



GE Zoneline[®] packaged terminal air conditioners

AZ41/61 2011 contract sales architects and engineers data manual



Quick Reference

Full Specs on pages 52 and 53

ALL UNITS REQUIRE POWER CONNECTION KIT

Power Connection Kit determines resistance heat output

7000 Btuh units are not offered with 4.7 KW resistance heater

Dry Air 25

4100 Series Cooling with Electric Heat

MODEL NUMBER	COOLING (Btuh)	EER
AZ41E07DA*	7300/7100	12.8/12.8
AZ41E09DA*	9450/9250	12.3/12.3
AZ41E12DA*	11800/11600	11.8/11.8
AZ41E15DA*	14700/14500	10.6/10.6
AZ41E07EA*	7300	12.8
AZ41E09EA*	9450	12.3
AZ41E12EA*	11800	11.8
AZ41E15EA*	14700	10.6

4100 Series Cooling with Electric Heat

MODEL NUMBER	COOLING (Btuh)	EER
AZ41E07DAP	6800/6600	12.2/12.2
AZ41E09DAP	9000/8800	11.8/11.8
AZ41E12DAP	11200/11000	11.3/11.3
AZ41E07EAP	6800	12.2
AZ41E09EAP	9000	11.8
AZ41E12EAP	11200	11.3

6100 Series Heat Pump with Backup Electric Heat

MODEL NUMBER	COOLING (Btuh)	EER	REVERSE CYCLE BTUH	COP
AZ61H07DA*	7200/7000	13.2/13.2	6400/6200	4.0/4.0
AZ61H09DA*	9400/9200	12.7/12.7	8300/8100	3.8/3.8
AZ61H12DA*	11800/11600	12.1/12.1	10600/10400	3.7/3.7
AZ61H15DA*	14800/14600	11.2/11.2	14000/13900	3.3/3.3
AZ61H07EA*	7200	13.2	6400	4.0
AZ61H09EA*	9400	12.7	8300	3.8
AZ61H12EA*	11800	12.1	10600	3.7
AZ61H15EA*	14800	11.2	14000	3.3



4100 and 6100 Series Control Panel

*Dual-rated 230/208-volt units are shown with ratings separated by "/".
Units with single rating are 265-volt units.

Power Connection Kits

230/208-Volt Line Cord Connection Units

Line Cord Kit	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK3153A	8150/7900	2400/2320	11.0/11.6	15
RAK3203A	11200/10900	3300/3200	15.1/16.0	20
RAK3303A	16000/15450	4700/4530	21.2/22.4	30

Electric Heat Amps include electric heater and fan motor current draw. Each Line Cord Kit has an integral Leakage Current Detection and Interruption (LCDI) or Arc Fault Current Interrupter (AFCI) device as required by National Electrical Code (NEC) and Underwriters Laboratories (UL) for units manufactured after August 1, 2004.

230/208-Volt Sub-Base and Direct Connected Units

Sub-Base	Direct Connection Kit	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204D15P	RAK4157	8150/7900	2400/2320	11.0/11.6	15
RAK204D20P	RAK4207	11200/10900	3300/3200	15.1/16.0	20
RAK204D30P	RAK4307	16000/15450	4700/4530	21.2/22.4	30

Electric Heat Amps include electric heater and fan motor current draw. Units connected through sub-base do not require an LCDI or AFCI device since they are not considered to be line-cord connected. Each 230/208-volt sub-base kit consists of sub-base with appropriate receptacle for minimum circuit amperage, chaseway to route power connector from sub-base to chassis, wiring to connect sub-base to building wiring and a short line cord with 9-pin connector to connect to chassis and plug into receptacle in sub-base. Short sub-base line cord may not be used without sub-base. Junction box for 230/208-volt chassis must be purchased separately. RAK4002A for 2900, 3900, 4100, and 6100 series units, RAK4002B for 5800 series units.

265-Volt Sub-Base and Direct Connected Units

Sub-Base	Power Connection Kit	Direct Connection Kit	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204E15	RAK5172	RAK5157	8150	2400	9.6	15
RAK204E20	RAK5202	RAK5207	11550	3400	13.3	20
RAK204E30	RAK5302	RAK5307	16350	4800	18.6	30

Electric Heat Amps include electric heater and fan motor current draw. 265-volt units are to be permanently connected in compliance with National Electrical Code and local codes and have a factory-installed junction box on the chassis. Each 265-volt sub-base kit consists of sub-base with appropriate receptacle for minimum circuit amperage, chaseway to route power connector from sub-base to chassis and wiring to connect sub-base to building wiring. **265-Volt Power Connection Kit must be ordered separately.**

Important

Essential Elements Ordering Overview

230/208-volt line cord connected units — order line cord kit

230/208-volt sub-base connected units — order sub-base

265-volt units — order sub-base and power connection kit

Zonline® Chassis Nomenclature

The Zonline chassis is identified by a model number defining the type of unit, cooling capacity, electrical information and optional features included on the unit. When specifying or ordering the Zonline chassis, the use of this nomenclature will assure receiving the correct unit.

EXAMPLE

A	Z	6	1	H	1	2	D	A	D
Zonline packaged terminal chassis	Chassis series 41=deluxe line cool/ electric heat 61=deluxe line heat pump	Nominal cooling capacity 07=7,000 BTUH cooling 09=9,000 BTUH cooling 12=12,000 BTUH cooling 15=15,000 BTUH cooling			Universal power connection				
	Unit type E=cooling with electric resistance heat H=heat pump with electric resistance heat	Voltage/Phase/ Frequency D=230/208-Volt, single-phase, 60 Hz E=265-Volt, single-phase, 60 Hz			Special Features B=base unit C=corrosion treated D=internal condensate removal (ICR) system (heat pump models only) (not for coastal areas) P=Dry Air 25 (4100 Series only)				

The Zonline® 4100 and 6100 Series have incorporated changes suggested by customers, along with enhancements by GE's Technology Team and changes necessary to meet new UL and NEC requirements. "L" shaped condenser coil.

Cross flow blower across the product line for quieter operation.

The "Partial Open Vent Air" feature was a specific request by a customer.

"Heat Sentinel" is an enhancement developed by GE's Technology Team to help lodging professionals welcome their guests with a moderate-temperature room and to help lower cooling costs.

Devices have been added on cord-connected units to protect against injury from unsafe power cords.

See the "Features and Benefits" section for in-depth explanation of these changes and the industry-leading features of GE Zonline retained from the previous series.

The Deluxe 4100 Series Zonline models include The "Dry Air 25" models which remove 25% more moisture than other Zonline models.



Deluxe Dry Air 25 Models Cooling With Resistance Heat

- Removes 25% more moisture than standard Zonline models.
- Cools and dries air in less time than standard Zonline models
- Dry Air is a separate sealed refrigerant system
 - No mechanical parts — No special maintenance required
- Helps maintain lower relative humidity in rooms
- Maintains comfort at slightly higher room temperatures
 - Reduces operating costs — Provides comfort without overcooling
- Corrosion treatment is standard
- Excellent choice for humid climates
- Available in 7000, 9000 and 12000 BTU sizes

The Dry Air 25 system, a heat pipe, is a hermetically sealed heat transfer surface installed in a "saddlebag" configuration around the indoor (evaporator) coil of the Zonline unit. This coil arrangement will transfer heat from the front coil of the saddlebag to the rear coil without power consumption. This assembly uses R-410A as the refrigerant and is not connected to the regular Zonline refrigerant circuit.

As warm, humid air is pulled through the pre-cool (front) section of the heat pipe, the heat removed from the air is absorbed by the refrigerant, causing the refrigerant to change to a gas and flow to the re-heat (rear) section of the heat pipe. The air leaving the pre-cool section of the heat pipe is cooler and at a higher relative humidity level than the room air. The pre-cooled air is further cooled as it passes through the evaporator; consequently allowing the evaporator coil to remove more moisture.

When the cold air from the evaporator comes in contact with the re-heat section of the heat pipe, the heat that was removed by the pre-cool section is added back to the air and the refrigerant in the heat pipe condenses and flows back to the pre-cool (front) section. The air discharged into the room by this process is much drier, creating a more comfortable room condition.

The Dry Air 25 models center around GE's exclusive use of the patented DinH® Dehumidifier Heat Pipe from Heat Pipe Technology, Inc. This innovative NASA spin-off technology enables Dry Air 25 to remove 25% more moisture from the air than other leading manufacturers' packaged terminal air conditioners. This helps maintain room comfort at a higher room temperature, reducing operating costs.

The Dry Air 25 keeps a room cool and dry, and this is the most important benefit when it comes to the occupant of the room—hotel guests, apartment residents, students. In a hot, humid climate, getting away from the humidity is just as important as getting away from the heat, and the Dry Air 25 is the perfect solution. The dehumidification of the Dry Air 25 has been verified by the same ARI test conditions that standard units are rated under.

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Important Notice

Equipment used as a primary source for heating or cooling is an integral part of the building in which it is installed. Proper application is essential for satisfactory performance over a wide range of operating conditions. It is strongly recommended that a professional engineer determine proper application.

If the unit is a replacement unit, its specifications and performance may differ from those of the unit it is replacing. For that reason, we again strongly recommend that a professional engineer determine proper application.

Introduction

This manual is designed to provide product, performance and application information to our customers and their architects and engineers for use in selection and design of a zonal comfort control system utilizing GE Zonline® Packaged Terminal Air Conditioners (PTAC) and Packaged Terminal Heat Pumps (PTHP). GE Zonline PTACs and PTHPs are self-contained units designed for through-the-wall installations in hotels, motels, apartments, hospitals, nursing homes, add-on rooms and many other installations.

Zonline units provide individual room or zone control in both cooling and heating operation. There is a model for practically every application, ranging in cooling capacity from 7,200 to 14,800 BTUH and heating capacity from 6,400 to 14,000 BTUH in heat pump operation. See pages 42 and 54 for resistance heaters available.

The **Deluxe Line** consists of the 4100 Series with electric resistance heat, the 4100 Series Dry Air 25 Models with enhanced dehumidification for hot and humid climates and the 6100 Series heat pump. The 6100 Series heat pump features reverse cycle defrost and simultaneous supplemental resistance heat, when needed, to maintain room comfort. Both offer tactile touch controls with digital display and optional corrosion protection.

Deluxe Line Standard Features:

- Two-fan-motor system with Indoor Cross-Flow Blower for quieter operation
- Digital Controls
 - LED Temperature Display
 - Easy Temperature Selection
 - Tactile Touch Pad
- Universal Heaters
- Heat Sentinel
- “L” Coil Design Condenser
- 3-Position Vent Door
- Freeze Sentinel™
- Indoor Coil Frost Control
- Central Desk Control Interface
- Remote Thermostat Control Interface
- Random Restart
- Electronic Temperature Limiting
- “Smart Fan” Fan Cycle/Continuous Control
- Transfer Fan Interface
- Reverse Cycle Defrost and Simultaneous Supplemental Resistance Heat on Heat Pumps
- Quick Heat Recovery

Deluxe Line Optional Features:

- Corrosion Protection
- Internal Condensate Removal (on 6100 Series Heat Pump without Corrosion Protection)

NOTE: Dry Air 25 models include all the standard features of the 4100 Series plus standard corrosion protection.

Advantages of the GE Zonline System:

- Flexible Application
 - May be installed from flush to finished floor to 3" from the ceiling
 - 7,200 to 14,800 BTUH units in same physical size
 - Deluxe 4100 and 6100 Series may be ducted to condition more than one room
 - Compatible with Class 2 remote thermostat control
 - Compatible with 2-wire CDC or many Energy Management Systems
- Economical Installation
 - No ductwork necessary
 - No mechanical equipment rooms or pipes required for heating/cooling units
 - Replacement units fit existing 42"-wide by 16"-high wall cases
- Quiet Operation
 - Indoor cross-flow blower
- Energy-Saving Operation
 - Units in unoccupied areas may be turned off
 - Designed for efficient cooling operation — EERs from 10.6 to 13.2
 - Efficient heat pump units — COPs from 3.3 to 4.0
 - Extended heat pump operation without sacrificing room comfort
- Ease of Maintenance
 - Permanently lubricated fan motors
 - Upfront lift-out interchangeable filters
 - Slide-out chassis for easy access for cleaning or if service is required
- Reverse Cycle Heat Pump Operation

The 6100 Series heat pumps utilize the unique GE PTAC heat pump operation to ensure a comfortable room. The logic used by the units is the same logic used by central system heat pumps to provide greater savings.

The Zoneline System

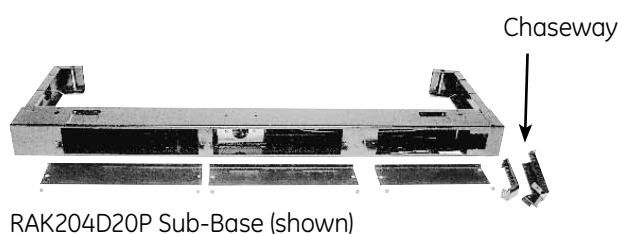
The typical Zoneline installation consists of the wall case (or sleeve), chassis, power cord and exterior grille. Some installations may use a sub-base for support of the unit or for ease of electrical connections. Each of the components should be the standard products offered by GE or, in the case of the exterior grille, approved by GE Applications Engineering. Use of components not specifically designed or approved for use with the Zoneline unit can result in unsatisfactory operation and can be the cause of failure not covered by the warranty.

Components of the Zoneline System

Typical Installation (Deluxe Series shown)



Optional Accessories of the Zoneline System



See pages 22 and 32 for information on electrical sub-bases and chaseway.
 See pages 37-39 for information on ducted installations.

Zonline® Features

	Resistance heat		Heat pump
	AZ 41 Series	AZ 41 Dry Air 25	AZ 61 Series
Cooling EER Range (230 Volts/265 Volts)	10.6 - 12.8	11.3 - 12.2	11.2 - 13.2
Heating COP Range (230 Volts/265 Volts)	N/A	N/A	3.3 - 4.0
Refrigerant type	R-410A	R-410A	R-410A
Cross-flow (tangential) blower	Standard	Standard	Standard
Enhanced Dehumidification	Optional	Standard	—
Heat pump with resistance heat back-up	—	—	Standard
Heat pump with supplemental resistance heat	—	—	Standard
Staged Heating	—	—	3-Stage***
Universal heaters - UPC**	Standard	Standard	Standard
Tactile touch pad controls with LED	Standard	Standard	Standard
Touch control set-up features	Standard	Standard	Standard
Highly featured microcomputer controls	Standard	Standard	Standard
Electric resistance heat lock-out (above 46°F)	—	—	Standard
Automatic emergency heat	Standard	Standard	Standard
Heat pump defrost system	—	—	Reverse cycle
High-Temperature Operation Protection	—	—	Standard
Quick heat recovery	—	—	Standard
Temperature Boost	—	—	Selectable
Separate Indoor & Outdoor Motors — Permanently Lubricated	AC	AC	DC
2-Speed Outdoor Fan	Standard	Standard	Standard
Indoor fan speed settings	Hi/Low	Hi/Low	Hi/Low
Fan Only setting—2-speed	Hi/Low	Hi/Low	Hi/Low
Cool & heat only settings	Hi/Low/Auto	Hi/Low/Auto	Hi/Low/Auto
"SmartFan" Fan Cycle Control	Standard	Standard	Standard
Auto power recovery	Standard	Standard	Standard
Automatic Compressor Restart Delay	Standard	Standard	Standard
Freeze Sentinel™ (41F)	Standard	Standard	Standard
Heat Sentinel (85F)	Standard	Standard	Standard
Automatic indoor frost control	Standard	Standard	Standard
Temperature limiting	Electronic 7-step	Electronic 7-step	Electronic 7-step
Solid-state thermostat	Standard	Standard	Standard
Remote thermostat compatibility	Standard	Standard	Standard
Central desk control compatibility	Standard	Standard	Standard
2-position discharge grille 50°/40°	Standard	Standard	Standard
Upfront filter (interchangeable)	Standard	Standard	Standard
3-position manual air vent control	Standard	Standard	Standard
Sleep function	Standard	Standard	Standard
Transfer Fan Connections	Standard	Standard	Standard
Ducted Installation Capability	Optional	Optional	Optional
Corrosion-treated chassis	Optional	Standard	Optional
Internal condensate removal (ICR)*	—	—	Optional

*Not for use in corrosive environments

**UPC — Universal Power Cord Connection (see pages 42 and 54).

*** Two stage heating if using remote thermostat

265-volt units must be connected in a manner to meet National Electrical Code and all local codes.

Features and Benefits

Standard Physical Dimensions

GE has maintained the same dimensions since 1961 — 42" wide x 16" high x 13-3/4" 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 "Superséal"

Properly installed unit in undistorted case keeps air leakage to a minimum.

7 CFM air infiltration with 25 MPH wind on ICR units — even less on units without 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 power connection kit.

230/208-volt — Line-Cord Connected Units — 2.4/2.32 KW with RAK3153A — 15-amp circuit; 3.3/3.20 KW with RAK3203A — 20-amp circuit; 4.7/4.53 KW with RAK3303A — 30-amp circuit.

230/208-volt - Sub-Base Connected Units — 2.4/2.32 KW with RAK204D15P — 15-amp circuit; 3.3/3.20 KW with RAK204D20P — 20-amp circuit; 4.7/4.53 KW with RAK204D30P — 30-amp circuit.

265-volt — 2.4 KW with RAK5172 — 15-amp circuit; 3.4 KW with RAK5202 — 20-amp circuit; 4.8 KW with RAK5302 — 30-amp circuit.

Unit Controls

4100 and 6100 Series — touch pad controls with digital readout of temperature set point.

Highly Featured Microprocessor Controls

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 6100 Series heat pumps.

Enables heat pump to operate at lower temperatures when other systems switch to more expensive electric resistance heat.

See pages 18 and 19 for discussion of heat pump operation and defrost systems.

High-Temperature Heat Pump Operation Protection

Automatically protects the compressor if heat pump is operated with high outdoor temperatures.

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 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 maintenance and totally enclosed to keep dirt and water out of the motor windings.

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.

Features and Benefits

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”

Unique “SmartFan” allows unit to operate fan continuously in cooling operation and fan cycle in heating to provide better guest comfort. Eliminates complaint of cold air draft during heating operation.

Eliminates need of changing fan-cycle switch seasonally.

“SmartFan” settings are controlled via the auxiliary control setting push button.

Compressor Random Restart

In the event of a power failure, all compressors attempting to restart immediately when power is restored can result in a power surge that can cause another power interruption.

The microprocessors in the Zoneline® units 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 units 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.

Zoneline units 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 turns on heater to help protect against damage caused by freezing room temperature.

Heater turns on at 41°F and warms indoor thermistor temperature to 46°F and shuts off.

Freeze Sentinel may be turned off by dip switch on auxiliary control.

Heat Sentinel

The property owner may choose to activate the Heat Sentinel feature on the Zoneline unit. If the Heat Sentinel is activated and 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 to control 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 unit. 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.

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

Limits are set via the auxiliary control setting push button.

Remote Control Capability with Wall-Mounted Thermostat

See pages 15–17.

Central Desk Control Capability

See page 14.

Energy Management System Interface with Load-Shedding Option

All units have a switch via the auxiliary control setting 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.

Features and Benefits



Up-Front Air Filters

Two interchangeable up-front filters, easy to remove and reinstall, may be cleaned without opening or removing the room front.

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

Concealed Manual Vent Control

Open ventilation doors on GE Zoneline® Packaged Terminal Air Conditioners and Heat Pumps allow

outside air to enter the room through a screen-covered opening in the weather barrier that separates the indoor and outdoor sections of the unit.

A concealed lever is located along the left side of the unit under the front cover is used to open and close the vent door.

The 3-position manual vent door control may be closed, partially open or fully open. Positive vent door closure prevents accidental opening and unwanted air infiltration.



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 and 265 volts.

For each CFM of air to enter the room, an equal amount of air must be removed through exhaust fans in the bathroom or roof tops. Greater amounts of air will be introduced (from chart shown above) depending on the size of the exhaust fan.

Outside ambient air entering the room through this screened vent opening is not conditioned. This unconditioned air becomes mixed with the conditioned air that is circulated by the indoor fan. This air mixture generates an additional heat load/heat loss that causes the unit to run longer and may translate into higher operating costs.

Zoneline vent openings are not intended to be the source of make-up air for building ventilation systems due to the additional heating or cooling loads generated.

Corrosion Protection (Optional)

4100 and 6100 Series units may be ordered with special protection to better withstand damage from salt air and salt water in seacoast areas.

Corrosion protection is standard on the 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 use the RAB77 wall sleeve and be examined/cleaned more frequently than normal installations.

Internal Condensate Removal (ICR)

See page 34 for a discussion of the Internal Condensate Removal system available on 6100 Series heat pumps.

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 4100 Series with the Dry Air 25 heat pipe application removes 25% more moisture than the base 4100 Series unit.

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

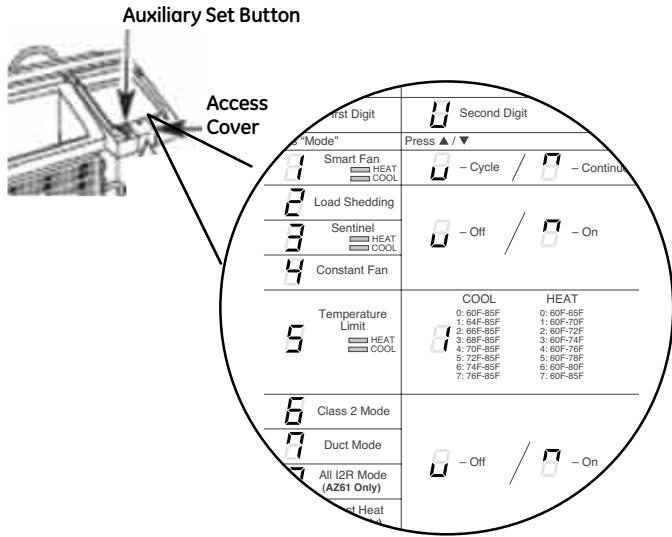
RAK8023 — A door with a lock that replaces the standard control cover door to prevent unauthorized changing of control setting is offered as an accessory.

Auxiliary Control—Aux Set Button

The auxiliary control push button is located behind the room cabinet, below the control panel. The auxiliary controls come preset to the modes most desired by customers. However, the owner is responsible for ensuring the auxiliary controls are set to the desired function. There are 9 different modes that can be set using the auxiliary set button.

To change modes:

- Press the STOP button.
- Press AUX SET (“AU” appears on the display).
- Press the MODE button on the control pad until the first digit in the display shows the number corresponding to the mode you are choosing and the correct HEAT/COOL LED is lit.
- Press the up or down arrow to change the mode setting selection (second digit in the display).
- Press the MODE button to move to the next feature or the AUX SET button to exit the set up process.



Auxiliary Control Settings

Mode 1—Smart Fan—Cooling/Heating

The default setting for Mode 1 is as follows:

Cooling: Continuous (ON)

Heating: Cycle (OFF)

*Note: In cyclic Cooling Mode, the indoor fan will activate occasionally to verify air temperature in the room. In cyclic Heating Mode, the fan will continue to operate for 90 seconds after the heating function has stopped in order to increase unit efficiency.

Mode 2—Load Shedding (Central Desk Control)

The default setting for Mode 2 is OFF.

This feature is active only if the unit is connected to a CDC and the CDC has control. When this mode is on, only the indoor fan can be turned ON or OFF with the unit controls. When this mode is off, all operation is disabled except Heat/Freeze Sentinel (Mode 3).

Press "AUX SET"	First Digit	Second Digit
Press "Mode"	Smart Fan HEAT / COOL	- Cycle / - Continue
2	Load Shedding	
3	Sentinel HEAT / COOL	- Off / - On
4	Constant Fan	
5	Temperature Limit HEAT / COOL	COOL 0: 60F-85F 1: 64F-85F 2: 66F-85F 3: 68F-85F 4: 70F-85F 5: 72F-85F 6: 74F-85F 7: 76F-85F HEAT 0: 60F-65F 1: 60F-70F 2: 60F-72F 3: 60F-74F 4: 60F-76F 5: 60F-78F 6: 60F-80F 7: 60F-85F
6	Class 2 Mode	
7	Duct Mode	- Off / - On
8	All I2R Mode (AZ61 Only)	
9	Boost Heat (AZ61 Only)	

Press "SET"	First Digit	Second Digit
Press "Mode"	Smart Fan HEAT / COOL	Smart Fan Cool – Cycle* Smart Fan Cool – Continue
Press "Mode"	Smart Fan HEAT / COOL	Smart Fan Heat – Cycle* Smart Fan Heat – Continue
Press "Mode"	2	Load Shedding – Off Load Shedding – On

Auxiliary Control Settings (cont)

Mode 3—Freeze Sentinel/Heat Sentinel

The default settings for Mode 3 are:

Heat Sentinel is off

Freeze Sentinel is on.

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

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

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

Mode 4—Constant ON Fan

The default setting for Mode 4 is OFF.

Mode 5—Temperature Limiting

The default setting for Mode 5 is as follows:

Cool: 0 (60°F to 85°F)

Heat: 7 (60°F to 85°F)

Temperature limits—Cool

0 = 60°F to 85°F

1 = 64°F to 85°F

2 = 66°F to 85°F

3 = 68°F to 85°F

4 = 70°F to 85°F

5 = 72°F to 85°F

6 = 74°F to 85°F

7 = 76°F to 85°F

Temperature limits—Heat

0 = 60°F to 65°F

1 = 60°F to 70°F

2 = 60°F to 72°F

3 = 60°F to 74°F

4 = 60°F to 76°F

5 = 60°F to 78°F

6 = 60°F to 80°F

7 = 60°F to 85°F

Mode 6—Remote Thermostat - Class 2

The default setting for Mode 6 is OFF.

Setting this mode to ON will allow the unit to operate with a Class 2 Remote Control Wall Thermostat.

Mode 7—Duct Mode

The default setting for Mode 7 is OFF.

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

Mode 8—All-Electric Heat (AZ6100 only)





































The default setting for Mode 8 is OFF.

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

Mode 9—Heat Boost (AZ6100 only)

The default setting for Mode 9 is OFF.

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

Press "Mode"  	Press ▲ / ▼  Freeze Sentinel – Off  Freeze Sentinel – On
Press "Mode"  	Press ▲ / ▼  Heat Sentinel – Off  Heat Sentinel – On
Press "Mode"  	Press ▲ / ▼  Constant Fan – Off  Constant Fan – On
Press "Mode"  	Press ▲ / ▼  Temperature Limit Cool 0: 60F-85F 1: 64F-85F 2: 66F-85F 3: 68F-85F 4: 70F-85F 5: 72F-85F 6: 74F-85F 7: 76F-85F 
Press "Mode"  	Press ▲ / ▼  Temperature Limit Heat 0: 60F-65F 1: 60F-70F 2: 60F-72F 3: 60F-74F 4: 60F-76F 5: 60F-78F 6: 60F-80F 7: 60F-85F 
Press "Mode"  	Press ▲ / ▼  Class 2 Mode – Off  Class 2 Mode – On
Press "Mode"  	Press ▲ / ▼  Duct Mode – Off  Duct Mode – On
Press "Mode"  	Press ▲ / ▼  ALL 12R Mode – Off  ALL 12R Mode – On
Press "Mode"  	Press ▲ / ▼  Boost Heat – Off  Boost Heat – On

Central Desk Control

Some installations may want to govern the ability of the unit to operate from a control device remote to the unit or even remote to the room in which the unit is located. The general term given to systems such as this is Central Desk Control. The most common installation of this type of system is a switch mounted at the registration desk and, 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 employ a device that will control the unit operation. For instance, in some resort areas devices are connected to sliding glass doors and opening the door causes a contact to close, turning the air conditioner off. This prevents energy being wasted by operating the air conditioner 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 allow the unit to operate; if no one is in the room the device signals the air conditioner to turn off.

Zonline® models offer load-shedding capabilities on units connected to Central Desk Control systems. For more information on the models' load-shedding feature, see page 10.

There is 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 Central Desk Control (CDC) system, GE Zonline units are compatible with most CDC and energy management systems. **Zonline units provide a 24 VAC circuit that powers the Central Desk Control system and no external power is needed.**

All Zonline 4100 and 6100 Series units are compatible with simple on/off 2-wire Central Desk Control systems. Consult with the provider of the energy management system to be sure it is compatible with GE Zonline units. Zonline units 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 Zonline units require no power supply or transformers external to the unit.

Important CDC Comments (all series applicable)

1. When the switching device closes the circuit of the CDC conductors, the unit operation stops.
2. Do not use a common bus (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 busing and may damage internal components or cause erratic operation of the system.
3. A 24-volt transformer is contained within the Zonline unit. 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.

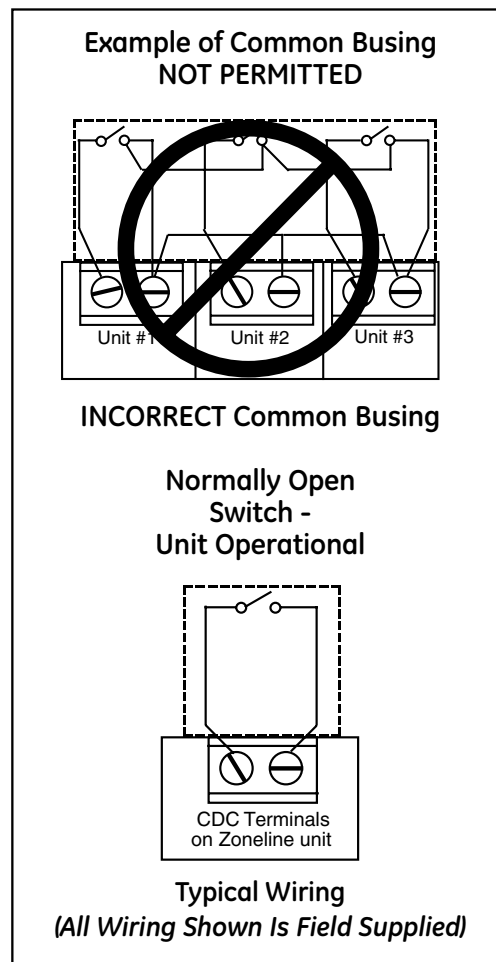
Freeze Sentinel™ and Heat Sentinel remains operational when the unit is connected to a CDC system. Even if the unit is turned "OFF" at the central location, if the sensor at the unit detects the low or high limit temperature, the unit will automatically turn on until it reaches the preset shutdown temperature (46°F heating, 80°F cooling).

Connecting the Zonline unit 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 removed from the CDC system, the selected controls—either the unit-mounted control or the remote thermostat—govern the operation of the unit.

Please see page 55 for installation recommendations for the Central Desk Control wiring.

CDC Terminal Location and Typical Wiring

See page 15 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.

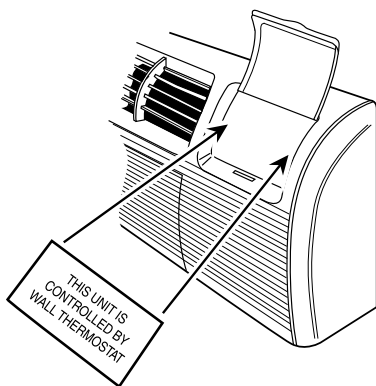
Important Notes: Remote thermostat wiring should NOT be run through wall case. Thermostat wiring should exit the wall below the unit and enter the unit between room cabinet and chassis. Wire molding may be used to hide thermostat wiring. If a sub-base is used, the thermostat wiring may be concealed by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

All Zoneline 4100 and 6100 Series units are adaptable to Class 2 remote low-voltage thermostat. The only additional field-supplied components are the remote thermostat and wiring necessary to connect it.

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

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 to direct the user to the wall thermostat for operation of the Zoneline unit.



Resistance Heat Models

The Zoneline 4100 resistance heat units may be connected to a single-stage thermostat designed for use with cooling with electric heat systems. GE offers two thermostats compatible with the 4100 Series unit.



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



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

The remote thermostat-Class 2 option (Mode 6 in the auxiliary control setting) must be turned ON to enable remote thermostat control. Refer to installation instructions packaged with the chassis.

Please see page 55 for installation recommendations for the remote thermostat wiring.

Compatibility of other thermostats considered for use with GE Zoneline units 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.

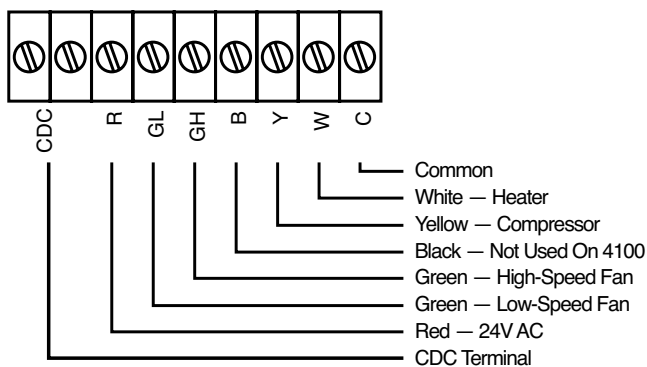
The fan speed for the 4100 Series in remote thermostat operation is selected by the connection of the fan wire from the thermostat to either the HIGH or LOW terminal on the unit. See the sketch of the unit terminals below for the location of the HIGH and LOW fan-speed terminals. Operating the unit in low fan speed reduces the operating sound level of the unit.

Freeze Sentinel™ and Heat Sentinel remain 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. See page 14 for additional information on the CDC system.

Unit temperature limiting settings are not functional when unit is connected to a remote thermostat.

Field Wiring Terminal

- R — 24V AC
- GL — Low-Speed Fan
- GH — High-Speed Fan
- B — Not Used on 4100
- Y — Compressor
- W — Heater
- C — Common



Remote Thermostat Control

Heat Pump Models

The Zoneline® 6100 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 two thermostats compatible with the 6100 series units:



RAK148D1 — solid-state digital thermostat requiring six connection wires.



RAK148P1 — solid-state digital programmable thermostat requiring six connection wires.

Please see page 55 for installation recommendations for the remote thermostat wiring. Compatibility of other thermostats considered for use with the GE Zoneline unit is the responsibility of the customer.

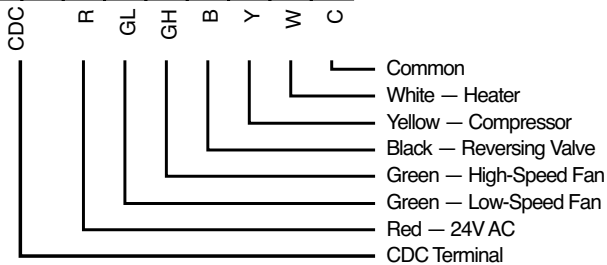
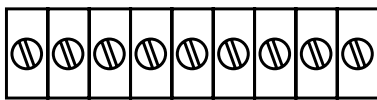
The control voltage on the remote control conductors is 24 VAC.

The remote thermostat-Class 2 option (Mode 6 in the auxiliary control setting) must be turned ON to enable remote thermostat control. Refer to installation instructions packaged with the chassis.

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

Field Wiring Terminal

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



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

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

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

Remote Thermostat Control Selection Chart For Zoneline Packaged Terminal Units

Zoneline Series	Thermostat Model	Type	Function	Low-Voltage Conductors
4100	RAK164D1	Digital	Cooling and Heating	5
	RAK164P1	Digital Programmable		5
6100	RAK148D1	Digital	Single-Stage Cooling – 2-Stage Heating	6
	RAK148P1	Digital Programmable		6

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

For remote thermostat operation follow the steps below:

1. Turn on the unit and ensure it is working properly BEFORE proceeding.
2. Unplug the unit or disconnect power and remove the room cover.
3. Connect the thermostat wiring per the appropriate diagram/colors for your model.
4. Plug the unit back in or reconnect power.
5. Press the Aux Set button once. The letters AU will appear in the display.
6. Press the mode button until the number “6” appears in the left hand digit.
7. Press the up arrow once so the top half of the right hand digit is lit.
8. Press the Aux Set button to exit the setup function.
9. Replace the room cover.

See pages 12 and 13 for full instructions on using the Auxiliary Controls Feature.

Heat Pumps and Energy Savings

- GE Zonline® heat pumps are designed to provide cost-efficient heat pump operation while monitoring room conditions to maintain comfort.

The units employ a logic system monitoring both outdoor and indoor temperatures to determine the heat source, thus increasing energy savings by operating longer in the heat pump mode.

Heat pumps save energy and cost less to operate than units with electric resistance heaters as the only heat source. Just as the EER of an air conditioner is an indication of the efficiency of the unit, COP (Coefficient of Performance) is the indication of the efficiency of the heat pump. This relative efficiency of a heat pump compares the unit to electric resistance heat. If a unit has a COP of 3.0, it means the unit will produce three times as much heat at rating conditions for the same electrical input wattage used for electric resistance heat.

The compressor is used in heat pump operation just as in air conditioning operation. In heat pump operation, the hot refrigerant gas is directed to the indoor coil rather than to the outdoor coil. Room air that circulates over the indoor coil gains heat from the coil rather than losing heat to the coil as during cooling operation.

As the outdoor temperature falls, the heat pump is able to extract less heat from the outdoor air to raise the temperature of the indoor air. For this reason, all packaged terminal heat pumps also have electric resistance heaters as backup to heat pump operation. At some point, the heat pump is unable to provide sufficient heat to adequately warm the room. Many Packaged Terminal Heat Pumps cease heat pump operation and change to more expensive resistance heat at some pre-determined outdoor temperature to compensate for the inability of the heat pump to maintain room temperature. This point, called the “switchover point,” is usually at an outdoor temperature where savings from heat pump operation may still be realized if the unit is designed to maintain room comfort at the lower outdoor temperatures.

Balance Point

An important consideration in the selection of a heat pump unit is the “balance point” of the installation. Virtually every room is unique—with different insulation, different sizes and types of windows, different types of construction, different directional exposures. All these variables, as well as geographical location, must be considered in order to determine the balance point, the point at which the heat pump is unable to produce enough heat to compensate for the heat loss of the room or area being heated. For these reasons a consulting engineer should be engaged to calculate the heat loss and specify the heat pump unit required.

GE offers the 6100 series of Zonline heat pump units—with highly featured microprocessor controls—react to the indoor temperature as well as the outdoor temperature in determining the heat source to provide comfortable room conditions and energy savings. This determination of the heat source based on the indoor temperature helps provide a more comfortable room.

Heat Pumps and Energy Savings

Heat Pump Operation — Zoneline 6100 Series

Heat sources: Heat pump, heat pump and simultaneous electric resistance heat or electric resistance heat.

Zoneline heat pumps employ a highly featured microprocessor control system interfaced with thermistors to accurately measure indoor air temperature, outdoor air temperature, indoor coil temperature and outdoor coil temperature. This system allows the microprocessor to precisely and predictably react to changing conditions in order to provide a very advanced packaged terminal heat pump operating system.

The Zoneline heat pumps are designed to help ensure 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 even if connected to a Central Desk Control.

Zoneline Heat Pump Heat Source Logic

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

The Boost Heat option utilizes the supplemental simultaneous heater at the same time as 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 below. For more information about the Quick Heat Recovery Feature, see page 9. The full heat output of the resistance heater is dependent upon circuit amperage and the power connection kit used. See pages 3 and 42–43 for information on power connection kits and available heater capacities.

An option is provided in the auxiliary controls (Mode 8) to allow the unit to operate only in resistance heat. The use of this option significantly increases the cost for heating.

Heat pump defrost — Zoneline 6100 Series

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 by criteria 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 reverses the flow of refrigerant to direct the hot gas into the outdoor coil to melt the frost buildup. 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 ensure 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

See page 34 for information on heat pump condensate. The Zoneline 6100 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.

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

*If the Boost Heat switch (auxiliary setting #9) is "ON", the supplemental simultaneous heater will be used with heat pump operation.
Simultaneous supplemental heater: 1.0 KW @ 230 V; 0.8 KW @ 208V; 1.0 KW @ 265V.

**Boost Heat option only applies to systems controlled at the unit. Boost Heat option should NOT be used with remote thermostat operation since this will cause the unit to switch to resistance heat when outdoor temperatures are below 46°F.

Application Comments

Use and Care Manual and installation instructions are shipped with Zoneline® units. It is important that any air conditioning system be properly sized and applied in order to achieve the desired temperature and humidity levels in the space to be conditioned. Zoneline units are designed primarily to provide heating and cooling with the additional benefit that during operation in the cooling mode, the units also remove some moisture from the conditioned space. The following are some brief application comments on undersizing, oversizing, heating, wall coverings, and air infiltration: all are important in the proper matching of the heating/air conditioning system to the building structure.

Undersizing: If an air conditioner is undersized (cooling capacity is less than required for a specific application), the unit will typically not be able to cool the space down to the desired temperature (thermostat set point), nor be able to remove enough moisture from the air. A result could be a warm and humid or warm and dry conditioned space.

Oversizing: If an air conditioner is oversized (cooling capacity is greater than required for the specific application), the unit will typically cool the space down to the desired temperature (thermostat set point) too quickly. The compressor then begins to cycle on and off. Dehumidification only takes place when the compressor is operating in the cooling mode. A typical result in a hot/humid climate could be a cool but excessively humid space.

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

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

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

Recommendation: For the above reasons it is strongly recommended that a professional engineer be retained to match the Zoneline unit with the building structure.

Air Distribution

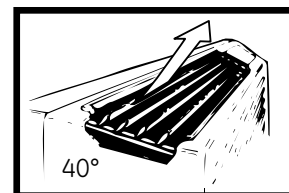
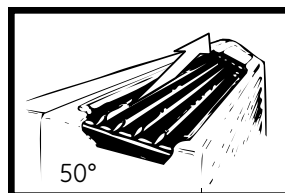
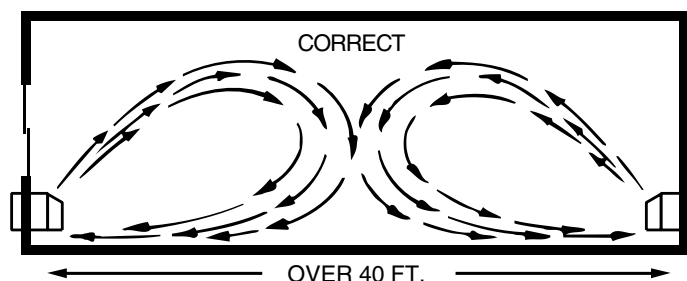
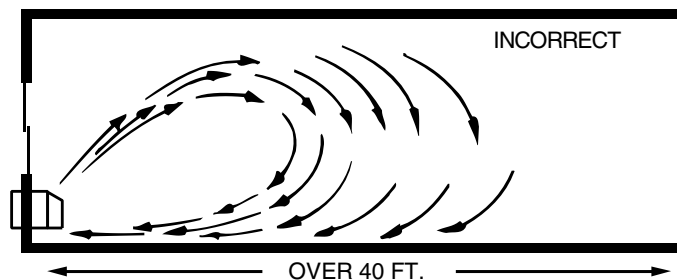
Zoneline packaged terminal air conditioners and heat pumps discharge air from the top of the unit through reversible two-position discharge louvers. Unit discharge louvers are reversed by removing the room cabinet from the unit, removing seven screws that hold the louver section in place, removing the louver section and rotating it end for end, reinstalling the louver section in the room cabinet with the seven screws, and reinstalling the room cabinet on the unit. The unit is shipped from the factory with the discharge louvers at an angle of 50° off vertical. In the alternate position, the louvers will be at an angle of 40° off vertical.

All room cabinets return air through the front of the unit.

High Wall Mount — 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" below the ceiling. In installations where units are close to the ceiling, the greatest horizontal discharge angle can be obtained by removing the discharge grille from the room cabinet.



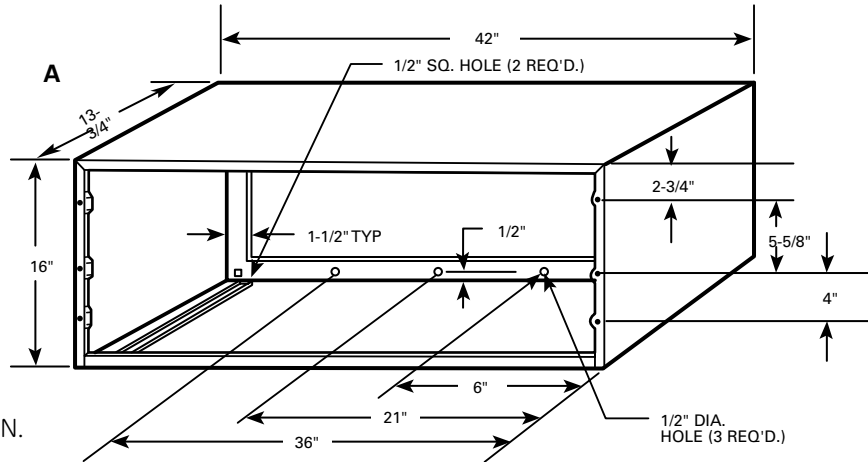
Supply Air Throw — One Zoneline unit should not be required to do a job obviously requiring two or more units. Units should be located around large rooms according to calculated loads or in such fashion as to achieve balanced air distribution in all parts of the room. The single unit in the "Incorrect" illustration below obviously cannot condition the entire room. Add a second unit as shown in the "Correct" illustration.



Dimensions

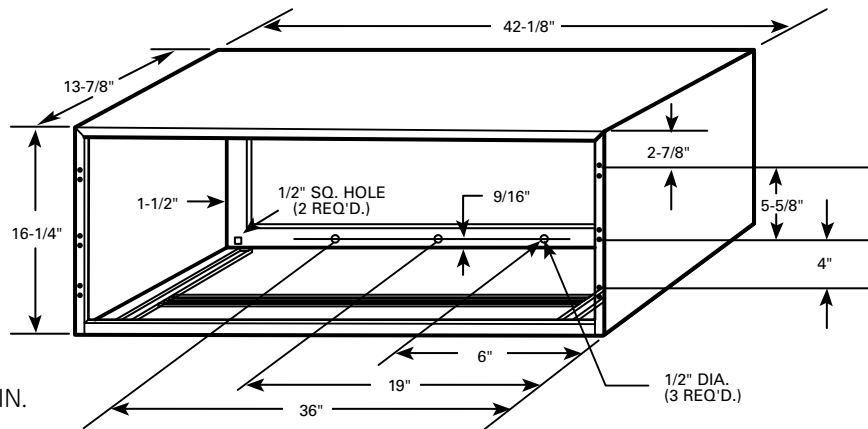
Additional
Wall Case Depths
RAB7116 - 16"
RAB7124 - 24"
RAB7128 - 28"
RAB7131 - 31"

RAB71A WALL CASE



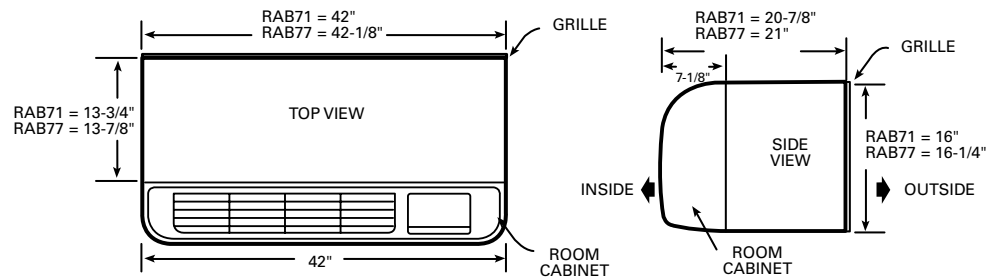
WALL OPENING
16-1/4" MIN. x 42-1/4" MIN.

RAB77 WALL CASE

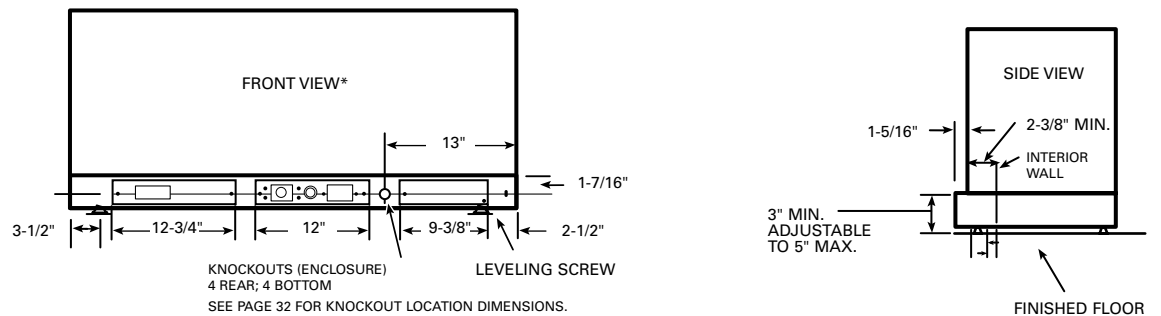


WALL OPENING
16-1/4" MIN. x 42-3/8" MIN.

WALL CASE WITH CHASSIS INSTALLED



WALL CASE WITH SUB-BASE



*SHOWN WITH ACCESS COVERS REMOVED.
NOTE: CAUTION - REMOVE KNOCKOUTS FROM INSIDE OUT.

Installation instructions packed with wall case. See page 25 for additional information concerning outdoor weather panel and case stiffener.

Wall Case

A choice of wall cases is available for Zonline® units.

RAB71A — This insulated case is constructed of heavy-gauge galvanized steel and finished with a baked-enamel finish for protection and appearance. Design of the case provides for support of the chassis and free draining of any water entering the wall case. A petroleum microcrystalline wax is applied at critical points of fabrication to seal against moisture. The dimensions of the RAB71A wall case are 42" wide by 16" high by 13-3/4" deep, the same dimensions as the original wall case for GE Zonline units built in 1961. The RAB71A wall case is also available in depths other than the standard depth. It is available on special order as: **RAB7116 – 16" deep; RAB7124 – 24" deep; RAB7128 – 28" deep; and RAB7131 – 31" deep.** All these special-order deep wall cases are insulated and have sheet-metal dividers, or splitters, to prevent the recirculation of condenser discharge air.

RAB77 — This non-insulated wall case is molded from fiberglass-reinforced polyester compound. This SMC (Sheet-Molded Compound) wall case offers outstanding strength, durability, color retention, water integrity and corrosion resistance. The dimensions of the RAB77 wall case are 42-1/8" wide by 16-1/4" high by 13-7/8" deep.

- Both wall cases are of universal design, accepting all Zonline chassis of current design as well as all GE Zonline chassis produced since 1961.
- Drain holes are provided in the rear of the wall case to permit excessive cooling condensate water, heat pump condensate or precipitation entering the wall case to drain freely. A drain kit may be connected to the wall case to control any water draining from the wall case. See page 35 for information on **RAD10 Drain Kit.**

RAK901L — For installations where the wall case extends into room, RAK901L is an insulation kit that can be used with the RAB77 or any existing non-insulated wall case to minimize the possibility of condensation forming on the indoor side of the case during the winter.

Sub-Base

The sub-base is an optional accessory for the Zonline unit and is presented with the wall case information since the decision to use or not use a sub-base in the installation is a factor in the location of the wall opening for the unit. National Electrical Code® requires that air conditioning units connected to voltages in excess of 250 volts be "permanently connected." There are also some installations where units connected to voltage sources under 250 volts may also need to be "permanently connected." If you are in doubt about the requirements for a particular installation, consult Article 440 of the NEC or the local electrical inspector. These requirements are designed to protect personal safety and should be strictly followed. Although NEC is cited here as a reference, all electrical wiring and installations must conform to any and all local electrical codes and regulations.

"Permanent connection" generally means wiring to the unit must be contained in an enclosed "chaseway," where access to the wiring connections is more restrictive than a normal line cord plugged into a receptacle. NEC requirements may be met by using flexible or rigid conduit to contain the wiring between the unit and a junction box that contains the wiring connections. The conduit is connected to the unit and to the junction box with connectors to hold the conduit in place. The junction box may be located in the floor or the wall of the structure but only approved connectors may be used outside the unit or the junction box. The sub-base is UL® listed as a junction box for permanent connection of a Zonline unit.

Using a sub-base in an installation requiring permanent connection provides a convenient, consistent location for unit wiring to be connected to building wiring. The use of a sub-base is not required, but the convenience and the improved aesthetics it offers makes the use of a sub-base a viable means of permanent connection.

RAK204U — The RAK204U Series of sub-bases provides a variety of designs that fit the site needs and are available for use with Zonline PTAC/PTHP units. The RAK204U will most likely be used for support of the wall case and unit. The RAK204U is the same physically as the other sub-bases except there is no receptacle installed. Receptacles and wiring can be field installed and, by using the RAK205CW chaseway and the RAK4002A junction box perform the same function as any of the other sub-base kits by selecting the correct receptacle and installing it in the interior mounting plate inside the RAK204U.

208/230-volt receptacles can also be mounted in the cover plate for easy access when direct connect wiring is not required. 265-volt units are to be "Permanently (or Direct) Connected" and the external receptacle (when wiring is not enclosed in a chaseway) does not meet this requirement. A knockout for a fuseholder or a disconnect is also provided in the cover plate.

RAK204U — No receptacle, no wiring; will accept any 15-, 20-, 30-amp receptacle and wiring. No chaseway is included. RAK205CW chaseway must be ordered separately.

The 230/208-volt sub-bases below include a short, sub-base power connection kit. Since sub-base connected units are not considered to be line-cord connected, a Leakage Current Detection and Interruption or Arc Fault Current Interrupter device is not necessary.

The junction box (RAK4002A for 4100 and 6100 Series units) that mounts on the chassis of 230/208-volt sub-base connected units must be purchased separately.

RAK204D15P 208/230-volt 15-amp receptacle. Receptacle is NEMA6-20R with 18" of #12AWG wires attached to the receptacle. Short power connection kit included. Chaseway included.

RAK204D20P 208/230-volt 20-amp receptacle. Receptacle is NEMA6-20R with 18" of #12AWG wires attached to the receptacle. Short power connection kit included. Chaseway included.

Sub-Base (Continued)

RAK204D30P 208/230 volt 30-amp receptacle. Receptacle is NEMA6-30R with 18" of #12AWG wires attached to the receptacle. Short power connection kit included. Chaseway included.

The junction box (RAK4002A for 4100 and 6100 Series units) that mounts on the chassis of 230/208 volt sub-base connected units must be purchased separately.

Sub-bases for the 265-volt units:

RAK204E15 265-volt 15-amp receptacle. Receptacle is NEMA7-15R with 18" of #12AWG wires attached to the receptacle. Chaseway included.

RAK204E20 265-volt 20-amp receptacle. Receptacle is NEMA7-20R with 18" of #12AWG wires attached to the receptacle. Chaseway included.

RAK204E30 265-volt 30-amp receptacle. Receptacle is NEMA7-30R with 18" of #12AWG wires attached to the receptacle. Chaseway included.

The junction box for 265-volt units is shipped with the chassis since all 265-volt units are to be "permanently (or direct) connected."

The power connection kit is not included

There are separate internal compartments to permit separation of low-voltage (Class 2) connections from line-voltage connections as required by NEC. Conduit containing building wiring enters the sub-base through knockouts located in the rear or bottom of the sub-base and is not accessible when the wall case is installed.

The sub-base attaches to the RAB71 wall case with two clips (field-assembled) that are screwed into pre-drilled holes in the bottom front flange of the wall case. It attaches to the RAB77 wall case with clips that fit over molded ribs without requiring the use of screws into the wall case. See page 33 for illustration. Since the sub-base extends under the wall case, clearance from the inner edge of the wall case to the finished wall must be 2-3/8" or greater. The sub-base has four leveling legs and adjustable side channels to enable the area under the wall case to be enclosed. Clearance from the bottom edge of the wall case to the finished floor must be between 3" and 5".

The sub-base may be used as support for the chassis and wall case in installations where the wall is of insufficient thickness to provide secure mounting of the wall case.

Wall Case Installation Data

General

Generally, Zonline units are installed 3" to 5" above the floor (flush to finished floor installation is possible) as near to the center of the room as possible; underneath a window or a glass panel is typical. Normal installation of the wall case allows installation flexibility; from flush with the finished interior wall to a minimum of 1/4" of the wall case extending beyond the finished exterior of the building. Special consideration must be given to installations where the wall case does not extend a minimum of 1/4" beyond the finished exterior wall. See pages 30 and 31 for information on this type

of installation. The unit may be installed high in the wall and these installations usually require a remote thermostat and are discussed on pages 15 and 16.

Regardless of the installation, there are several things to consider when selecting a location for installing the unit. For instance, drapery location could interfere with air discharge, and placement of furniture may have an impact on the performance of the unit. The following information is intended to minimize installation problems and assure you of trouble-free installation.

Refer to page 21 for required wall opening dimensions. Minimum recommended interior and exterior case projections for standard wall thicknesses are shown in the drawings in this manual. The case may be installed flush with the finished indoor wall. Special attention must be paid to room-side case projection when the unit is installed in a ducted application as shown on pages 38 and 39.

In walls thicker than 13-1/2" for line-cord-connected units and 11-1/8" for sub-base installations, it may be necessary to install a field-fabricated case extension or use one of the special-order RAB71 deep wall cases. Such extensions must be carefully flashed and sealed both to the wall case and to the wall to ensure water integrity. This is necessary to ensure that any water entering the wall case, either from operation of the unit or from other sources, such as rain storms or from washing the exterior of the building, will drain from the case without the possibility of capillary action drawing the water into either the room or the wall cavity. In an installation where the case is recessed less than 3" from the outside surface, flashing and sealing may be all the modification necessary. In such an installation, the sides and top of the wall opening must be waterproof to prevent moisture from seeping into and damaging the walls. See pages 30 and 31 for suggested detail. Since the installation of a case extension requires a considerable amount of attention, we recommend using one of the deep wall cases if the standard case is not of sufficient depth.

Mounting an outdoor grille or louver section to the building face may cause a space between the outdoor coil and the louver section. Air splitters, aligned with the ends of the outdoor coil, must be installed between the outdoor coil inlet and outlet air streams. Gaps between the outdoor coil and the louver section may allow condenser air recirculation and affect the operation of the unit. See page 41 for requirements for custom louvers.

The wall case should be level from side to side and from level to 1/4 bubble tilt to the outdoors. The condensate disposal system in the unit is designed to dissipate the condensate water generated during cooling operation in accordance with ARI standards and actually uses this water for maximum unit efficiency. A level unit will also ensure proper performance of the Internal Condensate Removal (ICR) system optional on heat pump units.

Wall Case Installation Data (Continued)

For new construction, early planning with the architect is necessary. Unit location, electrical connection locations and wall openings of the proper dimensions are essential to avoid the necessity of rework, fillers, framing, moving electrical outlets and other expensive modifications.

For existing construction it is important that carpentry, masonry and electrical work be performed by competent, qualified personnel. Since installations in existing construction may involve removal of building material from the structure, locating the wall case must be done correctly.

Architectural Window/ Louver Installation

Many installations utilize an architectural window/louver combination to enhance the exterior appearance of the building. The exterior grille for the air conditioner is built as an integral part of the window frame. An internal drain system is highly recommended for these installations (see page 36). When this type of installation is made, there must be provision in the grille work for condensate water to drain to the exterior (including the overflow relief drain holes) and not be routed back into the interior of the building or into the wall cavity. Failure to allow for the drainage of condensate water can cause extensive damage to structural components. The problems associated with the lack of condensate drain consideration often show up shortly after the air conditioners are turned on in a new building. New buildings that have been virtually wide-open during construction have a significant amount of moisture in the air and in the building components that the air conditioners start removing as they operate. The free area in the louver section must also comply with the requirements shown on page 41.

The wall case should be anchored to the architectural window/louver section to reduce air infiltration and excessive vibration of the chassis and wall case during unit operation. Field-fabricated and installed case angles are the recommended method of securing the wall case to the window/louver framework.

Window, Curtain and Panel Wall Construction

With this type of construction, provision for support of the unit, other than by the wall itself, is often required. Such support may be in the form of wood or metallic material of the proper thickness to maintain a level case. This additional support should be located both near the wall and at the front of the wall case. Sub-base (RAK204 Series) with four leveling legs provides an excellent support for the unit in this type of installation. See page 28 for details of this type of installation.

In existing construction, common practice is to remove a pane of glass, metal, wood, or other construction material and build a frame around the wall case. Similar filler panel material may be installed around the case for appearance and weather seal.

Masonry Wall Construction

The wall case should be installed during construction and lintels should be used to support the blocks above the wall case. The wall case will not support the concrete block. The installation instructions show how the wall case must be secured to the masonry and caulked. Do not remove the cardboard stiffener supplied with the wall case until ready to install the chassis. See page 29 for details of installation in masonry wall.

For existing masonry construction, wall openings must be made by removing concrete blocks to achieve the proper-size opening. Consult the builder, architect or owner to determine the necessity for lintels to support the block above the wall case.

Anchor bolts are normally required to secure the case to the wall and shims may be required to prevent distortion of the wall case when securing the wall case to the wall. Field-supplied case angles can be used to position and secure the wall case to the wall and to cover oversized wall openings.

Brick, Frame, Stucco and Shingle Construction

For new construction, the opening for the wall case should be framed and the wall case inserted into the opening during construction. Lintels should be used when the building material is heavy and is not self-supporting (such as brick). The wall case will fit an opening of six courses of standard brick or five courses of jumbo brick. Wall framing in this type construction is normally on 16" centers and the wall case will fit a framed opening spanning three 16" O.C. 2" x 4" stud spaces.

For existing construction, the indoor and outdoor wall will need to be cut out, allowing for clearances of 1/8" on all sides of the wall case. Work should begin on the inside wall. Cut the correct dimensions and mark (using drill holes) the outside wall from each corner of the inside cutout. Studding that interferes with the opening must be removed and a suitable frame constructed to secure the wall case and provide adequate support for case and chassis.

As shipped, the RAB71A Series or RAB77 is ready for installation.

Preparation of the Wall Case for All Types of Construction

Do not remove the stiffener from inside the wall case or the weather closure panel from the outside face of the wall case until the outdoor grille and chassis are ready to be installed.

Installation of Wall Case in Wall Opening

1. Position the wall case into the wall. The room-side edge of the RAB71A or RAB77 wall case should be at least flush with the finished wall for line-cord installations and permanent-connection installations when no sub-base is used, and should project into the room at least 2-3/8" when a sub-base is used. The outside edge of the wall case should extend at least 1/4" beyond the outside wall. This is necessary for proper caulking, to prevent sealing the drain holes in the rear flange of the wall case, and to facilitate the installation of an accessory drain, if used. If the minimum exterior dimensions are not met, refer to pages 30 and 31.

The wall case should be level from side to side and from level to 1/4 bubble tilt to the outdoors. The condensate disposal system in the unit is designed to dissipate the condensate water generated during cooling operation in accordance with ARI standards and actually uses this water for maximum unit efficiency. A level unit will also ensure proper performance of the Internal Condensate Removal (ICR) system optional on heat pump units.

2. The wall case should be secured to the wall at both sides. Use a minimum of two screws or other fastening device on each side. See Figure 2 on page 26. Mark the wall case on each side 2" from the bottom and 2" from the top at a point where basic wall structure is located. Drill wall case and use fasteners appropriate for wall construction. All holes for fasteners in the side of the wall case must be at least 2" up from the bottom of the wall case. Never locate screws or put other holes in the bottom of the wall case. The ONLY exception is when an RAD10 drain kit is installed to connect to an internal drain system. See page 36 for RAD10 drain kit information.
If the wall opening is greater than the case dimensions, spacers must be used on the sides between the wall case and the wall support structure to prevent distorting the wall case.
3. Caulk or gasket the entire opening on the outside between the wall case and exterior wall surface (four sides) to provide total water and air seal.
4. Caulk or gasket room-side opening between wall case and interior wall surface (four sides). Opening beneath or around the wall case can allow outdoor air to leak into the room, resulting in increased operating costs and improper room temperature control.

Care should be taken in location of electrical supply entry in relationship to wall sleeve to assure access to receptacle or junction box once unit is installed.

- Refer to page 43 for maximum power cord length.
- Permanently connected units close to finished floor must allow for conduit clearance.

Case Angles

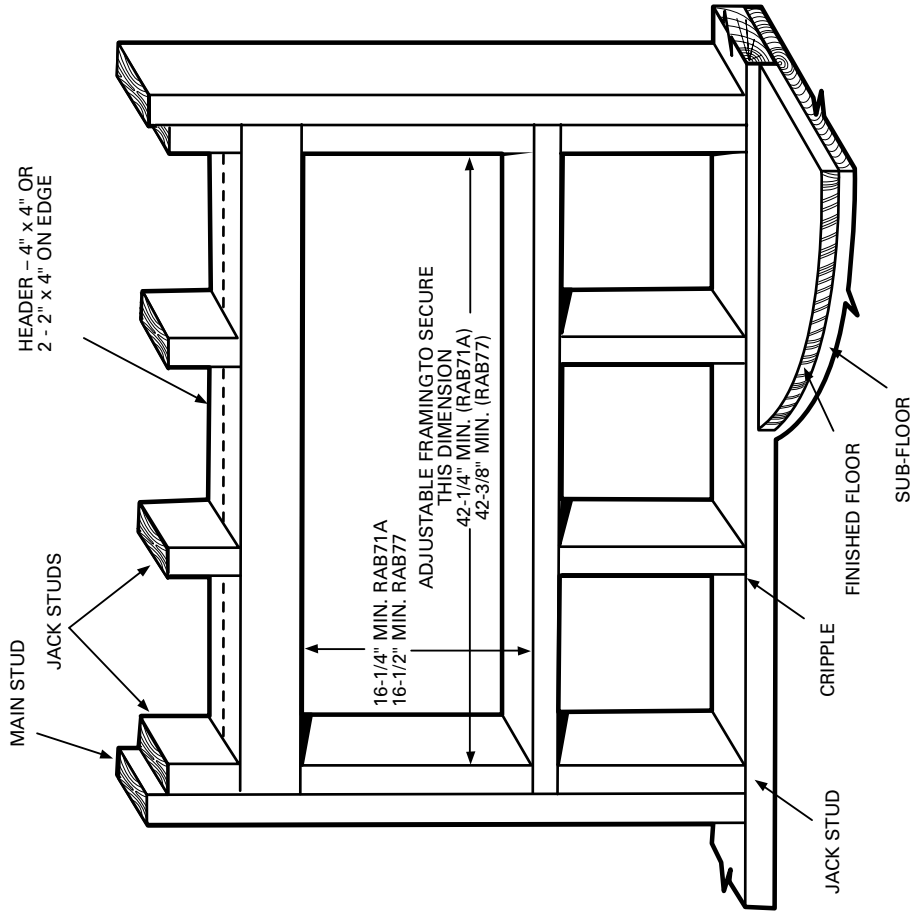
In some installations, such as curtain walls, window walls, or where the structural material of the wall is insufficient to support or fasten wall case, case angles may be used. Case angles are pieces of steel or other material of similar structural strength that are formed to a 90° angle, with holes to fasten the case angle to the wall case and to the structural component of the wall surrounding the wall case.

The following describes the procedure when **field-fabricated and -installed** case angles are applied.

1. Position case angles around top and sides of wall case at the desired location. Position case angles vertically on each side of wall case to provide a level installation.
2. Mark wall case through holes in case angles. The lowest hole on the sides of the wall case must be a minimum of 2" above the bottom of the case.
3. For **RAB71A** wall case, drill 5/32" diameter holes at locations marked on wall case in Step 2, and assemble angles to wall case using #10 x 1/2" self-tapping screws. For **RAB77** wall case, follow the same procedure except use a #10 x 1/2" bolt, washer and nut to attach case angles to case. Install screws or bolts from inside wall case.
4. Do not drill any holes in bottom of wall case. Do not distort wall case.
5. Do not use case angles for a lintel.

FRAMING FOR WALL CASE

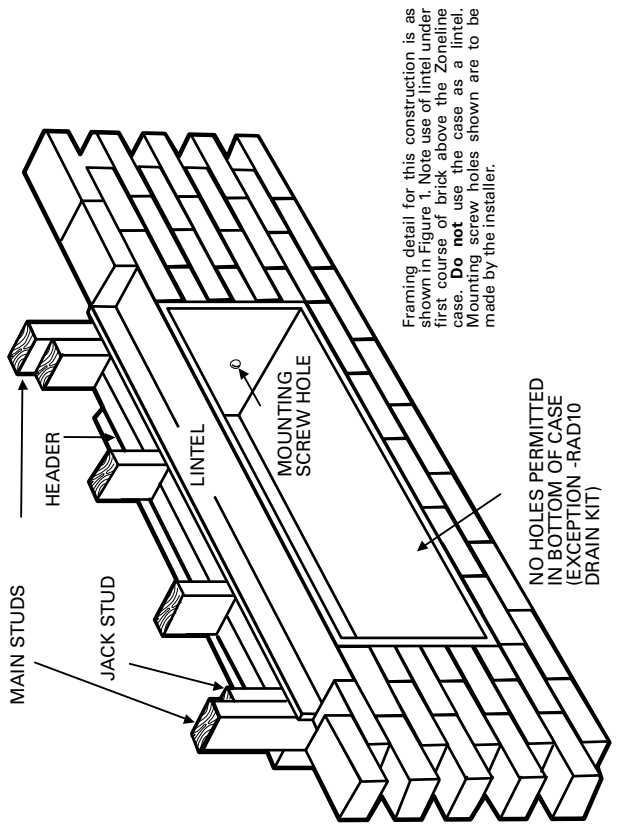
Brick Veneer and Frame Construction



Note: Do not remove the stiffener support from inside the wall case until the chassis is to be installed.

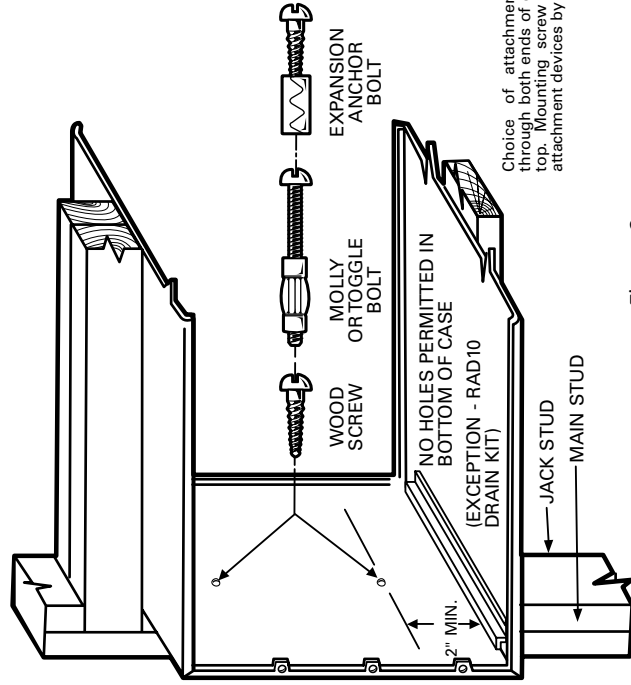
Figure 1

FASTENING WALL CASE



Framing detail for this construction is as shown in Figure 1. Note use of lintel under first course of brick above the Zoneline case. Do not use the case as a lintel. Mounting screw holes shown are to be made by the installer.

NO HOLES PERMITTED IN BOTTOM OF CASE (EXCEPTION - RAD10 DRAIN KIT)



Choice of attachment devices through both ends of case or the top. Mounting screw holes and attachment devices by installer.

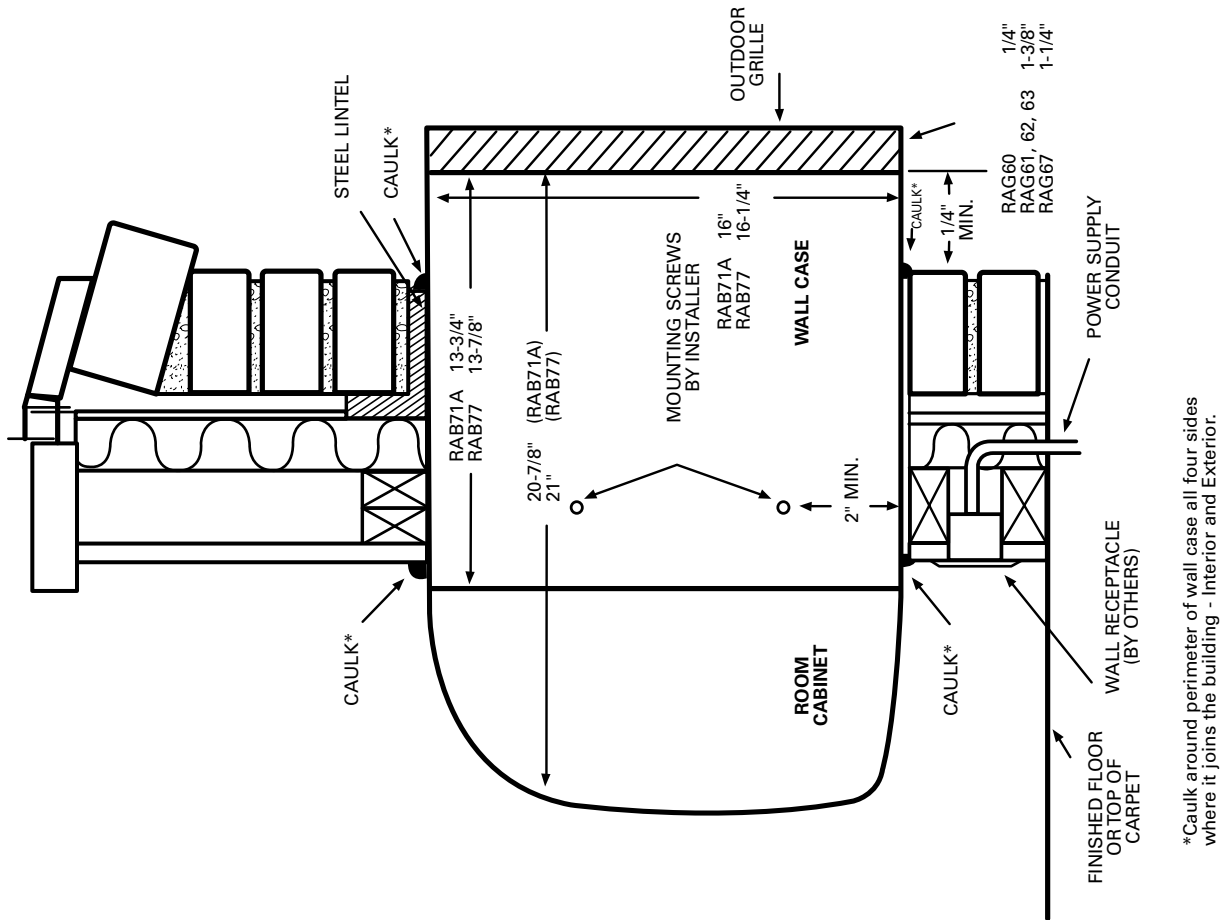
Figure 2

WALL SECTION - DETAILED SIDE VIEW

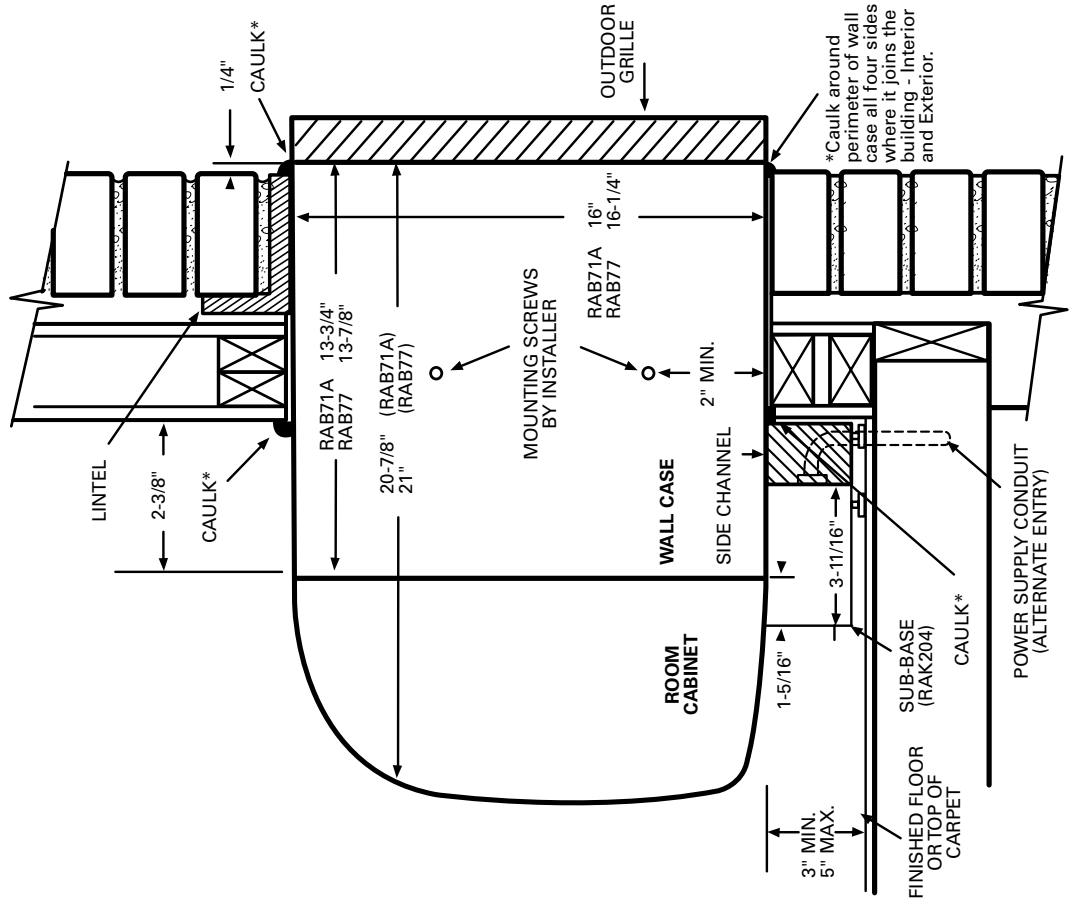
Frame and Brick Veneer Installation

Cord set connected

Sub-Base Connected



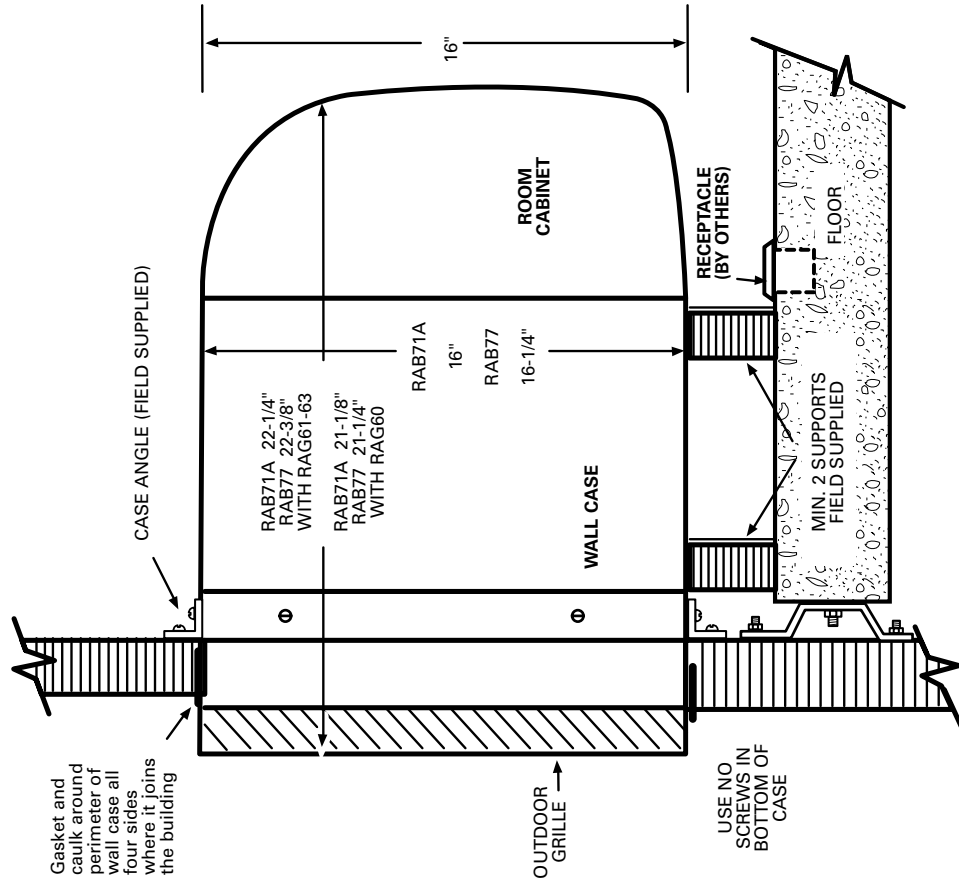
*Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.



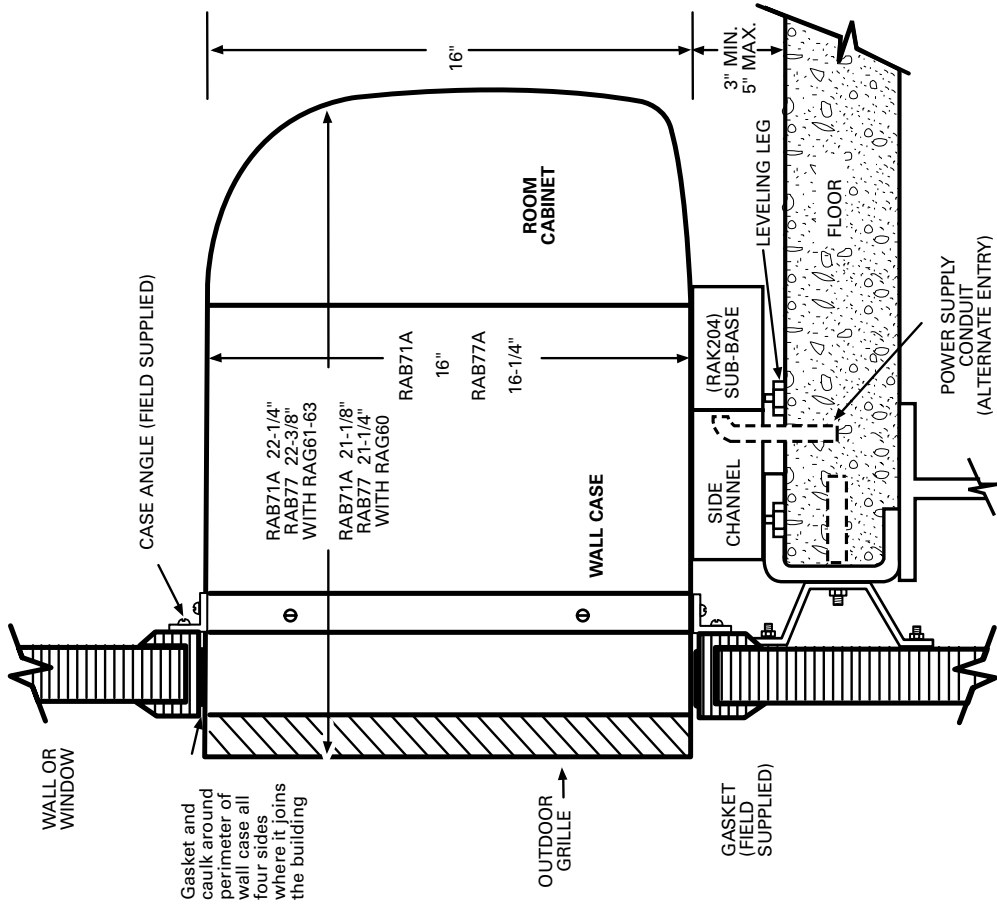
WALL SECTION - DETAILED SIDE VIEW

Window, 2" curtain or panel wall installation with rag rear grille extended beyond outer wall surface

Cord Set Connected

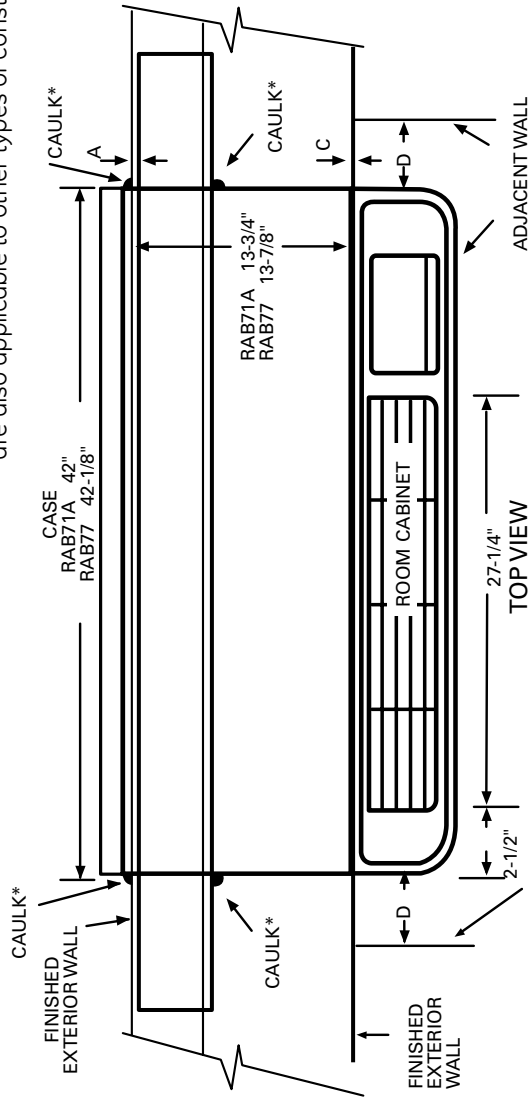


Sub-Base Connected

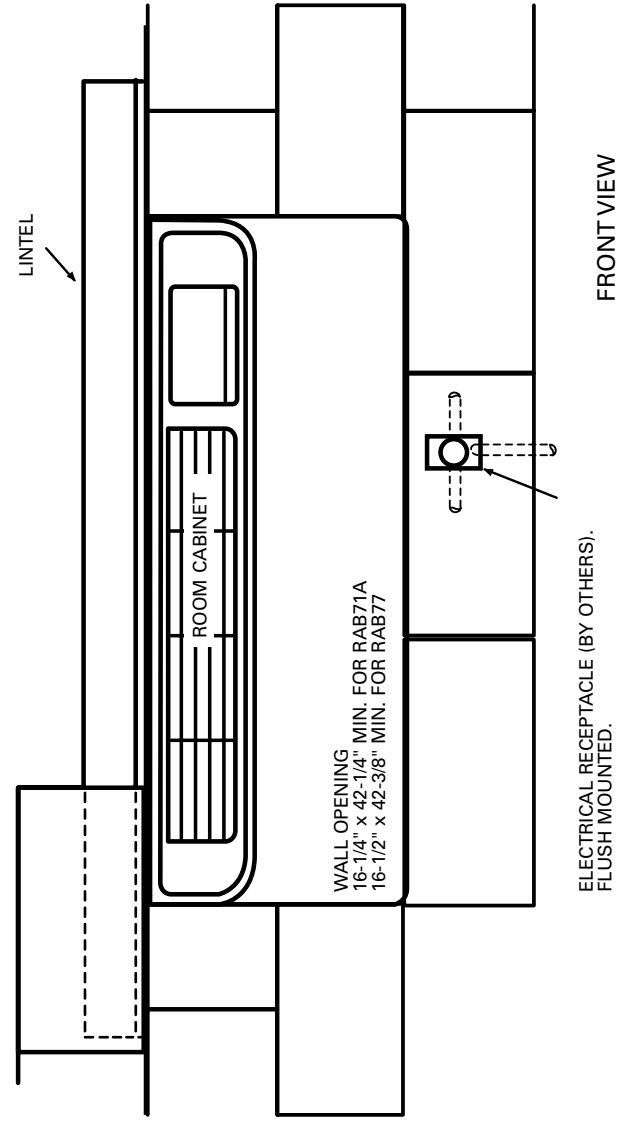


WALL CASE INSTALLATION - CORD SET CONNECTED

Example: block and veneer - dimensional data and comments are also applicable to other types of construction



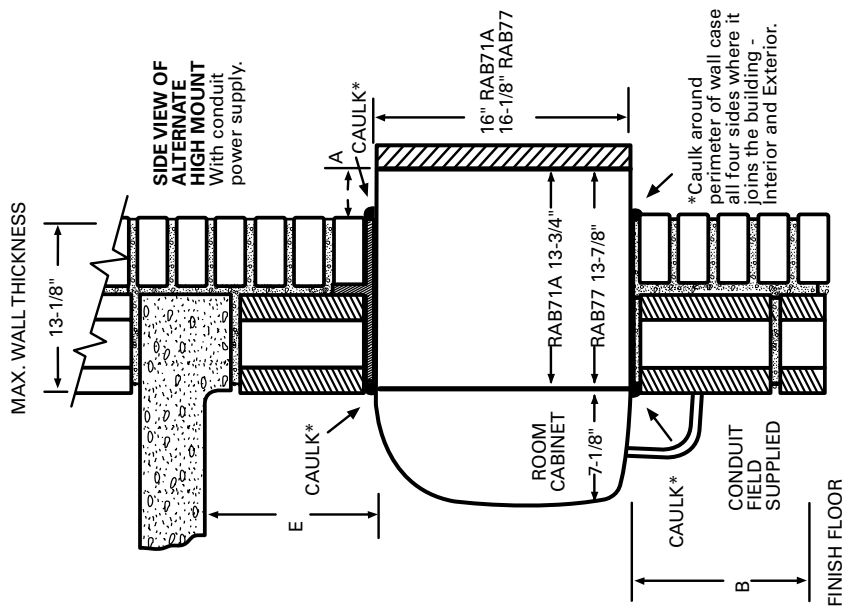
*Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.



ELECTRICAL RECEPTACLE (BY OTHERS). FLUSH MOUNTED.

Dimension	Manufacturer Required Minimum Installation Clearance
A	1/4" (See note 1)
B	Allow For Electrical Wiring 0" Min. (See page 27)
C	0" Minimum
D	0" Minimum 2" Recommended See pages 38-39 for ducted application.
E	3" Minimum

NOTE:
1. FOR OUTSIDE FLUSH MOUNTING SEE PAGE 35 FOR DRAIN INSTALLATION.



See page 43 for line cord length.

METAL CASE EXTENSION FOR WALLS DEEPER THAN 13-1/8" (11-1/8" WITH SUB-BASE)

Field fabricated – GE recommends the use of one of the deeper RAB71 wall cases offered as special order items.

Zoneline units can be installed in walls of greater depth than the wall case. Where the case recession is less than 3" and where it is possible to waterproof the exposed sides and top of the opening, the suggested procedure is to apply a flashing to the bottom of the wall case as shown on page 31. Where waterproofing is questionable or not possible, or for installations in walls of greater depth, the following is a suggested application procedure. It involves the field fabrication of a case extension. **Since the wall case is a water-bearing container, the extension likewise must also be water-bearing and the connection between the two must be watertight. The case extension must contain splitters to prevent recirculation of the outdoor air circuit.**

1. The case extension is field fabricated. The extension depth "D" should allow for a minimum outdoor projection of 1/4". This allows for room cabinet clearance to the finished wall and ample surfaces to apply sealant or caulking for a tight weather seal between the completed wall case/extension assembly and the wall opening. It is recommended that the extension be painted and corner and lap joints be additionally sealed with a quality-grade sealant.

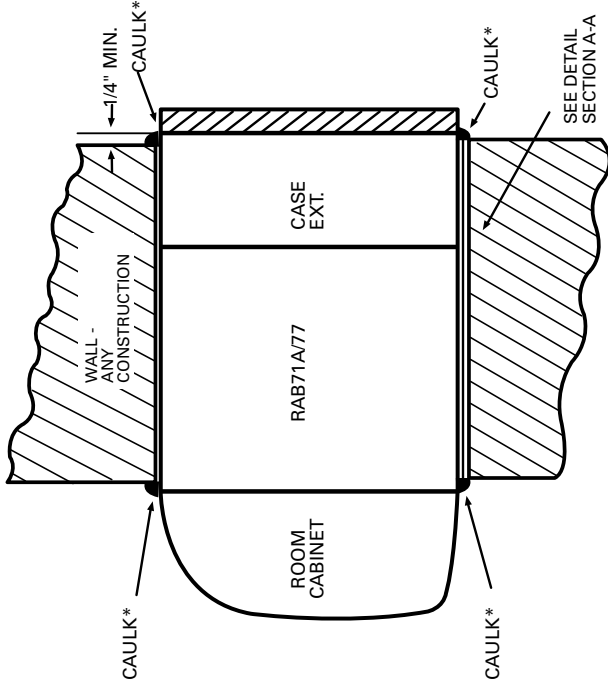
2. The wall case and extension should be connected prior to installation in the wall opening. A quality-grade sealant should be applied to all four (4) butting flanges. Use bolts and nuts or oversized self-tapping screws (driven from the wall case to the extension) to attach the two assemblies. Clean all drain holes of excess sealant. The assembly must be free draining.

3. Install flashing, using a quality-grade sealant between the flashing and wall as shown in section A-A below.

4. Install the wall case/extension assembly following procedures described for a standard installation. See diagrams below. The assembly should be sealed or caulked to the wall around all four sides both outdoors and indoors.

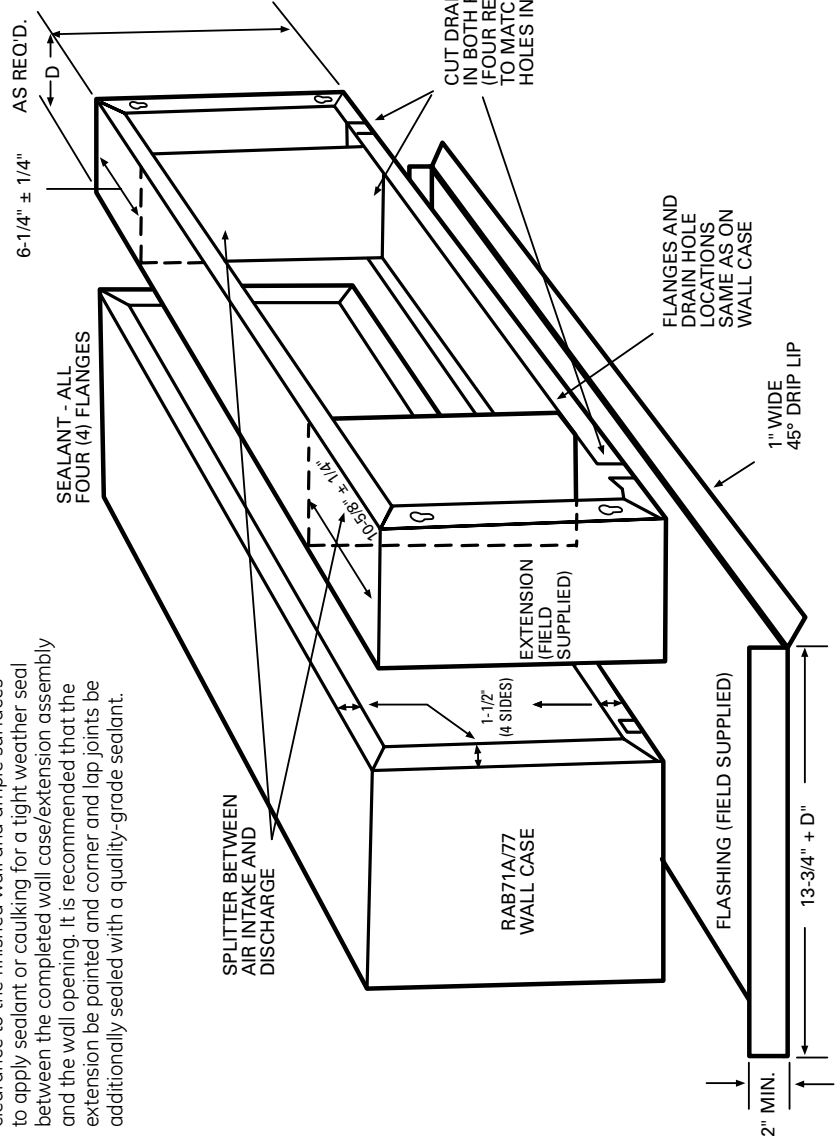
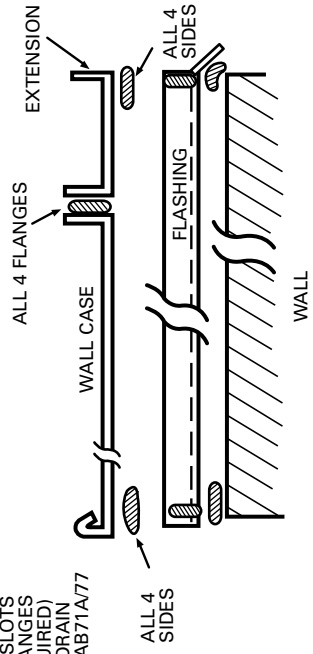
NOTE: The wall case/extension assembly should be level.

5. Suggested materials for case extension and flashing should be non-ferrous metals. Minimal acceptable material: Galvanized G-90 painted.



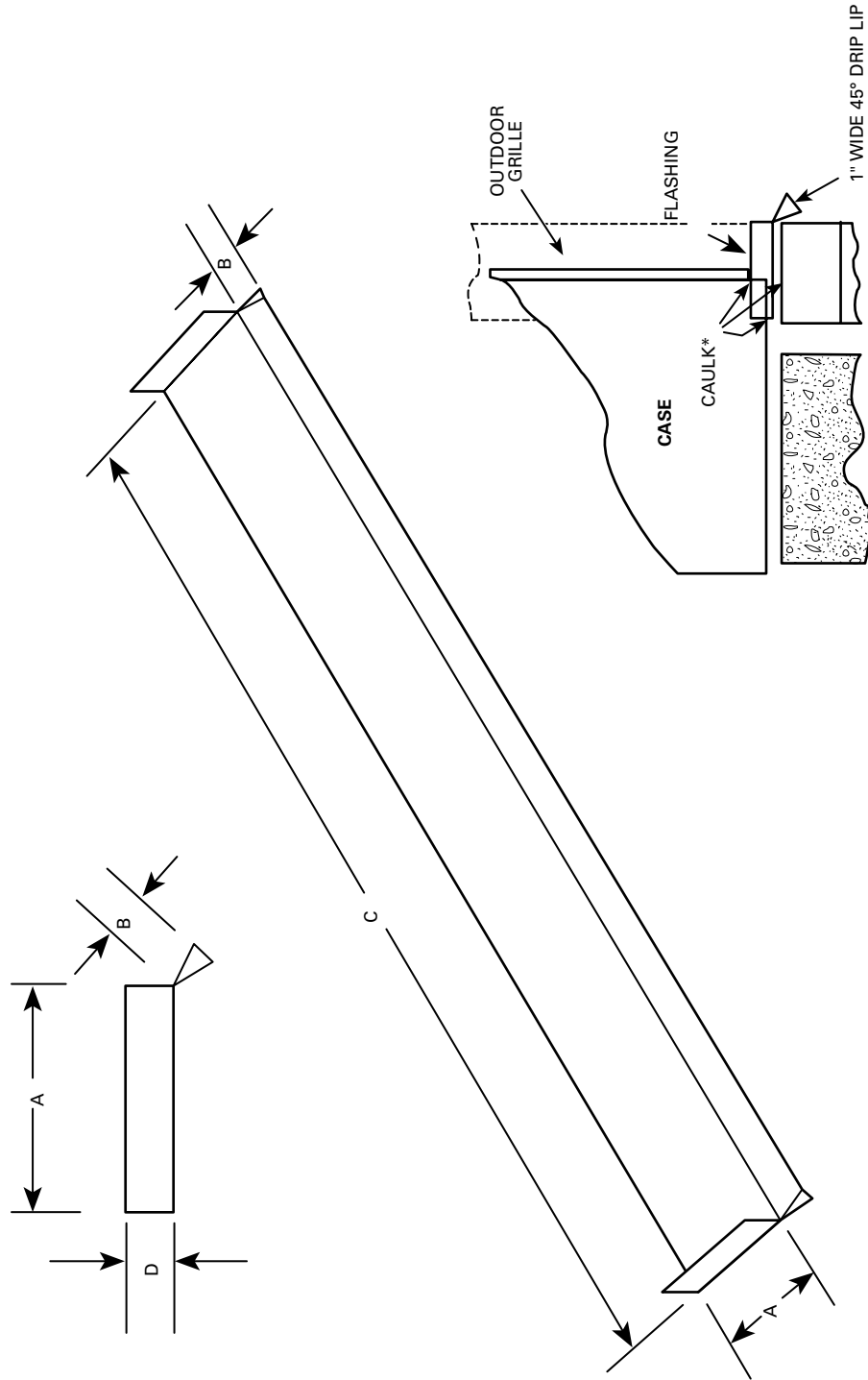
*Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.

SECTION A-A
BASEPAN/FLANGE DESIGN
SHOWING SEALANT LOCATIONS.



ALTERNATE - CASE RECESSION LESS THAN 3" WITH SIDES AND TOP OF WALL OPENING WATERPROOF, FLASHING ON BOTTOM ONLY

For an installation that will provide better protection against water infiltration, GE recommends the use of one of the deeper RAB71 Series wall cases offered as special-order items. See page 21.



- DIMENSIONS:**
- A. DISTANCE FROM GRILLE OR CASE TO OUTSIDE SURFACE OF WALL PLUS 2" TO 4" (TO INSERT UNDER CASE).
 - B. 1" DRIP LIP (MINIMUM)
 - C. 42" PLUS - SUFFICIENT TO FIT SNUGGLY UNDER AND UP AROUND THE CASE.
 - D. 2" MINIMUM
- (CAUTION: WHEN CAULKING, DO NOT BLOCK DRAIN HOLES IN CASE OR GRILLE.) IF GRILLE IS TO BE MOUNTED TO WALL SURFACE A SPLITTERS MUST BE USED; SEE PAGE 30.

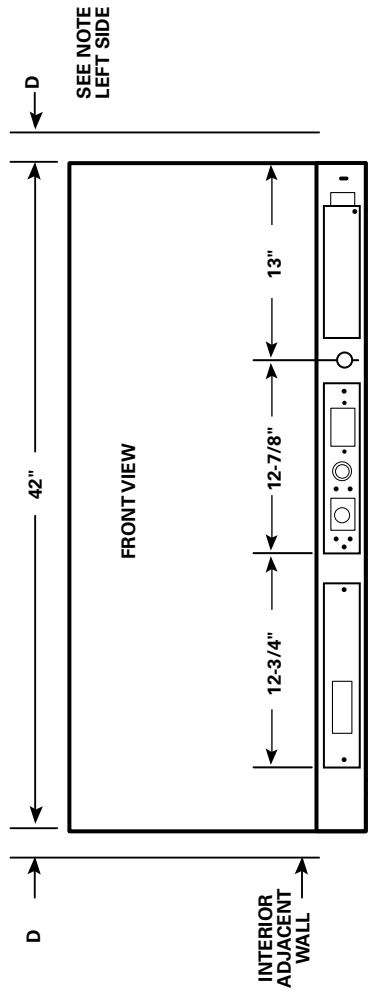
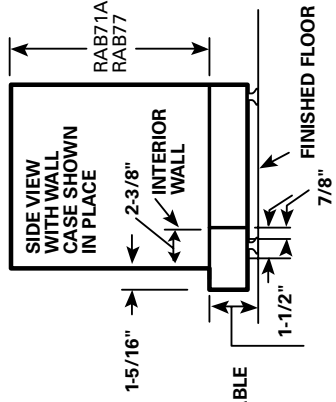
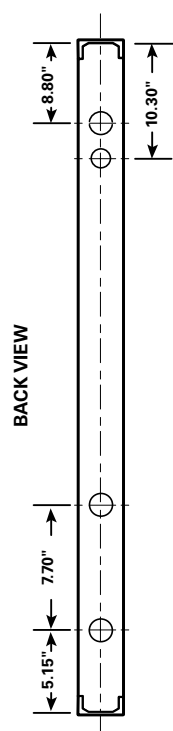
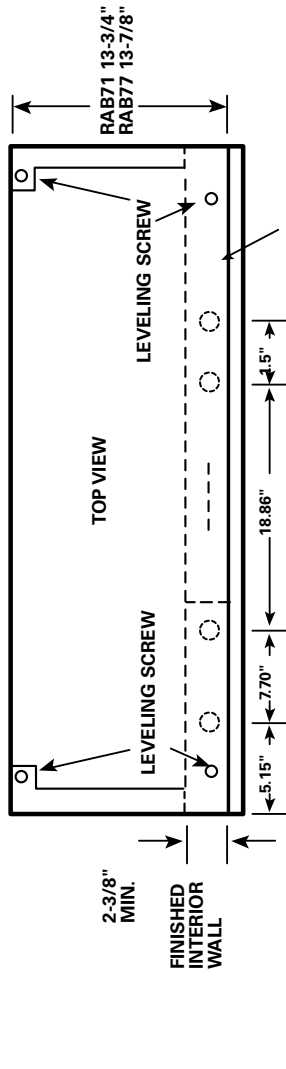
* Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.

RAB71/77 WALL CASE INSTALLATION - RAK204 SERIES SUB-BASE CONNECTED

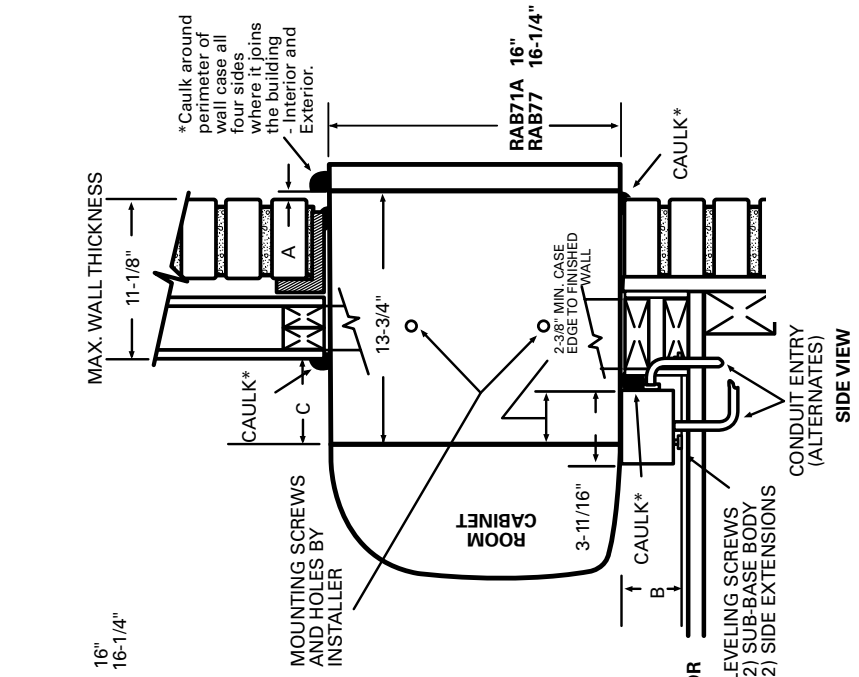
Example: frame and brick veneer - dimensional data and comments are also applicable to other types of construction

Dimension	Manufacturer Required Minimum Installation Clearance
A	1/4" (See note 1)
B	3" Min. (5" MAX.)
C	2-3/8" Minimum
D	0" Minimum 2" Recommended See pages 38-39 for ducted application.

NOTE:
1. FOR OUTSIDE FLUSH MOUNTING SEE PAGE 31 FOR FLASHING INSTALLATION.



KNOCKOUTS (ENCLOSURE) 4 REAR; 4 BOTTOM	
KNOCKOUT SIZE	LEVELING SCREW
LARGE 1-1/8" DIA.	
SMALL 7/8" DIA.	

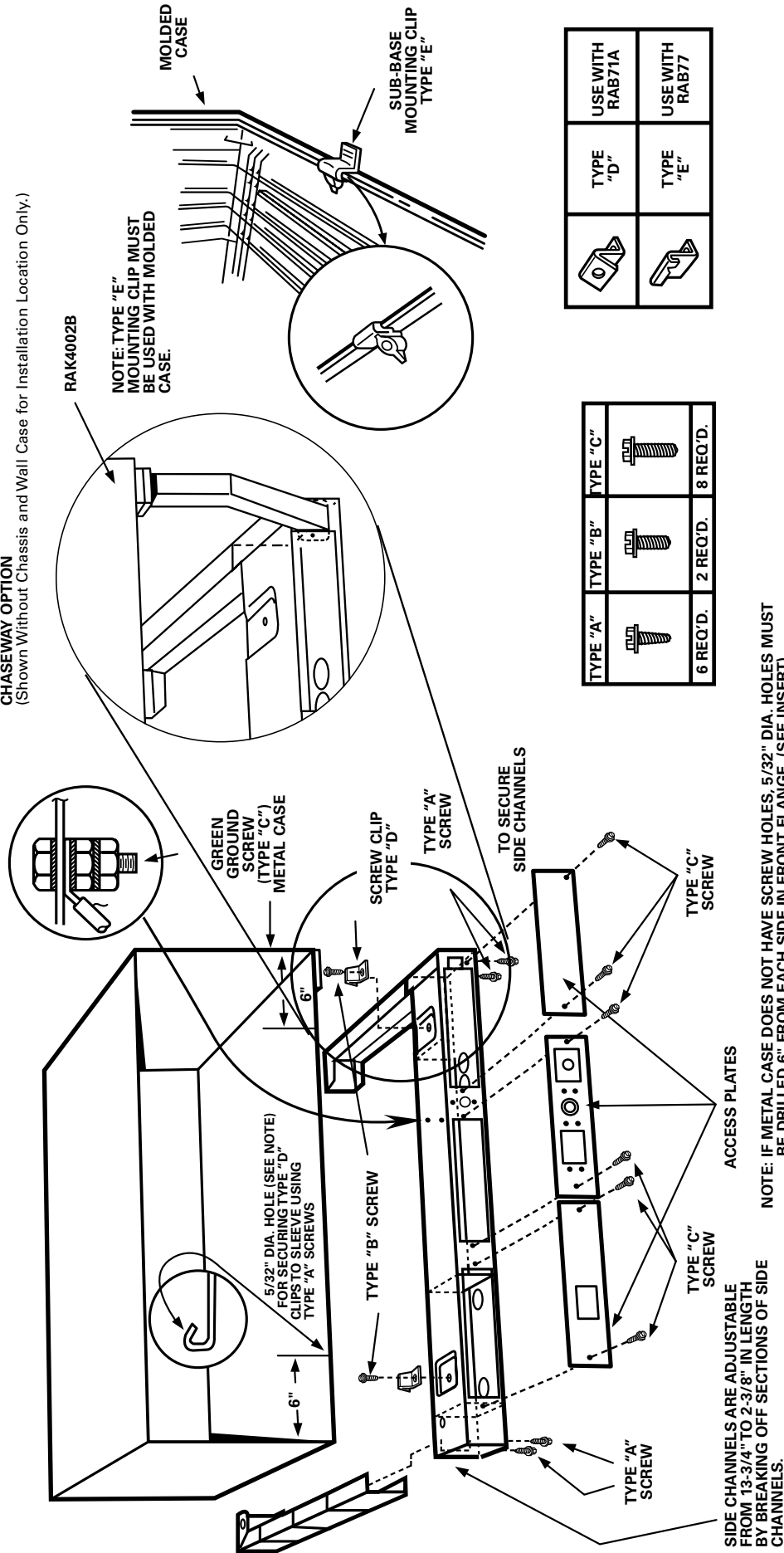


*SHOWN WITH ACCESS COVERS REMOVED.
NOTE: CAUTION - REMOVE KNOCKOUTS FROM INSIDE OUT.

RAK204 SERIES SUB-BASE INSTALLATION AND ELECTRICAL DATA

RAB71A/77 Wall Case

CHASEWAY OPTION
(Shown Without Chassis and Wall Case for Installation Location Only.)



RAK4002B

NOTE: TYPE "E" MOUNTING CLIP MUST BE USED WITH MOLDED CASE.

MOLDED CASE

SUB-BASE MOUNTING CLIP TYPE "E"

	TYPE "D"	USE WITH RAB71A
	TYPE "E"	USE WITH RAB77

	TYPE "A"	TYPE "B"	TYPE "C"
6 REQ'D.	2 REQ'D.	8 REQ'D.	

NOTE: IF METAL CASE DOES NOT HAVE SCREW HOLES: 5/32" DIA. HOLES MUST BE DRILLED 6" FROM EACH SIDE IN FRONT FLANGE. (SEE INSERT).

SIDE CHANNELS ARE ADJUSTABLE FROM 13-3/4" TO 2-3/8" IN LENGTH BY BREAKING OFF SECTIONS OF SIDE CHANNELS.

Electrical wiring may enter the sub-base through any of the knockout holes provided in the sub-base. Knockout holes in the sub-base access plate may accommodate a receptacle, which allows the use of a power cord (if permitted by code for the particular installation). A knockout for a circuit breaker, fuseholder or a disconnect is also provided. See pages 22 and 23 for description of electrical contents of these sub-bases.

Condensate Disposal Systems

Cooling Condensate

Air conditioners produce condensate water as a result of lowering the humidity of the area being conditioned. When the indoor coil temperature is below the dew point, moisture in the air condenses into water droplets on the coil. This water drains to a pan located under the indoor coil and is routed through the barrier (the partition separating the indoor and outdoor sides of the unit) to the base pan on the outdoor side. It is then picked up and dispersed against the outdoor coil, which is hot when the unit is in the air conditioning mode. The water is evaporated into the atmosphere by contact with the hot outdoor coil. This evaporation process also helps lower the temperature of the outdoor coil and improves the operating efficiency of the unit.

Slinger Ring Systems

Packaged terminal units employ various means of dispersing the condensate water. One of the most popular, and most effective, means is by 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 Zonline® Series packaged terminal air conditioners and packaged terminal heat pumps utilize a slinger ring for cooling condensate disposal.

Certification Test Requirements

ARI (Air Conditioning & Refrigerating Institute) requires that all certified packaged terminal air conditioners and packaged terminal heat pumps pass a cooling condensate disposal test. One stipulation of the ARI test is that "the test start with condensate collection pan brimful." In order to pass the ARI Condensate Disposal Test the unit must operate continuously for four hours without condensed water blowing, dripping, or running off the unit casing during the test or after the unit has been turned off. Under extremely high outdoor humidity conditions or extreme operating conditions, such as exceptionally high air infiltration (a door or window left open while the unit is running, for instance) it is possible for any air conditioner to be unable to dissipate all the cooling condensate generated.

All Zonline Series packaged terminal air conditioners and packaged terminal heat pumps meet the condensate disposal requirements of ARI standards 310 and 380.

Heat Pump Condensate

During the operation of a unit in the heat pump, or "reverse cycle," 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- as well as 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 and greatly reduce the outdoor air. 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 is expanded and the plug fits tightly into 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 contracts, 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 approximately 45°F.

Drain Kits

Although the Zonline 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. See pages 35 and 36 for information covering the drain systems and the RAD10 kit available to connect to the wall case.

Internal Condensate Removal (ICR) System

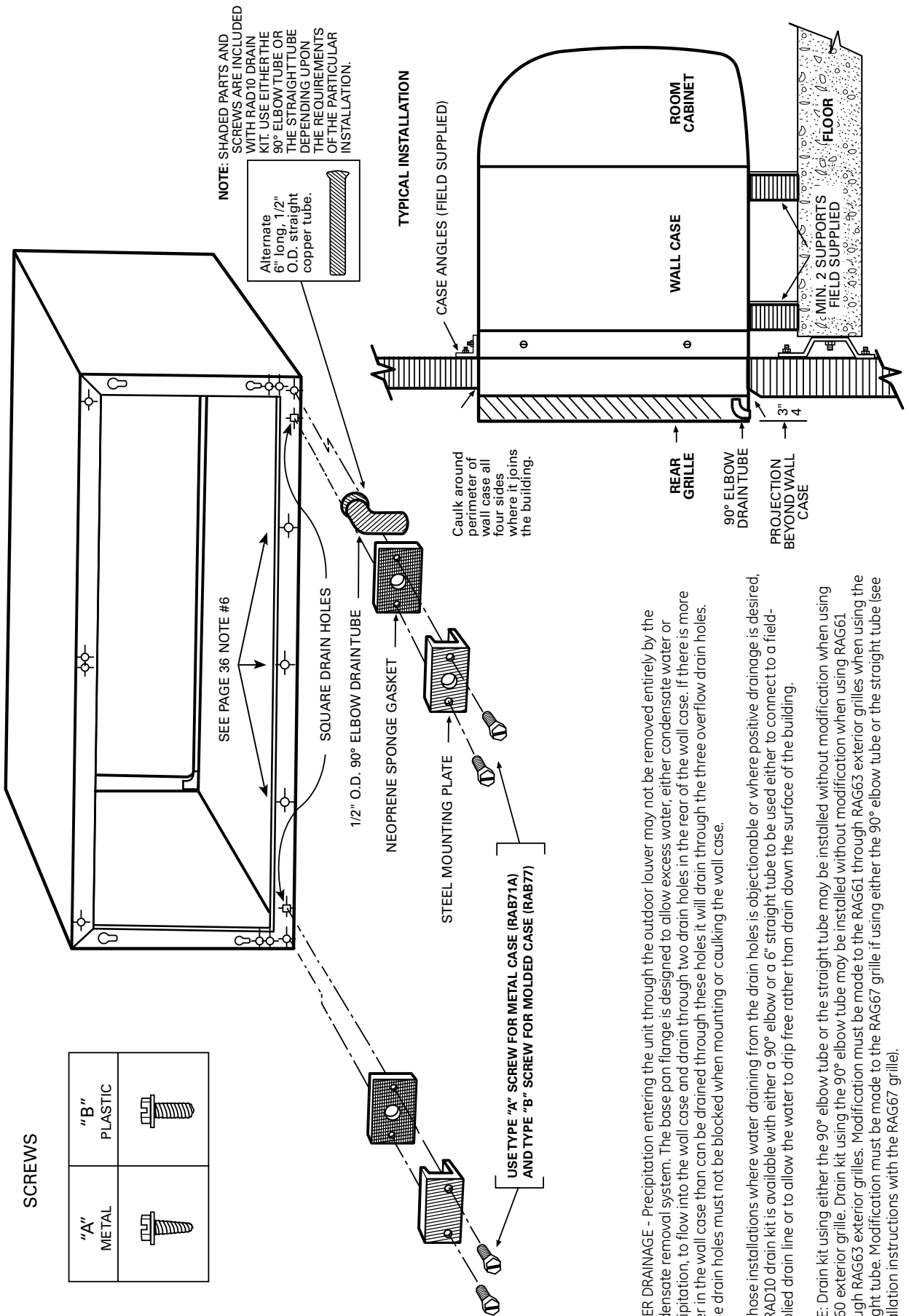
GE has developed an Internal Condensate Removal (ICR) system for packaged terminal heat pumps. This system has been offered as an option on Zonline packaged terminal Heat Pumps since 1982, and thousands of them are in use. During heat pump operation the ICR system utilizes a small pump to lift the water 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 drippage of condensate water from the wall case, the installation of an internal or external drain system is recommended.

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

WALL CASE WITH RAD10 DRAIN KIT

External Drain. See page 36 for internal drain.



NOTE: SHADED PARTS AND SCREWS ARE INCLUDED WITH RAD10 DRAIN KIT. USE EITHER THE 90° ELBOW TUBE OR THE STRAIGHT TUBE DEPENDING UPON THE REQUIREMENTS OF THE PARTICULAR INSTALLATION.

Alternate
6" long, 1/2"
O.D. straight
copper tube.

SCREWS

"A" METAL	"B" PLASTIC

USE TYPE "A" SCREW FOR METAL CASE (RAB71A) AND TYPE "B" SCREW FOR MOLDED CASE (RAB77)

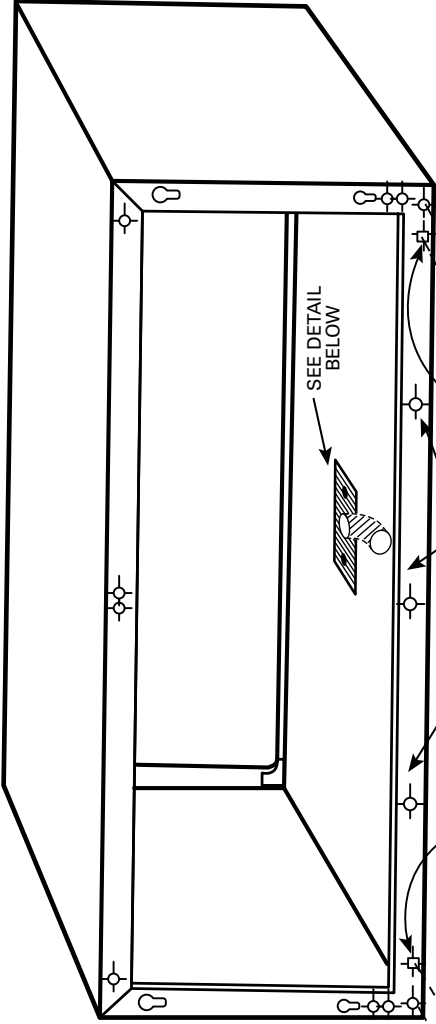
WATER DRAINAGE - Precipitation entering the unit through the outdoor louver may not be removed entirely by the condensate removal system. The base pan flange is designed to allow excess water, either condensate water or precipitation, to flow into the wall case and drain through two drain holes in the rear of the wall case. If there is more water in the wall case than can be drained through these holes it will drain through the three overflow drain holes. These drain holes must not be blocked when mounting or caulking the wall case.

For those installations where water draining from the drain holes is objectionable or where positive drainage is desired, the RAD10 drain kit is available with either a 90° elbow or a 6" straight tube to be used either to connect to a field-supplied drain line or to allow the water to drip free rather than drain down the surface of the building.

NOTE: Drain kit using either the 90° elbow tube or the straight tube may be installed without modification when using RAG60 exterior grille. Drain kit using the 90° elbow tube may be installed without modification when using RAG61 through RAG63 exterior grilles. Modification must be made to the RAG61 through RAG63 exterior grilles when using the straight tube. Modification must be made to the RAG67 grille if using either the 90° elbow tube or the straight tube (see installation instructions with the RAG67 grille).

WALL CASE WITH RAD10 DRAIN KIT

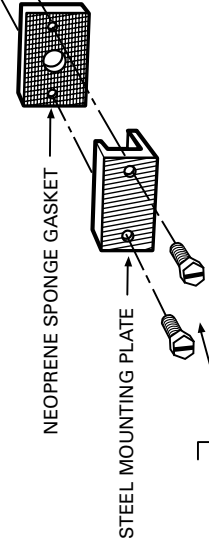
Internal Drain. See page 35 for external drain.



NOTE: SHADED PARTS AND SCREWS INCLUDED WITH RAD10 DRAIN KIT. THE 90° ELBOW/TUBE IS RECOMMENDED FOR INTERNAL DRAIN INSTALLATION.

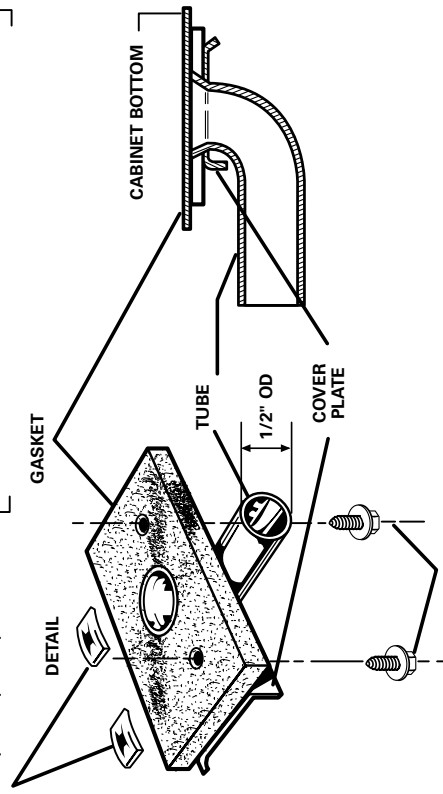
SCREWS

"A" METAL	"B" PLASTIC



USE TYPE "A" SCREW FOR METAL CASE (RAB71) AND TYPE "B" SCREW FOR MOLDED CASE (RAB77)

NUT (MOLDED CASE (RAB77) ONLY)



USE TYPE "A" SCREWS FOR BOTH RAB71A AND RAB77

1. The RAD10 drain kit is installed in the bottom of the wall case when it is desired to drain condensate to an internal drain system in the building.
2. The drain kit is mounted on the bottom of the wall case prior to installation of the case in the wall. It may be located anywhere on the room-side portion except for sub-base installations. For these the drain should be at least 3" from the indoor edge of the case so as to adequately clear the sub-base.
3. A template is furnished with the kit for locating the necessary three holes in the case bottom —two to provide a securing means and one to provide a drain hole for the 1/2" OD tubing (see details at left).
4. A tube or hose 1/2" I.D. (obtained locally) must be installed on the drain tube and connected to the internal drain system in the building.
5. With the RAD10 the two square drain holes in the bottom outer flange of the wall case are sealed by the gaskets and mounting plates shown above.
6. Three (3) 1/2" diameter holes located 1/4" above the case bottom in the bottom outer flange provide overflow drainage to the outdoors when wind-driven rain enters the chassis.

Ducted Installations

4100 and 6100 Series Zoneline® units may be used in ducted installations.

With a ducted installation it is possible to condition the air in two areas that have a common wall separating them. A special adapter mounts on the wall case and a transition piece directs the air from the unit into the adapter. Instructions for mounting the adapter to the wall case are included with the duct adapter. The adapter contains a grille that allows air from the unit to be discharged into the primary room and the adapter connects to a duct extension that allows the air to flow to the adjoining room. Ducting a unit may allow a single unit to be used rather than a separate unit in each room, providing a means of reducing initial equipment cost. The duct may extend a total of 15 feet (with a field-fabricated insulated duct extension) in one direction, either to the right or to the left of the unit. A baffle in the adapter allows up to 50% of the discharge air to be delivered to the secondary room.

The installation of the wall case and sub-base, if used, is the same for units being ducted as for free-standing units. The duct adapter support bracket overlaps the wall case by 1" and the bracket and mounting screws add approximately 3/8" (3/16" on each side) to the width of the wall case. If less than 1" of the wall case projects into the room it will be necessary to allow for the additional width in the opening for the wall case. The duct adapter mounting brackets should be mounted prior to installing the case in the wall.

Refer to pages 38 and 39 for drawings of ducted installations.

Prior to the installation of the transition from the room cabinet to the adapter, it will be necessary to remove the discharge grille from the room cabinet. Instructions for this modification are included with the duct adapter.

New Ducted Installations

Components



Duct Adapter RAK6052

Duct Adapter RAK6052 — The duct adapter is secured to each side of the wall case and requires the drilling of mounting holes in the wall case during installation. A template for the hole location is in the installation instructions. By securing the duct adapter to the wall case, the chassis retains the slide-out feature for servicing after the transition piece is removed.

Duct Extension RAK601 — This kit contains a 44"-long insulated duct, a register mounting collar, and an air supply register. It can be secured to the duct adapter at either end of the adapter. This duct may be cut at any dimension and used in two applications providing the sum of the two duct lengths necessary does not exceed the 44" length. Even in single applications the mounting flange must be cut off one end of the duct to accept the collar and supply register.



RAK601 Duct Extension, Mounting Collar and Register

Mounting Collar and Supply Register RAK602 —These components are included in the Duct Extension Kit RAK601. They may be ordered separately for installations where two duct extensions are made from one RAK601.

Ducted Application Considerations

When designing a ducted application, some application considerations to be made include:

1. Do not exceed the 15-foot-length maximum for the duct extension. Field-supplied duct extension must be completely insulated with minimum of 1/2" insulation
2. The duct **must be a straight run**. Turns or bends in the duct extension create air pressure drops that the unit is not designed to overcome.
3. Turn the "Duct Mode" on in the auxiliary control settings (Mode 7). This increases the fan speed to ensure proper circulation.
4. Minimum recommended clearance between the unit and the adjacent wall is 2".
5. Provisions for return air must be made to allow air circulation from secondary room. Doors in both secondary and primary rooms may be undercut or a return grille may be installed through a common wall.
6. When calculating the heat gain/heat loss take both areas into consideration.

Replacements of Existing Ducted Units

Since the design of the Zoneline chassis has changed over the years to provide better performance and appearance, some of the components used in ducted applications have changed. Select the proper components from the information below. The best procedure in determining the correct kit is to measure duct extension cross section.

Flat-Top Discharge Units (Zoneline Units Built Prior to 1988)

Existing Duct Extension Cross Section Measurements:
8-3/8" height x 6-1/2" width

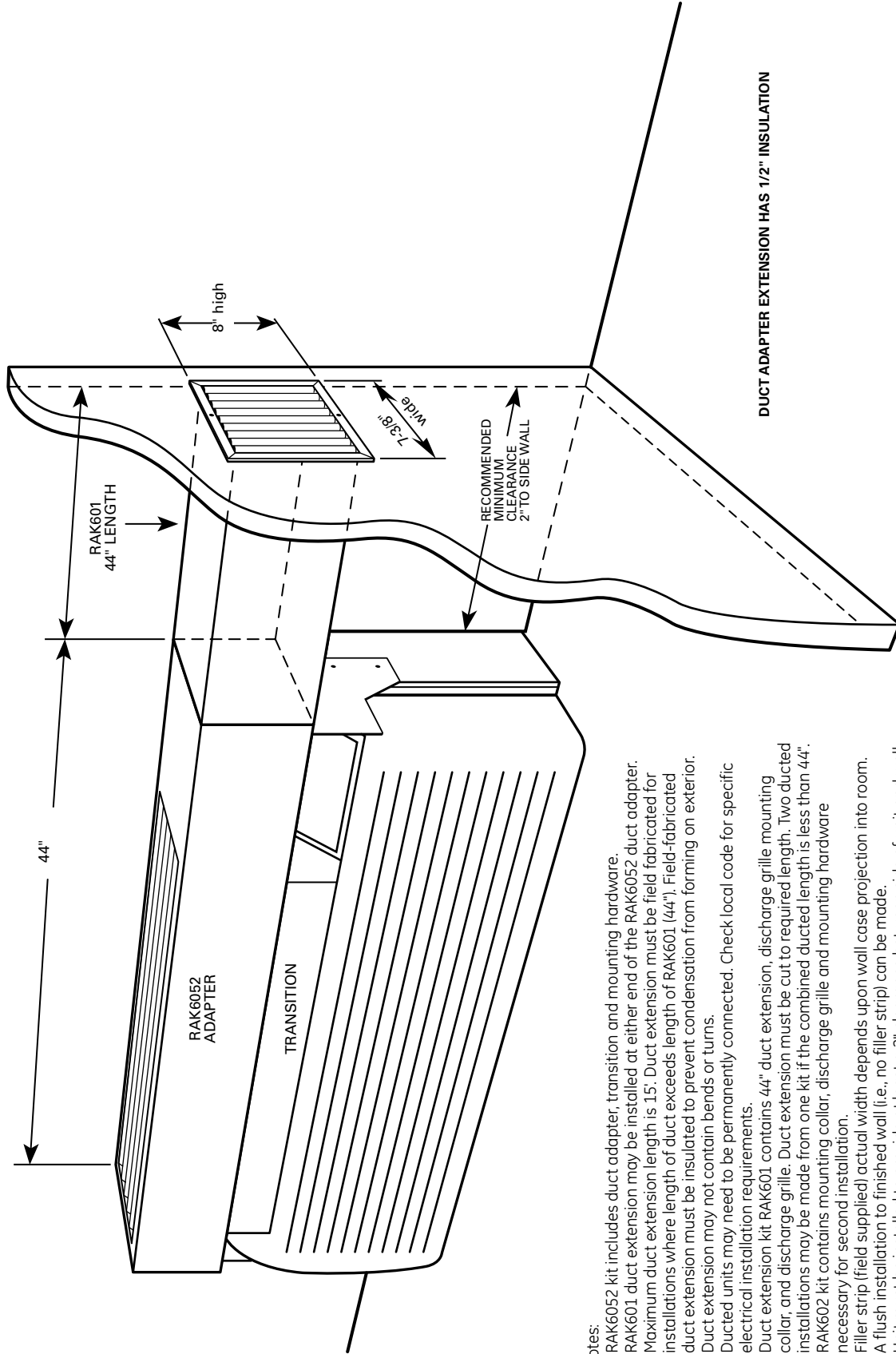
Duct Adapter RAK7012 — This duct adapter will allow the replacement of a new chassis (4100 or 6100 Series unit) into an existing ducted application. This adapter will align properly with the duct extension and will eliminate the need to modify the wall opening. In order to minimize replacement costs, some of the components of the old duct adapter must be removed and used in the new installation. Consult the Installation Instructions of the RAK7012 before removing and discarding the old duct adapter. See additional notes page 56.

Slope-Front Discharge Units (Models With AZC, AZR, AZW, or AZ21 or AZ31 Prefix)

Existing Duct Extension Cross Section Measurements:
7-3/32" height x 6-1/2" width

Duct Transition RAK7022 — This duct transition will allow the replacement of a new slope-front discharge Zoneline chassis (4100 or 6100 Series unit) into a previous-design slope-front ducted installation. See additional notes page 56.

DUCTED APPLICATION (AZ2500/2800/2900/3500/3800/3900/4100/6100 SERIES)



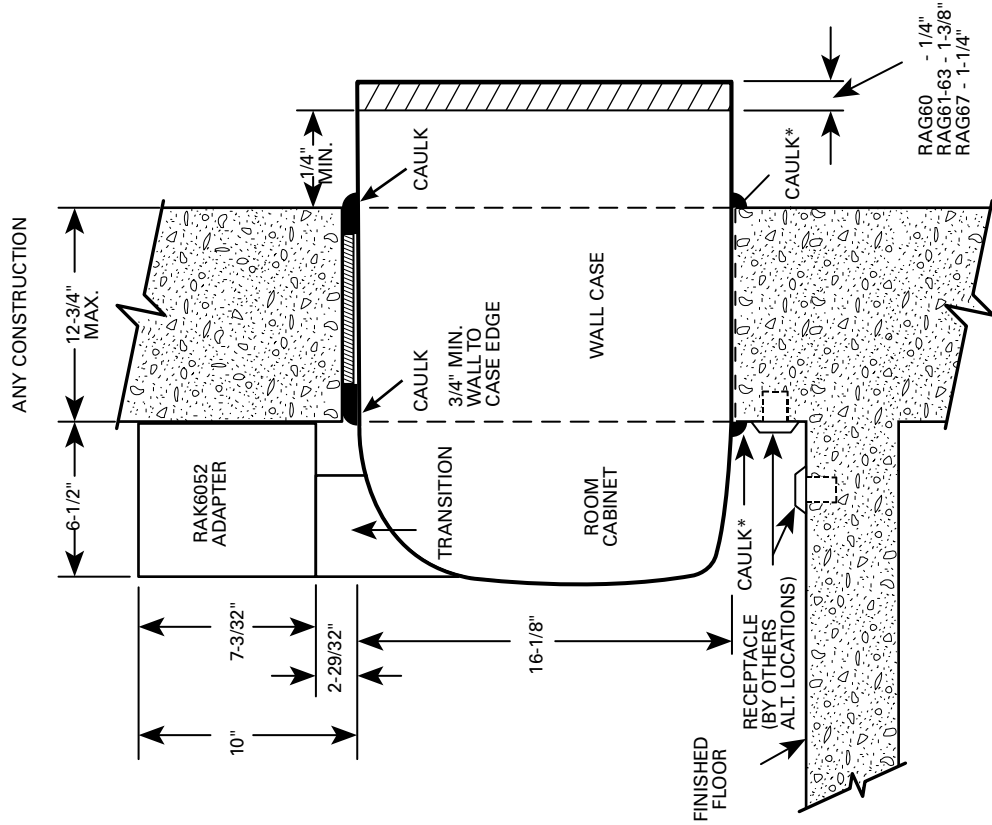
DUCT ADAPTER EXTENSION HAS 1/2" INSULATION

- Notes:
1. RAK6052 kit includes duct adapter, transition and mounting hardware.
 2. RAK601 duct extension may be installed at either end of the RAK6052 duct adapter. Maximum duct extension length is 15'. Duct extension must be field fabricated for installations where length of duct exceeds length of RAK601 (44"). Field-fabricated duct extension must be insulated to prevent condensation from forming on exterior. Duct extension may not contain bends or turns.
 3. Ducted units may need to be permanently connected. Check local code for specific electrical installation requirements.
 4. Electrical installation kit RAK601 contains 44" duct extension, discharge grille mounting collar, and discharge grille. Duct extension must be cut to required length. Two ducted installations may be made from one kit if the combined ducted length is less than 44". RAK602 kit contains mounting collar, discharge grille and mounting hardware necessary for second installation.
 5. Filler strip (field supplied) actual width depends upon wall case projection into room. A flush installation to finished wall (i.e., no filler strip) can be made.
 6. Unit must be installed to provide at least a 2" clearance between side of unit and wall.
 7. Provisions for return air must be made in order to allow air circulation from secondary room. Doors in both secondary and primary rooms may be undercut or a return grille may be installed through common wall.
 8. For replacement of previous-design units, see pages 37 and 56.

DUCTED DETAILED SIDE VIEWS (AZ2500/2800/2900/3500/3800/3900/4100/6100 SERIES)

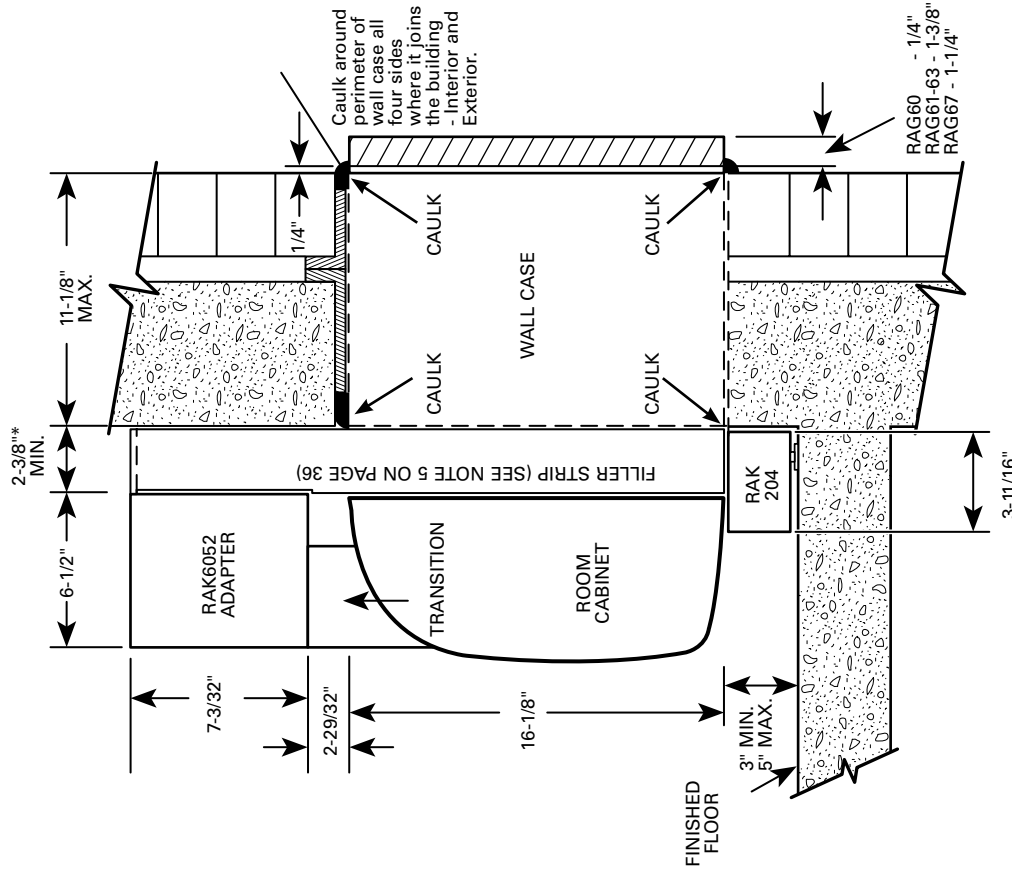
See page 38 for all notes

Line Cord Installation



*Caulk around perimeter of wall case all four sides where it joins the building - Interior and Exterior.

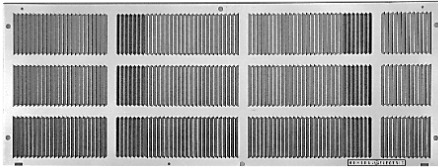
Sub-Base Installation



*2-3/8" min. when installed with RAK204.

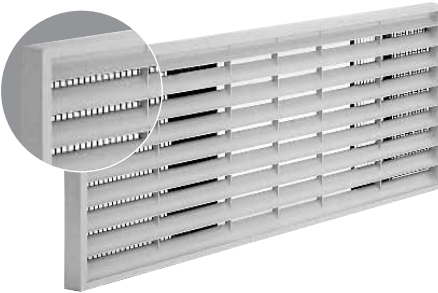
Exterior Grilles

Four styles of outdoor grilles are available for exterior treatments. The standard stamped aluminum grille (RAG60), the molded architectural louvered exterior grilles (RAG61-63) and the extruded aluminum architectural louvered grille (RAG67). All grilles include air deflectors (RAK40) and gaskets to prevent condenser air recirculation.



RAG60
Outdoor Grille

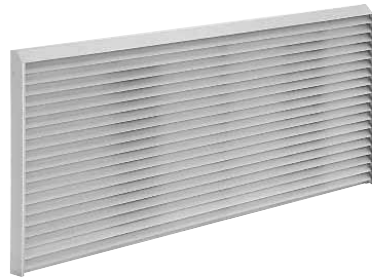
RAG60 Outdoor Grille — The standard exterior grille is made of durable aluminum to protect chassis components and prevent air recirculation.



RAG61
Outdoor Grille

RAG61, 62, 63 Architectural Grille — One-piece optional molded grille and frame assembly provides improved appearance, protection and weatherability. Molded of durable polycarbonate, the surfaces of the grille have a colorfast, slightly textured finish which blends well with most types of wall surfaces. The grilles can be painted in the field to match the building for improved aesthetics.

Colors: RAG61 — Beige
RAG62 — Dark Maple
RAG63 — Bittersweet Chocolate



RAG67

RAG67 Extruded Aluminum Grille — The RAG67 is made from extruded anodized aluminum for use where an aluminum architectural grille is preferred. The RAG67 is available in a clear finish and may be special ordered from GE in other colors. Minimum order quantities may be required. Contact your General Electric salesperson for details.

All grilles are installed and secured to the wall case from the inside. Keyhole slots in the rear flange of the case allow the grille to be placed in position before securing it firmly to the wall case.

Replacement of existing units: If an existing grille is not replaced, capacity and efficiency will be reduced and the unit may fail to operate properly or fail prematurely. A deflector kit, RAK40, must be used with grilles that were not designed for current AZ Series GE Zoneline® units. The RAK40 contains air deflectors and gaskets that mount to the chassis to direct the hot exhaust air away from the air intake to allow the unit to function properly. All grilles used with GE Zoneline units must comply with requirements of Exterior Architectural Treatments and Special Outdoor Grilles as follows.

Exterior Architectural Treatments and Special Outdoor Grilles

The architectural design of a building may dictate the use of special or oversized louvers for aesthetic reasons. Louvers other than standard Zoneline exterior grilles may be used on the Zoneline unit, however, these special louvers, or any special exterior architectural treatments of the building facade that may restrict the free circulation of condenser airflow, should be referred to GE Application Engineering for evaluation and approval. The following guidelines should be followed in selecting a louver:

1. **The louver must have a minimum of 65% free area.**

ASHRAE defines free area as the minimum area of the opening in an air inlet or outlet through which air can pass. Percent (%) free area equals the X dimension divided by the Y dimension.

2. The louver should be attached to the wall case in a manner that will prevent recirculation of condenser discharge air into the air inlet. If the louver is not attached directly to the wall case, a field-supplied splitter or gasket is required between the chassis and the louver to prevent recirculation.

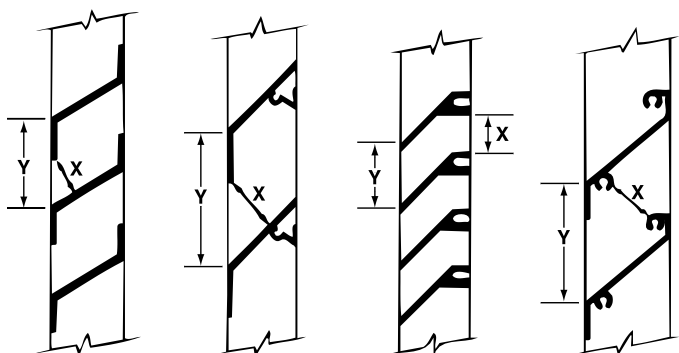
It is important that the above criteria be followed since a louver that is too restrictive or allows recirculation will reduce the unit's capacity and efficiency, increase the electrical current draw, cause intermittent operation due to the compressor overload protector shutting the compressor off, and cause failure of the compressor overload and shorten compressor life. Using the unit with a grille that is too restrictive or allows recirculation **may constitute improper installation and will void the unit's warranty.**

A scale drawing of the louver section should be sent to GE Application Engineering. To assure the proper performance of the Zoneline unit and comply with Underwriters Laboratories requirements, it may be necessary to send a sample louver section (at least 16" x 42") to an independent lab to be tested with the Zoneline unit.

Sample Calculations

$$\text{Free Area (\%)} = \frac{x}{y} \times 100 \quad x = 1" \quad y = 1.5"$$

$$\text{F.A. \%} = \frac{1}{1.5} \times 100 = 66.7\%$$



Power Connection for 4100 and 6100 Series Zoneline® Units

All 4100 and 6100 Series Zoneline units are equipped with universal heaters allowing chassis installation flexibility. The Zoneline units are connected to the building power supply by a unique power connection kit. By utilizing a separate universal power connection (UPC) kit, each unit is capable of providing various outputs of electric resistance heat to more closely meet the heating requirements of the particular room, thereby increasing the installation flexibility of the particular chassis. This power connection kit is the only means of supplying power to the Zoneline chassis. The appropriate kit is determined by the voltage, the means of electrical connection, either line-cord connected or permanently connected, and the desired resistance heat output that may be supported by the branch circuit.

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 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)
RAK3153A	8150/7900	2400/2320	11.0/11.6	15
RAK3203A	11200/10900	3300/3200	15.1/16.0	20
RAK3303A	16000/15450	4700/4530*	21.2/22.4	30

Electric Heat Amps include electric heater and fan motor current draw.
*Wattage not available with 7,000 BTU systems.

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 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 4100 and 6100 Series 230/208-volt units where a permanent installation using flexible conduit is desired, the RAK4002A forms an enclosed junction box on the chassis. The RAK4002A has a 7/8"-diameter hole to allow conduit to be connected to the junction box. For direct connection, purchase and install the appropriate Universal Power Supply Kit (also referred to as the Direct Connection Kit below) that matches the ampacity of the building circuit connected to the unit. This nine-pin connector with three 7"-long conductor wires is used for direct connections to the building wiring inside a direct-connect junction box. These wires are then connected to the building wiring by field-supplied connectors.



230/208 Volt Sub-Base and Direct-Connected Units

Sub-Base	Direct Connection Kit	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204D15P	RAK4157	8150/7900	2400/2320	11.0/11.6	15
RAK204D20P	RAK4207	11200/10900	3300/3200	15.1/16.0	20
RAK204D30P	RAK4307	16000/15450	4700/4530*	21.2/22.4	30

Electric Heat Amps include electric heater and fan motor current draw.
*Wattage not available with 7,000 BTU systems.

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

National Electric Code (Article 440.60) 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 and Direct-Connected Units

Sub-Base	Electric Heat BTUH	Electric Heater Watts	Electric Heat Amps	Min. Circuit Protection (Amps)
RAK204E15	8150	2400	9.6	15
RAK204E20	11550	3400	13.3	20
RAK204E30	16350	4800*	18.6	30

Electric Heat Amps include electric heater and fan motor current draw.
Each 265-volt sub-base kit consists of a sub-base with appropriate receptacle for minimum circuit amperage, a chaseway to route the power connector from the sub-base to the chassis and wiring to connect the sub-base to the building wiring.
*Wattage not available with 7,000 BTU systems.

The 265-volt power connection kit must be ordered separately.

All wiring must conform to local electrical regulations and codes.

Essential Elements Ordering Overview

230/208-volt line-cord connected units — order line cord kit.

230/208-volt sub-base connected units — order sub-base (includes power connection kit) and junction box for chassis (if hard wired).

265-volt units — order sub-base and power connection kit separately.

Electrical Wiring Information – 4100/6100 Series

All Zonelines are single-phase 60 hertz units.

For all installations, the feeder, sub-feeder, branch circuit and electrical protective devices and selection must conform to the National Electrical Code and to local codes.

Maximum connected load in amperes, including demands for the electric heater and the fan motor, are shown on page 44. Branch circuit ampacity and electrical protective device sizing are shown on page 42 for 230/208-volt and for 265-volt units.

More than one unit per branch circuit is not recommended. When in doubt, consult the National Electrical Code. All wiring, including installation of receptacle, must conform to local electrical regulations and codes.

Replacement of Existing Chassis

230/208-Volt and 265-Volt Units

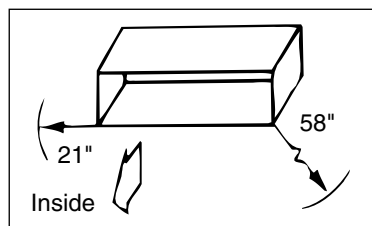
There have been changes to NEC and improvements and modifications to the Zonline chassis and sub-bases since the unit was first introduced. Some of these changes require alterations to be made when replacing an older unit with a new chassis.

Line-Cord Connected Units

The plug configuration of new line-cord connected units complies with the current NEC standards. Older installations may have wall receptacles that conformed to NEC standards at the time the building was constructed and may not match the configuration of the plug on the new line cord. The recommended solution is to change the wall receptacle to conform to current standard plug configuration. See chart on this page for current receptacle configuration.



Typical Line-Cord Power Connection Kit RAK3203A shown



Maximum Cord Extension

Permanently Connected Units With Sub-Base

If the existing unit is connected to a sub-base, the installation of the new unit may involve modifying the existing installation slightly. It is recommended these modifications be made by a qualified electrician.

If the existing sub-base is the full width of the wall case, RAK201 sub-base access plate may be ordered and used to replace the cover on the old sub-base. Field-supplied wiring, conduit and conduit connectors should be used to make a connection between the new chassis and the center knockout of the RAK201. The wiring connections should be made inside the sub-base and the RAK201 attached to the sub-base with the two screws provided.

If the existing sub-base is not the full width of the wall case, the electrician will have to modify the existing cover plate to allow field-supplied wiring, conduit and conduit connectors to be run from the permanent connection kit to the sub-base.

The wiring harness enclosure can be ordered separately as RAK4002CW.

Receptacle

Type	Mfg	Part No	Configuration
15 AMP Tandem NEMA6-15R	Hubbell P&S	5661 5661	
20 AMP Perpendicular NEMA6-20R	Hubbell P&S	5461 5871	
30 AMP Large Tandem NEMA6-30R	Hubbell P&S	9330 5930	

Maximum Connected Load

The maximum connected load of a Zoneline® unit occurs when the unit is in resistance heating operation. The maximum amperage shown in the tables below is the combined total of the resistance heater and the indoor fan motor.

230/208-Volt Line-Cord Connected Units

MODEL NUMBER	Power Connector Kit					
	RAK3153A RAK4157 RAK204D15P		RAK3203A RAK4207 RAK204D20P		RAK3303A RAK4307 RAK204D30P	
	230 V	208 V	230 V	208 V	230 V	208 V
AZ41E07DA*	11.0	11.6	15.1	16.0	N/A	N/A
AZ41E09DA*	11.0	11.6	15.1	16.0	21.2	22.4
AZ41E12DA*	11.0	11.6	15.1	16.0	21.2	22.4
AZ41E15DA*	11.0	11.6	15.1	16.0	21.2	22.4
AZ61H07DA*	11.0	11.6	15.1	16.0	N/A	N/A
AZ61H09DA*	11.0	11.6	15.1	16.0	21.2	22.4
AZ61H12DA*	11.0	11.6	15.1	16.0	21.2	22.4
AZ61H15DA*	11.0	11.6	15.1	16.0	21.2	22.4

*All versions

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

265-Volt Units

MODEL NUMBER	Sub-Base/Power Connector Kit		
	RAK204E15 RAK5172 RAK5157	RAK204E20 RAK5202 RAK5207	RAK204E30 RAK5302 RAK5307
	265 V	265 V	265 V
AZ41E07EA	9.6	13.3	N/A
AZ41E09EA*	9.6	13.3	18.6
AZ41E12EA*	9.6	13.3	18.6
AZ41E15EA*	9.6	13.3	18.6
AZ61H07EA*	9.6	13.3	N/A
AZ61H09EA*	9.6	13.3	18.6
AZ61H12EA*	9.6	13.3	18.6
AZ61H15EA*	9.6	13.3	18.6

*All versions

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

Latent System Capacity

The total capacity of an air conditioner is made up of the **sensible** capacity, the output of the unit used to remove heat from the air in the area being conditioned, and the **latent** capacity, the output of the unit used to dehumidify the air in the area being conditioned. For humid climates and applications, the sensible/latent capacity split of the unit should be considered. The sensible capacity listed in the specification charts on page 53 is at a standard rating condition of 95°F dry bulb/75°F wet bulb outdoors; 80°F dry

bulb/67°F wet bulb indoors. The latent system capacity is 1.00 minus the Sensible capacity. (If the Sensible capacity is listed at .74 the Latent capacity is .26. This means that 74% of the capacity of the unit is used to remove heat from the air and 26% is used to remove moisture from the air at standard test conditions.)

In some applications information about the Sensible/Latent split, or ratio, at conditions other than the standard rating conditions is needed.

Normal Yearly Operating Data

(Cooling Hours based on 75°F indoor temperature with air conditioner sized to meet the design conditions.)

Location	ASHRAE Heating Degree Days	Estimated Cooling Hours	Location	ASHRAE Heating Degree Days	Estimated Cooling Hours	Location	ASHRAE Heating Degree Days	Estimated Cooling Hours
ALABAMA			KENTUCKY			OHIO		
Birmingham	2,551	1,390	Lexington	4,683	830	Cincinnati	5,265	840
Huntsville	3,070	1,340	Louisville	4,660	1,130	Cleveland	6,351	610
Mobile	1,560	1,640	LOUISIANA			Columbus	5,660	810
Montgomery	2,291	1,580	Alexandria	1,921	1,670	Dayton	5,622	740
ARIZONA			Baton Rouge	1,560	1,860	Toledo	6,494	590
Flagstaff	7,152	310	New Orleans	1,385	1,790	OKLAHOMA		
Phoenix	1,765	2,280	Shreveport	2,184	1,470	Oklahoma City	3,725	1,200
Tucson	1,800	1,920	MAINE			Tulsa	3,860	1,410
Yuma	974	2,520	Portland	7,511	290	OREGON		
ARKANSAS			MARYLAND			Medford	5,008	620
Fort Smith	3,292	1,410	Baltimore	4,654	850	Pendleton	5,127	590
Little Rock	3,219	1,330	MASSACHUSETTS			Portland	4,635	270
CALIFORNIA			Boston	5,634	500	PENNSYLVANIA		
Bakersfield	2,122	1,530	MICHIGAN			Harrisburg	5,251	730
Fresno	2,611	1,210	Detroit	6,293	590	Philadelphia	5,144	810
Los Angeles	2,061	310	Flint	7,377	440	Pittsburgh	5,987	590
Sacramento	2,502	1,030	Grand Rapids	6,894	530	Scranton	6,254	440
San Diego	1,458	390	MINNESOTA			WilliamSPORT	5,934	600
San Francisco	3,015	110	Duluth	10,000	200	RHODE ISLAND		
COLORADO			Minneapolis	8,382	550	Providence	5,954	470
Colorado Springs	6,423	520	MISSISSIPPI			SOUTH CAROLINA		
Denver	6,283	550	Jackson	2,239	1,560	Charleston	2,033	1,390
Grand Junction	5,641	910	MISSOURI			Columbia	2,484	1,440
CONNECTICUT			Columbia	5,046	960	Greenville	2,980	1,120
Hartford	6,235	480	Kansas City	4,711	1,210	SOUTH DAKOTA		
DISTRICT of COLUMBIA			Springfield	4,900	970	Rapid City	7,345	580
Washington	4,224	1,010	St. Louis	4,900	1,080	Sioux Falls	7,839	610
DELAWARE			MONTANA			TENNESSEE		
Wilmington	4,930	770	Billings	7,049	520	Chattanooga	3,254	1,180
FLORIDA			Glasgow	8,996	410	Knoxville	3,494	1,070
Jacksonville	1,239	1,690	Great Falls	7,750	420	Memphis	3,232	1,320
Miami	214	2,850	Missoula	8,125	350	Nashville	3,578	1,220
Orlando	766	1,930	NEBRASKA			TEXAS		
Tallahassee	1,485	1,500	Grand Island	6,530	770	Corpus Christi	914	2,380
Tampa	683	2,350	Omaha	6,612	750	Dallas	2,363	1,900
GEORGIA			NEVADA			El Paso	2,700	1,580
Atlanta	2,961	1,130	Ely	7,733	500	Houston	1,396	1,850
Augusta	2,397	1,400	Las Vegas	2,709	1,980	Lubbock	3,578	1,310
Macon	2,136	1,440	Reno	6,332	520	San Antonio	1,546	1,920
Savannah	1,819	1,510	NEW JERSEY			UTAH		
IDAHO			Newark	4,589	710	Milford	6,497	910
Boise	5,809	670	NEW MEXICO			Salt Lake City	6,052	830
Lewiston	5,542	600	Albuquerque	4,348	1,040	VERMONT		
Pocatello	7,033	570	Clayton	5,158	720	Burlington	8,269	130
ILLINOIS			Silver City	3,705	1,260	VIRGINIA		
Chicago	6,155	780	NEW YORK			Norfolk	3,421	1,010
Moline	6,408	760	Albany	6,875	480	Richmond	3,865	1,020
Springfield	5,429	890	Binghamton	7,286	310	Roanoke	4,150	870
INDIANA			Buffalo	7,062	450	WASHINGTON		
Evansville	4,435	1,090	New York	4,811	790	Seattle	5,145	180
Fort Wayne	6,205	710	Rochester	6,748	470	Spokane	6,655	430
Indianapolis	5,699	820	Syracuse	6,756	500	Yakima	5,941	530
South Bend	6,439	600	NORTH CAROLINA			WEST VIRGINIA		
IOWA			Asheville	4,042	690	Charleston	4,476	860
Burlington	6,114	730	Charlotte	3,191	1,230	Huntington	4,446	820
Des Moines	6,588	710	Raleigh	3,393	1,070	WISCONSIN		
Sioux City	6,951	770	Winston-Salem	3,595	960	Madison	7,863	530
KANSAS			NORTH DAKOTA			Milwaukee	7,635	450
Dodge City	4,986	1,020	Bismarck	8,851	510	WYOMING		
Goodland	6,141	800	Fargo	9,226	490	Casper	7,410	600
Topeka	5,182	880	Williston	9,243	580	Cheyenne	7,381	420
Wichita	4,620	1,070				Sheridan	7,680	530

Formula for Calculating Operating Costs Using Above Data:

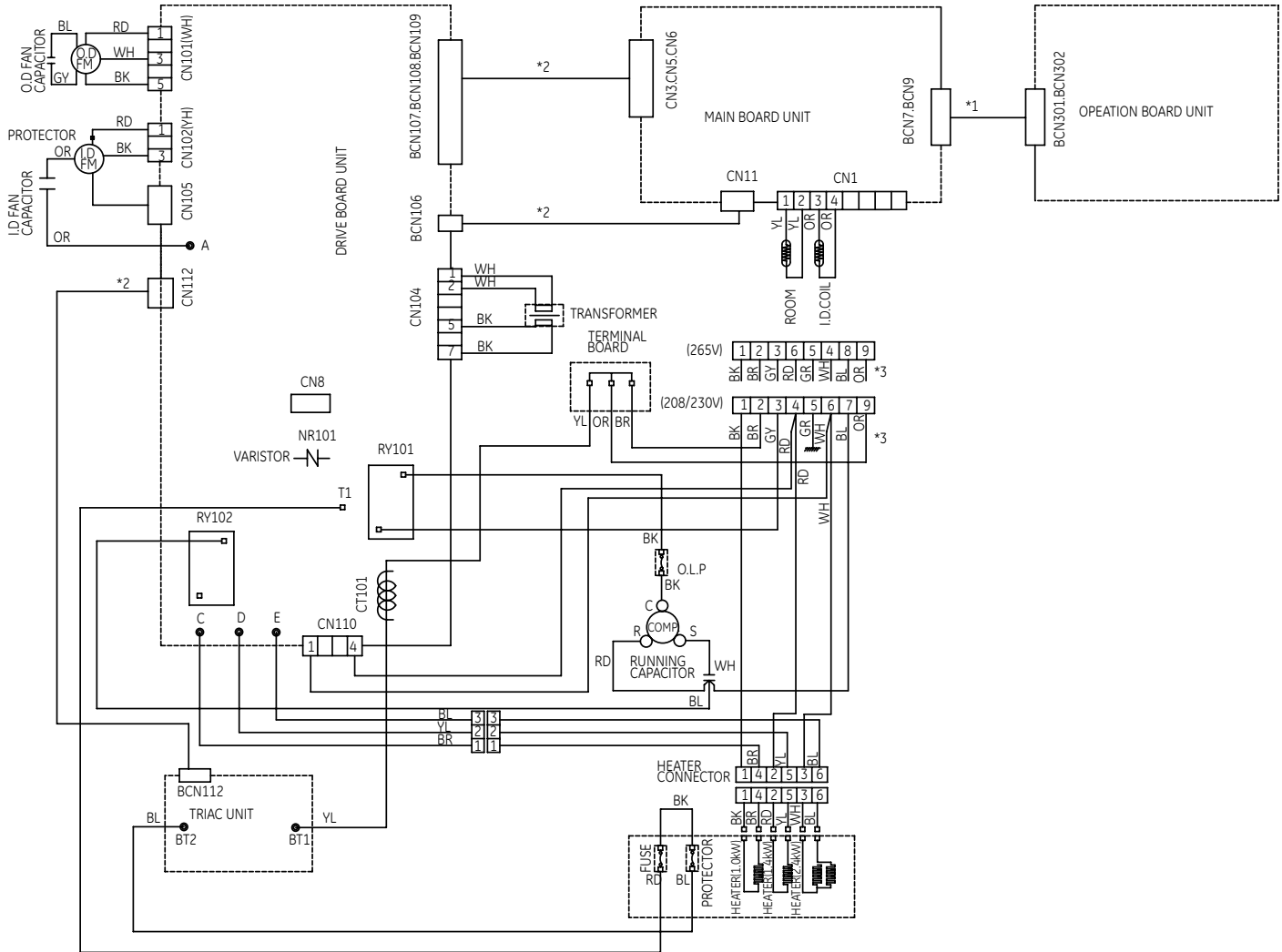
$$\text{Heating*} - \frac{\text{Heat Loss KW} \times \text{Heating Degree Days} \times \text{"C"} \times \text{Cost Per KWH}}{\text{Outdoor Design Temperature Difference}} = \text{Operating Cost}$$

*The above formula is for electric resistance heating only. Power consumption using the Zonline heat pumps should be adjusted by Seasonal Performance Factor (SPF).

The local power supplier should be consulted for recommended value of "C." This factor will vary between 17 and 24.

$$\text{Cooling} - \frac{\text{Calculated Heat Gain (BTUH)}}{\text{Installed unit capacity (BTUH)}} \times \frac{\text{Unit Cooling Watts}}{1000 \text{ Watts/KW}} \times \text{Cooling Hours} \times \text{Cost per KWH} = \text{Operating Cost}$$

Typical 4100 Series, 230/208-Volt Wiring Diagram



NOTE:

1. *1.The lead wires are multicoulored with black tube.
- *2.The jointwires are white except that the first one is red.
- *3.The 7k BTU models don't have this wire.

- 2.COLOR: BK:BLACK GR:GREEN RE:RED
BL:BLUE GV:GRAY WH:WHITE
BR:BROWN OR:ORANGE YL:YELLOW

3.THERMISTOR SENSOR RESISTANCE:

SENSOR RESISTANCE(ohm)		
degF	ROOM	I.D COIL
10	63260	94900
30	34620	51940
32	32860	49330
50	19970	29960
70	11950	17930
90	7320	10970

4.TRANSFORMER WINDING RESISTANCE:

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

5.This diagram applied to AZ41E series.

6.HEATER RESISTANCE:
TEST TEMPERATURE IS 68degF.

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

7.Motor winding resistance

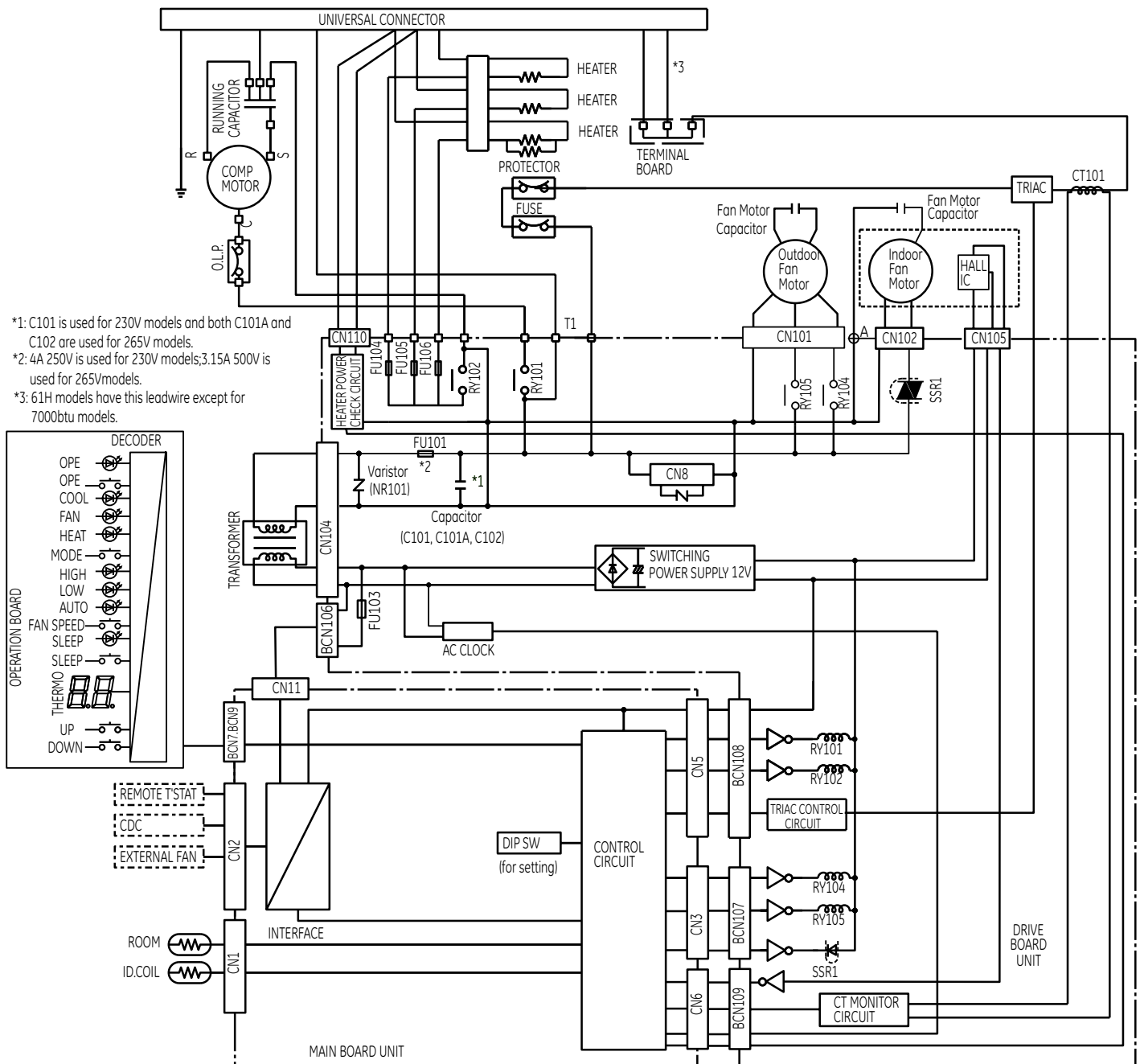
TEST TEMPERATURE IS 68degF.

MODEL NAME	WINDING RESISTANCE(ohm)		
	INDOOR MOTOR RD-BK	HIGH SPEED RD-BK	LOW SPEED WH-BK
AZ41E07DAB	183±15%	390±15%	284±15%
AZ41E07DAC	183±15%	399±15%	148±15%
AZ41E07DAP	183±15%	399±15%	148±15%
AZ41E07EAB	265±15%	400±15%	234±15%
AZ41E07EAC	265±15%	400±15%	139±15%
AZ41E07EAP	265±15%	400±15%	139±15%
AZ41E09DAB	183±15%	193±15%	204±15%
AZ41E09DAC	183±15%	193±15%	204±15%
AZ41E09DAP	183±15%	193±15%	204±15%
AZ41E09EAB	265±15%	294±15%	125±15%
AZ41E09EAC	265±15%	294±15%	125±15%
A441E09EAP	265±15%	294±15%	125±15%
AZ41E12DAB	183±15%	126±15%	146±15%
AZ41E12DAC	183±15%	126±15%	146±15%
AZ41E12DAP	183±15%	126±15%	146±15%
AZ41E12EAB	265±15%	148±15%	124±15%
AZ41E12EAC	265±15%	148±15%	124±15%
AZ41E12EAP	265±15%	148±15%	124±15%
AZ41E15DAB	183±15%	126±15%	146±15%
AZ41E15DAC	183±15%	126±15%	146±15%
AZ41E15EAB	265±15%	148±15%	124±15%
AZ41E15EAC	265±15%	148±15%	124±15%

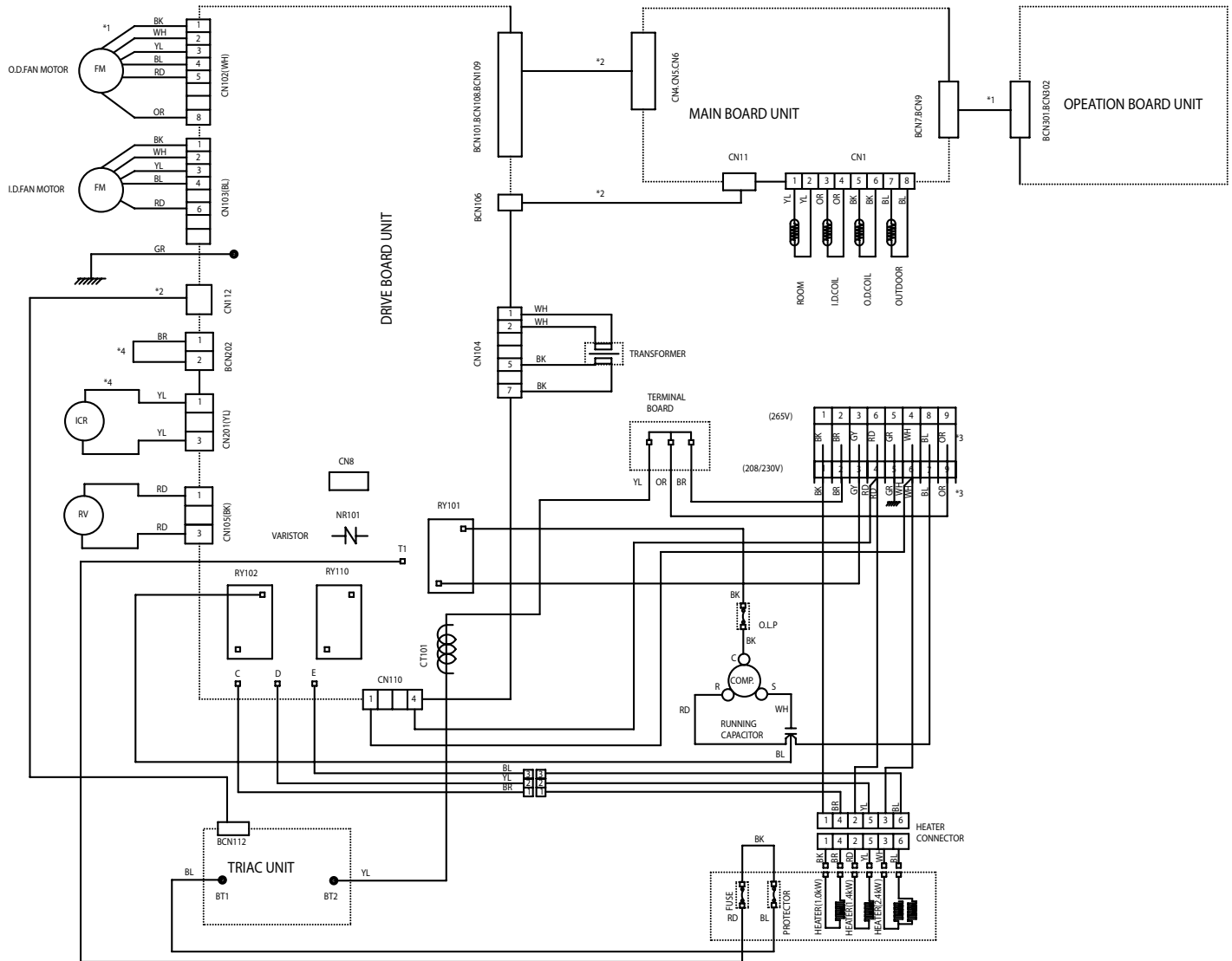
8.FAULT ANALYSIS OF INDOOR FAN MOTOR

If the motor winding resistance is out of spec, please check whether it's the motor's problem.
If there is no voltage between pin1 and pin2 of CN102, please check whether it's the problem of PWB.

Typical 4100 Series, 230/208-Volt Schematic Diagram



Typical 6100 Series, 230/208-Volt Wiring Diagram



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

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

4. TRANSFORMER WINDING RESISTANCE:

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

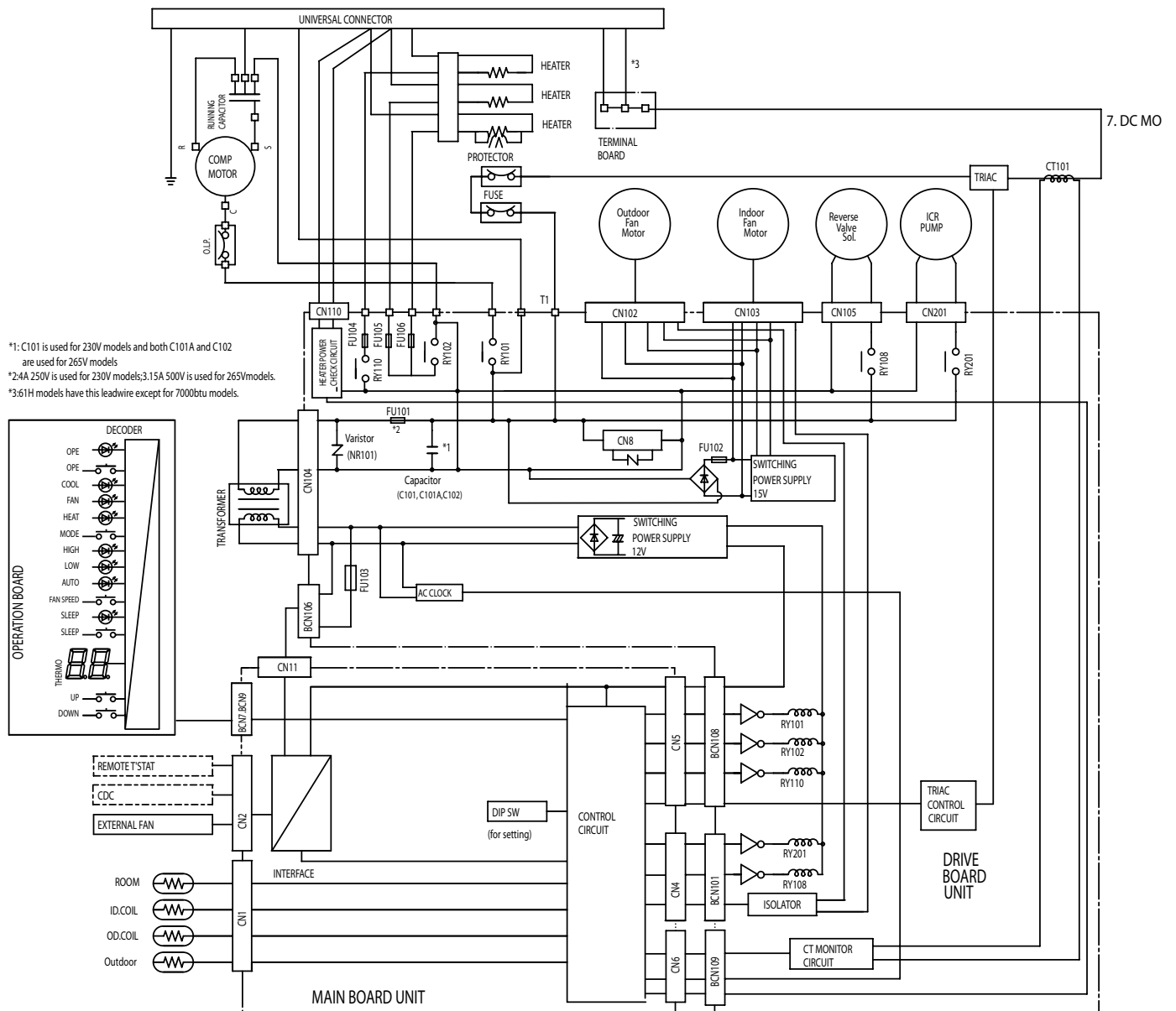
5. This diagram applied to AZ61H series.
 6. Heater resistance:
 TEST TEMPERATURE IS 68degF.

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

TOR VOLTAGE:
 (1)CN103:PIN 1-2(BK-WH) DC15V; PIN1-6(BK-RD):
 The DC voltage is AC power supply voltage x 1.4
 (2)CN102:PIN1-2(BK-WH) DC15V; PIN1-5(BK-RD):
 The DC voltage is AC power supply voltage x 1.4

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

Typical 6100 Series, 230/208-Volt Schematic Diagram



*1: C101 is used for 230V models and both C101A and C102 are used for 265V models
 *2: 2.4A 250V is used for 230V models; 3.15A 500V is used for 265V models.
 *3: 61H models have this leadwire except for 7000btu models.

Suggested Bid Form Specifications

The following are suggested specifications for the Zoneline® 4100 Series Packaged Terminal Air Conditioner and the 6100 Series Packaged Terminal Heat Pump.

The contractor will furnish Packaged Terminal Air Conditioners of the sizes and capacities shown on the schedule and in the specifications. The units shall be located as shown on the drawings and each shall consist of a chassis, room cabinet, wall case, sub-base if specified, and outdoor grille.

Units shall be listed by UL, and ARI and cUL certified as to capacity and efficiency and shall be GE Zoneline models or equal. Unit dimensions shall not exceed 42-1/8" wide and 16-1/4" high with room cabinet in place.

Units shall be designed to operate on (208) (230) (265) volts, 60 Hz., single-phase power.

Chassis. The air conditioner chassis shall be the standard product of the manufacturer and shall be shipped in protective cartons to prevent damage. Cartons shall be appropriately marked at the factory with wording sufficient to warn handlers against improper stacking, up-ending, rolling or dropping.

The chassis shall be the slide-in type, ready to operate after installation.

Each shall consist of the following sections and components:

- Each unit shall have a matching, easily removable, textured finish, wrap-around room cabinet molded of high-temperature styrene to resist corrosion and damage. The room cabinet shall have slide-out washable filters accessible without requiring removal of room cabinet from chassis;
- Hermetically sealed refrigerant system with external vibration isolated rotary-type compressor, condenser and evaporator coils and capillary refrigerant control. Airflow system consisting of one permanently lubricated two-speed fan motor for the outdoor fan and a separate permanently lubricated two-speed fan motor for the indoor fan. Outdoor fan shall be multi-blade axial-flow design made of non-corrosive material. Indoor fan shall be of a design to optimize airflow and operating sound. All motors on the exterior side of the weather barrier shall be of an enclosed design to reduce the effects of moisture and corrosion;
- Line-cord connected units shall require a line-cord power connection kit with integral Leakage Current Detection and Interruption device or Arc Fault Current Interrupter as required by National Electrical Code® (NEC) and Underwriters Laboratories. The unit shall have a universal resistance heater with output determined by connection to the power source with the appropriate power connection kit to provide specified heat output;
- A fan-cycle option to permit continuous fan operation or fan cycle operation, independently selectable for heating and cooling operation;
- Fan-only operation in either high or low fan speed selectable by room occupant;
- A positive cooling condensate disposal system which meets the test requirements of applicable A.R.I. Standard 310 (for Packaged Terminal Air Conditioners) and 380 (for Packaged Terminal Heat Pumps) (80°F dry bulb, 75°F wet bulb, 80% relative humidity);

- Condenser and evaporator coils to be constructed of copper tubing and aluminum plate fins designed to achieve EER and COP rating of the unit;
- Indoor and outdoor airflows that match the capacity of the coils for efficient heat transfer. Water blow-off shall not occur on the indoor coil;
- Adjustable indoor discharge air louvers that provide a 50° off vertical air pattern with an alternate position to provide a 40° off vertical air pattern;
- Easily accessible controls for selection of unit operation and thermostat setting. Controls shall be covered by a hinged door;
- Positive-closing, manually controlled, three-position fresh-air vent capable of providing selection of fully open, partially open or closed setting. Vent door is to be secured for shipping;
- Solid-state thermostat control to sense room temperature;
- Electronic temperature limiting with seven independent heating and cooling settings to limit maximum and minimum temperatures without restricting movement of thermostat control knob;
- Freeze Sentinel™ to automatically activate the electric resistance heater and fan motor to warm and circulate indoor air to help prevent damage due to freezing temperatures. Freeze Sentinel shall operate as long as unit is connected to powered electrical circuit and unit shall provide ability for owner to defeat the Freeze Sentinel operation;
- Heat Sentinel to automatically activate air conditioner operation when the unit is in the STOP setting when the room temperature warms to 85°F and turns air conditioner operation off when the room temperature cools to 80°F, if selected by owner;
- Compatible with two-wire Central Desk Control systems;
- Remote Thermostat compatibility with Class 2 remote thermostat;
- Connections to interface with a transfer fan to move air into another room;

Unit shall have means of electrical connection listed by Underwriters Laboratories and compatible with the unit's required voltage and ampacity in conformance with National Electrical Code and local codes.

Additional specifications for GE Zoneline 6100 Series Packaged Terminal Heat Pumps

Heat pump units shall provide operation that will either: A) automatically phase in electric resistance heat, if outdoor temperature is below 46°F, if heat pump alone is unable to maintain room temperature; or B) use partial electric resistance heat simultaneous with heat pump operation any time the outdoor temperature is below 46°F. Selection of A or B operation is made by means of a selector switch concealed from room occupant. In either A or B operation, the unit will switch to full resistance heat if room temperature continues to decline or the outdoor temperature falls below 25°F. If the outdoor temperature is above 46°F, unit will lock out electric resistance heat and operate on heat pump only.

Suggested Bid Form Specifications (continued)

Heat pump unit shall include Reverse Cycle Defrost that automatically begins a defrost cycle when microprocessor determines criteria for defrosting has been met. Defrosting shall be accomplished by systematically ceasing heat pump operation, pausing to allow internal refrigerant pressures to equalize, then operating the compressor with the flow of refrigerant reversed to allow the hot gas to flow through the outdoor coil, melting the accumulated frost. The unit shall automatically resume heat pump operation, after pausing to allow refrigerant pressures to equalize, at conclusion of defrost cycle.

The unit shall be equipped with a temperature-activated drain valve to allow water generated in heat pump operation and defrost cycles to drain into the wall case.

The unit shall have a switch concealed from room occupant to allow heat pump operation to be overridden and heat provided by electric resistance heat regardless of outdoor temperature.

In the event of compressor failure during heat pump operation, unit shall automatically switch to electric resistance heat to maintain selected room temperature regardless of outdoor temperatures.

Specifications for optional Internal Condensate Removal (ICR) system for 6100 Series heat pump units.

The unit shall have a factory-installed Internal Condensate Removal (ICR) system to permit unit to automatically dispose of heat-pump-generated condensate water with no overflow to outdoors during heating under outdoor ambient of 55°F dry bulb, 90% relative humidity; indoor ambient 70°F dry bulb, 52% relative humidity, for four hours of continuous run time.

Wall Cases and Grilles (needed for new installations.)

(Alternate specification for steel wall case)

Wall Case. The wall case shall be constructed of heavy-gauge, insulated, zinc-coated phosphated steel with a protective baked-on enamel finish. Bottom critical points of the steel wall case shall be coated with petroleum microcrystalline wax for added corrosion protection and shall meet ASTM B-117, 1800-hour hot air aerated salt spray test.

(Alternate specification for molded wall case)

Wall Case. The wall case shall be constructed of a non-corroding fiberglass-reinforced polyester compound.

Cases shall be installed through exterior walls where shown on the plans and shall be installed per manufacturer's installation instructions. In no instance shall fasteners be used through the bottom in order to retain the water integrity of the bottom of the wall case.

Outside weather panels shipped with the cases shall remain in place until the outdoor air louvers and chassis are installed, at which time they are to be removed and discarded by the installer.

Outside Grille. Each unit shall be equipped with a standard exterior grille that has been designed to allow unit operation in high ambient conditions. Grilles shall be of material and design specified.

Special grilles or customer louver sections to be supplied by others will conform to a minimum of 65% free area (as calculated by ASHRAE) to allow for proper unit operation and shall be submitted to the PTAC/PTHP manufacturer, if requested, for feasibility and airflow characteristics.

Specifications for Sub-Base (if required)

Sub-Base. Each unit shall have a field-installed UL-listed electrical sub-base. The sub-base shall be attached to the lower inside flange of the wall case prior to installation in the exterior wall. It shall include adjustable screws at the bottom corners to permit exact leveling of the wall case. The sub-base shall have a factory-installed receptacle to allow unit line cord to plug into mating receptacle and shall have a chaseway to contain and conceal the line cord. The sub-base shall have side panels adjustable from a minimum of 2-3/8" to a maximum of 13-3/4" to enclose the area under the wall case.

Weather Resistance. Complete unit including outside louver shall be submitted to an independent agency for weather-resistance tests.

Air-infiltration test to be conducted in accordance with ASTM E283-91. With static air pressure differential of 1.57 lb./ft.² (.3" H₂O) equivalent to 25 mph wind, allowable air infiltration shall not exceed 7 ft.³/min.

Water-infiltration test to be conducted in accordance with ASTM E331-86 with static air pressure differential of 10.0 lb./ft.² (1.93" H₂O) equivalent to 63 mph wind, 5.0 gal./ft.² (8" rain/ft²/hr.) for 15 minutes and there shall be no leakage into the room.

Approvals. Units shall be certified under the ARI and cUL certification program and listed by UL.

Service. Submit complete information with bid covering service availability to whom service on units will be assigned, along with complete address and phone number, including phone number of emergency service personnel.

Start-Up, Adjust, Demonstrate. Contractor shall be responsible for the initial starting of units, adjustments thereto, etc., to place the units in required operating condition. Contractor shall demonstrate to the owner or his representative the operation of units for both summer and winter functions.

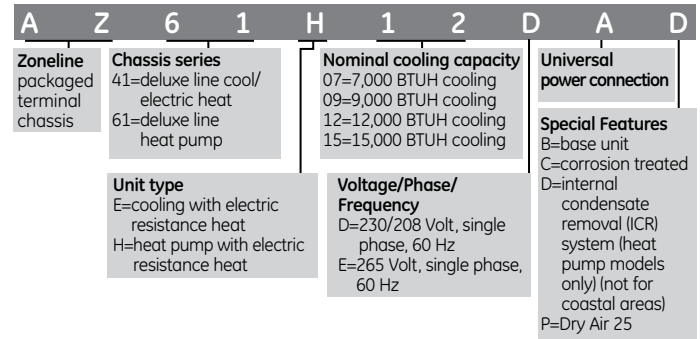
Warranty. The warranty shall be a full one-year parts and labor on the entire unit, plus an additional full four years parts and labor for the sealed refrigerating system, including service call for diagnosis and transportation to and from service shop (if necessary) at no charge to the customer. The warranty shall also include a limited second-through-fifth-year parts-only warranty for fan motors, switches, thermostat, heater, heater protectors, compressor overload, solenoids, circuit boards, auxiliary controls, thermistors, frost controls, ICR pump, capacitors, varistors and indoor blower bearing.

Installation Responsibility. Units shall be installed according to the manufacturer's recommendations and the manufacturer shall not be responsible for unit failure as a result of improper installation, or unit performance when installed with accessories not approved by the manufacturer.

Zonline® Chassis Nomenclature

The Zonline chassis is identified by a model number defining the type of unit, cooling capacity, electrical information and optional features included on the unit. When specifying or ordering the Zonline chassis use of this nomenclature will assure receiving the correct unit.

EXAMPLE



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;



265V 30 Amp
NEMA7-30R;

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 Zonline® chassis (see chart below).

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

Power connection kits

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



RAK3153A/3203A/3303A
230/208 volt line cord
connection kit



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



RAK5157/5207/5307
265 volt universal power
supply kit

230/208 volt	Line cord connected units		
LCIDI Power Connection Kit	RAK3153A	RAK3203A	RAK3303A
Heater KW	2.4/2.32	3.3/3.2	4.7/4.53
Watts	2,400/2,320	3,300/3,200	4,700/4,530*
BTUH	8,150/7,900	11,200/10,900	16,000/15,450
Amps	11.0/11.6	15.1/16.0	21.2/22.4
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
2.4	3.4	4.8
2,400	3,400	4,800*
8,150	11,550	16,350
9.6	13.3	18.6
15	20	30
15 amp time delay fuse	20 amp time delay fuse	30 amp time delay fuse

230/208 volt	Direct connection kit†		
	RAK4157	RAK4207	RAK4307
Heater KW	2.4/2.32	3.3/3.2	4.7/4.53
Watts	2,400/2,320	3,300/3,200	4,700/4,530*
BTUH	8,150/7,900	11,200/10,900	16,000/15,450
Amps	11.0/11.6	15.1/16.0	21.2/22.4
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 Direct connection kit†		
RAK5157	RAK5207	RAK5307
2.4	3.4	4.8
2,400	3,400	4,800*
8,150	11,550	16,350
9.6	13.3	18.6
15	20	30
15 amp time delay fuse	20 amp time delay fuse	30 amp time delay fuse

*Wattage not available with 7,000 BTU systems.

**To be used with sub-base

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

Specifications subject to change.

Preliminary Specifications

230/208V Models	Deluxe series – cooling & electric heat				Dry Air 25		
	4100 series units				Dry Air 25		
	AZ41E07D	AZ41E09D	AZ41E12D	AZ41E15D	AZ41E07DAP	AZ41E09DAP	AZ41E12DAP
Capacity							
Cooling BTUH	7,300/7,100	9,700/9,600	11,800/11,600	14,700/14,500	6,800/6,600	9,300/9,100	11,200/11,000
EER (BTU/Watt)	12.8/12.8	12.1/12.1	11.8/11.8	10.6/10.6	12.2/12.2	11.8/11.8	11.3/11.3
Dehumidification Pts/Hr	1.7	2.7	3.5	4.6	2.3	3.4	4.4
Features							
Refrigerant type	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
CFM, indoor fan high	290	340	420	409	220	280	330
CFM, indoor fan low	218	229	323	324	190	208	270
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45	50/40	70/45	75/45
Power/Ratings							
Power factor	89%	93%	93%	90%/92%	86%/87%	92%	92%
Sensible heat ratio @ 230 volts	80%	75%	70%	70%	60%	60%	60%
Watts	570/555	805/795	1000/985	1390/1370	555/540	790/770	995/975
Cooling Amperes, F.L.	2.8/3.0	3.6/3.9	4.7/5.1	6.7/7.2	2.8/3.0	3.6/3.9	4.7/5.1
Amperes, L.R.	190	210	295	310	190	210	295
Weight (Net/Ship)	89.5/102.5	99.9/112.9	99.4/112.4	100.3/113.3	97.0/110.0	105.2/118.2	105.4/118.4

265V Models	AZ41E07E	AZ41E09E	AZ41E12E	AZ41E15E	AZ41E07EAP	AZ41E09EAP	AZ41E12EAP
	Capacity						
	Cooling BTUH	7,300	9,800	11,800	14,700	6,800	9,400
EER (BTU/Watt)	12.8	12.1	11.8	10.6	12.2	11.8	11.3
Dehumidification Pts/Hr	1.7	2.7	3.5	4.6	2.3	3.4	4.4
Features							
CFM, indoor fan high	290	340	420	406	220	280	330
CFM, indoor fan low	215	229	323	324	190	208	270
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45	50/40	70/45	75/45
Power/Ratings							
Power factor	90%	91%	92%	92%	87%	90%	92%
Sensible heat ratio @ 265 volts	80%	75%	70%	70%	60%	60%	60%
Watts	570	810	1000	1390	555	800	995
Cooling Amperes, F.L.	2.4	3.2	4.1	5.7	2.4	3.2	4.1
Amperes, L.R.	120	165	235	260	120	165	235
Weight (Net/Ship)	91.3/104.3	101.2/114.2	99.9/112.9	101.0/114.0	97.4/110.5	104.9/117.9	108.0/121.0

230/208V Models	Deluxe series – heat pump units**			
	6100 series units			
	AZ61H07D	AZ61H09D	AZ61H12D	AZ61H15D
Capacity				
Cooling BTUH	7,200/7,000	9,400/9,200	11,800/11,600	14,800/14,600
EER (BTU/Watt)	13.2/13.2	12.7/12.7	12.1/12.1	11.2/11.2
Dehumidification Pts/Hr	1.7	2.7	3.5	4.5
Features				
Refrigerant type	R-410A	R-410A	R-410A	R-410A
CFM, indoor fan high	340	360	370	370
CFM, indoor fan low	194	212	284	290
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
Power/Ratings				
Power factor	91%	92%	92%	91%/92%
Sensible heat ratio @ 230 volts	85%	75%	70%	65%
Cooling Watts	545/530	740/725	975/960	1,325/1,305
Cooling Amperes, F.L.	2.6/2.8	3.5/3.8	4.6/5.0	6.3/6.8
Amperes, L.R.	190	210	295	310
Reverse cycle heat BTUH	6,400/6,200	8,300/8,100	10,600/10,400	14,000/13,900
COP	4.0/4.0	3.8/3.8	3.7/3.7	3.3/3.3
Heating Watts	470/455	645/630	850/835	1,245/1,235
Heating Amperes	2.2/2.4	3.1/3.3	4.1/4.5	5.8/6.3
Weight (Net/Ship)	94.1/107.1	101.4/114.4	102.1/115.1	100.8/113.8

265V Models	AZ61H07E	AZ61H09E	AZ61H12E	AZ61H15E
	Capacity			
	Cooling BTUH	7,200	9,400	11,800
EER (BTU/Watt)	13.2	12.7	12.1	11.2
Dehumidification Pts/Hr	1.7	2.7	3.5	4.5
Features				
Refrigerant type	R-410A	R-410A	R-410A	R-410A
CFM, indoor fan high	340	360	370	370
CFM, indoor fan low	194	211	284	290
Vent CFM (full open/partial open)	50/40	70/45	75/45	75/45
Power/Ratings				
Power factor	94%	90%	92%	93%
Sensible heat ratio @ 265 volts	85%	75%	70%	65%
Cooling Watts	545	740	975	1,325
Cooling Amperes, F.L.	2.2	3.1	4.0	5.4
Amperes, L.R.	120	165	235	260
Reverse cycle heat BTUH	6,400	8,300	10,600	14,000
COP	4.0	3.8	3.7	3.3
Heating Watts	470	645	850	1,245
Heating Amperes	2.0	2.7	3.6	5.0
Weight (Net/Ship)*	94.6/107.6	103.6/116.6	103.6/116.6	104.3/117.3

*ICR adds 3 pounds to unit weight
 **Corrosion model BTUH and watts may vary.

Specifications subject to change.

Complete Accessory List

Kit Number	Description	For Additional Information Refer to Page
RAA63	Spare Filters for AZ2900, AZ3900, AZ4100, AZ5800 and AZ6100 Series units	11
RAB71A	Steel Wall Case - 13-3/4" deep	22
RAB7116	Steel Wall Case - 16" deep	22
RAB7124	Steel Wall Case - 24" deep	22
RAB7128	Steel Wall Case - 28" deep	22
RAB7131	Steel Wall Case - 31" deep	22
RAB77	Molded Wall Case	22
RAD10	Interior/Exterior Drain kit	35
RAF453	Room Front for AZ4100 and AZ6100 Series units (included with chassis)	11
RAG60	Stamped Aluminum Exterior Grille	40
RAG61	Architectural Exterior Grille, Beige Molded High-Impact Plastic	40
RAG62	Architectural Exterior Grille, Maple Molded High-Impact Plastic	40
RAG63	Architectural Exterior Grille, Bittersweet Chocolate Molded High-Impact Plastic	40
RAG67	Aluminum Architectural Grille (Custom Colors Available by Special Order)	40
RAK40	Condenser Air Deflector Kit	40
RAK148D1	Wall Thermostat For Heat Pump Models - Electronic Digital	16
RAK148P1	Wall Thermostat For Heat Pump Models - Electronic Digital Programmable	16
RAK164D1	Wall Thermostat For Resistance Heat Models - Electronic Digital	15
RAK164P1	Wall Thermostat For Resistance Heat Models - Electronic Digital Programmable	15
RAK201	Sub-Base Cover Plate with Knockouts	43
RAK204D15P	Sub-Base - 208/230-Volt with NEMA 6-20R 15/20 Amp Receptacle - Power Cord and Chaseway included	22
RAK204D20P	Sub-Base - 208/230-Volt with NEMA 6-20R 15/20 Amp Receptacle - Power Cord and Chaseway included	22
RAK204D30P	Sub-Base - 208/230-Volt with NEMA 6-30R 30 Amp Receptacle -Power Cord and Chaseway included	23
RAK204E15	Sub-Base - 265-Volt with NEMA 7-15R 15 Amp Receptacle - Chaseway included	23
RAK204E20	Sub-Base - 265-Volt with NEMA 7-20R 20 Amp Receptacle - Chaseway included	23
RAK204E30	Sub-Base - 265-Volt with NEMA 7-30R 30 Amp Receptacle - Chaseway included	23
RAK204U	Sub-Base - non-electrical Chaseway not included	22
RAK205CW	Chaseway for Sub-Base	22
RAK3153A	Universal Power Cord - 4100/6100 series - 15-Amp 230/208 V - 2.40/2.32 kW heat	42
RAK3203A	Universal Power Cord - 4100/6100 - 20-Amp 230/208 V - 3.3/3.2 kW heat	42
RAK3303A	Universal Power Cord - 4100/6100 - 30-Amp 230/208 V - 4.7/4.53 kW heat	42
RAK4002A	Direct-Connect Junction Box - 230/208-volt units 4100/6100 Series	42
RAK4002B	Direct-Connect Junction Box - 230/208-volt units 5800 Series	42
RAK4002CW	Wiring Harness w/Inline Connector - Adapt Line Cord to Direct Connection	43
RAK4157	208/230V Universal Power Supply, 15 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK4207	208/230V Universal Power Supply, 20 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK4307	208/230V Universal Power Supply, 30 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK5157	265V Universal Power Supply, 15 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK5207	265V Universal Power Supply, 20 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK5307	265V Universal Power Supply, 30 Amp for 2800, 2900, 3800, 3900, 4100, 5500, 5800, 6100, 7500 and 8500 only	42
RAK5172	Universal Connection Kit - 265V - 15 Amp - Use w/RAK204E15 Sub-Base - 2.40 kW heat	42
RAK5202	Universal Connection Kit - 265V - 20 Amp - Use w/RAK204E20 Sub-Base - 3.40 kW heat	42
RAK5302	Universal Connection Kit - 265V - 30 Amp - Use w/RAK204E30 Sub-Base - 4.80 kW heat	42
RAK601	Duct Extension - Insulated - 44" long - includes Register and Trim Flange	37
RAK602	Register and Trim Flange (Included with RAK601)	37
RAK6052	Duct Adapter for New Installation (or older non-GE duct adapter installation)	37
RAK7012	Duct Adapter for replacement of A-B with rounded-front AZ chassis for 2200, 3200, 2500, 3500, 2800, 2900, 3800, 3900, 4100 and 6100 only	37
RAK7022	Duct Transition for replacement of AZC with rounded-front AZ chassis for 2200, 3200, 2500, 3500, 2800, 2900, 3800, 3900, 4100 and 6100 only	37
RAK8023	Locking Door Kit	11
RAK806	Control Panel Cover (for use with remote thermostat)	15
RAK901L	Wall Case Insulation Kit	22

General Installation Suggestions

Many times poor or non-existent caulking around the exterior of the wall case results in air infiltration, causing the unit to run excessively. One way to check for air infiltration is to look under and around the unit to the outdoors. If you can see light, there is air infiltration. The first floor of a building is where this problem most frequently occurs since caulking the bottom of the wall case may require lying outside in the dirt while working. This has been the cause of many complaints about the “short cycling” of the unit.

Curtains, furniture or other obstructions interfering with the discharge air circulation will make the unit cycle/turn off too soon since the cooled (or heated) discharge air is pulled back into the unit. This results in a room that is not adequately heated or cooled.

Blocking the discharge air on the unit during the heating operation can result in the air getting hot enough to distort the plastic room front. If you have a property where this may occur we recommend a “tent card” advising room occupants not to put anything on the unit.

Electrical Wiring Installation

Do not allow the installer to drill a hole in the wall case to run the electrical wiring. If this is done, the wiring will have to be run between the chassis and the edge of the wall case so it can be connected to the unit wiring on the room side of the wall case. When the chassis is removed for servicing or cleaning, the insulation on the wires can be cut and can create a safety hazard.

If the electrical connection on a 230-volt or 208-volt installation is to be made by the line cord plugged into a wall-mounted receptacle, the receptacle should be located in the wall under the case or close to the side of the wall case. This installation makes a much neater appearance than a line cord running a foot or more across the floor. The electrician may want to place the receptacle as far from the unit as possible to save a few feet of wiring without considering how the installation may appear.

Central Desk Control and Remote Thermostat Wiring

Do not allow the installer to drill a hole in the wall case to run Central Desk Control wiring or remote thermostat wiring to the unit terminals. CDC and remote thermostat wiring is classified as low-voltage wiring and does not have to be run in conduit unless required by local code. CDC and remote thermostat wiring should be run in the walls and exit the wall under the wall case about 2" from the right-hand side. The base pan is designed with a clearance for the line cord and the low-voltage wiring can also be run to the chassis in this area. Wire molding can be used to hold the wiring close to the bottom of the wall case. If a sub-base is used, the wiring can be run through the sub-base, entering the rear and exiting through one of the front panels. When the room cabinet is in place the CDC or remote thermostat wiring is usually not

visible to someone standing or sitting in the room. Do not run the low-voltage wiring in conduits with line-voltage wiring or near uninsulated line-voltage wiring since induced current can interrupt the low-voltage controls.

Consult the electrical inspector early in the project, especially if the power to the air conditioner is to be 265 volts, to understand what is required to comply with local electrical codes.

Wall Case/Exterior Grille

When making an installation where the exterior grille is flush with the exterior wall, or part of a custom window/louwer section, make sure the installer caulks the wall case to the exterior wall, especially the bottom of the case. Many times the air conditioners are run during construction and the building is not closed. This can result in excessive humidity from the warm humid air entering the building, or from the “drying out” of the building materials. Many problems have been caused by condensate water or rainwater running back into the building where proper caulking has not been done.

Capacity Considerations

A unit that has a greater cooling capacity than required will cool the room quickly but will usually not run long enough under normal operation to adequately dehumidify the room. Most musty odors in rooms are due to excess humidity. Using a smaller-capacity unit or using Dry Air 25 units will provide better dehumidification. The largest factor in causing mold and mildew in the room is excess moisture. A smaller unit running longer or a Dry Air 25 model can remove more moisture. Mold behind wall coverings that do not allow water vapor to pass through—vinyl wallpaper or oil-base paints, for example—is not a problem of excessive moisture in the room, but rather is caused by moisture trapped in the walls.

Using a resistance heater larger than required—using a 4.7 kW heater when a 3.3 kW heater would suffice for example—may not cost any more in electrical consumption since the larger heater will operate for less time. The “Demand Charge” portion of the utility bill—which is based on the highest electrical load for a period of time—may be a significant portion of the utility bill. Some customers have reported the demand charge actually being more than the usage charge. In a 100-room property it would be possible for the demand of the 4.7 kW heater versus a 3.3 kW heater to be 140 kW more than the demand charge if the lower wattage heaters were used. Working with the utility companies to understand their method of billing and taking advantage of any rebates they may offer can reduce the utility bill.

Exterior Grilles

When replacing an older unit, the existing outdoor grille may need to be changed or modified. Outdoor airflow patterns have changed and this may dictate the need for outdoor grille replacement or modification.

General Installation Suggestions

Ducted Installation Comments

New Installations

The GE Zoneline® 4100 and 6100 Series are approved for ducted installation using the GE Duct Adapter model RAK6052 and the GE Duct Extension RAK601. A field-fabricated duct extension with the same interior measurements as the RAK601 may be used with the RAK6052 duct adapter. GE does not recommend ducting in more than one direction.

The use of a duct adapter other than the RAK6052 is not approved by GE and may cause problems such as inadequate airflow to the secondary room or the unit shutting off on one of the overload devices.

Failure to allow for adequate air return from the secondary room is often the cause of less than satisfactory performance of a ducted installation.

Replacement Installations

GE offers duct adapters to allow for easy replacements of previous-design chassis in ducted installations where a GE duct adapter was used in the original installation. A duct adapter is available that will align with the duct extension when GE-built components were used in the original installation.

The duct adaptor/extension used from the early 1960s until late 1987 was 8-3/8" high by 6-1/2" wide. If the chassis to be replaced is the flat-top discharge (design until late 1987) the duct adapter model RAK7012 will align with the existing duct extension. This means the duct extension will not have to be changed. However, to keep the cost of the replacement to a minimum there are components that will need to be taken off the existing installation and used on the RAK7012 duct adapter. The wall case mounting brackets, screws, discharge grille, damper and end cap will need to be retained.

If the chassis is a slope-front discharge and the duct dimensions are 8-3/8" high by 6-1/2" wide, then the chassis has already been replaced and the purchase of a new duct adapter is not required. The only piece that needs to be replaced in this installation is the transition piece, model RAK7022, which fits between the chassis and the duct adapter.

If the chassis being replaced has a model number that begins with AZ22, AZ25, AZ28, AZ29, AZ32, AZ35, AZ38 or AZ39, the new 4100 or 6100 Series unit can be installed using the same duct components.

If the existing chassis is a slope-front discharge and the duct dimensions are 7-3/32" high by 6-1/2" wide, only the RAK7022 transition piece is required to install a 4100 or 6100 Series unit in the ducted installation.

There were a number of Zoneline units installed in ducted installations that did not use a GE duct adapter. The easiest way to determine if the existing duct adapter is a GE duct adapter is if compare the duct adapter dimensions to the dimensions above. If the dimensions are different from the dimensions above or if the duct adapter is not made of sheet metal, it is not a GE duct adapter. In such installations GE recommends the removal of the old duct adapter and duct extension and the installation of a RAK6052 duct adapter and a RAK601 duct extension. Zoneline units installed in installations not using GE duct adapters and an extension with the same cross-section dimensions as the duct adapter may not be covered by the warranty.

Zoneline Warranty*

What is covered

Limited one-year warranty

For one year from the date of the original purchase, GE will repair or replace any part of the air conditioner which fails due to a defect in materials or workmanship. During this limited one-year warranty, GE will provide, free of charge, all labor and related service costs to repair or replace the defective part.

Limited five-year warranty

For five years from the date of the original purchase, GE will repair or replace the Sealed Refrigerating System if any part of the Sealed Refrigerating System (the compressor, condenser, evaporator, and

all connecting tubing) should fail due to a defect in materials or workmanship. During this limited five-year warranty, GE will provide, free of charge, all labor and related service costs to repair or replace the defective part.

Limited second-through-fifth-year parts warranty

From the second through the fifth year from the date of the original purchase, GE will replace the Fan Motors, Switches, Thermostat, Heater, Heater Protectors, Compressor Overload, Solenoids, Circuit Boards, Auxiliary Controls, Thermistors, Freeze Sentinel™, Frost Controls, ICR Pump, Capacitors, Varistors and Indoor Blower Bearing, if any of these parts should fail due to a defect in materials or workmanship. During this additional four-year limited warranty, you will be responsible for any labor and related service costs.

*See written warranty for details

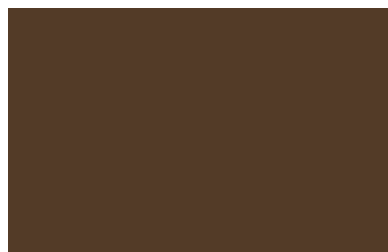
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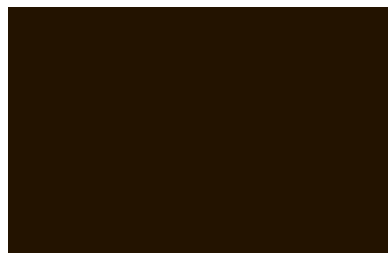
Exterior Grille Color Samples



Beige



Maple



Bittersweet

Colors may vary slightly due to printing process.



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