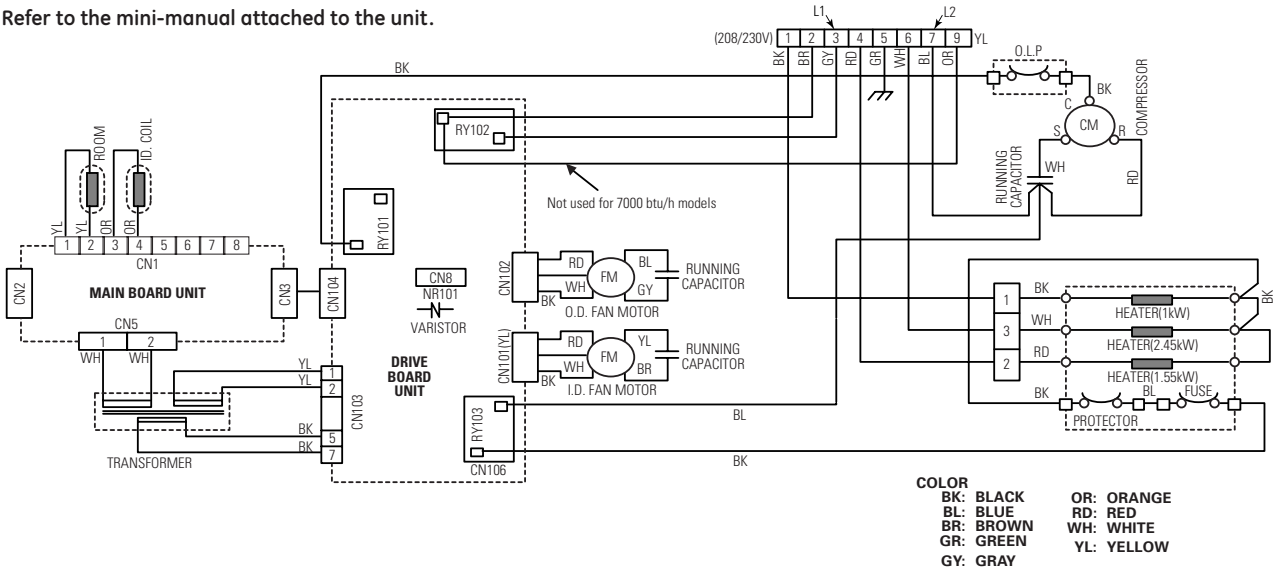
If electronic thermostat does it light up?
24VAC at "R" to "C"?
Is "dip" switch #4 up?
Does unit operate on controls if #4 down?

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

2800 Series Typical Wiring Diagram

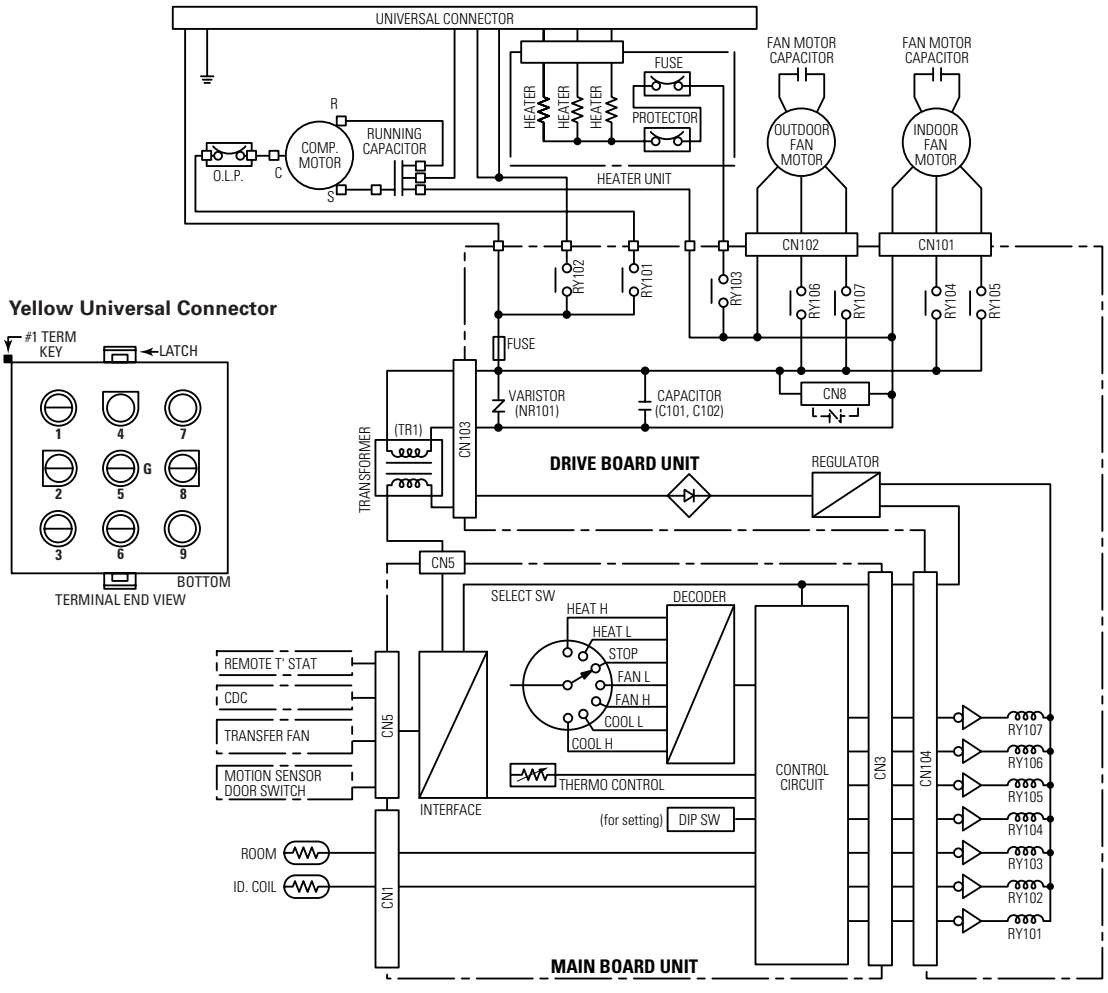
Note: Refer to Yellow Universal Connector

Refer to the mini-manual attached to the unit.



2800 Series Typical Wiring Schematic

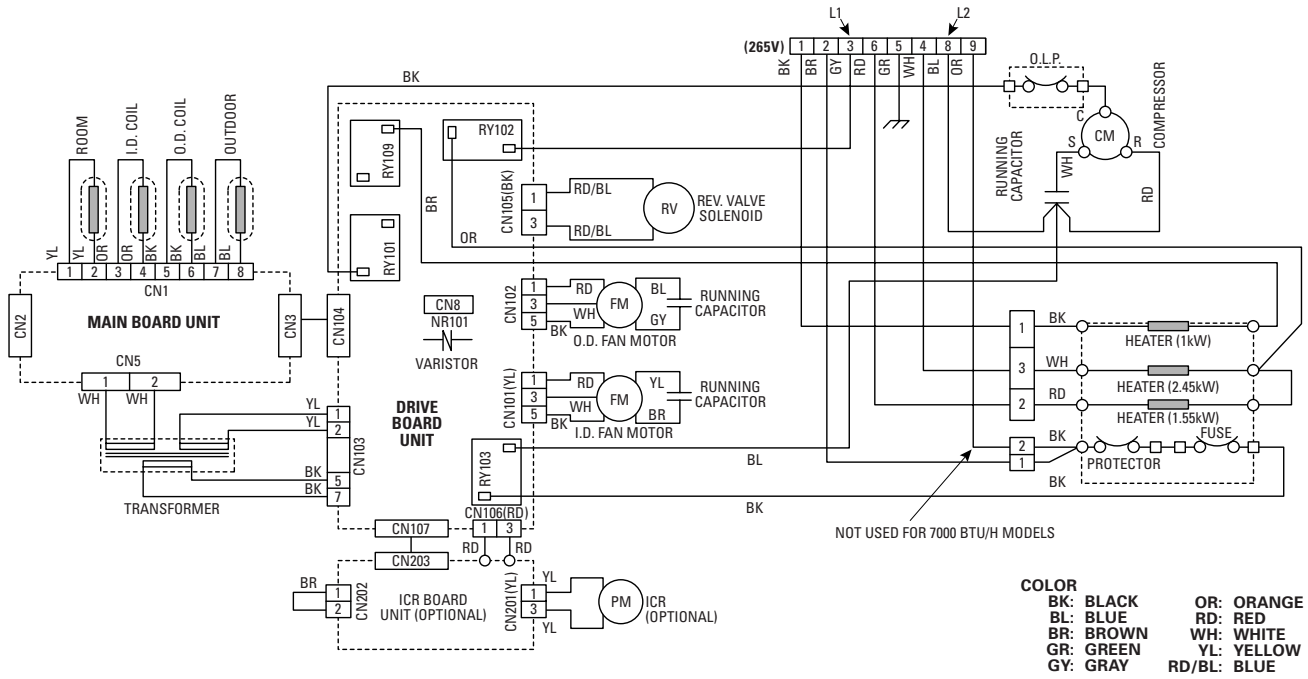
Refer to the mini-manual attached to the unit.



3800 Series (AC Motor) Typical Wiring Diagram

Refer to the mini-manual attached to the unit.

Note: Refer to Yellow Universal Connector

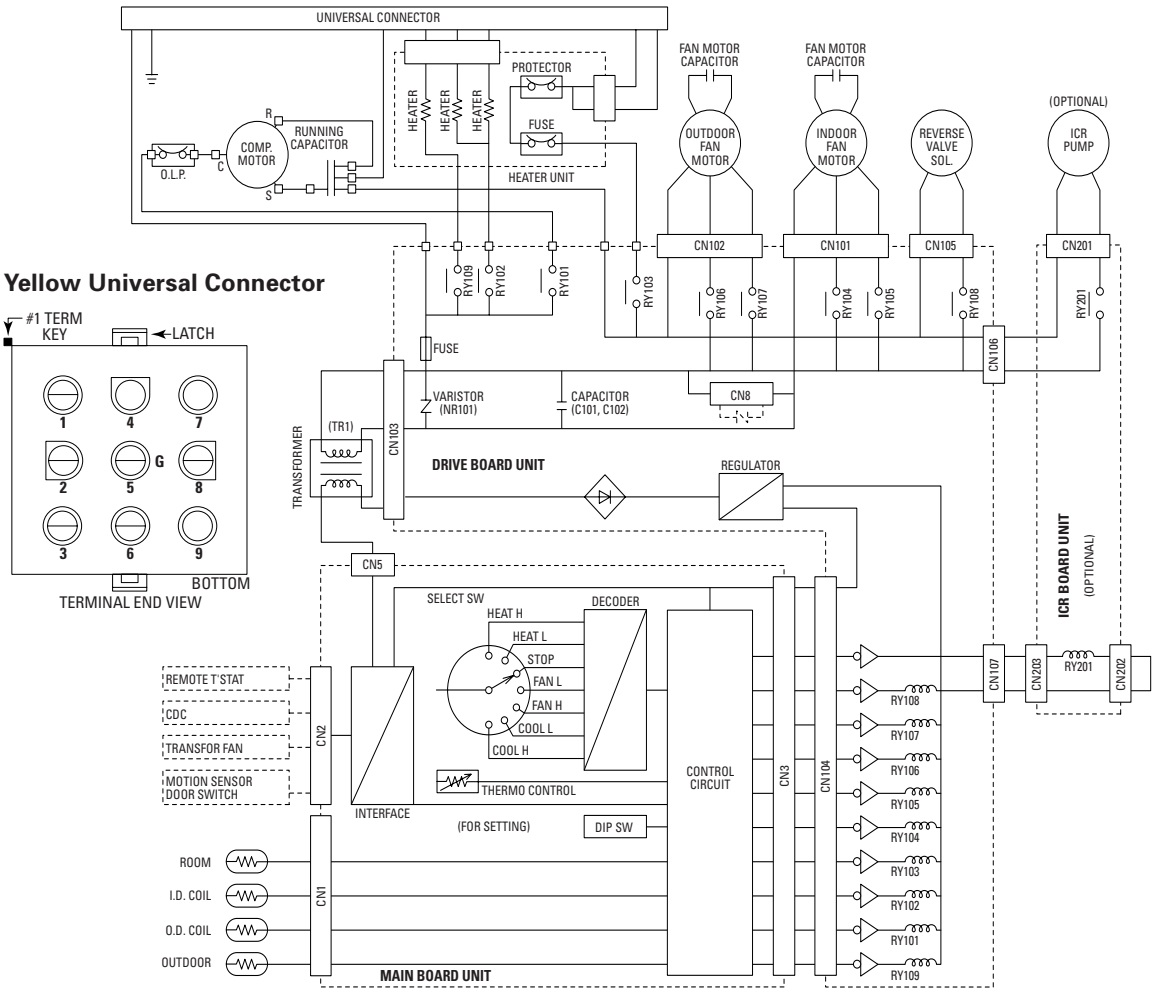


COLOR

BK:	**BLACK**	**OR:**	**ORANGE**
BL:	**BLUE**	**RD:**	**RED**
BR:	**BROWN**	**WH:**	**WHITE**
GR:	**GREEN**	**YL:**	**YELLOW**
GY:	**GRAY**	**RD/BL:**	**BLUE**

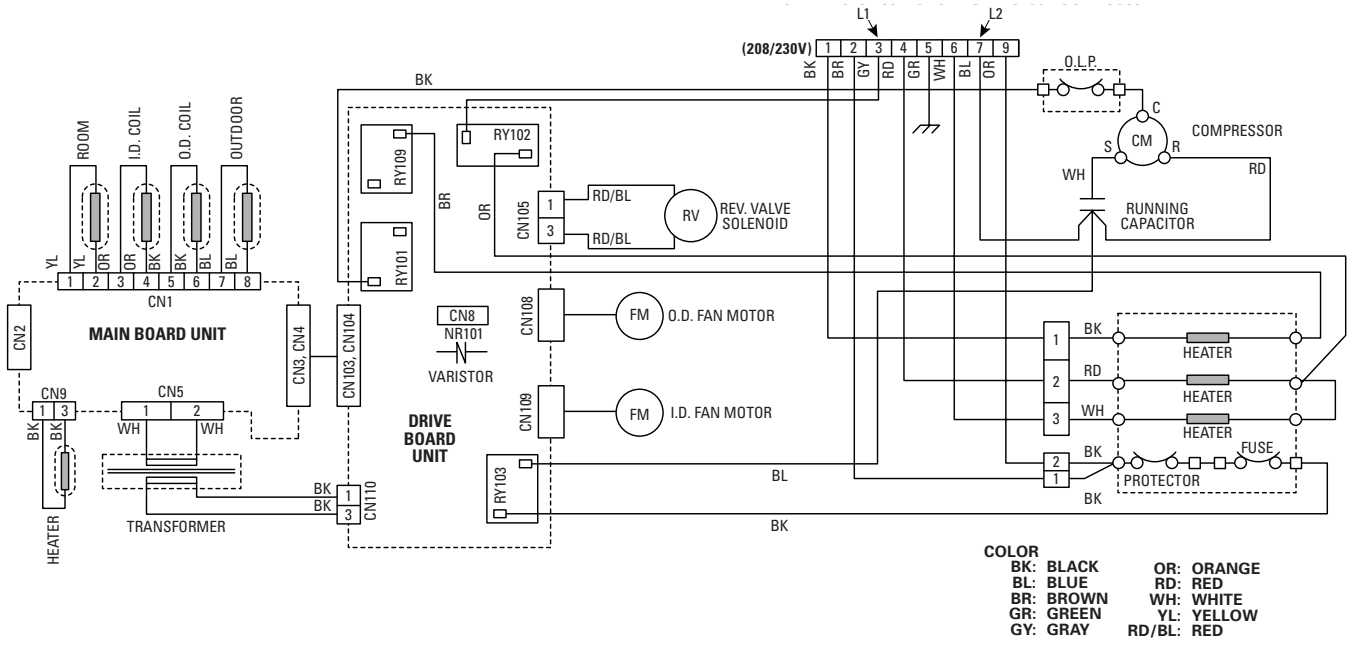
3800 Series (AC Motor) Typical Wiring Schematic

Refer to the mini-manual attached to the unit.



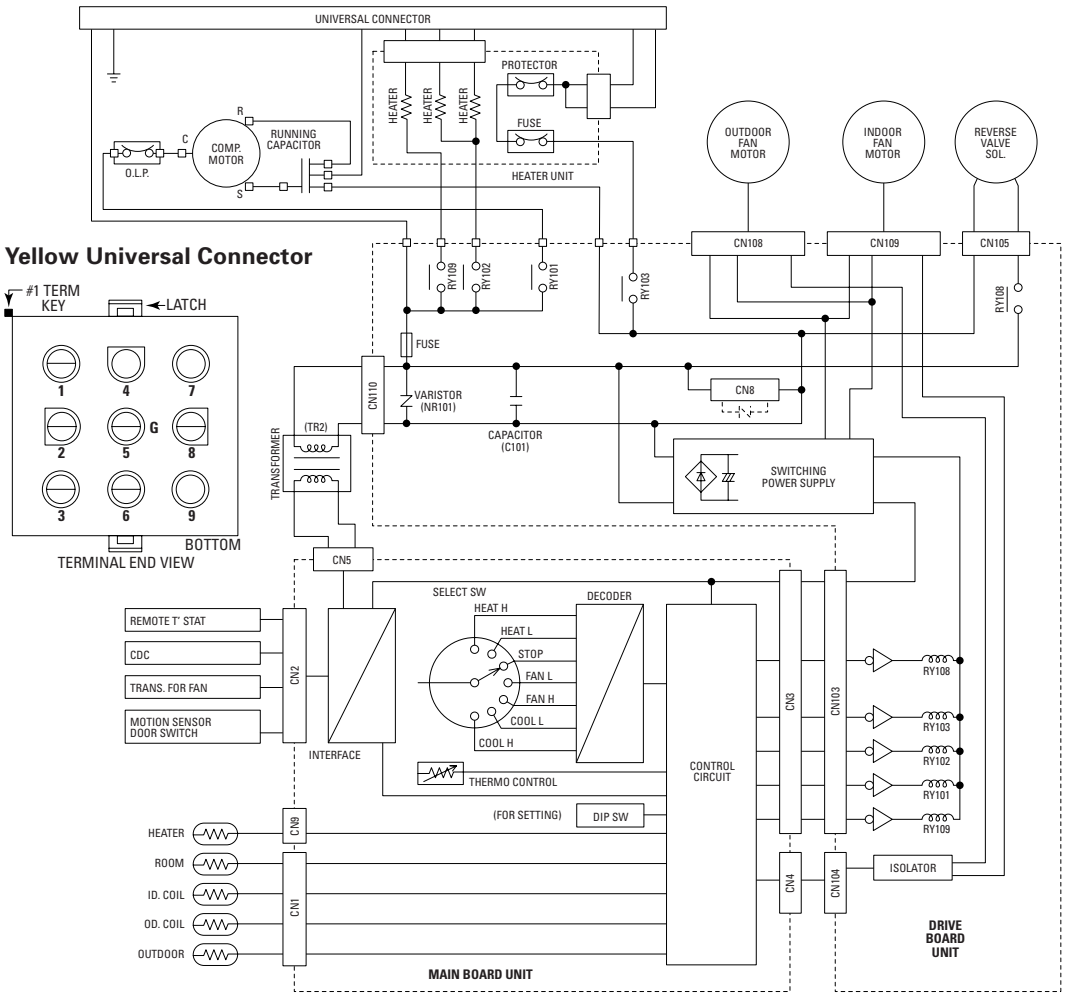
3800 Series (DC Motors) Typical Wiring Diagram

Refer to the mini-manual attached to the unit.



3800 Series (DC Motors) Typical Wiring Schematic

Refer to the mini-manual attached to the manual.



Warranty

All warranty service provided by our Factory Service Centers, or an authorized Customer Care® technician. To schedule service, on-line, 24 hours a day, visit us at www.GEAppliances.com, or call 800.GE.CARES (800.432.2737). For service in Canada, call 1.800.361.3400.

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

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

What GE Will Not Cover:

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

  If you have an installation problem, or if the air conditioner is of improper cooling 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.**

This warranty is extended to the original purchaser and any succeeding owner for products purchased for use within the USA and Canada. 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