

ZONELINE® PACKAGED TERMINAL AIR CONDITIONERS

ARCHITECTS AND ENGINEERS DESIGN DATA MANUAL



FEATURING THE NEW DRY AIR 25 SERIES



We bring good things to life.

Zonline®

The line of General Electric Zonline® models has been designed with the focus on efficiency, quietness and reliability. You can depend on the same flexible applications that you expect from previous Zonline models. To fully realize all of the benefits of General Electric Zonline heating and cooling, proper installation is necessary.

Please take a moment to read the important notice at the bottom of page 4.

The Zonline® Cooling/Heating Systems are Ideally Suited for a Variety of Installations such as . . .

Apartments All living spaces.

Motels and Hotels Guest rooms, offices and lobbies.

Office Buildings Perimeter offices, meeting rooms, cafeterias.

Dormitories Student rooms and public areas.

Schools and Colleges Classrooms, offices and public areas.

Hospitals, Nursing Homes and Clinics

Patients rooms, waiting rooms, and offices.

Residential Ideal for add-on rooms.

Mobile Homes And portable classrooms.

Modulars Motels, office buildings, housing for elderly, student dorms.

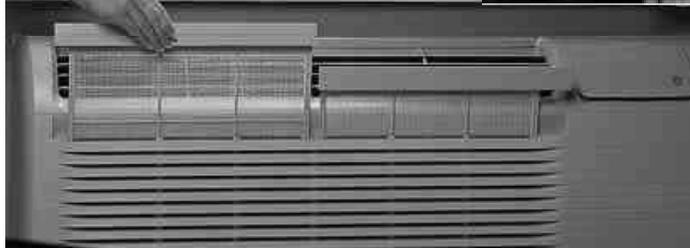
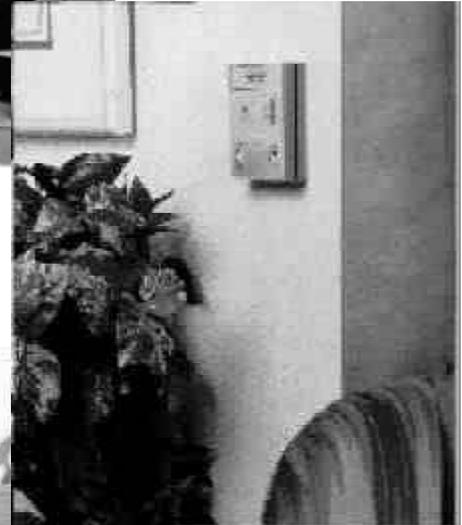


◀ Central Desk Control

All Zonline units are compatible with two-wire central desk ON/OFF controls, load shedding systems, including many computerized control systems. Note: Requires Optional Interface Module. (RAKOIM)

Remote Installation Capability ▶

All Zonline units are compatible with wall-mounted remote controls. Note: Requires Optional Interface Module. (RAKOIM)



◀ Upfront Filters

All Zonline units have removable upfront filters for ease of cleaning, thus assuring high performance and longer life.



▲ Freeze Sentinel™

All Zonline units are equipped with Freeze Sentinel to provide protection against freezing in unoccupied rooms, regardless of unit setting.



▲ Optional Corrosion Treatment*

Zonline units can be ordered with special protective coatings designed to reduce the effects of corrosive environments. A special treatment is placed on the outdoor coil and other components to extend the life of the unit.

*(Standard on Dry Air 25 Models.)

See individual sections for application details.

The Deluxe 2200 Series Zonelines Includes The New Dry Air 25 Models Which Remove 25% More Moisture Than Standard Zoneline Units.



The Newest Innovation from GE...
 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 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 the heat, and the Dry Air 25 is the perfect solution.

Deluxe Dry Air 25 Models

Cooling With Resistance Heat

Removes 25% More Moisture than other Zoneline Models, up to 2.7 Additional Gallons Per Day

Cool and Dry Air in Less Time than Standard Zoneline Models

Heat Pipe 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

Best Suited for Humid Climates

Available in 7000, 9000 and 12000 BTU Sizes

Two Fan Motors

- Improved Quiet Sound Levels
- High Efficiency

Mechanical Temperature Limiting

- Reduces Operating Costs

Freeze Sentinel™

- Protects from Damage by Freezing Temperatures

GE Exclusive Superseal

- Increased Room Comfort
- Energy Savings

Upfront Filters

- Ease of Cleaning
- Long Lasting Nylon Mesh

Central Desk Control Compatibility (Requires RAKOIM)

Remote Thermostat Capability (Requires RAKOIM)

COMPARISON OF DRY AIR 25 IN DEHUMIDIFICATION*

GE Dry Air 25	Removes 25% More Moisture
GE 2200 Series Zoneline*	
Amana	
Carrier	

*Based on 12,000 BTU Units.

NOTE: All 2200 Series features mentioned in this manual include the Dry Air 25 models.

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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 this 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. See page 42.

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 and add-on rooms.

Zonline models provide individual room or zone control in both cooling and heating operation. There is a model for practically every application, ranging in cooling capacities from 7,000 to 15,000 BTUH and heating capacities from 6,400 to 14,500 BTUH in heat pump operation. A choice of electric resistance heat is available ranging from 2.55 KW to 5.0 KW on 230 volt units and from 1.7 KW to 5.0 KW on 265 volt units.

The Zonline offers a two tier lineup; the **Deluxe Line** - the 2200 Series with electric resistance heat, the Dry Air 25 Models with enhanced dehumidification for hot and humid climates and the 3200 Series heat pump; the **Premium Line** - 5200 Series heat pump.

The **Deluxe Line** units use standard microprocessor controls with a two fan motor design. Zonline 2200 Series (including the Dry Air 25 Models) Packaged Terminal Air Conditioners and 3200 Series Packaged Terminal Heat Pumps offer as standard many of the features found on competitive units only as added cost options. Features such as Freeze Sentinel™, Central Desk Control compatibility*, Low Voltage Remote Thermostat Control compatibility*, compressor restart protection, random restart after power failure, mechanical temperature limiting, are standard on the Deluxe Line. The Deluxe Line also provides some features not found, even as options, on some competitive units. Features such as Indoor Coil Frost Control to enable the unit to operate in the cooling mode under low outdoor ambient conditions, and a two-stage thermostat on the 3200 Series Heat Pump unit helps maintain a comfortable room for the occupant while saving energy for the property owner.

The **Deluxe Line** units also offer cooling with electric heat and heat pump efficiencies that make them an outstanding value; Deluxe represented by low operating cost - Deluxe represented by the standard features - and Deluxe represented by the competitive initial cost.

The **Premium Line** units are highly featured micro-processor controlled and have separate indoor and outdoor fan motors. The 5200 Series Packaged Terminal Heat Pumps offer as standard all the features found on the Deluxe Line units - Freeze Sentinel™, Central Desk Control compatibility*, Low Voltage Remote Thermostat Control compatibility*, and Indoor Coil Frost Control - plus the added features made possible through the use of electronic controls; features such as automatic fan speed control, staged heating, electronic temperature limiting, high ambient heat pump operation, and unit diagnostics. The 5200 Series Heat Pump units also have an exclusive feature in PTHP units - Selectable Full Time or On Demand Simultaneous Operation of Heat Pump and Supplemental Resistance Heat - which provides the most advanced heat pump operation to assure room occupant comfort while providing the energy savings of a heat pump. The active

demand reverse cycle defrost system is designed to melt accumulated frost on the outdoor coil and allow the unit to resume cost efficient heat pump operation.

Advantages of the GE Zonline® System:

Flexible Application

May be installed flush to finished floor to 3" from the ceiling
7,000 to 15,000 BTUH units in same physical size
2200 and 3200 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 double cut-off scroll: two fan motor 2200 and 3200 Series units
Indoor cross-flow blower: 2 fan motor 5200 Series units

Energy-Saving Operation

Units in unoccupied areas may be turned off
Designed for efficient cooling operation - EERs from 9.6 to 12.0
Efficient heat pump units - COPs from 3.1 to 3.5
Extended heat pump operation without sacrificing room comfort

Ease of Maintenance

Permanently lubricated fan motors
Upfront lift out filters
Slide out chassis for easy access if service is required

Heat Pump Operation (Defrost Termination)

After the heat pump models have been exposed to a low outdoor temperature and operating in the switchover operational mode, the 3200 series returns to heat pump operation at 36°F outdoor coil temperature, and the 5200 series returns to heat pump operation at 32°F outdoor air temperature.

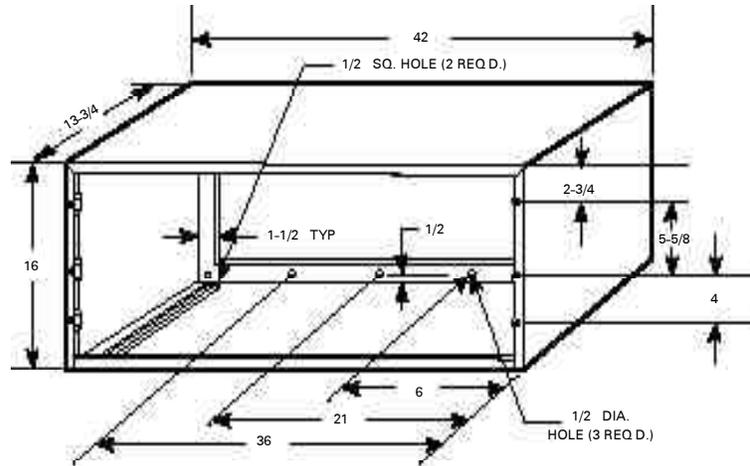
NOTE: All 2200 Series features mentioned in this manual include the Dry Air 25 models.

*Optional Interface Module (RAKOIM) is required for Central Desk Control or Remote Thermostat Control adaptation.

Dimensions

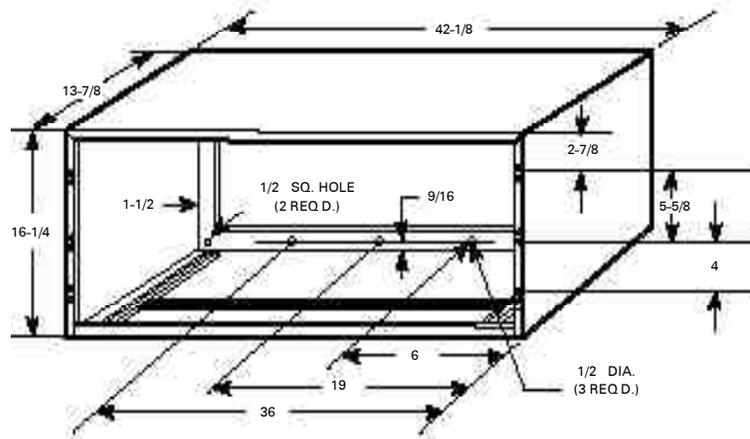
RAB71 WALL CASE

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

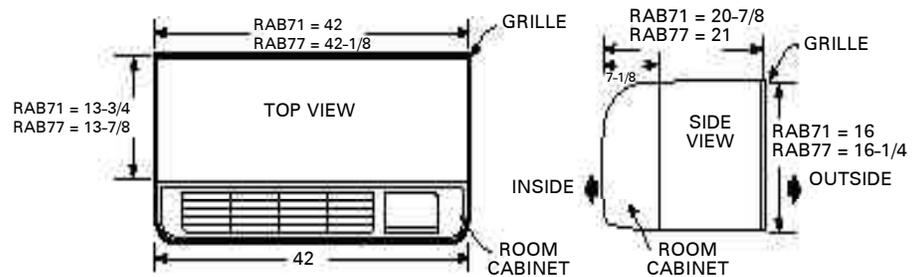


RAB77 WALL CASE

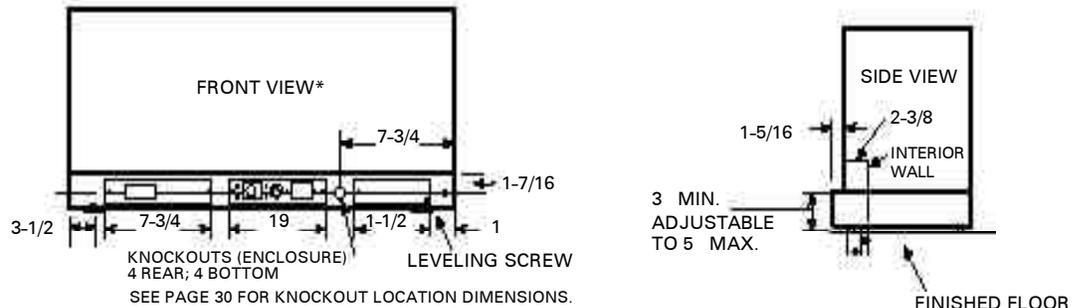
WALL OPENING
16-1/2 MIN. x 42-3/8 MIN.



WALL CASE WITH CHASSIS INSTALLED



WALL CASE WITH SUB-BASE

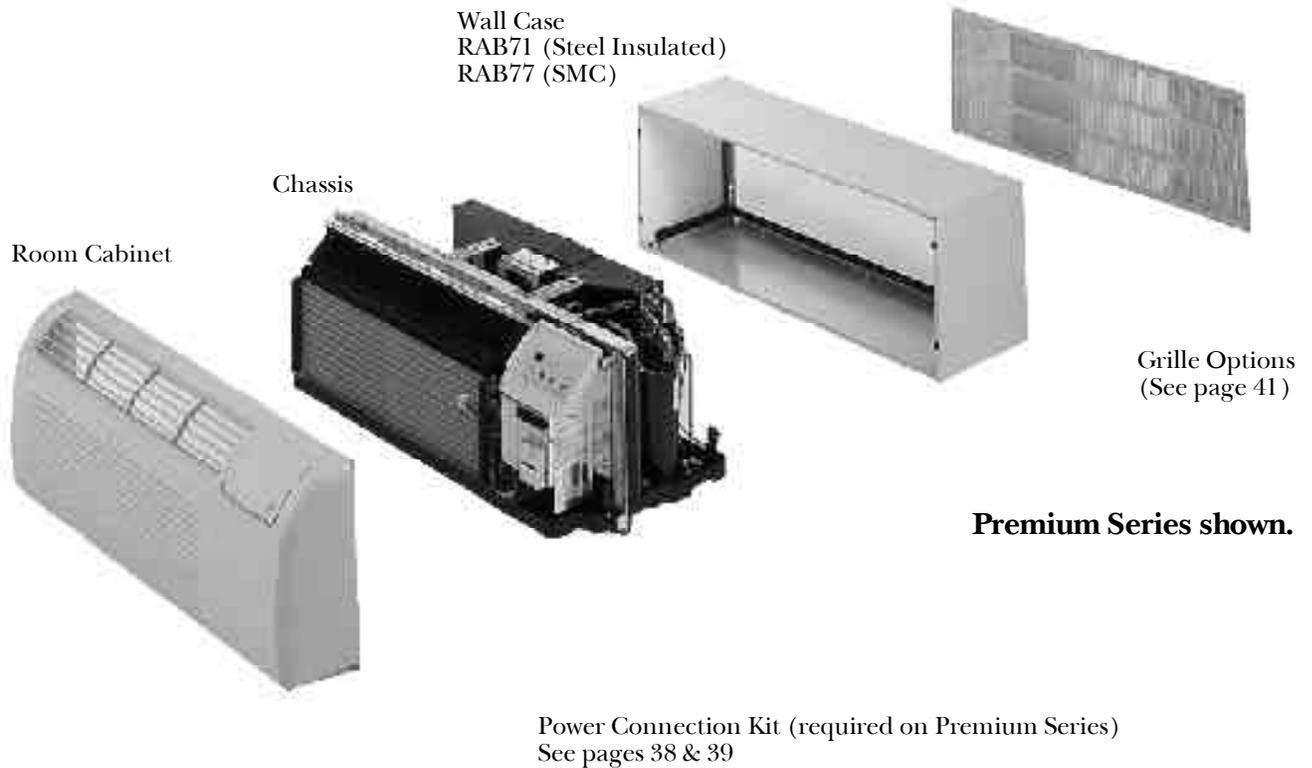


*SHOWN WITH ACCESS COVERS REMOVED.
NOTE: CAUTION - REMOVE KNOCKOUTS FROM INSIDE OUT.

Installation Instructions Packed With Wall Case . . . See Page 23 For Additional Information Concerning Outdoor Weather Panel and Case Stiffener.

The Zonline® System

Components of the Zonline® System



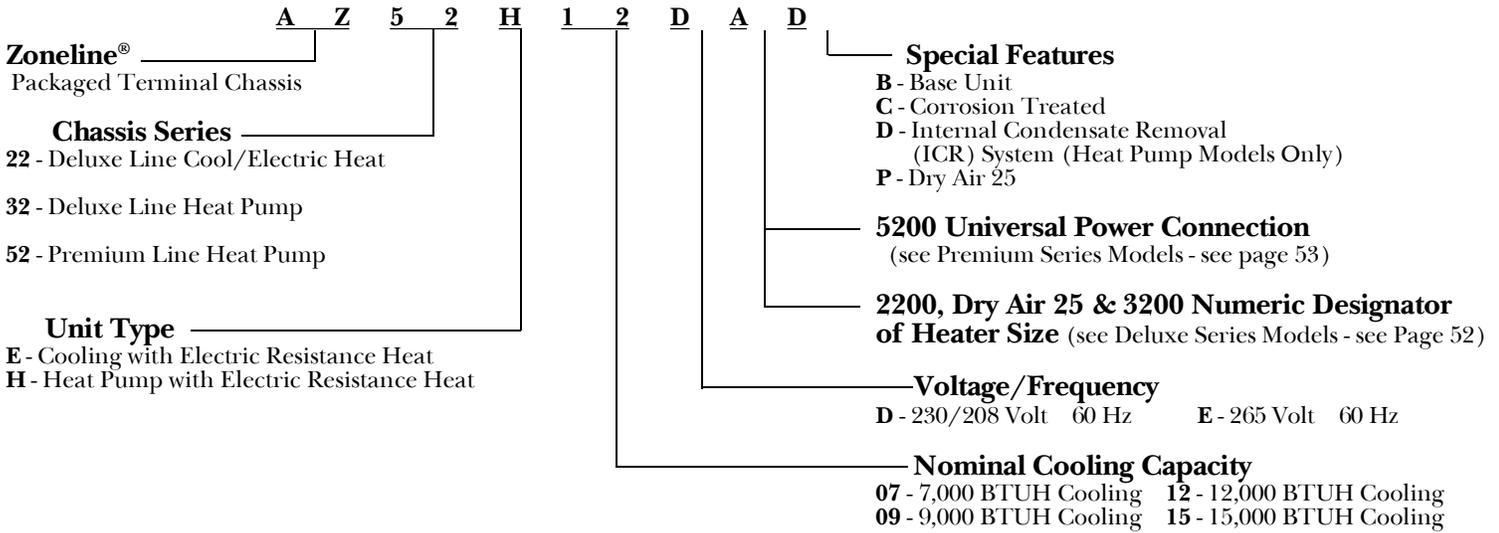
Optional Accessories of the Zonline® System



Zoneline® Chassis Nomenclature

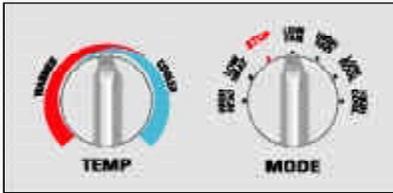
The Zoneline chassis is identified by a model number defining the type of unit, cooling capacity, electrical information and optional features included on the unit. When specifying or ordering the Zoneline chassis the use of this nomenclature will assure receiving the correct unit.

Example



2200 Series

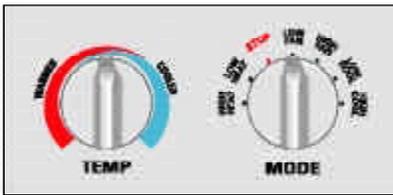
Dry Air 25 Models



COOLING WITH RESISTANCE HEAT

High Efficiency (EER 9.6 to 11.6) - Standard Microprocessor Controls, Fan cycle switch, Fan only setting and Concealed manual vent control. All models are equipped with Freeze Sentinel™, mechanical temperature limiting and low voltage (24v) DC power supply for 2 wire Central Desk Control* systems. Units are easily convertible for use with remote thermostat control.*

3200 Series



COOLING, HEAT PUMP WITH RESISTANCE HEAT BACKUP

High Efficiency (EER 9.6 to 11.6; COP 3.1 to 3.5) Standard Microprocessor Controlled Heat Pump models. **3200 Series includes all 2200 Series features**, plus heat pump operation. Heat Pump operates to outdoor temperatures as low as 25°F. (9°F outdoor coil temp) depending upon outdoor humidity conditions and/or the balance point of the system. The unit automatically switches to Resistance Heat if heat pump is unable to maintain room conditions. Utilizes passive air defrost system. Resumes Heat Pump operation when outdoor coil reaches 36°F. Internal Condensate Removal (ICR) system is available as an option. ICR minimizes the need for expensive internal or external drain systems to remove condensate generated during heat pump operation.

5200 Series



COOLING, HEAT PUMP WITH RESISTANCE HEAT BACKUP

Full Featured, High Efficiency (EER 10.0 to 12.0; COP 3.1 to 3.5), Highly Featured Microprocessor Controlled Heat Pumps. **5200 Series features** include Freeze Sentinel™, Automatic Fan Speed Control, Staged Heating, Universal Heater, UPC Power Connection, and 7-step Electronic Temperature Limiting. All 5200 Series models are adaptable to 2 wire Central Desk Control* systems. Units are also easily convertible for use with remote thermostat control.* The Heat Pump operates to outdoor temperatures as low as 25°F. After a low outdoor temperature (less than 25°F) the unit resumes heat pump operation when outdoor air temperature reaches 32°F. If heat pump is unable to maintain selected room conditions when outdoor temperatures are below 46°F., the unit will automatically phase-in **partial resistance heat simultaneously with heat pump operation** before switchover to full resistance heat. 5200 Series features an **active demand reverse cycle defrost system**. Internal Condensate Removal (ICR) system is available as an option. ICR minimizes the need for expensive internal or external drain systems to remove condensate generated during heat pump operation.

*(Requires Optional Interface Module (RAKOIM) for Central Desk Control or Remote Thermostat Control operation.)

Zonline® Features

Model Series

	AZ 2200	AZ 3200	AZ 5200
Enhanced Dehumidification - Dry Air 25	Optional	N/A	N/A
Cooling EER Range (230 Volts/265 Volts)	9.6 - 11.6	9.6 - 11.6	10.0 - 12.0
Heating COP Range (230 Volts/265 Volts)	N/A	3.1 - 3.5	3.1 - 3.5
Heat Source - Electric Resistance Heat	Pages 52, 53		
Heat Source - Heat Pump With Backup Resistance Heat		Std. Pages 52, 53	
Heat Source - Heat Pump With Selectable Full Time or On Demand Simultaneous/ Supplemental Resistance Heat			Std. Pages 16, 53
Quick Heat Recovery		Std. - Page 14	Std. - Page 14
Heat Pump Defrost system		Passive	Reverse Cycle
Fan Motors - Permanently Lubricated	2	2	2
Standard Microprocessor Controls	Standard	Standard	
Highly Featured Microprocessor Controls			Standard
Rotary Compressor	Standard	Standard	Standard
Automatic Compressor Restart Delay	Standard	Standard	Standard
Corrosion Treated (Not Available in 5KW Heater)	Optional	Optional <small>(Not Available in 265V, 2KW Heater)</small>	
Power Connection**	Included	Included	UPC*
Universal Heater			Standard
Reversible Indoor Air Louvers	Air Discharge Angles: 40°/50°	Air Discharge Angles: 40°/50°	Air Discharge Angles: 40°/50°
Fan Cycle Switch	Standard	Standard	Standard
Indoor Fan Speed Selections - Hi/Low	Standard	Standard	Standard
Automatic Indoor Fan Speed			Standard
2 Speed Outdoor Fan	Standard	Standard	Standard
Fan Only Setting	Standard	Standard	Standard
Up-Front Filters	Standard	Standard	Standard
Concealed Manual Vent Control	Standard	Standard	Standard
Rotary Control Knobs	Standard	Standard	
Touch Controls (Tactile Controls)			Standard
Electronic Temperature Selection (Slews Up & Down) with Digital Display			Standard
Staged Heating			Standard
Freeze Sentinel™	Standard	Standard	Standard
Automatic Emergency Heat		Standard	Standard
Electric Resistance Heat Lock-Out (above 46°F)			Standard
Temperature Limiting	Mechanical	Mechanical	7-Step Electronic
Remote Control Capability With Wall Mounted Thermostat	Requires RAKOIM Page 16	Requires RAKOIM Page 16	Requires RAKOIM Page 16
Central Desk Control Capabilities With Load Shedding Option	Requires RAKOIM Page 16	Requires RAKOIM Page 16	Requires RAKOIM Page 16
Ducted Installation Capability	RAK6052	RAK6052	
Unit Diagnostics			Standard
Service Indicator			Temp Display Blinks
Internal Condensate Removal (ICR) Factory Installed Option. Cannot be used in Corrosion Areas.	N/A	Optional	Optional

*UPC - Universal Power Cord Connection (See pages 38, 39 and 53)

**265 volt product. MUST be direct connected to meet National Electrical Code and all local codes.

Chassis Features and Benefits

Consistent Physical Dimension

Fits all existing GE Zoneline wall cases (see page 21)

The GE Zoneline was first introduced into the marketplace in 1961. Since that time, efficiencies and features have been greatly improved. In spite of these improvements, GE recognizes that some features should stay the same. That's why any recently-manufactured Zoneline chassis can be installed in any Zoneline wall case, regardless of age. The original Zoneline wall case was 42" wide by 16" high, the same dimension of the wall case today, enabling a new Zoneline to be installed in an existing 42" by 16" wall case without the need for extensive modifications. Note: Existing outdoor grille may need to be replaced or modified. (see page 41)

Controls Conveniently Located, Easy to Operate

Reduces uncertainty of operation for room occupant (see page 8)

Zoneline controls are mounted on the top of the unit, angled for better visibility and access. The controls are under a door for appearance enhancement. The 2200 Series and the 3200 Series have rotary controls for temperature and operation selection. The 5200 Series units have Touch Pad controls. An optional locking control door, RAK8022 is available.

Universal Heater - Premium Models

Resistance heat output of unit can be matched to the heating demands of the particular area (see pages 38, 39 and 53)

Often, the choice of a Zoneline heater is influenced by the location of the room it is intended to heat. For instance, the end room in a wing or the corner rooms on top floors will have a higher heat loss than interior rooms having only one wall exposed to the outdoors. These higher heating demands are often compromised for the sake of equipment consistency. In many instances, all rooms are sized higher to accommodate the minority of the rooms having the higher heat loads. Naturally, such sizing policies result in increased total connected current load, and quite often, higher overall energy costs.

In response to this customer need, each Premium Model is equipped with three built-in heaters and, when connected with the proper Universal Power Connection Kit (UPC), can be closely matched to the heating requirements and circuit ampacity of a specific room. In addition, this feature allows maintenance personnel to interchange units in rooms having different heating requirements.

Discreet Heater - Deluxe Models

Resistance heat output of unit can be matched to the heating demands of the particular area (see pages 38, 39 and 53)

Deluxe Models offer cost-conscious customers factory-installed discreet heaters. The ninth character in the Deluxe Line model number represents the specific wattage of the heater. A Deluxe Model chassis may be ordered with a custom resistance heater in any one of the following KW ratings:

230/208 Volts: 2.55/2.09 KW; 3.45/2.82 KW;
5.00*/4.09 KW

265 Volts: 2.00 KW; 3.00 KW; 4.00 KW; 5.00 KW*

Premium Models - Universal Heater and Power Cord

UPC Heater KW- Premium Models

230/208 volt	15 amp RAK3152	2.55/2.09 KW
	20 amp RAK3202	3.45/2.82 KW
	30 amp RAK3302	5.00*/4.09 KW
265 volt	15 amp RAK5152	1.7 KW
	15 amp RAK5172	3.0 KW
	20 amp RAK5202	3.7 KW
	30 amp RAK5302	5.0 KW*

Reversible Discharge Louver

Enables discharge air flow to be changed to maximize air distribution and comfort (see page 42)

Reversible louver section on all units.

The discharge louver section comes from the factory set to exhaust air into the room at an angle of 50° off vertical. The louver section may be reversed to provide a discharge angle of 40° off vertical with the simple removal of seven screws, rotating the louver section end to end, and reinserting the screws. The screws are located on the inside of the room cabinet.

Fan Cycle Switch

Allows indoor fan to be set to run continuously or cycle on and off with compressor and heater

Setting the fan to cycle off and on with the compressor or heater results in some energy savings when the fan is not operating. The amount of energy savings will vary depending upon many factors.

2200 & 3200 Series: The room cabinet must be removed to gain access to the fan cycle switch. The switch is set in the DOWN/OFF position at the factory to provide continuous fan operation in the cool and heat modes. Leaving the switch in the continuous setting allows circulation of room air and will result in a more uniform temperature throughout the room.

The fan switch on the Deluxe Models is located on the Auxiliary Control Panel. It is switch number two. Setting the switch in the UP/ON position will cause the fan to cycle on and off with the compressor or resistance heater. In humid climates, operating the unit in FAN CYCLE may result in better dehumidification.

5200 Premium Model: The fan cycle switch is located behind the room cabinet. The switch is set in the DOWN/OFF position at the factory to provide continuous indoor fan operation in the cool and heat modes. Leaving the switch in the DOWN/OFF setting allows continuous circulation of room air and will result in a more uniform temperature throughout the room. In humid climates, operating the unit in FAN CYCLE may result in better dehumidification.

The fan switch on the Premium Models is located on the Auxiliary Control Panel. It is switch number nine. Setting the switch in the UP/ON position will cause the fan to cycle on and off with the compressor or resistance heater.

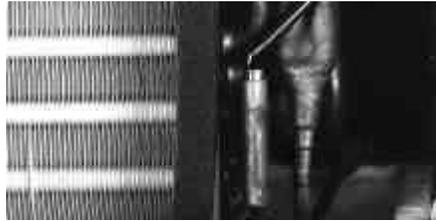
*NOTE: 5.0 KW heaters not available on 7,100 BTUH units.

Chassis Features and Benefits

Automatic Frost Control

Permits unit to be operated in cooling mode with low outdoor temperatures

Occasionally, cool outdoor temperatures and high indoor humidity conditions will cause frost to form on an air conditioner's indoor coil. When this occurs, the excessive frost restricts air flow and decreases cooling performance. GE Zoneline's Automatic Frost Control detects when frost is forming and shuts off the compressor to prevent component damage. The unit restarts automatically when the frost has melted. This feature enables a room occupant to select cooling in spite of low outdoor temperatures.



Weather Protected Electrical Components

Extends life of electrical components

Outdoor conditions may shorten the life expectancy of electrical components such as capacitors and relays. To the extent possible, all electrical components are located on the indoor side of the weather barrier (the sheet metal component separating the indoor side and the outdoor side of the unit) to protect them from the outdoor elements.

Corrosion Treatment (Optional)

Helps extend the life of the unit in corrosive environments

An air conditioner installed close to a seacoast or highly corrosive industrial environment, where acids or salts are in the atmosphere, will not have the life expectancy of a unit installed elsewhere. To help extend the life of a Zoneline installed in these areas, steps are taken to make the unit less susceptible to corrosion. For example, selection of non-corroding materials, a process of protecting metal parts by galvanizing and an electro-deposited paint system, all help retard corrosion. In addition, the aluminum fins on the outdoor coil are specially treated to extend their operating life. (Standard on Dry Air 25 Models)

All GE Zonelines can be ordered corrosion treated except 3200 Series Heat Pump units with Internal Condensate Removal (ICR) System, 265V 2KW Heater Models, 5200 Series Heat Pumps or 2200 & 3200 Series 5KW Heater Models. Never install a unit with ICR in a seacoast or corrosive environment. Units installed in corrosive environments should be examined and cleaned regularly.

Weather-Resistant Superseal

Minimizes air and water infiltration through the unit

When the GE Zoneline is properly installed in an undistorted GE Zoneline wall case, the air infiltration through a unit without ICR is a maximum of seven cubic feet per minute with a 25 mile per hour wind velocity. Units with ICR have a maximum of ten cubic feet per minute with the same conditions. The air infiltration test is conducted in accordance with ASTM E283-91. The ARI specification for air infiltration for a unit the physical size of the Zoneline is 19 cubic feet per minute.

Unit also meets ASTM E331-86 (Hurricane Test) which specifies no water can enter through the unit during 15 minute exposure to rainfall at the rate of eight inches per hour with 63 mile per hour wind velocity.

Ventilation Control

Hidden controls help prevent unauthorized selection of outdoor air ventilation - Saves energy

Zoneline chassis are capable of introducing up to 70 CFM of fresh air into a room. This feature allows maintenance personnel to freshen a room and reduce odors caused by stale indoor air.

The vent door control is located on the left side of the chassis behind the room cabinet and out of sight of the room occupant. Hiding the vent control from the room occupant ensures that it cannot be changed from the condition desired by the building management. This is important because an open vent door introduces unconditioned air into the room. The additional heat load causes the unit to operate longer and that translates into higher operating costs! In warm humid climates the introduction of outdoor air may allow excessive moisture (water vapor) to enter the room. If the room air reaches a humidity level above the Dew Point of the cold discharge air, the moisture in the room air will condense into visible droplets. This condition is often referred to as the unit is producing Fog, or Fogging.



Easy Access Air Filters

Two up-front filters are removable from top of unit without removing room cabinet

A clean filter is essential for good air conditioner performance and longer life. A dirty filter reduces air flow which results in higher energy consumption. **GE has made filter cleaning an easy task! Some packaged terminal air conditioners or heat pumps which require removal of the room cabinet or a blind positioning of the filter under the unit, the up-front filters on the GE Zoneline are conveniently accessed by simply pulling them up from the top of the room cabinet. This feature reduces maintenance time and helps keep the units operating in peak condition. Because the filters are so easy to remove, it also increases the likelihood that cleaning will occur on schedule.**



Chassis Features and Benefits

Permanently Lubricated Fan Motors / Indoor and Outdoor Air Movers

Designed for low maintenance and optimum value, efficiency, and performance

Zoneline units have permanently lubricated fan motors. Fan motors that require oiling on a periodic basis generate an additional maintenance cost for removing, oiling, and reinstalling the units in the wall case. The Permanent Split Capacitor (PSC) motors used in Zonelines are permanently lubricated and totally closed to prevent dirt and foreign material from entering the motor and shortening its life.

2200 and 3200 Series units use squirrel cage indoor blower and propeller type outdoor fan. The Zoneline 2200 Series Packaged Terminal Air Conditioner (PTAC) and the Zoneline 3200 Series Packaged Terminal Heat Pump (PTHP) use two fan motors to operate the indoor blower and the outdoor fan. A squirrel cage blower on the indoor side combined with 2 discharge ports provide balanced temperature air flow and quiet operation. The outdoor fan is a molded polymer propeller type fan. The outdoor fan motor does not operate in FAN ONLY or in resistance heat operation on 2200 series.

5200 Series units employ a cross-flow indoor blower and propeller outdoor fan. The Zoneline 5200 Series PTHP has two fan motors. A quiet, efficient, tangential cross-flow blower is driven by the indoor fan motor. The outdoor fan is a molded polymer propeller type fan driven by a separate motor. The outdoor fan motor does not operate in FAN ONLY.

Rotary Compressor

Fewer moving parts for quiet, dependable service

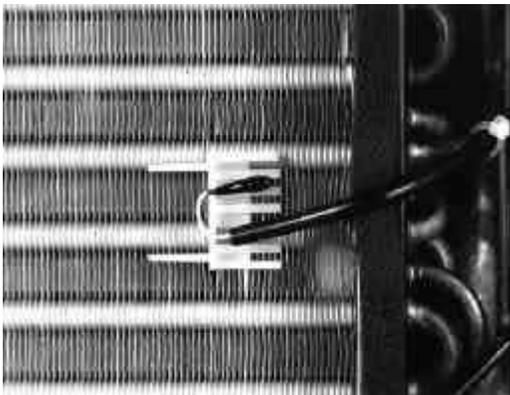
GE introduced the use of rotary compressors in their air conditioners in 1957. Today, rotary compressors are the quiet and efficient compressor choice for Packaged Terminal Air Conditioners and Heat Pumps.

Control Devices

Designed to maximize value and room comfort

All Zonelines have electronic thermostats. Electronic thermostats utilize a thermistor to sense room temperature.

A thermistor is a resistor that changes value (resistance) with a change in temperature. The resistance changes rapidly and predictably with temperature. Interfaced with a microprocessor in the Zoneline 2200, 3200 and 5200 series units, the thermistor can sense temperature changes as small as 0.2°F. in staged heating and less than 1.0°F. in the heating and cooling modes.



Freeze Sentinel™

Automatically turns on resistance heaters to help prevent damage from freezing temperatures

Freeze Sentinel™ is standard on the Zoneline. The temperature in unoccupied rooms may fall below freezing during extremely cold weather. In these circumstances, Freeze Sentinel™ automatically provides heat without relying upon individuals reacting to weather changes. The Freeze Sentinel™ turns the heater and fan on at 41°F. and off at 46°F. These are temperatures measured at the room air temperature sensor.

Compressor Restart Protection

Electronically locks-out compressor operation to allow system pressure equalization

Compressor Restart Protection is standard on all Zoneline Units, and prevents the compressor from starting before sufficient time has elapsed for the internal refrigerant pressures to equalize. This situation could occur if a room occupant turns the unit back on too quickly after shutting it off - or if the thermostat is adjusted immediately after the compressor has shut off. By locking out the compressor until the pressures have equalized, the thermostat prevents the compressor overload from tripping. That in turn, alleviates any anxious moments for the room occupants while they wait for the overload to reset.

High Ambient Heat Pump Operation Protection

Automatically protects the compressor during heat pump operation.

High Ambient Heat Pump Protection is standard on the 3200 and 5200 Series Zoneline.

If a heat pump is operated in the HEAT mode when outdoor temperatures are at a point where heat is not normally required, the compressor may cycle on the overload protector. An electronic sensor monitors indoor coil temperature and terminates outdoor fan operation when high temperatures are reached and resumes when the indoor coil temperature drops.

Emergency Heat Switch

The 3200 and 5200 Series Models are equipped with an emergency heat switch that overrides the heat pump feature and energizes the electric resistance heaters. With the emergency override dip switch set, the heat pump function is locked out and the unit operates as an electric resistance heat model. Operating the unit in resistance heat results in higher utility costs.

Chassis Features and Benefits

Temperature Limiting

Saves energy by controlling temperature extremes

Temperature limiting restricts the operating range by preventing the controls from being set to energy wasting extremes. **2200 and 3200 Series units**

have mechanical temperature limiting.

Mechanical temperature limiting involves positioning screws, located under the control panel, to restrict the movement of the temperature control knob. Each location will reduce the operating temperature extreme by about 2.5°F.



Limiting Screws Shown in Factory Setting

Mechanical temperature limiting is independent type limiting, which means limiting the lowest cooling temperature will not permit heating selections below that point, and limiting highest heating temperature will not permit cooling selections above that point.

Mechanical temperature limiting is detectable to the user since the control knob will not turn to its extreme settings.

5200 Series units with highly featured microprocessor controls have electronic temperature limiting. The temperature is limited electronically. The display is limited to the temperature that the unit can attain. If the temperature limits have not been programmed, the full range from 60°F to 85°F can be changed by the user. It also allows the heating and cooling temperature limits to be set independently.

Temperature limiting can reduce energy costs by limiting the lowest cooling temperature and the highest heating temperature. Electronic Temperature Limiting is achieved by setting the first six small vertical dip switches in a strip of 14 mounted on the auxiliary control circuit board. The first three (1 thru 3) are used to select cooling range limits and the next three (4 thru 6) are used to select heating range limits.

Programmable Temperature Cooling Limits at the Thermistor							
60	64	66	68	70	72	74	76
Programmable Temperature Heating Limits at the Thermistor							
85	80	78	76	74	72	70	65

Random Restart

Prevents extreme amperage draw on main circuit after power failure

Automatic Random Restart is standard on all Zoneline units.

When power is restored after an outage, several compressors starting simultaneously can cause a power drain. The Random Restart feature prevents all units from restarting at the same time. Each unit will restart in a period of three minutes and three seconds to three minutes and twenty seconds after the power is restored to the units. The circuit design adds a random variance to prevent all of the units from restarting at precisely the same time, and allows time for the internal pressure of the refrigerant system to equalize so the compressor will start and not trip the overload.

Compressor Malfunction Indicator

Service indicator on control panel signals a possible compressor problem

The Service Indicator is standard on the Zoneline 5200 Series. Should the compressor fail to start after four attempts, with a three-minute pause between each attempt, the temperature display will blink to alert the user or the maintenance staff that the unit needs service. The 5200 Series heat pump will continue to provide heat for the room with the electric resistance heaters. However, the unit should be serviced as soon as possible so it may be returned to economical heat pump operation.

Auto Fan Speed Control

Automatically selects fan speed necessary for better comfort and quieter operation

Auto Fan Speed Control is standard on Zoneline 5200 Series. The units have three fan speed selections - HIGH, LOW and AUTO

changed by pressing the FAN touch control. When the AUTO setting is selected, the indoor cross-flow blower and the outdoor fan automatically switch to LOW fan speed when the room temperature is within 1.8°F. of the selected setting. This feature reduces operating sound level in both the cooling and heating modes by changing the fan speed to its lowest operating level.



Zoneline 5200 Control Panel

If the unit is connected to a remote thermostat, Auto Fan Speed Control is not functional and, if the fan speed is set at AUTO, the unit will operate in HIGH fan speed. However, LOW fan speed may be selected by changing setting of dip switch B (11th from the left) on auxiliary control panel to the UP/ON position.

Chassis Features and Benefits

Unit Diagnostics

Switch on auxiliary control panel cycles unit's components to help detect malfunction

Unit Diagnostics is standard on the Zoneline 5200 Series.

When the Unit Diagnosis switch, located on the auxiliary control panel, is turned to the ON/UP position, the unit cycles through the operation of various components. The operation of the main heater, supplemental heater, indoor fan motor (both high and low speeds), and the compressor are checked.

The reversing valve is also cycled through the cooling and heating modes. The Unit Diagnostics feature helps a servicer identify a malfunctioning component thus reducing service call time. During the Diagnostic Cycle a d will be displayed in the temperature display.

Quick Heat Recovery (5200 and 3200 Series)

Provides faster room comfort conditions in heating operation

As the name implies, Quick Heat Recovery activates whenever the heating selection has been initialized. This feature provides electric resistance heat whenever the unit is turned on in a heating mode or switched from any other mode to heating. Its purpose is to quickly bring a room to the desired temperature by using electric resistance heaters. This feature minimizes any concerns a room occupant might raise about the discharge air temperature of a heat pump and the time it might take to bring the room up to temperature. Quick Heat Recovery is functional when connected to a Central Desk Control system.

Electric Resistance Heat Lock-Out (5200 Series Only)

Saves energy during milder temperature conditions

The electric resistance heaters are disabled on the 5200 Series whenever the outdoor temperature is above 46°F. This feature decreases operational costs by automatically maintaining energy-efficient heat pump operation during conducive weather conditions. However, The Quick Heat Recovery Feature (described above) is still operational.

Load Shedding Option (RAKOIM required)

Provides installation flexibility

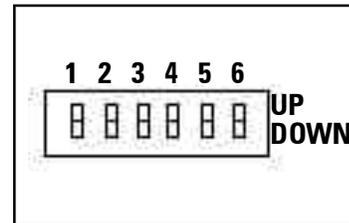
Load shedding may be accomplished on any Zoneline connected to an Energy Management Control System.

Premium Models: The Load Shedding dip switch (switch C (12th from the left), located on the auxiliary control panel) must be set in the ON/UP position. **Deluxe Models:** Load Shedding may also be achieved by setting switch (5th from the left), located on the auxiliary control panel) to the ON/UP position.

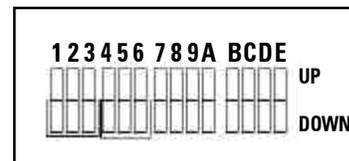
Load Shedding allows building management to gain control of the Zoneline's compressor and heater without affecting fan operation. Under these circumstances, the fan will operate whenever the Zoneline's thermostat closes. Normal operation is restored when the Energy Management Control System relinquishes control.

Auxiliary Controls

The switches on the Zoneline models can be set to provide operational control to the unit that is not available to the tenant of the room. It is the owners responsibility to position these switches to provide the unit operation they desire.



2200/3200 Series



5200 Series

2200 Series Enhanced Dehumidification

The Newest Innovation from GE...the Dry Air 25

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 the Dry Air 25 to remove 25% more moisture from the air than other packaged terminal air conditioners.

The Dry Air 25 system, Heat Pipe, is a hermetically sealed heat transfer surface that is saddle-bagged around the indoor coil (evaporator) of the Zoneline. This coil arrangement will transfer heat from one coil to another without power consumption. This assembly uses R-22 as the refrigerant and is isolated from the regular Zoneline refrigerant circuit.

As warm humid air is pulled through the pre-cool section of the Heat Pipe, the heat removed from the air is absorbed by the refrigerant, causing the refrigerant to boil. As the pre-cooled air passes through the Zoneline evaporator, the air is further cooled (colder than it would be normally), removing 25% more moisture than other packaged terminal units.

As the cold air passes through the re-heat section of the Heat Pipe, the refrigerant condenses and the liquid flows back to the pre-cool section to be re-heated again. The air discharged into the room by this process is much drier, creating a more comfortable room condition.

The Dry Air 25 is perfect for high humidity climates. Available on 7000, 9000 and 12000 BTU models.

Heat Pumps and Energy Savings

GE Zoneline 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 as an electric resistance heater.

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 of 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 of 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 two series of Heat Pump units - the 3200 Series with Standard Microprocessor controls and the 5200 Series with Highly Featured microprocessor controls - and both Series utilize multi-stage thermostats to 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 Pump Operation Zoneline 3200 Series

Switchover to resistance heat is determined by indoor temperature differential and outdoor coil temperature

The **Zoneline 3200 Series** heat pumps are Standard Microprocessor controlled units. A solid state thermostat control is used to measure the room temperature and compare it to the temperature selected with the **TEMP** control knob. A temperature sensor is in contact with the outdoor coil to monitor the outdoor coil temperature during heat pump operation.

The switchover point of the 3200 Series heat pump is determined by the outdoor coil temperature or the indoor air temperature. When the outdoor coil temperature is above 9°F. (which corresponds to approximately 25°F. outdoor air temperature), the unit attempts to provide sufficient heat through heat pump operation to satisfy the selected temperature setting.

A two-stage thermostat monitors the indoor room temperature and determines if the heat pump output is adequate to maintain comfort conditions. As long as the heat pump output maintains the room temperature within 2.7°F of the set point, the unit will operate in the heat pump mode. If the room temperature continues to decline with the heat pump operating, heat pump operation will terminate and the unit will switch over to electric resistance heat to warm the room. This heat source logic allows the heat pump to operate to lower outdoor temperatures, increasing the savings from heat pump operation, while providing the ability to use resistance heat only when necessary. **The heat pump and the electric resistance heaters never operate simultaneously on the Zoneline 3200 Series Units.**

Heat pump defrost - 3200 Series

If the outdoor coil drops below 9°F. (which corresponds to approximately 25°F. outdoor air temperature), the unit employs a passive defrost system. A passive defrost system prevents heat pump operation until outdoor temperatures rise sufficiently to enable economical heat pump operation to resume. During the defrost mode, the indoor temperature is maintained by the electric resistance heaters. The defrost cycle terminates when the outdoor coil temperature rises above 36°F., at which point the two-stage thermostat will allow the unit to return to economical heat pump operation.

Heat pump condensate

See page 32 for information on heat pump condensate. The Zoneline 3200 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.

Heat Pumps and Energy Savings

Heat Pump Operation Zoneline 5200 Series

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

The **Zoneline 5200 Series** 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 5200 series is designed to help insure a comfortable room. When HEAT is selected, the unit will determine if the room air is warm enough to satisfy the thermostat setting. If the temperature at the unit sensor is below the desired temperature, the electric resistance heater will be utilized to warm the room to the point where the thermostat is satisfied. This feature is designed to allow the temperature of an unoccupied room to be maintained at an energy saving level without inconveniencing the room occupant. Once the thermostat has been satisfied, the resistance heater will turn off and the heat pump will operate as shown in Zoneline 5200 Series Heat Source Logic chart when the thermostat calls for heat again. The unit will operate in this manner even if connected to a Central Desk Control.

Zoneline 5200 Series Heat Source Logic			
ROOM TEMPERATURE VS. THERMOSTAT SET POINT	Outdoor Temperature		
	Above 46°F.	Between 46°F. and 25°F.	Below 25°F.
Less Than 1.8°F. Below	Heat Pump	Heat Pump*	Full Resistance Heat
1.8°F to 2.7°F. Below	Heat Pump	Heat Pump + Supplemental Heater	Full Resistance Heat
More than 2.7°F. Below	Heat Pump	Full Resistance Heat	Full Resistance Heat

*If the Temperature Boost switch (dip switch #8) is in the ON position the supplemental simultaneous heater will be used with heat pump operation. Simultaneous supplemental heater: 1.0 KW @ 230 V; 0.8 KW @ 208 V; 1.7 KW @ 265 V

The Temperature Boost option, selected by a hidden dip switch #8, utilizes the supplemental simultaneous heater with heat pump operation when the outdoor temperature is below 46°F. regardless of the indoor air temperature. The chart above indicates the heat source of the Zoneline 5200 series 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 Zoneline 5200 Series Heat Source Logic shown in the chart above. For more information about the Quick Heat Recovery Feature, see page 14. The full heat output of the resistance heater is dependent upon circuit amperage and the power connection kit used. See pages 38 and 39 for information on the power connection kits and available heater capacities.

Heat pump defrost - 5200 Series

The Zoneline 5200 Series has a reverse cycle demand defrost system to extend heat pump operation and increase savings from the 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 build-up. Before and after actual reverse cycle defrosting, the unit shuts off the compressor to allow the refrigerant pressures to equalize throughout the system. This eliminates the possibility of a loud reversing noise. During these periods of pressure equalization, the full resistance heat capacity of the unit is activated to help insure room comfort conditions during the defrost cycle. The defrost cycle termination requires a minimum of 2 minutes and a maximum of 9 minutes or an outdoor coil temperature of 68°F.

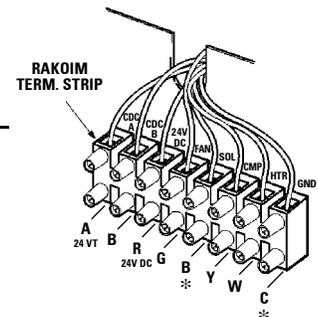
Heat pump condensate See page 32 for information on heat pump condensate. The **Zoneline 5200 Series** heat pump may be ordered with a factory installed Internal Condensate Removal (ICR) system to minimize the amount of condensate water draining from the unit during heat pump operation.

Optional Interface Module RAKOIM

The RAKOIM is required if a unit is to be installed with a Central Desk Control or Remote Thermostat.

The RAKOIM is installed under the control box. There are channels to contain the RAKOIM and screws are provided to secure it in place. There is a short wire harness on the RAKOIM that is plugged into the mating receptacle on the front of the control box just below the dip switches. There are screw terminals on the front of the RAKOIM for field wiring. Follow the instructions included with the RAKOIM when installing this accessory.

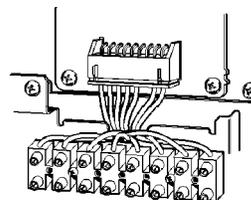
Remote Thermostat Terminal ID	RAKOIM Terminal Identification
R	R 24V DC
G	G Fan
*B	*B Sol
Y	Y Cmp
W	W Htr
*C	*C Gnd



*These terminals are not used for the Cooling/Electric Heat 2200 series models (Thermostat RAK163) Four (4) conductors are required.

All of the terminals are required for the Heat Pump models, 3200 and 5200 Series (Thermostat RAK147) Six (6) conductors are required.

The two terminals (A and B) are for Central Desk Control.



Central Desk Control -

Optional Interface Module (RAKOIM) is required

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, signalling the air conditioner to turn 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.

Zoneline models offer Load Shedding capabilities on units connected to Central Desk Control Systems. For more information on the Models Load Shedding Feature, see page 14.

There are a wide variety of devices available, each with its own benefits and constraints. While GE does not offer components that are external to the unit for a Central Desk Control (CDC) system, GE Zonelines are compatible with most CDC and Energy Management systems. **No external power source is required to operate this system. The unit provides a 24 volts DC circuit that powers the Central Desk Control system.**

All Zoneline 2200, 3200, and 5200 Series units can have the **Optional Interface Module (RAKOIM)** field installed to provide a CDC interface that permits the unit to be connected to most of the energy management systems on the market. The devices connected to the Zoneline units require no power supply or transformer external to the unit.

See page 16 RAKOIM for field wiring.

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 buss (at the unit or at the switch panel) in the wiring.** Both wires comprising the circuit must connect to the unit s (RAKOIM) and to the controlling switch. Running one wire from one unit to another unit - common bussing - may damage internal components or cause erratic operation of the system.
- 3) A 24 volt transformer is contained within the Zoneline. **No external voltage should be applied to the unit through the CDC terminals.** (Voltage on the CDC conductors is 24 volts DC.)
- 4) Recommended wire size must be followed as a minimum requirement.

Wire Size #AWG

#22

#20

#18

#16

Maximum Allowable Length

600 Ft.

900 Ft.

1500 Ft.

2000 Ft.

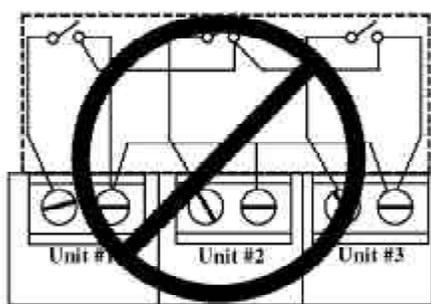
Freeze Sentinel™ remains operational when the unit is connected to a CDC system. Even if the unit is turned OFF at the central location, if the sensor at the unit detects the low temperature, the electric resistance heaters and the fan will automatically turn on.

Connecting the Zoneline to a CDC system does not eliminate the ability to connect the unit to a remote thermostat. Once the circuit is opened, and control of the unit removed from the CDC system, the selected controls - either the unit mounted control or the remote thermostat - govern the operation of the unit.

CDC Terminal Location and Typical Wiring

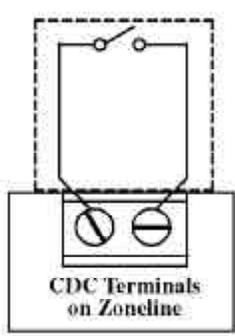
Auxiliary Control Panels With Cover Removed

**Example of Common Bussing
NOT PERMITTED**



INCORRECT Common Bussing

**Normally Open
Switch -
Unit Operational**



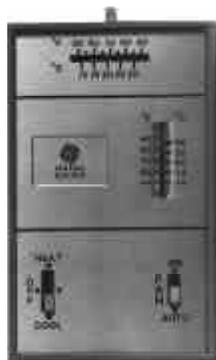
Typical Wiring

(All Wiring Shown Is Field Supplied)

Remote Thermostat Control

Optional Interface Module (RAKOIM) is required

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



RAK163A1

All Zoneline 2200, 3200 and 5200 Series units are adaptable to the Optional Interface Module (RAKOIM) kit to be controlled with a Class 2 remote low voltage thermostat. The only additional field supplied components are the remote thermostat and wiring necessary to connect it.

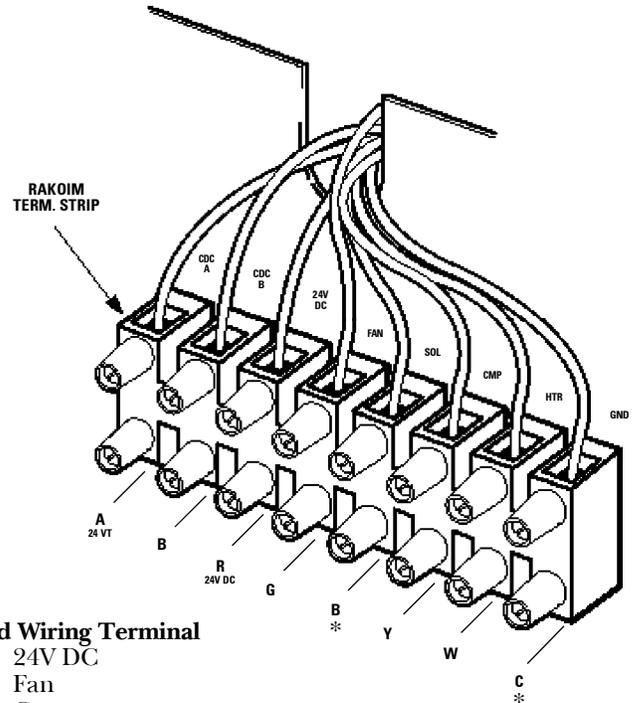
The controls on the unit are not functional when the remote control function is used.

Resistance Heat Models

The Zoneline 2200 resistance heat units may be connected to a single stage manual switchover thermostat designed for use with cooling electric heat systems. A thermostat, model RAK163, is available from GE for use with these units. The control voltage on the remote control conductors is 24 volts DC. **The DC voltage may not be compatible with some solid state remote control thermostats.**

As shipped, the 2200 Series units operate in **HIGH** fan speed when connected to a remote thermostat. Low fan speed can be attained by positioning the dip switch #4 (low fan) to the ON/UP position.

Freeze Sentinel™ remains operational if the unit is connected to a remote thermostat. The unit may be connected to a Central Desk Control (CDC) system and controlled with a remote thermostat when the CDC system has the unit in an operational status. See pages 16 and 17 for additional information on the CDC system.



Field Wiring Terminal

R 24V DC

G Fan

Y Cmp

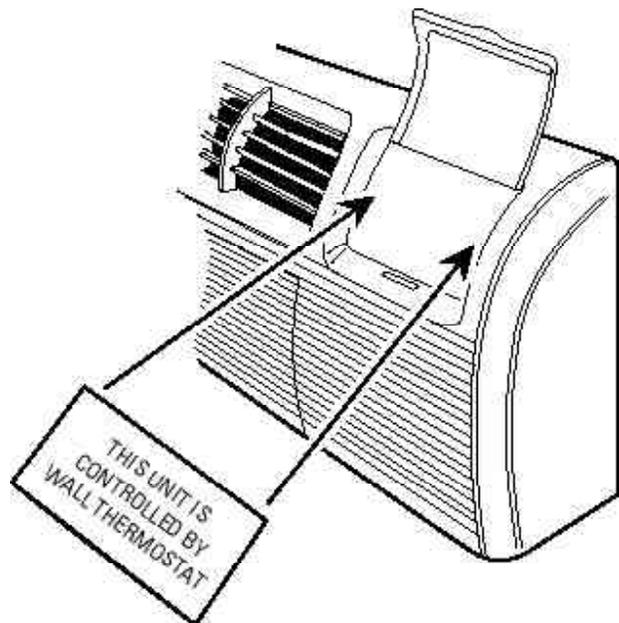
W Htr

* These terminals not used for the 2200

Follow the instructions included with the RAKOIM when installing this accessory.

RAK 806 Universal Control Cover Label

When a Zoneline unit is using a remote thermostat control, the RAK806 Universal Control Cover Label is recommended. The label adheres over the control panel directing the user to the wall thermostat for operation of the Zoneline unit.



Remote Thermostat Control

Heat Pump Models

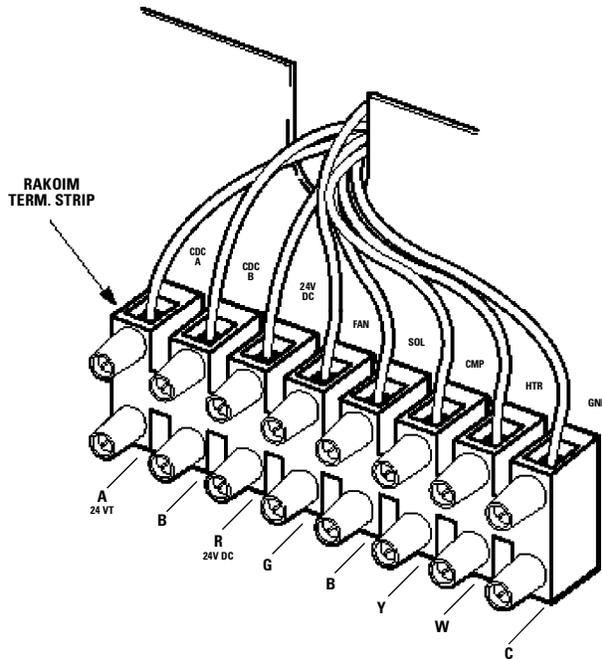
The **Zoneline 3200 and 5200 Series** heat pump units may be connected to a one stage cooling/two stage heating manual switchover thermostat designed for use with heat pump systems. A thermostat, model **RAK147**, is available from GE for use with these units. The control voltage on the remote control conductors is 24 volts DC. **This DC voltage may not be compatible with some solid state remote control thermostats.**



RAK147A1

The **3200 and 5200 Series** units use the Optional Interface Module (RAKOIM), purchased separately. The wiring connections from the thermostat are made to the color coded conductors on the socket wire kits. To ensure proper operation, be sure no wiring is exposed that may come in contact with the chassis. (A wiring diagram is packaged with each chassis.)

The 6 remote thermostat conductors for **3200 Series and 5200 Series** units are connected to the RAKOIM low voltage terminal board as shown below. The Class 2 Mode Switch (dip switch #10 on the auxiliary control board) must be set to the ON/UP mode to enable remote thermostat control.



Note: When the unit is operated with a remote thermostat, the unit operates on high fan speed.

Low fan speed can be attained if (3200 #4 dip switch) (5200 #11 dip switch) the low fan dip switch is positioned to ON/UP .

Reverse cycle defrost on the 5200 series remain operable when remote thermostat is used.

Freeze Sentinel™ remains operational if the unit is connected to a remote thermostat. The unit may be connected to a Central Desk Control (CDC) system and controlled with a remote thermostat when the CDC system has the unit in an operational status. (See pages 16 & 17 for additional information on the CDC system.)

Heat pump operation on a **3200 Series** and **5200 Series** unit connected to a remote thermostat is the same as the operation of the unit without the remote thermostat with the following exceptions:

The **Staged Heating feature** (See page 16) **on the 5200 Series units does not function with remote thermostat control.** Staged Heating is dependent upon the temperature sensing ability of the thermistor on the unit, which is overridden by the remote thermostat. The unit will operate on heat pump as long as the room temperature is less than 3.6°F. below the thermostat set point and will change to full resistance heat if the difference is more than 3.6°F. The temperature differential between heat pump and resistance heat operation is determined by the remote thermostat rather than the thermistor on the unit. Even when connected to a remote thermostat, **electric resistance heat is locked-out when outdoor temperature is above 46°F.** (See Page 16 for the heat pump operating logic of the 5200 Series units.) Only Electric Heat is available below 46°F. outdoor temperature if the Temperature Boost switch (dip switch #8) is set to the ON/UP position.

Field Wiring Terminal

- R 24V DC
- G Fan
- B Sol
- Y Cmp
- W Htr
- C Gnd

Follow the instructions included with the RAKOIM when installing this accessory.

See RAK806 on page 18.

Remote Thermostat Control Selection Chart For Zoneline Packaged Terminal Units

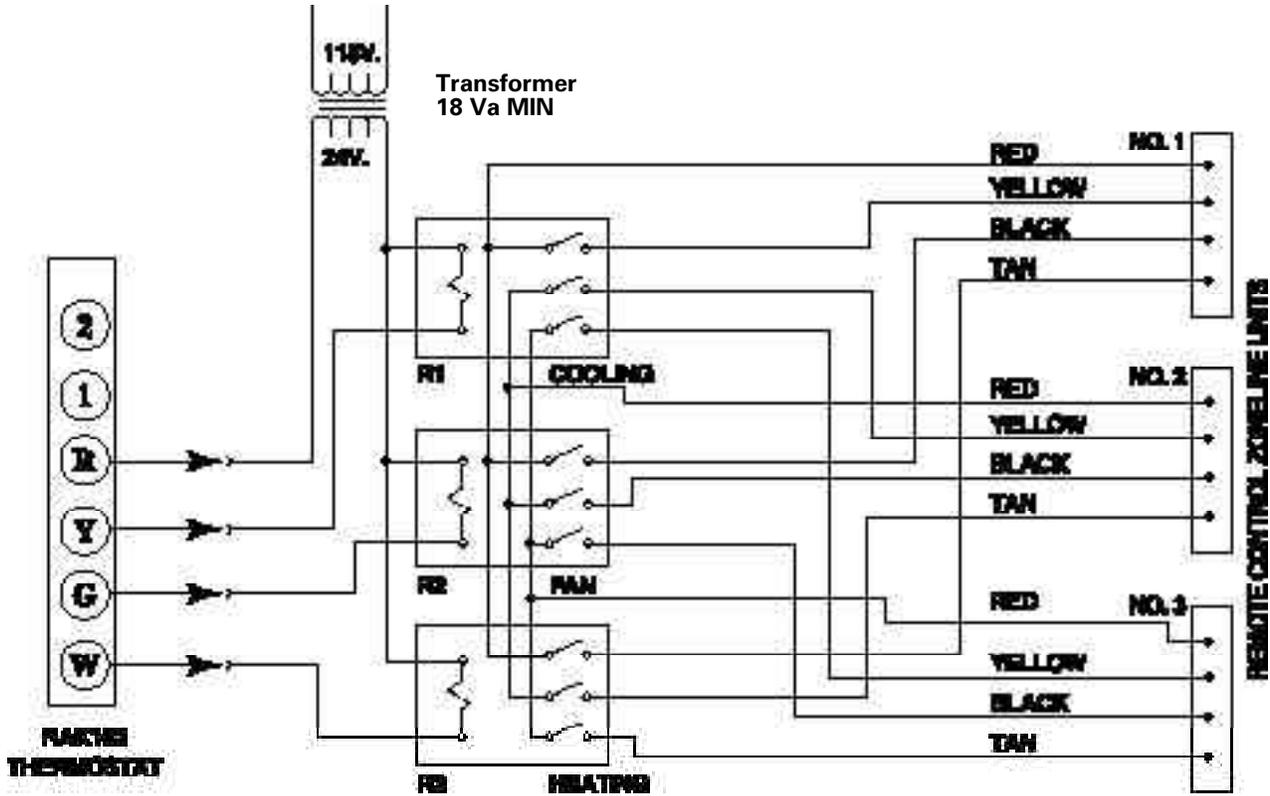
ZONELINE SERIES	THERMOSTAT MODEL	FUNCTION	SWITCHING	LOW VOLTAGE CONDUCTORS (field supplied)
2200	RAK163A	Cooling and Heating (Vertical)	Temperature Selector Dial System Switch (Heat-Off-Cool) Fan Switch (On-Auto)	4 up to 60 ft AWG20 up to 66 ft AWG18
3200 and 5200	RAK147A	1 Stage Cooling and 2 Stage Heating	Temperature Selector Dial System Switch (Heat-Off-Cool) Fan Switch (On-Auto)	6 up to 60 ft AWG20 up to 66 ft AWG18
ALL	RAK165A	See Thru Locking Cover for All Thermostats		

Remote Thermostat Control

Multiple Units Connected to One Remote Thermostat (2200 Series)

One remote control thermostat may be used to control multiple resistance heat Zoneline units, **however the units may not be wired direct.** Since each Zoneline unit has an integral transformer, direct wiring can result in a bucking

or boosting voltage condition, and **is in violation of the National Electric Code.** The diagram below shows the correct wiring for such an installation through the use of field supplied isolation relays.



Remote Control (Low Voltage) Wiring

One stage Thermostat Controlling Three Zoneline Units
Resistance Heat Zoneline 2200 Series Units
(Not Applicable on Heat Pump Units)

FIELD SUPPLIED RELAY SPECIFICATIONS

NUMBER OF UNITS CONTROLLED	RELAY DESIGNATION
	R1, R2, and R3
2	POTTER and BRUMFIELD TYPE KA11AY-24 OR EQUIVALENT
3	POTTER and BRUMFIELD TYPE KA14AY-24* OR EQUIVALENT
4	POTTER and BRUMFIELD TYPE KU17A11-24* OR EQUIVALENT
MORE THAN 4	USE COMBINATION OF RELAYS SPECIFIED ABOVE

NOTE: Current draw through thermostat contacts should not exceed 1.0 amps.

*Special order, 100 piece minimum order.

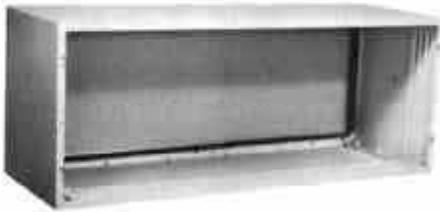
Wall Case

A choice of wall cases is available for the Zoneline.

RA B71 - This insulated case is constructed of heavy gauge galvanized steel and finished with a protective 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 RAB71 wall case are: 42" wide by 16" high by 13 3/4" deep, the same dimensions as the original wall case for GE Zonelines built in 1961.



RA B71 Wall Case



RA B77 Wall Case

RA B77 - 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 Zoneline chassis of current design as well as all GE Zoneline 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 pages 33 and 34 for information on **RAD10 Drain Kit**.

RA K901L - For installations when wall case extends into room, an 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.

Sub-Base

The sub-base is an optional accessory for the Zoneline and is presented with the wall case information since the decision to use or not to 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 being designed, consult Article 440 of the NEC. 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 between the building wiring and 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 Zoneline.

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.

RA K204U - The RAK204U Series of sub-bases provides a variety of designs that fit the site needs and are available for use with Zoneline 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 RAK4002 junction box, performs 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 center cover plate for easy access when direct connect wiring is not required. 265 volt units are to be Direct Connected and the external receptacle (not enclosed in a chaseway) does not meet this requirement. Knockout for fuseholder is provided.

RA K204U No receptacle, no wiring, will accept any 15, 20, 30 amp receptacle and wiring. No chaseway is included. Note: RAK205CW is the chaseway and must be ordered separately.

RA K204D20 208/230 volt 15/20 amp receptacle. Note: 18 inch #12AWG wires attached to the receptacle. (Receptacle NEMA6-20 GE4181-2) Chaseway included.

RA K204D30 208/230 volt 30 amp receptacle. Note: 18 inch #12AWG wires attached to the receptacle. (Receptacle NEMA6-30 GE4139-3) Chaseway included.

RA K204E15 265 volt 15 amp receptacle. Note: 18 inch #12AWG wires attached to the receptacle. (Receptacle NEMA7-15R GE0716-6) Chaseway included.

RA K204E20 265 volt 20 amp receptacle. Note: 18 inch #12AWG wires attached to the receptacle. (Receptacle NEMA7-20R GE0720-3) Chaseway included.

RA K204E30 265 volt 30 amp receptacle. Note: 18 inch #12AWG wires attached to the receptacle. (Receptacle NEMA7-30R GE0730) Chaseway included.

Sub-Base (Cont.)

Chaseway RAK205CW is included with RAK204D20, RAK204D30, RAK204E15, RAK204E20 and the RAK204E30. If the chaseway is needed when using the RAK204U, it must be ordered separately as RAK205CW.

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 31 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 4 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, Zonelines 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 28 and 29 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 page 18, 19, 27 and 42.

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 24 and 25 for required wall opening dimensions. Minimum recommended interior and exterior case projection 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 page 37, or with a sub base as shown on page 25.

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. If you are unable to locate a local source for case extensions please contact your salesperson for a possible supplier. Such extension must be

carefully flashed and sealed both to the wall case and to the wall to insure water integrity. This is necessary to insure 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 28 and 29 for suggested detail.

When the outdoor grille or louver section is mounted to the building face, causing 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. See page 41 for requirements for custom louver sections.

The wall case should be level from side to side and front to back. 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 to increase the efficiency of the unit. A level unit will also insure proper performance of the Internal Condensate Removal (ICR) system optional on heat pump units.

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.**

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 (RAK204U Series) with four leveling legs provides an excellent support for the unit in this type of installation. See page 26 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

Masonry Wall Construction (Cont.)

to install the chassis. See page 27 for details of installation in masonry wall.

For existing masonry construction, wall openings must be made. This normally involves the removal of 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.

Wall Case Installation Data

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.

Preparation of the Wall Case for All Types of Construction

As shipped, the RAB71 or RAB77 is ready for installation. 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 RAB71 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. If the minimum exterior dimensions are not met, refer to page 28 and 29. 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.

The wall case should be level from side to side and front to back. 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 insure 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 page 24. 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 34 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 (4 sides) to provide total water and air seal.
4. Caulk or gasket room-side opening between wall case and interior wall surface (4 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 38 for maximum power cord length.

Permanent connected units close to finished floor must allow for conduit clearance.

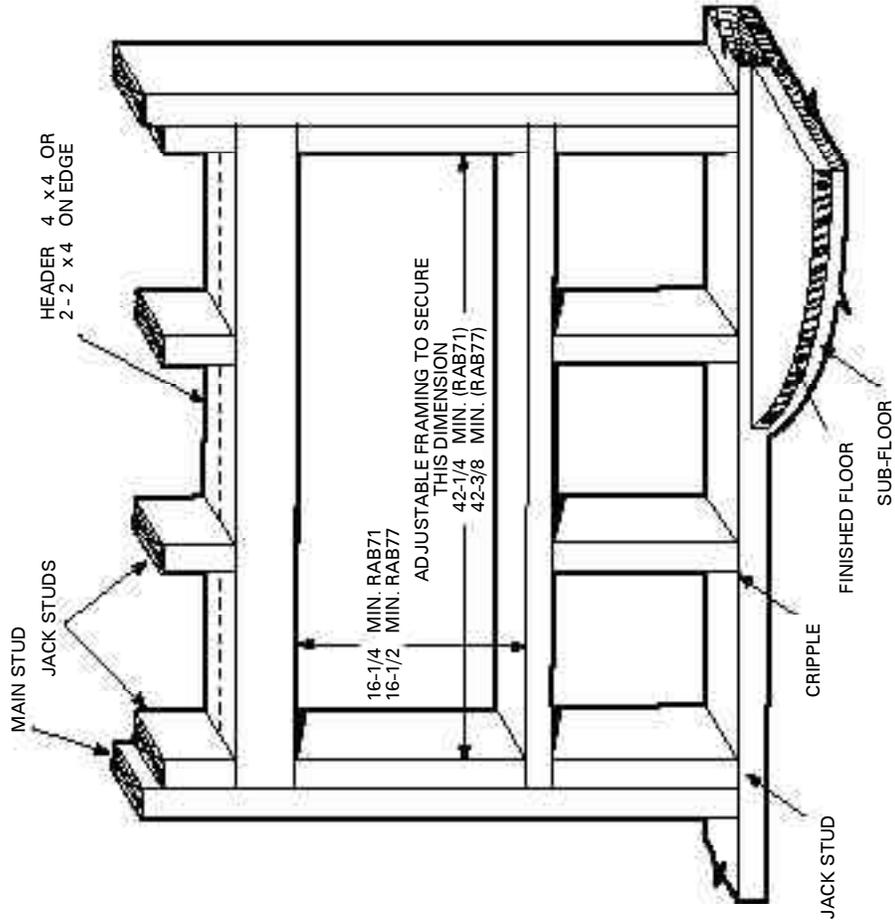
Case Angles

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 to, the use of 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 **RAB71** 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 outside 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.

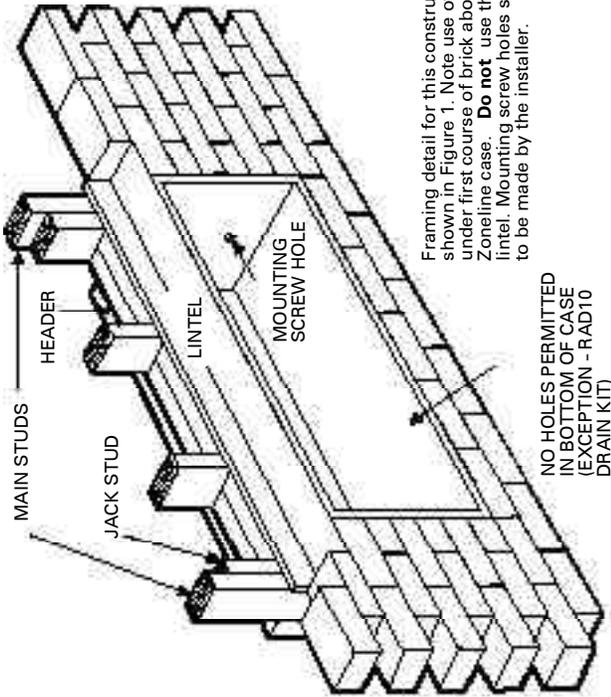
FRAMING FOR WALL CASE BRICK VENEER AND FRAME CONSTRUCTION



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

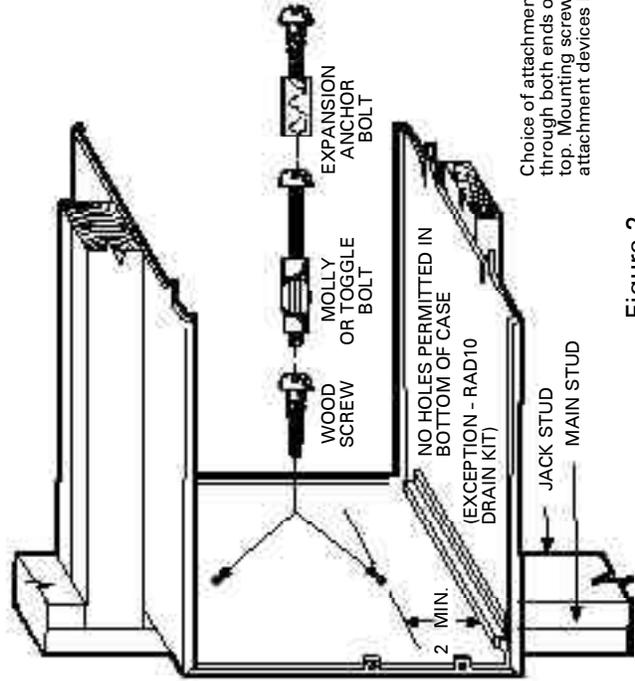
Figure 1

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)

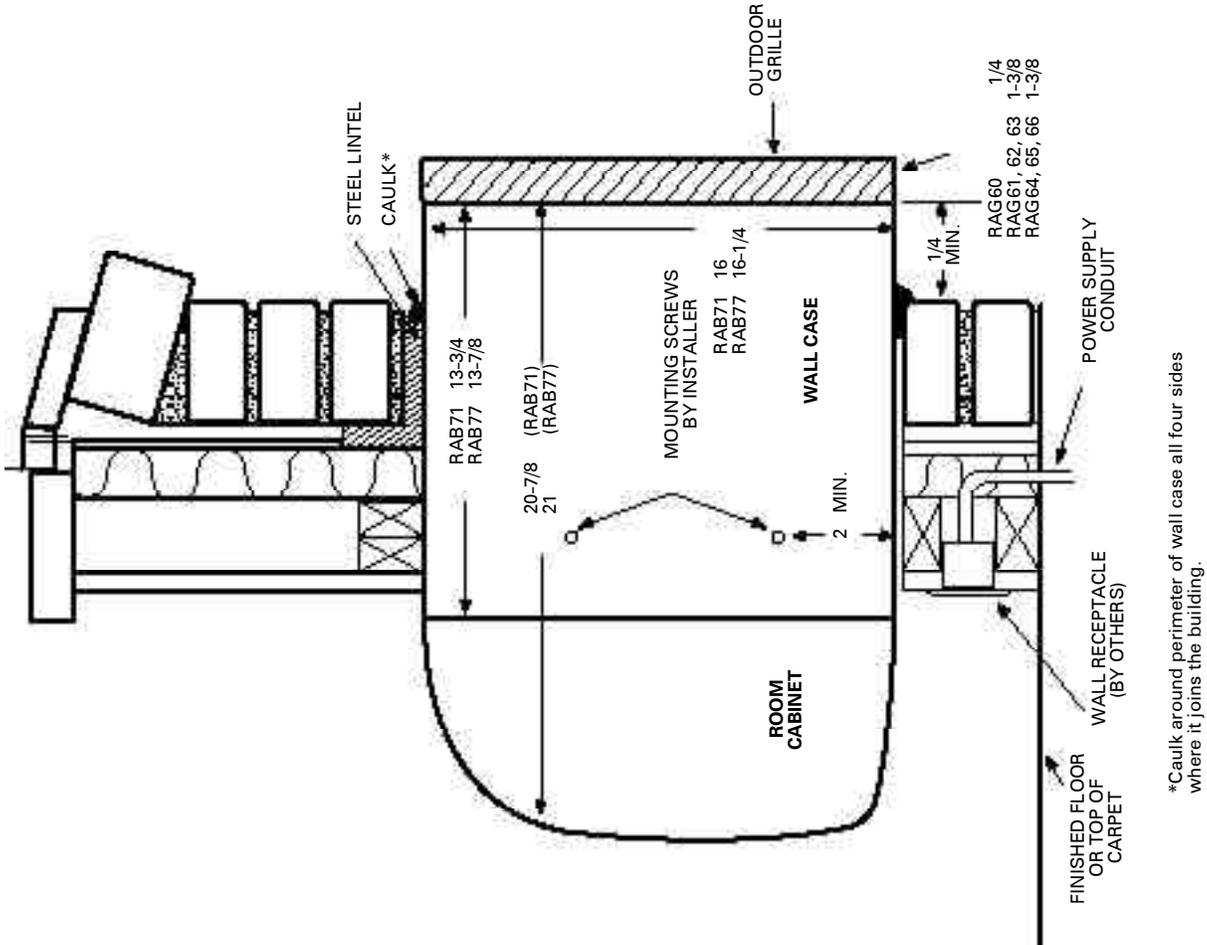


Choice of attachment devices through both ends of case or the top. Mounting screw holes and attachment devices by installer.

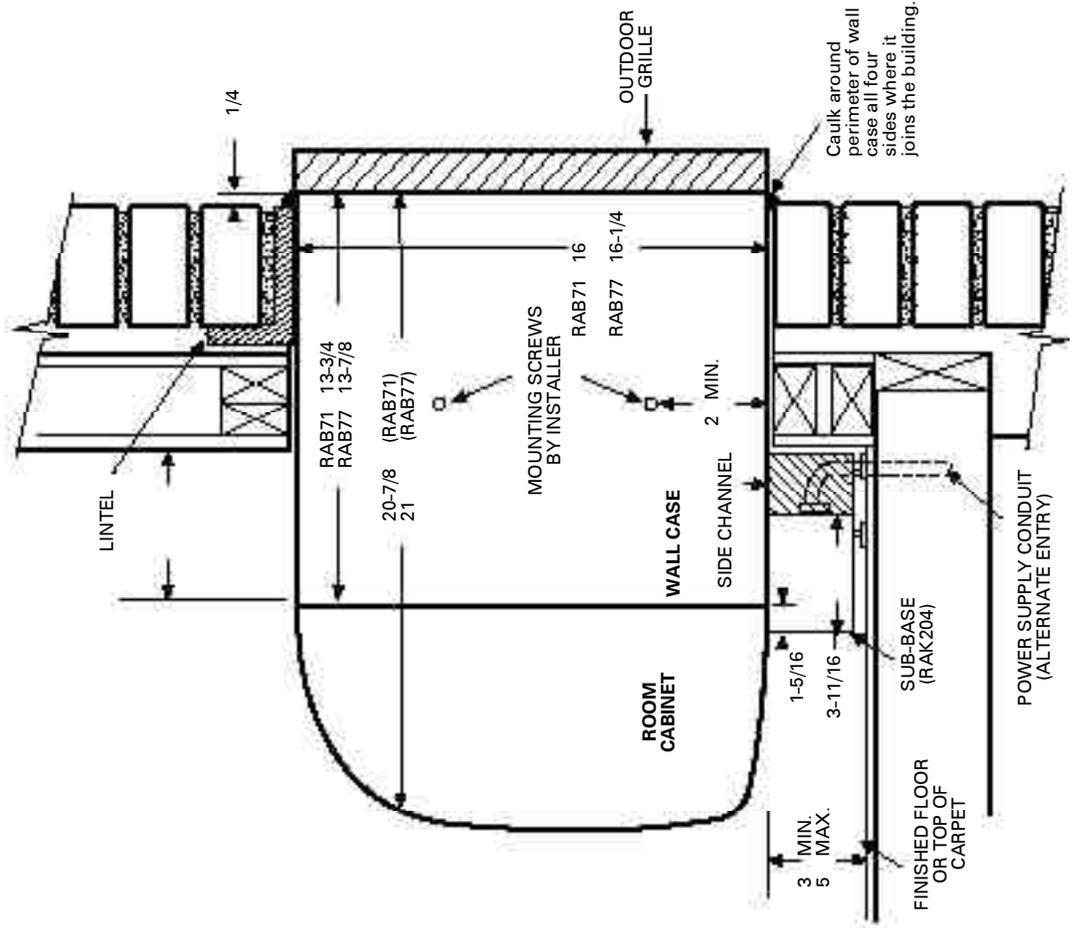
Figure 2

**WALL SECTION DETAILED SIDE VIEW
FRAME AND BRICK VENEER INSTALLATION**

Cord Set Connected



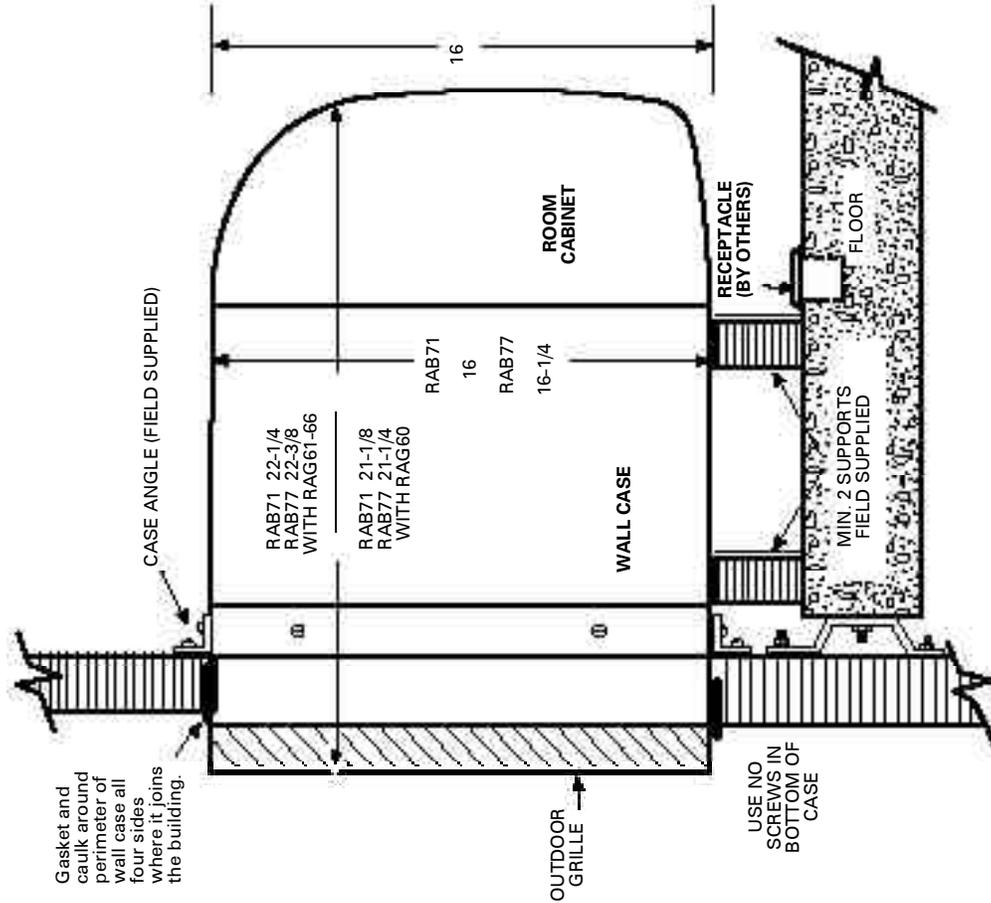
Sub-Base Connected



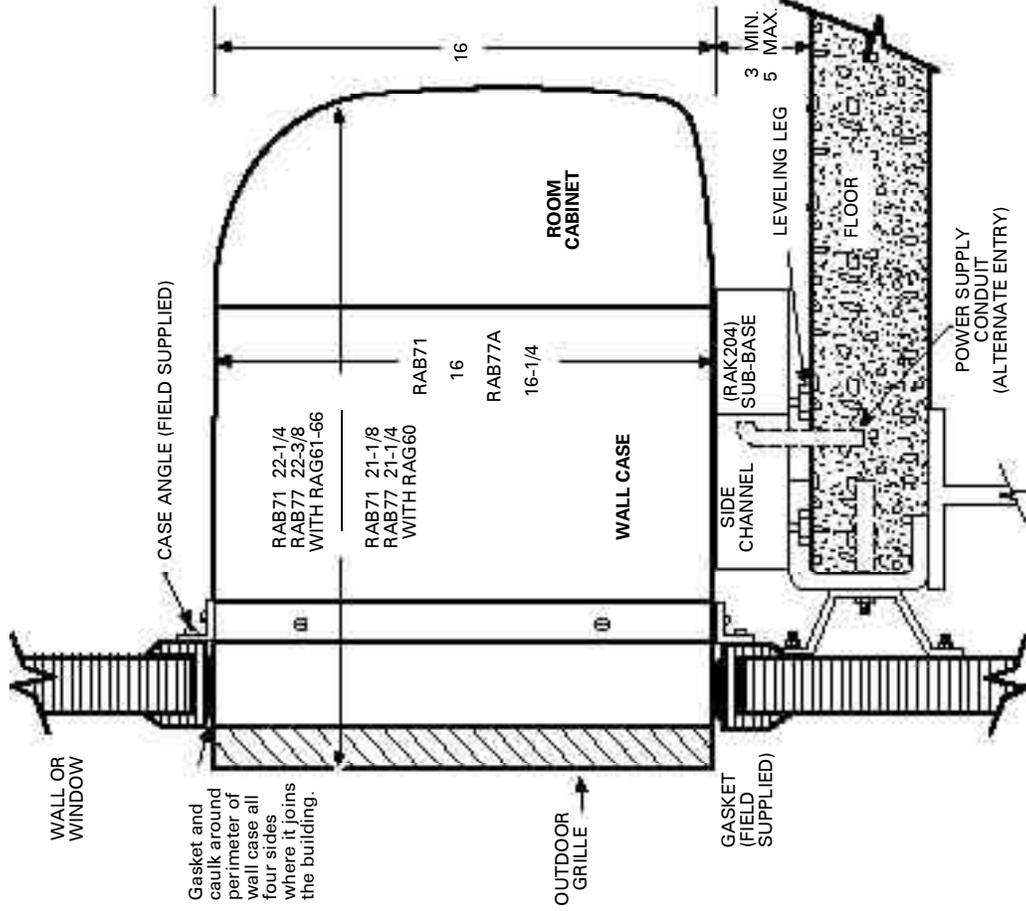
WALL SECTION DETAILED SIDE VIEW

WINDOW, 2 CURTAIN OR PANEL WALL INSTALLATION WITH RAG REAR GRILLE EXTENDED BEYOND OUTER WALL SURFACE

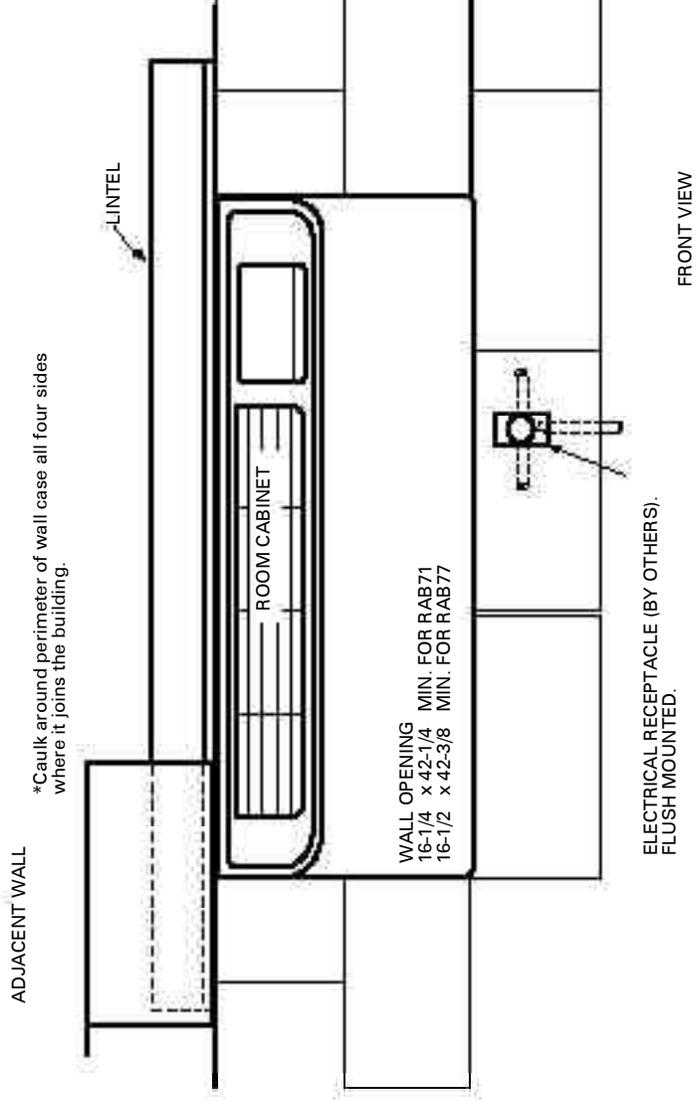
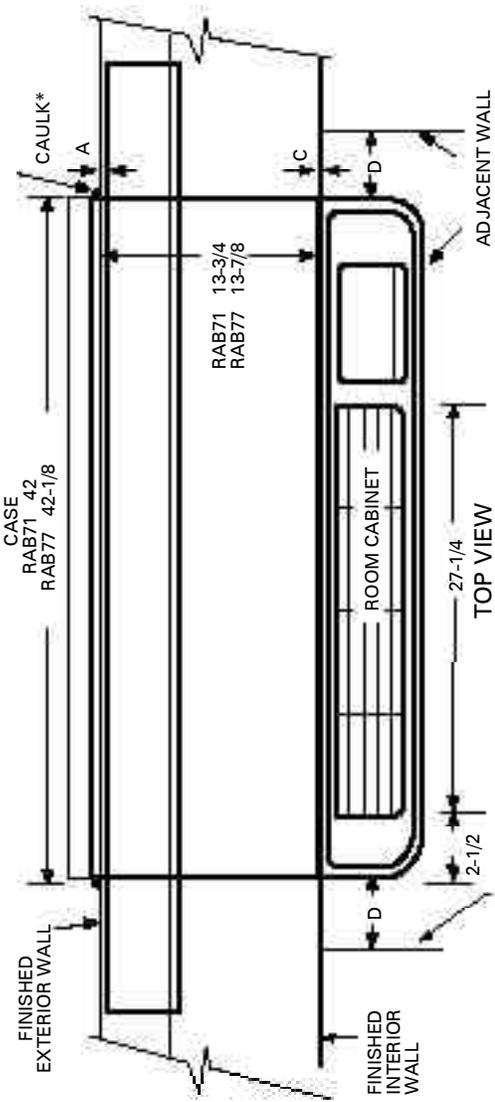
Cord Set Connected



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



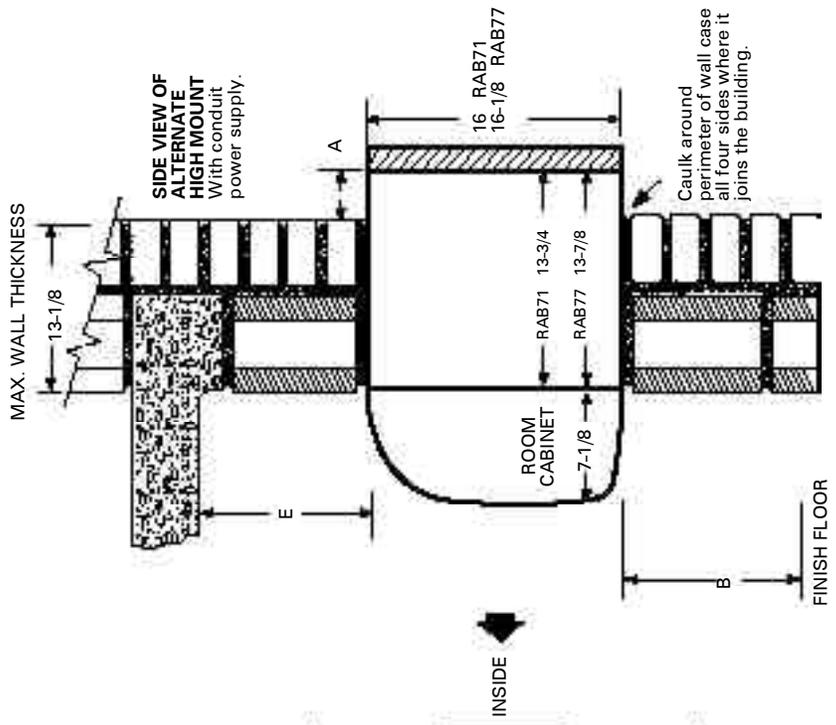
*Caulk around perimeter of wall case all four sides where it joins the building.

ELECTRICAL RECEPTACLE (BY OTHERS).
 FLUSH MOUNTED.

See page 38 for line cord length.

Dimension	Manufacturer Required Minimum Installation Clearance
A	1/4 (See note 1)
B	0 Min. (See page 26)
C	0 Minimum
D	0 Minimum 2 Recommended See pages 35-36 for ducted application.
E	3 Minimum

NOTE:
 1. FOR OUTSIDE FLUSH MOUNTING SEE PAGE 34 FOR DRAIN INSTALLATION.



FINISH FLOOR

FRONT VIEW

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

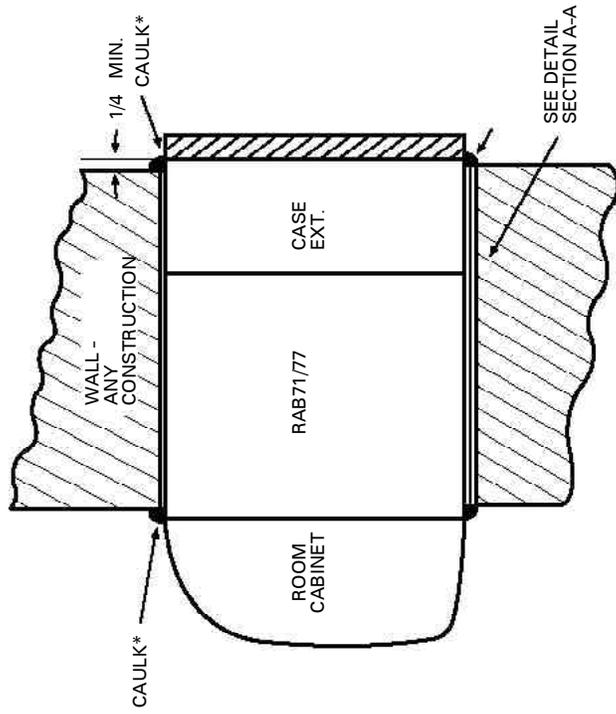
Zonline units can be installed in walls of greater depth than the wall case. Where the case recession is less than 3 and where it is possible to waterproof the exposed sides and top of the opening, the suggested procedure is to apply a flashing to the bottom of the wall case as shown on page 29. Where 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.

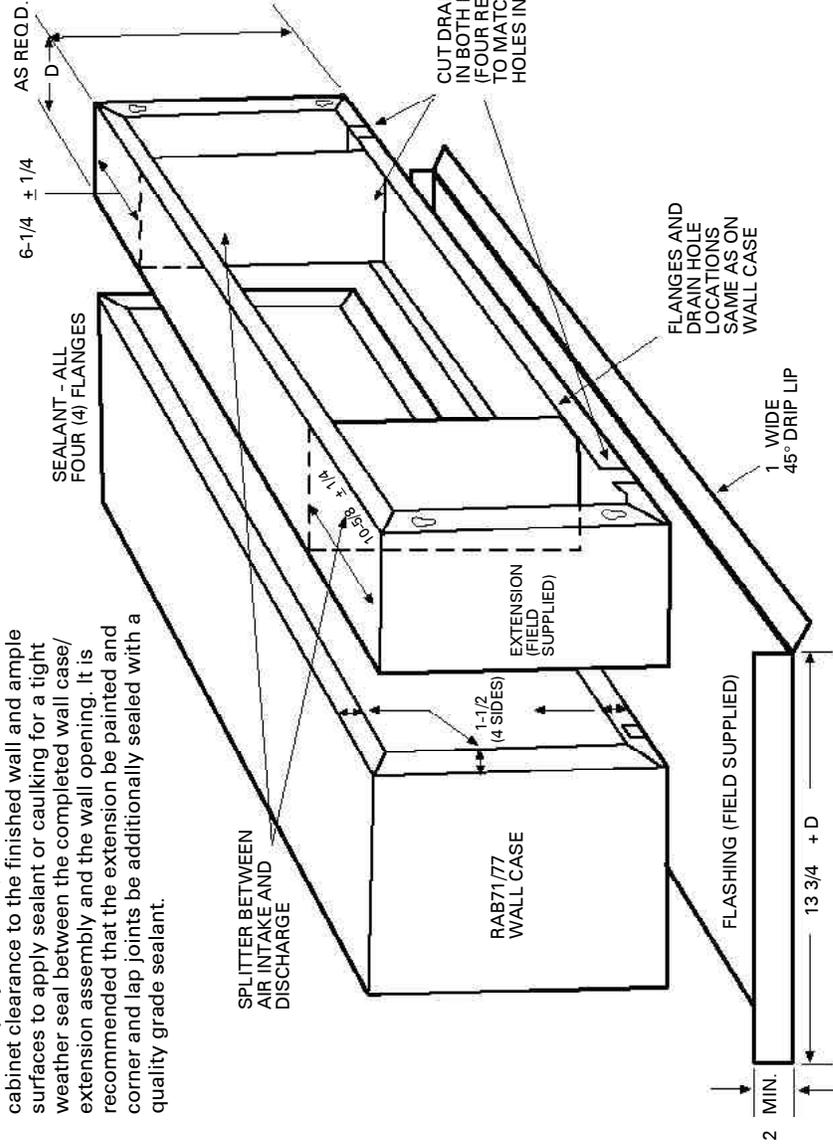
2. The wall case and extension should be connected prior to installation in the wall opening. A quality grade sealant should be applied to all four (4) butting flanges. Use bolts and nuts or oversized self tapping screws (driven from the wall case to the extension) to attach the two assemblies. Clean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

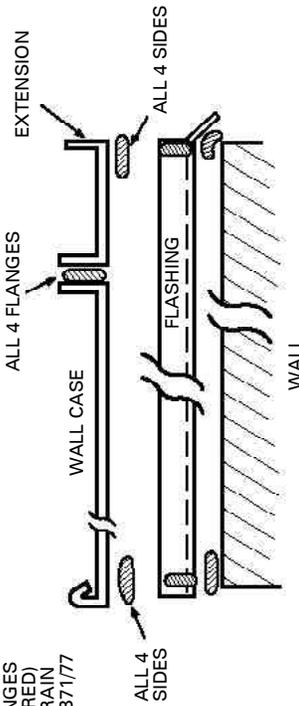
5. Suggested materials for case extension and flashing should be non-ferrous metals. Minimal acceptable material: Galvanized G-90 painted.



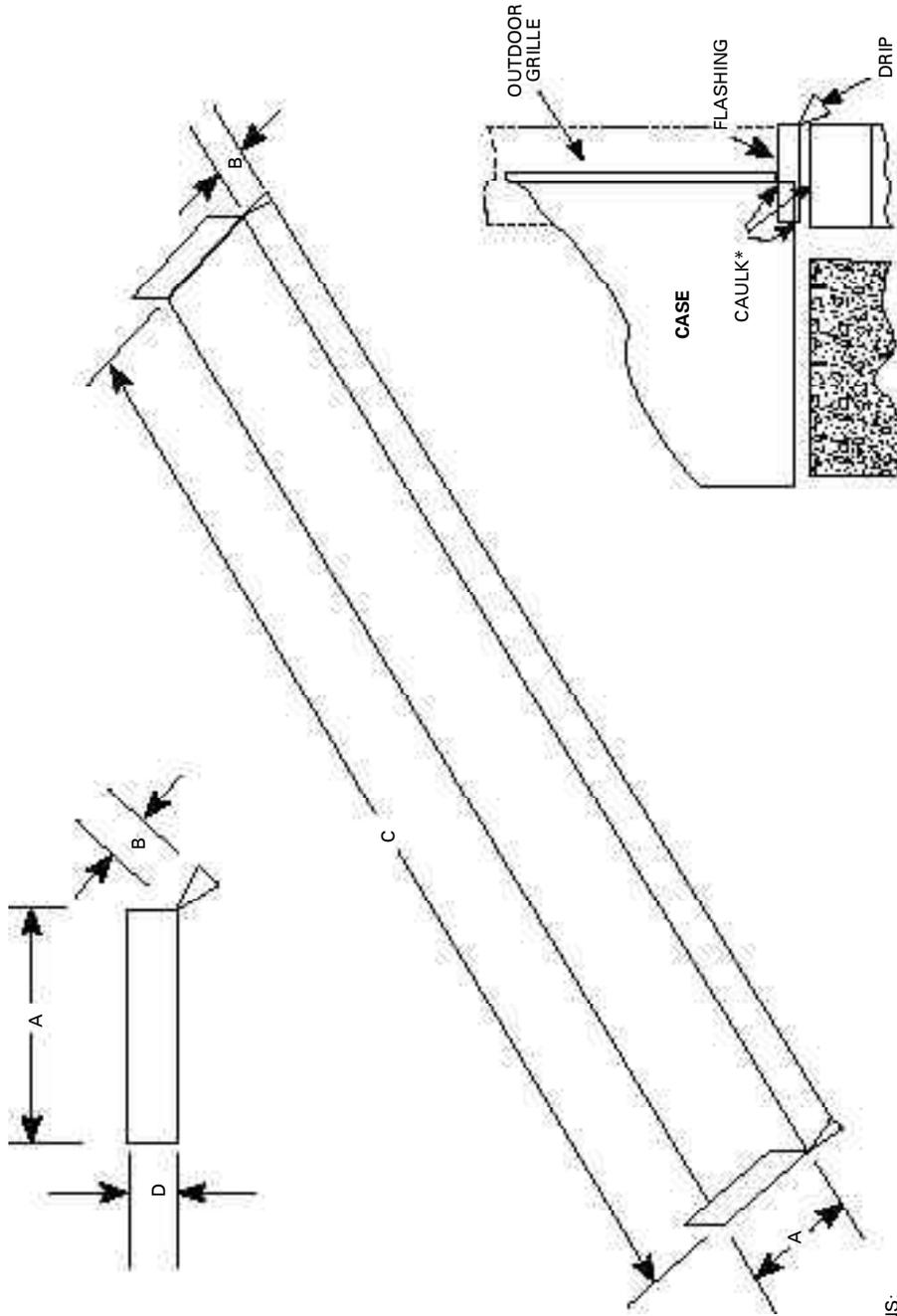
*Caulk around perimeter of wall case all four sides where it joins the building.



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



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



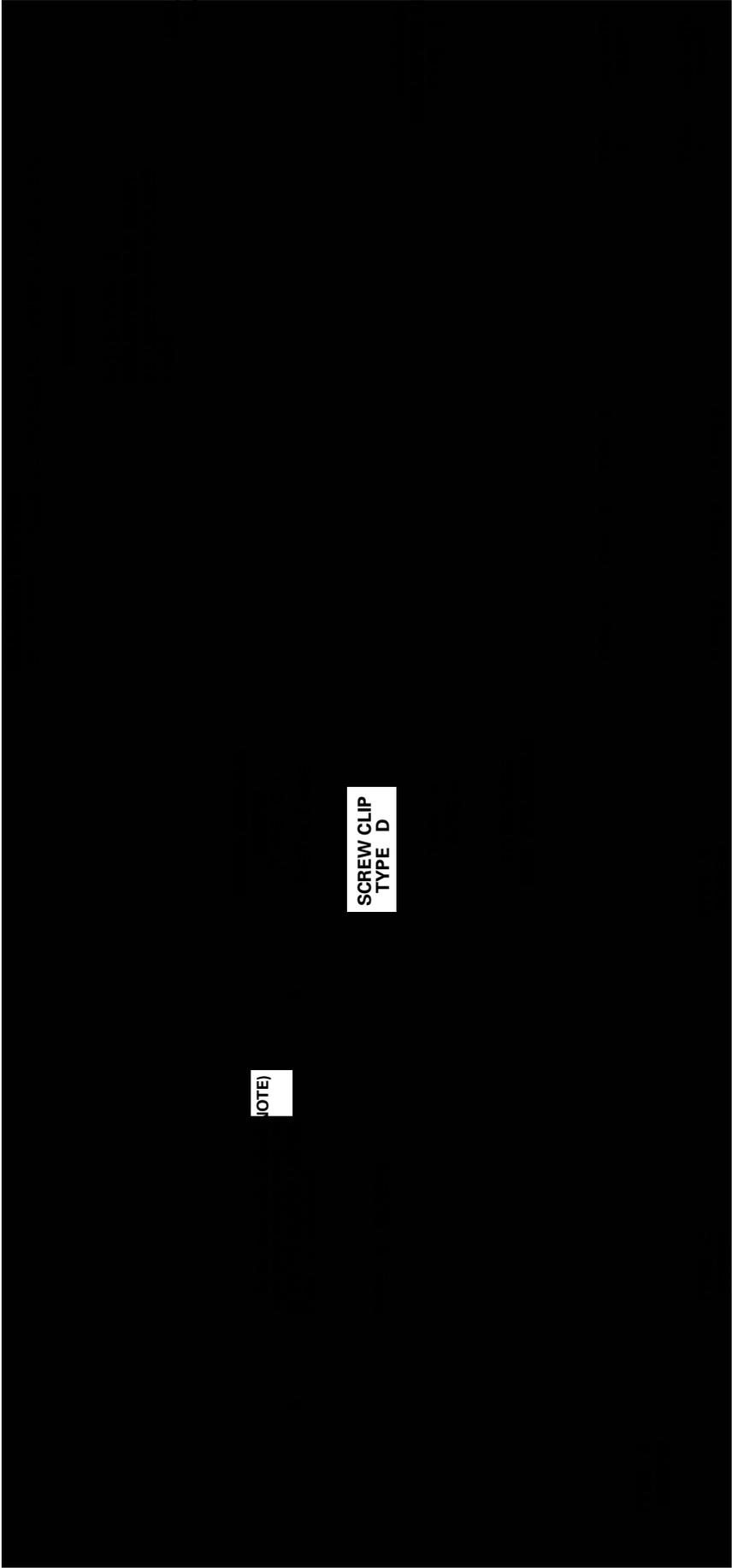
DIMENSIONS:

- 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 SNUGLY 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 28.

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

RAK204 SERIES SUB-BASE INSTALLATION AND ELECTRICAL DATA
RAB71/77 WALL CASE



(NOTE)

SCREW CLIP
TYPE D

ACCESS PLATES

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

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).

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 page 21 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 sheet metal 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 against the outdoor coil. 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 Zoneline Series Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps utilize a slinger ring for cooling condensate disposal.

Certification Test Requirements

ARI 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 Zoneline Series Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps meet the condensate disposal requirements of ARI standards 310-90 and 380-90.

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 air flow through the coil and greatly diminish the ability of the heat pump to extract heat from

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 49°F.

Drain Kits

Although the Zoneline units are designed to dissipate all 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 33 and 34 for information covering the drain systems and the **RAD10** kit available to connect to the wall case.

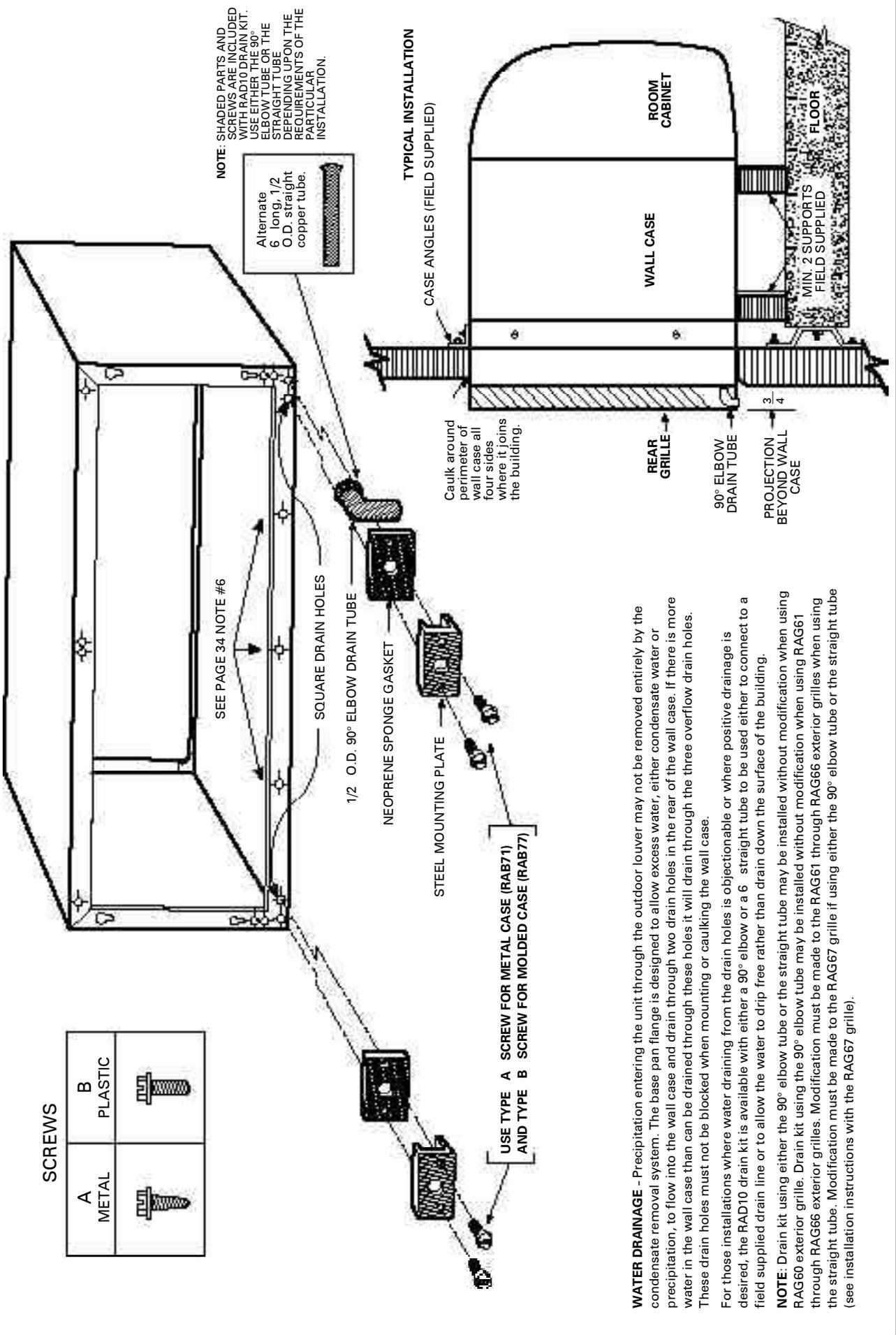
Internal Condensate Removal (ICR) System

GE has developed an Internal Condensate Removal (ICR) System for Packaged Terminal Heat Pumps. This system has been offered as an option on Zoneline Packaged Terminal Heat Pumps since 1982, and thousands of them are in use. During heat pump operation the ICR system utilizes a small pump to lift the water from the base pan and pump it into a collector tray positioned above the indoor coil. The water drains from the collector tray and drips onto the warm indoor coil where it is evaporated into the room atmosphere. If an excess amount of water is pumped to the indoor side, it is routed back to the outdoor portion of the base pan.

The ICR system has proven to be an effective means of minimizing the amount of heat pump condensate dripping from the unit. However, if the restrictions of a particular installation will allow absolutely no 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 34 FOR INTERNAL DRAIN



SCREWS

A METAL	B PLASTIC

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.

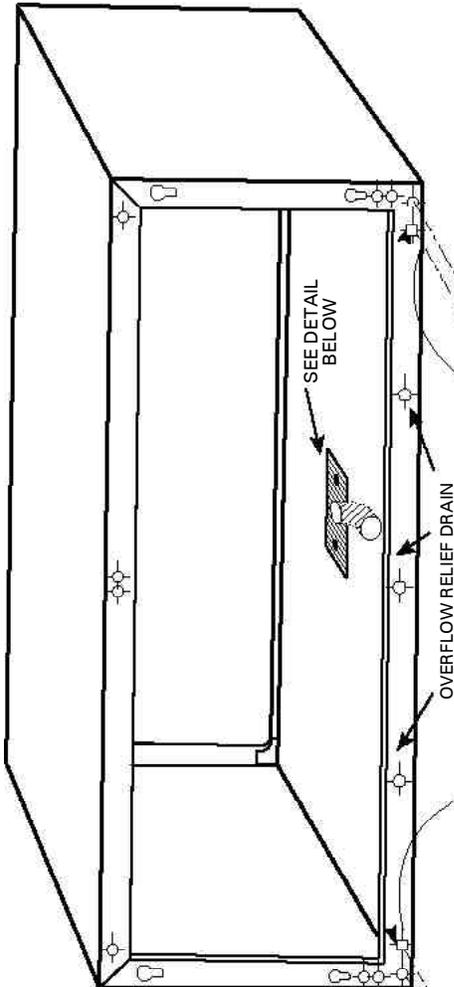
USE TYPE A SCREW FOR METAL CASE (RAB71) AND TYPE B SCREW FOR MOLDED CASE (RAB77)

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 RAG66 exterior grilles. Modification must be made to the RAG61 through RAG66 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 33 FOR EXTERNAL DRAIN

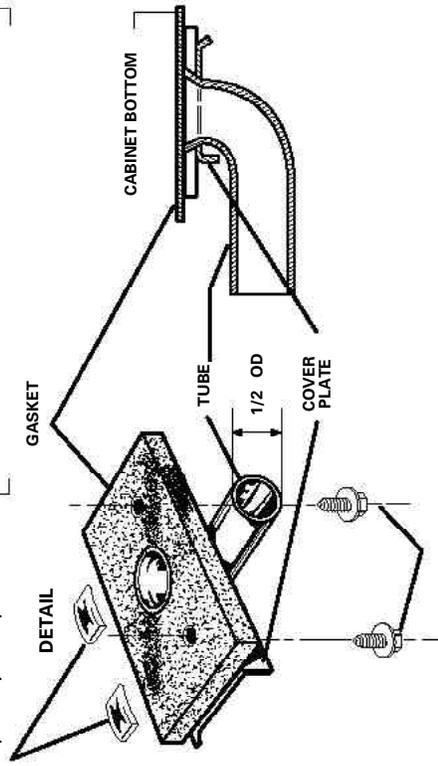


NOTE: SHADED PARTS AND SCREWS INCLUDED WITH RAD10 DRAIN KIT. THE 90° ELBOW TUBE IS RECOMMENDED FOR INTERNAL DRAIN INSTALLATION.

SCREWS

A	B
METAL	PLASTIC

NUT (MOLDED CASE (RAB77) ONLY)
USE TYPE A SCREW FOR METAL CASE (RAB71) AND TYPE B SCREW FOR MOLDED CASE (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 3 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

2200 and 3200 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.

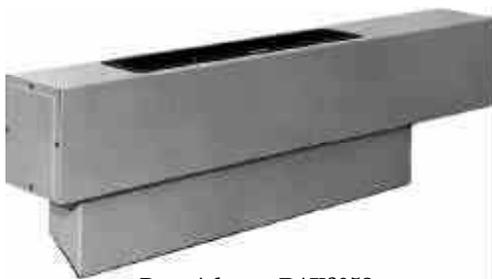
Refer to pages 36 and 37 for drawings of ducted installations.

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 to permit optimum air flow into the adapter. Instructions for this modification are included with the duct adapter.

New Ducted Installations

Components

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. 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 Adapter RAK6052

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 do 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.

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.



RAK601 Duct Extension, Mounting Collar and Register

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. Minimum recommended clearance between the unit and the adjacent wall is 2".
4. 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.
5. When calculating the heat gain / heat loss take both areas into consideration.

Replacements of Existing Ducted Units

Since the design of 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 of determining the correct kit is to measure duct extension cross section.

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

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

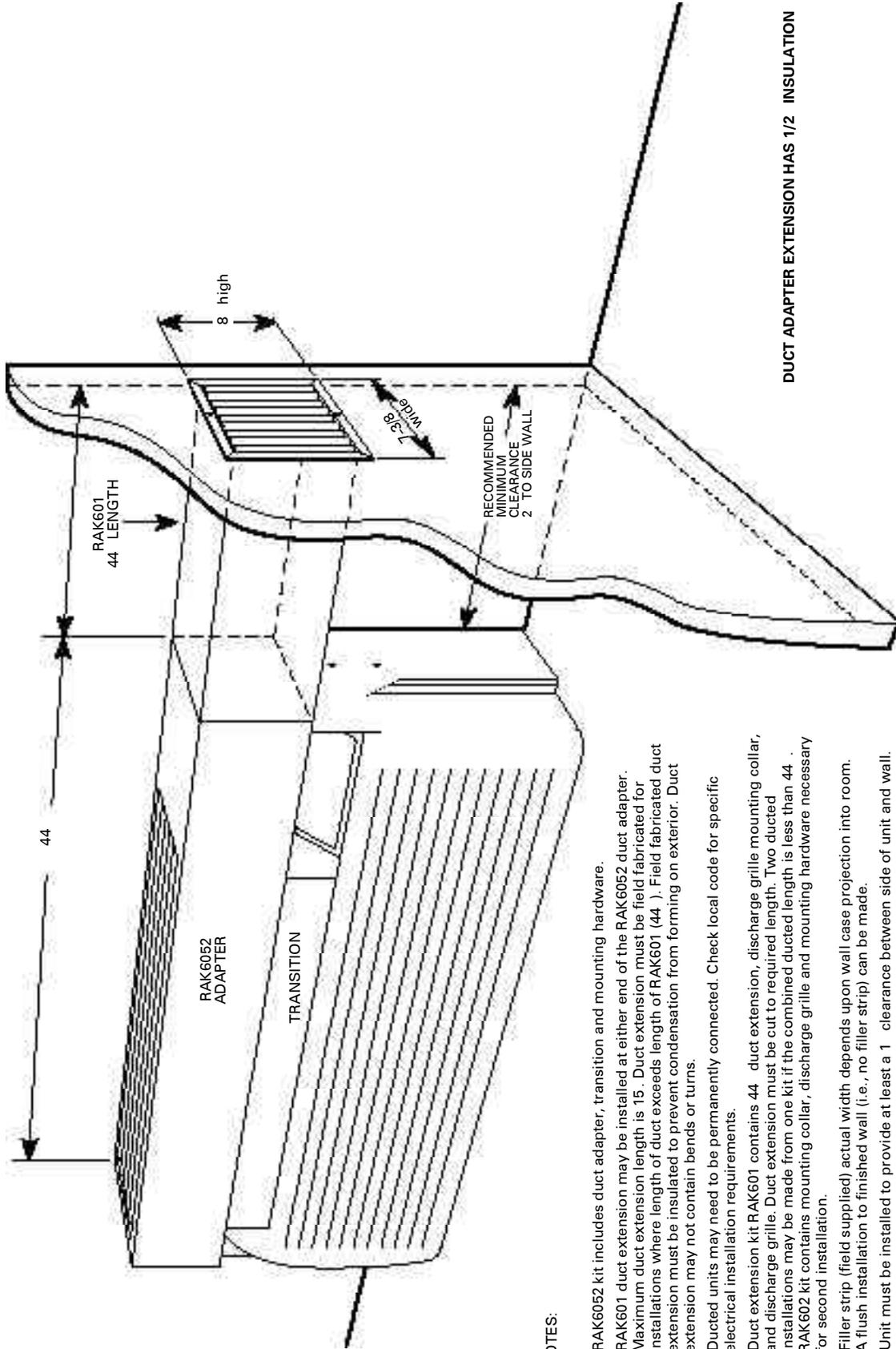
Duct Adapter RAK7012 - This duct adapter will allow the replacement of a new chassis (AZ22 or AZ32 Series unit) into an existing ducted application. This adapter will align properly with the duct extension and will eliminate the need to modify the wall opening. In order to minimize replacement costs, 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.

Slope-Front Discharge Units (Models With AZC, AZR, AZW, or AZ 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 (AZ22 or AZ32 Series unit) into a previous design slope-front ducted installation.

DUCTED APPLICATION (AZ2200/3200 SERIES)



DUCT ADAPTER EXTENSION HAS 1/2 INSULATION

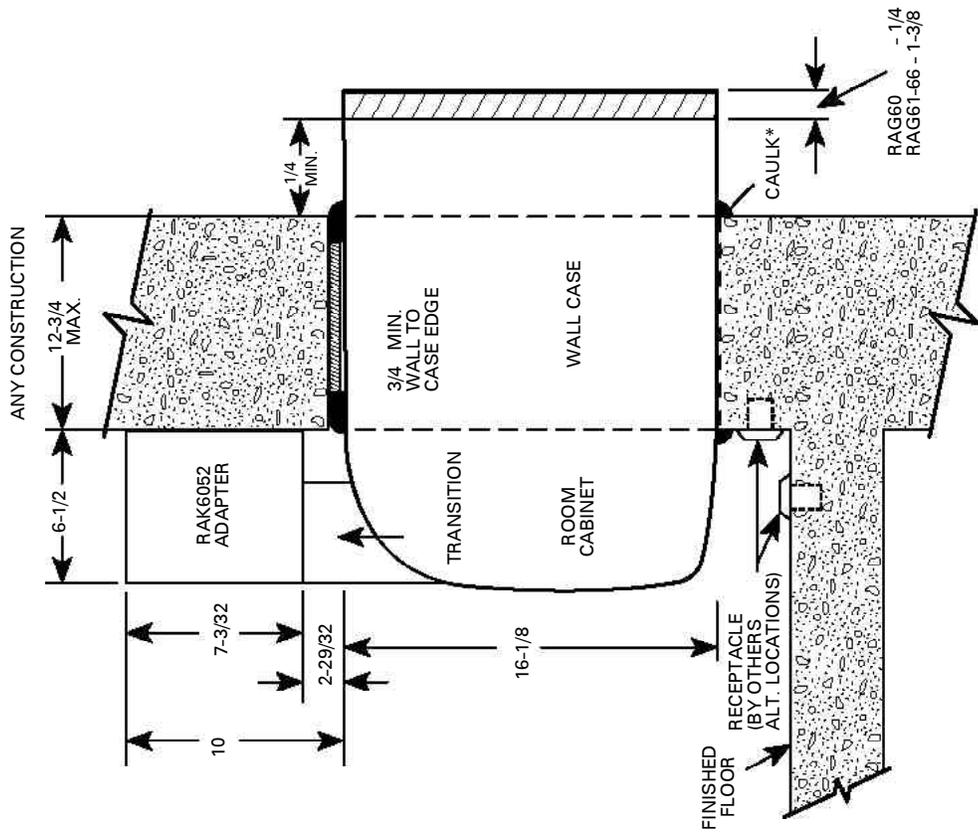
NOTES:

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. Duct extension 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 1' 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 page 35.

DUCTED DETAILED SIDE VIEWS (AZ2200/3200 SERIES)

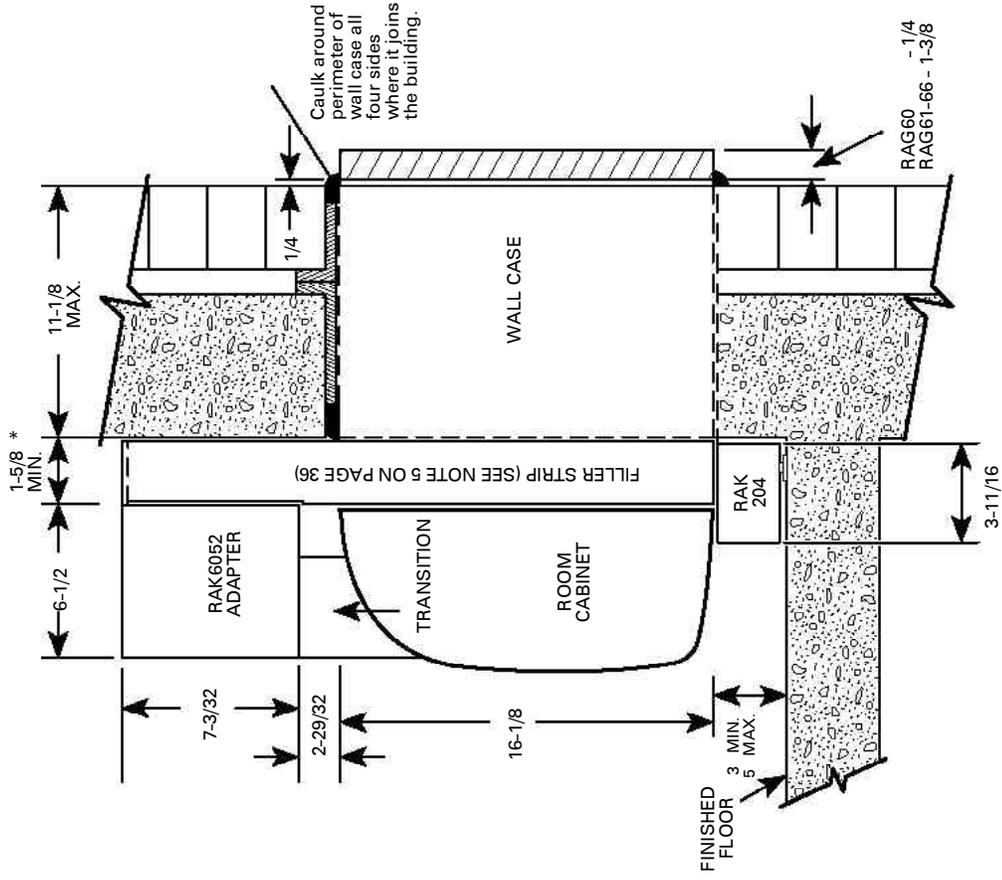
SEE PAGE 36 FOR ALL NOTES

Line Cord Installation



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

Sub-Base Installation



Caulk around perimeter of wall case all four sides where it joins the building.

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

Power Connection Kits For Premium Series (5200)

The Zoneline 5200 series 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 and the appropriate kit is determined by the voltage, the means of electrical connecton - either line cord connected or permanent connected - and the desired resistance heat output that may be supported by the branch circuit.

230/208 Volt Installations

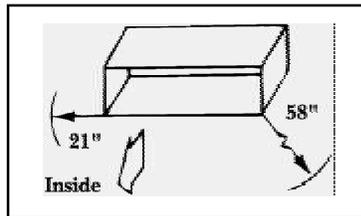
Connections to 208 or 230 volt circuits may be made with a line cord power connection kit.

Line Cord Kits consist of a self-aligning 9-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 9-pin connector determines the heater wattage and current requirements when it is plugged into the Zoneline chassis.

Permanent



Premium
Typical Line Cord
Power Connection Kit



Maximum Cord Extension

Line Cord Kit	Voltage	Heater KW	Circuit Ampacity	Protective Device
RAK3152	230/208	2.55/2.09	15 Amp	15 Amp Time Delay Fuse or Breaker
RAK3202	230/208	3.45/2.82	20 Amp	20 Amp Time Delay Fuse or Breaker
RAK3302	230/208	5.00/4.09	30 Amp	30 Amp Time Delay Fuse or Breaker

Type	Mfg	Receptacle Part No	Configuration
15 AMP Tandem NEMA6-15R	GE Hubbell P&S	GE4069 5661 5661	
20 AMP Perpendicular NEMA6-20R	GE Hubbell P&S	GE4182 5461 5871	
30 AMP Large Tandem NEMA6-30R	GE Hubbell P&S	GE4139-3 9330 5930	

Connection is accomplished by ordering the correct ampacity electrical sub-base to match the Power Cord being used. See page 21 Sub-Base for description.

There may be special requirements by some sites that rigid or flexible conduit be used. (Such as the wall case must be installed flush to finished floor and there is no room for a sub-base.) In these installations the RAK4002 junction box will be needed and the Power Cord/Cord Set will be cut and connected to building wiring inside the RAK4002 junction box. Conduit will be attached to the RAK4002 and to the site supplied building/room junction box where the building wiring enters the room. Wiring will be totally enclosed by conduit and junction boxes.

Power Connection Kits For Premium Series (5200)

265 or 277 Volt Installations

National Electrical Code (Article 440 section G) requires permanent connection for installation on circuit in excess of 250 volts.

Permanent Connection Kits are available for 265 volt installations. The regular kit consists of a self-aligning 9-pin connector that plugs into a mating connector on the chassis, a length of power cord with the plug cap molded to the end. There are four 265 volt cord sets so that the desired heater KW will be achieved when the correct RAK5*** kit is selected. See chart below for guide. These cord sets will match the receptacle in the RAK204E Series sub-base. It is important that care be used in this selection process. This cord set, when used with the appropriate sub-base with provided chase way from the junction box to the sub-base, is considered to be permanently connected.

For those installations that require a method of direct connection using flexible or rigid conduit, the RAK4002 junction box (provided with chassis) can be used and the field supplied conduit attached to it. The universal cord set will be cut off and connections made inside the junction box.



Permanent Connection Kit	Voltage	Heater KW	Circuit Ampacity	Protective Device (Fuse Included)
RAK5152	265	1.7	15 Amp	15 Amp
RAK5172	265	3.0	15 Amp	15 Amp
RAK5202	265	3.7	20 Amp	20 Amp
RAK5302	265	5.0	30 Amp	30 Amp

NEMA7-15R; receptacle used on 265V sub-base GE0715		15 Amp
NEMA7-20R; receptacle used on 265V sub-base GE0720-3		20 Amp
NEMA7-30R; receptacle used on 265V sub-base GE073		30 Amp

Electrical Wiring Information

For all installations 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 54. Branch circuit ampacity and electrical protective device sizing are shown at left. More than one unit per branch circuit is not recommended; however, 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 Zoneline 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. Recommended solution is to change the wall receptacle to conform to current standard plug configuration. See chart on page 38 for current receptacle configuration.

Permanent 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 connection between 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 2 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.

Power Connection For Deluxe Series (2200 & 3200)

The Zoneline 2200 and 3200 series units have discrete heater wattages. Each unit has a factory installed heater and must be installed on an electrical circuit with sufficient over-current protection to carry the amperage load of the unit. See specifications on page 52 for model number nomenclature, heater amperage, and minimum circuit ampacity for the particular Zoneline model. To determine maximum connected load for individual model see page 54 and 55.

230/208 Volt Unit Installation - Line Cord Connected Units

Zoneline 2200 and 3200 series units for installation on 230 or 208 volt circuits have a factory installed line cord with a plug conforming to NEC standards for the circuit amperage. Graphic representation of the wall receptacles are shown on page 38. The line cord length is also shown on page 38.

230/208 Volt Unit Installation - Permanent Connected Units

If a permanent, or direct wired, installation of a 230 or 208 volt units is desired, a junction box kit, RAK4002, is available to allow direct connection when the 208/230 volt chassis is installed with the appropriate electrical sub-base. When the cord set is enclosed by the RAK4002 and the sub-base chase way RAK205CW, the wiring is totally enclosed and the unit is considered to be permanently connected. (correct ampacity RAK204 series sub-base required)

If an installation using flexible conduit is desired, the RAK4002 kit mounts to the chassis to form an enclosed junction box with a removable front panel for access to the unit wiring. A 7/8" diameter hole in the bottom of the enclosure enables field supplied rigid or flexible conduit to be connected to the kit. A wiring harness of three conductors and an in-line connector is included with the RAK4002.

The factory installed line cord must be cut off approximately 8" from where it comes through the barrier, or bulkhead, of the unit. Strip insulation off 3/4" of each conductor to expose wire for field connection. These wires are then connected to the building wiring by field supplied connectors.

265 or 277 Volt Unit Installation - Permanent Connected Units

National Electric Code (Article 440 Section G) requires permanent connection for units connected to power sources over 250 volts, therefore these units must be permanently connected (direct wired).

Zoneline 2200 or 3200 series units rated for installation on 265 volt circuits have discrete heater wattages and the appropriate cord set to match the 265 volt sub-base receptacle installed in this sub-base. When installed with the correct sub-base and chaseway the wiring is totally enclosed and the installation is considered to be permanently connected.

If an installation using flexible conduit is desired, the 7/8" diameter hole in the bottom of the RAK4002 junction box enables field supplied rigid or flexible conduit to be connected to the unit. A knockout is provided in the junction box for the installation of a field supplied cartridge type fuse, if required. A wiring harness of three conductors and an in-line connector is included with the RAK4002.

This wiring harness can be ordered separately as RAK4002CW.

When direct connecting the unit, connections to the

building wiring should be made in the junction box with field supplied connectors.

All wiring must conform to local electrical regulations and codes.



RAK4002



RAK4002
Installed

Exterior Grilles

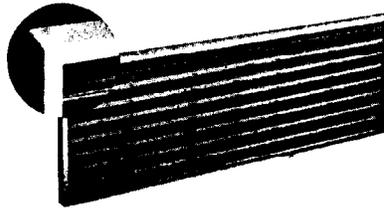
Four styles of outdoor grilles are available for exterior treatments. The standard stamped aluminum grille (RAG60), the molded architectural louvered exterior grilles (RAG61-63), the molded architectural louvered exterior grilles with flange (RAG64-66), and the extruded aluminum architectural louvered grille (RAG67). All grilles include air deflectors and gaskets to prevent condenser air recirculation.

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



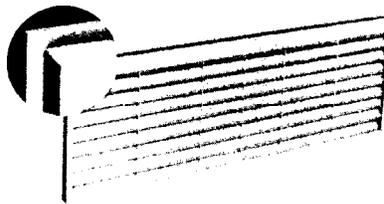
RAG60 Outdoor Grille

RAG61, 62, 63 Architectural Grille - One piece optional molded grille and frame assembly provides improved appearance, protection and weatherability. Molded of GE Cycloy[®], 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.



RAG61 Outdoor Grille

RAG64, 65, 66 Architectural Grille with Flange - Identical to RAG61-63 grilles with the addition of a 1/2" flange around the top and sides to help conceal the juncture of the



RAG64 Outdoor Grille

RAB71 wall case and the wall opening. The best appearance is achieved with this grille when the wall case extends minimally (between 1/4" and 1/2") beyond the exterior face of the building.

Colors: RAG61 and 64 - Beige; RAG62 and 65 - Dark Maple RAG63 and 66 - Bittersweet Chocolate (See color samples on Inside Back Cover.)

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 ordered directly from the grille manufacturer in other colors. Contact your General Electric salesperson for details.



RAG67

Installation: 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 grill is not

replaced, capacity and efficiency will be reduced and the unit may fail to operate properly or fail prematurely. A deflector kit, **RAK40**, may be used with grilles that were not designed for current AZ Series GE Zonelines. 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 Zonelines 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:

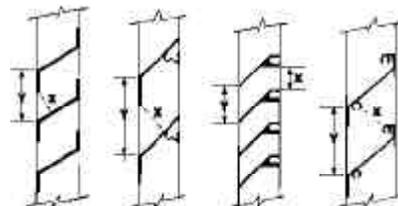
1. **The louver must have a minimum of 65% free area.** ASHRAE defines free area as the minimum area of the opening in an air inlet or outlet through which air can pass. Percent (%) free area equals the X dimension divided by the Y dimension.
2. The louver should be attached to the wall case in a manner 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.** 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 GE to be tested with the Zoneline unit.

Sample Calculations

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

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



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 with the space to be conditioned. Air conditioners 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. 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 wall papers, 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 with the building structure.

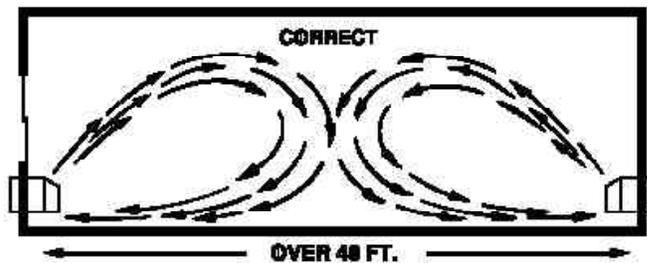
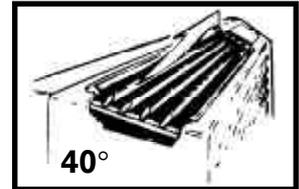
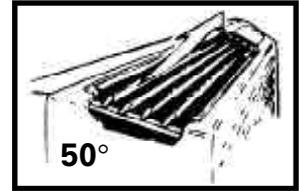
Air Distribution

Zoneline packaged terminal air conditioners and heat pumps discharge air from the top of the unit through reversible 2-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 most horizontal discharge angle can be obtained by removing the discharge grill 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.



Cooling Performance Data

Total Capacity - BTU/Hr.
BTUH At 80°F D.B. - 67°F W.B.

Temperature of Air Entering Condenser	Zoneline 2200 Series				Zoneline 3200 Series				Zoneline 5200 Series			
	AZ	AZ	AZ	AZ	AZ	AZ	AZ	AZ	AZ	AZ	AZ	AZ
	22E07D 22E07E	22E09D 22E09E	22E12D 22E12E	22E15D 22E15E	32H07D 32H07E	32H09D 32H09E	32H12D 32H12E	32H15D 32H15E	52H07D 52H07E	52H09D 52H09E	52H12D 52H12E	52H15D 52H15E
65	7800	10000	12950	17900	7800	10000	12950	17900	7800	10000	13050	18000
75	7750	9900	12800	15900	7750	9900	12800	15900	7750	9900	12900	16000
85	7500	9600	12500	15500	7500	9600	12500	15500	7500	9600	12600	15600
95	7100	9000	11700	14600	7100	9000	11700	14600	7100	9000	11800	14700
105	6600	8250	10750	13600	6600	8250	10750	13600	6600	8250	10850	13700
115	6000	7500	9650	12300	6000	7500	9650	12300	6000	7500	9750	12400

Heat Pump Performance Data

Capacities and COP at Various Outdoor Temperatures
BTUH At 70°F Indoor Temperature

Zoneline 3200 Series

Outdoor Temperature F°	AZ32H07D AZ32H07E		AZ32H09D AZ32H09E		AZ32H12D AZ32H12E		AZ32H15D AZ32H15E	
	BTUH	COP	BTUH	COP	BTUH	COP	BTUH	COP
65	7200	3.75	10000	3.75	13050	3.55	15950	3.35
60	7000	3.70	9600	3.70	12550	3.50	15300	3.30
55	6800	3.65	9100	3.65	11950	3.45	14650	3.25
50	6600	3.55	8700	3.55	11350	3.35	13850	3.15
47	6400	3.50	8400	3.50	10900	3.30	13400	3.10
45	6250	3.45	8200	3.45	10600	3.25	13050	3.05
40	5950	3.35	7700	3.30	9800	3.10	12250	2.95
35	5550	3.20	7100	3.20	9000	3.00	11300	2.80
30	5150	3.05	6500	3.05	8200	2.85	10300	2.65
25	4700	2.90	5900	2.85	7300	2.65	9250	2.50

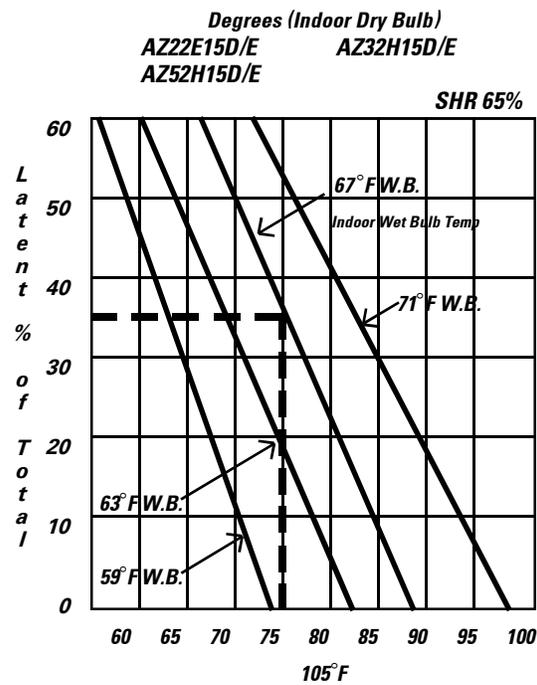
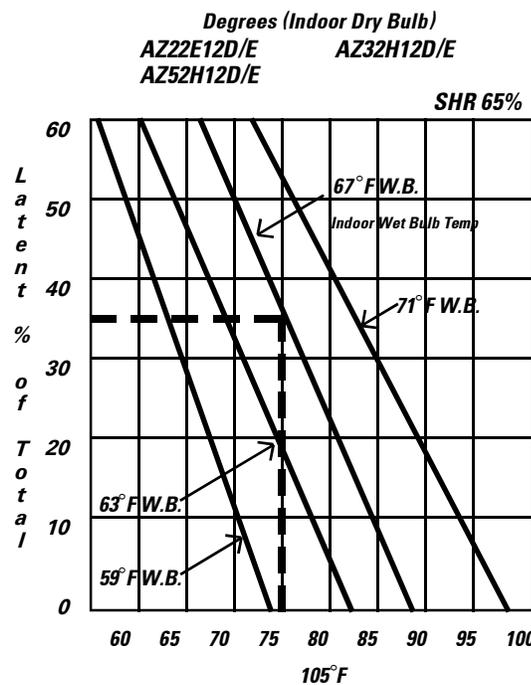
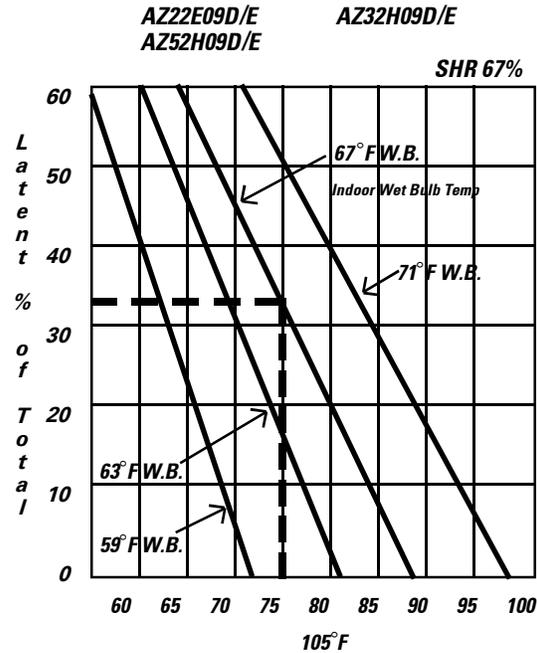
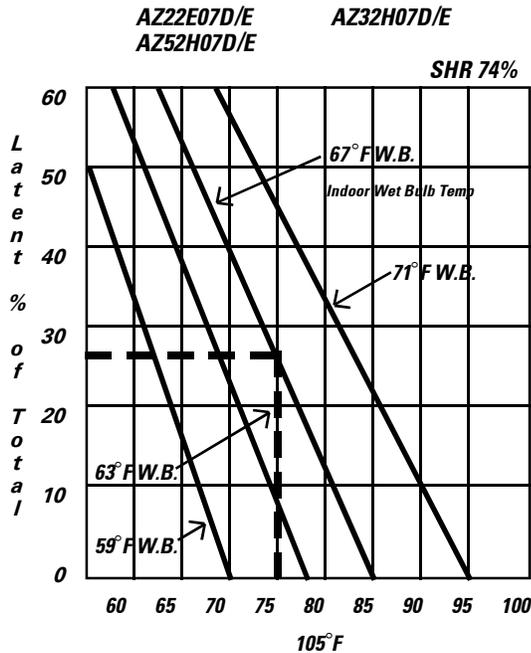
Zoneline 5200 Series

Outdoor Temperature F°	AZ52H07D AZ52H07E		AZ52H09D AZ52H09E		AZ52H12D AZ52H12E		AZ52H15D AZ52H15E	
	BTUH	COP	BTUH	COP	BTUH	COP	BTUH	COP
65	7200	3.75	10000	3.75	13050	3.55	15950	3.35
60	7000	3.70	9600	3.70	12550	3.50	15300	3.30
55	6800	3.65	9100	3.65	11950	3.45	14650	3.25
50	6600	3.55	8700	3.55	11350	3.35	13850	3.15
47	6400	3.50	8400	3.50	10900	3.30	13400	3.10
45	6250	3.45	8200	3.45	10600	3.25	13050	3.05
40	5950	3.35	7700	3.30	9800	3.10	12250	2.95
35	5550	3.20	7100	3.20	9000	3.00	11300	2.80
30	5150	3.05	6500	3.05	8200	2.85	10300	2.65
25	4700	2.90	5900	2.85	7300	2.65	9250	2.50

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 pages 52 and 53 are at standard rating conditions 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. The charts below provide data at various indoor conditions. To use the charts, first determine which Zonline model is being considered and refer to the appropriate chart. Next, locate the indoor dry bulb temperature under consideration across the horizontal axis of the chart and draw a line straight up until it touches the line representing the indoor wet bulb temperature of the area; from this point draw a horizontal straight line to the vertical axis. The point where the line touches the axis represents the latent percent of the total capacity of the unit. An example is shown for the standard indoor conditions of 80°F. dry bulb/67°F. wet bulb.



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
ALABAMA		
Birmingham	2,551	1,390
Huntsville	3,070	1,340
Mobile	1,560	1,640
Montgomery	2,291	1,580
ARIZONA		
Flagstaff	7,152	310
Phoenix	1,765	2,280
Tucson	1,800	1,920
Yuma	974	2,520
ARKANSAS		
Fort Smith	3,292	1,410
Little Rock	3,219	1,330
CALIFORNIA		
Bakersfield	2,122	1,530
Fresno	2,611	1,210
Los Angeles	2,061	310
Sacramento	2,502	1,030
San Diego	1,458	390
San Francisco	3,015	110
COLORADO		
Colorado Springs	6,423	520
Denver	6,283	550
Grand Junction	5,641	910
CONNECTICUT		
Hartford	6,235	480
D.C.		
Washington	4,224	1,010
DELAWARE		
Wilmington	4,930	770
FLORIDA		
Jacksonville	1,239	1,690
Miami	214	2,850
Orlando	766	1,930
Tallahassee	1,485	1,500
Tampa	683	2,350
GEORGIA		
Atlanta	2,961	1,130
Augusta	2,397	1,400
Macon	2,136	1,440
Savannah	1,819	1,510
IDAHO		
Boise	5,809	670
Lewiston	5,542	600
Pocatello	7,033	570
ILLINOIS		
Chicago	6,155	780
Moline	6,408	760
Springfield	5,429	890
INDIANA		
Evansville	4,435	1,090
Fort Wayne	6,205	710
Indianapolis	5,699	820
South Bend	6,439	600
IOWA		
Burlington	6,114	730
Des Moines	6,588	710
Sioux City	6,951	770
KANSAS		
Dodge City	4,986	1,020
Goodland	6,141	800
Topeka	5,182	880
Wichita	4,620	1,070

Location	ASHRAE Heating Degree Days	Estimated Cooling Hours
KENTUCKY		
Lexington	4,683	830
Louisville	4,660	1,130
LOUISIANA		
Alexandria	1,921	1,670
Baton Rouge	1,560	1,860
New Orleans	1,385	1,790
Shreveport	2,184	1,470
MAINE		
Portland	7,511	290
MARYLAND		
Baltimore	4,654	850
MASSACHUSETTS		
Boston	5,634	500
MICHIGAN		
Detroit	6,293	590
Flint	7,377	440
Grand Rapids	6,894	530
MINNESOTA		
Duluth	10,000	200
Minneapolis	8,382	550
MISSISSIPPI		
Jackson	2,239	1,560
MISSOURI		
Columbia	5,046	960
Kansas City	4,711	1,210
Springfield	4,900	970
St. Louis	4,900	1,080
MONTANA		
Billings	7,049	520
Glasgow	8,996	410
Great Falls	7,750	420
Missoula	8,125	350
NEBRASKA		
Grand Island	6,530	770
Omaha	6,612	750
NEVADA		
Ely	7,733	500
Las Vegas	2,709	1,980
Reno	6,332	520
NEW JERSEY		
Newark	4,589	710
NEW MEXICO		
Albuquerque	4,348	1,040
Clayton	5,158	720
Silver City	3,705	1,260
NEW YORK		
Albany	6,875	480
Binghamton	7,286	310
Buffalo	7,062	450
New York	4,811	790
Rochester	6,748	470
Syracuse	6,756	500
NORTH CAROLINA		
Asheville	4,042	690
Charlotte	3,191	1,230
Raleigh	3,393	1,070
Winston-Salem	3,595	960
NORTH DAKOTA		
Bismarck	8,851	510
Fargo	9,226	490
Williston	9,243	580

Location	ASHRAE Heating Degree Days	Estimated Cooling Hours
OHIO		
Cincinnati	5,265	840
Cleveland	6,351	610
Columbus	5,660	810
Dayton	5,622	740
Toledo	6,494	590
OKLAHOMA		
Oklahoma City	3,725	1,200
Tulsa	3,860	1,410
OREGON		
Medford	5,008	620
Pendleton	5,127	590
Portland	4,635	270
PENNSYLVANIA		
Harrisburg	5,251	730
Philadelphia	5,144	810
Pittsburgh	5,987	590
Scranton	6,254	440
Williamsport	5,934	600
RHODE ISLAND		
Providence	5,954	470
SOUTH CAROLINA		
Charleston	2,033	1,390
Columbia	2,484	1,440
Greenville	2,980	1,120
SOUTH DAKOTA		
Rapid City	7,345	580
Sioux Falls	7,839	610
TENNESSEE		
Chattanooga	3,254	1,180
Knoxville	3,494	1,070
Memphis	3,232	1,320
Nashville	3,578	1,220
TEXAS		
Corpus Christi	914	2,380
Dallas	2,363	1,900
El Paso	2,700	1,580
Houston	1,396	1,850
Lubbock	3,578	1,310
San Antonio	1,546	1,920
UTAH		
Milford	6,497	910
Salt Lake City	6,052	830
VERMONT		
Burlington	8,269	130
VIRGINIA		
Norfolk	3,421	1,010
Richmond	3,865	1,020
Roanoke	4,150	870
WASHINGTON		
Seattle	5,145	180
Spokane	6,655	430
Yakima	5,941	530
WEST VIRGINIA		
Charleston	4,476	860
Huntington	4,446	820
WISCONSIN		
Madison	7,863	530
Milwaukee	7,635	450
WYOMING		
Casper	7,410	600
Cheyenne	7,381	420
Sheridan	7,680	530

Formula for Calculating Operating Costs Using Above Data:

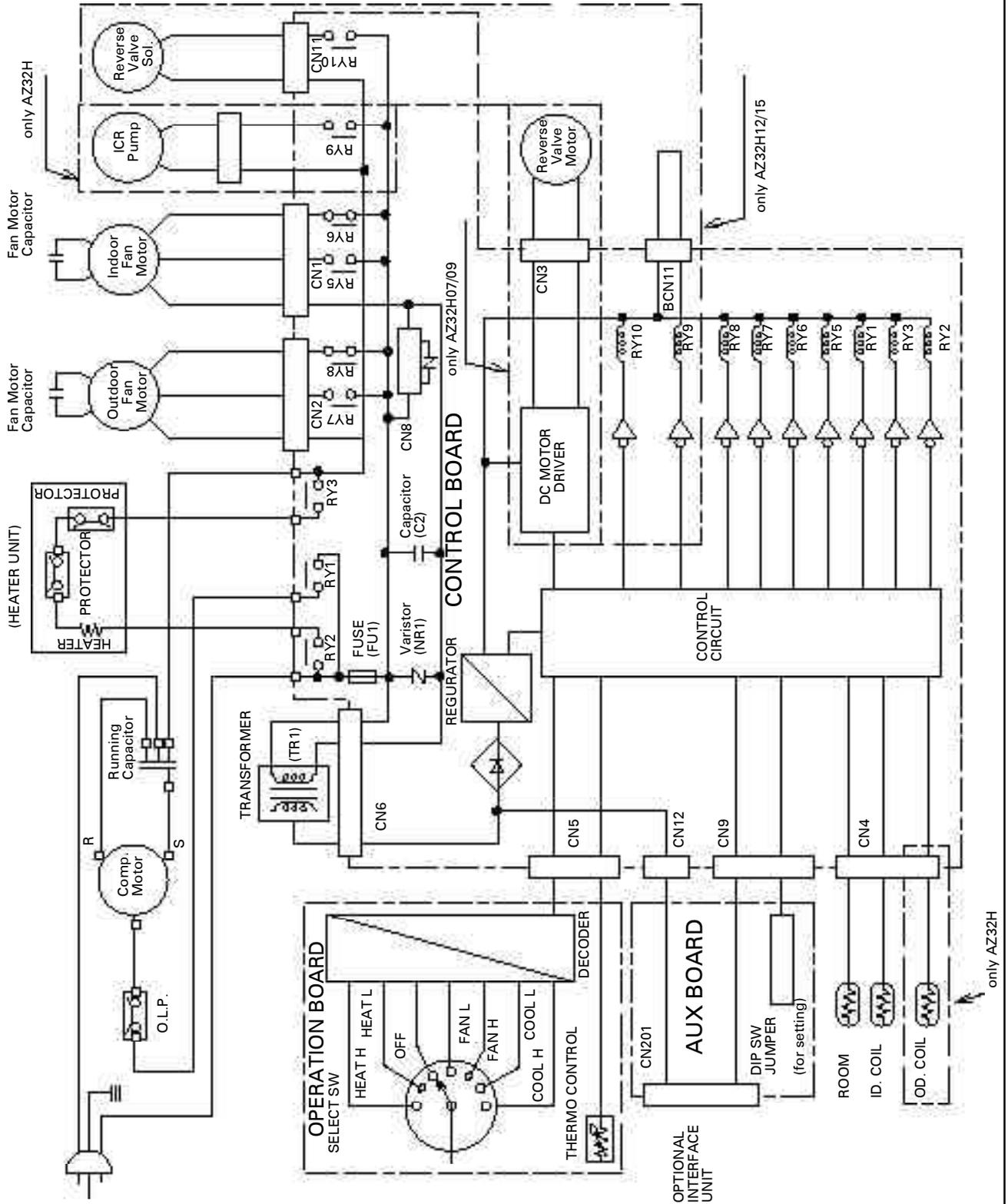
$$\text{Heating}^* - \frac{\text{Heat Loss KW} \times \text{Heating Degree Days} \times C \times \text{Cost per KWH}}{\text{Outdoor Design Temperature Difference}} = \text{Operating Cost}$$

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

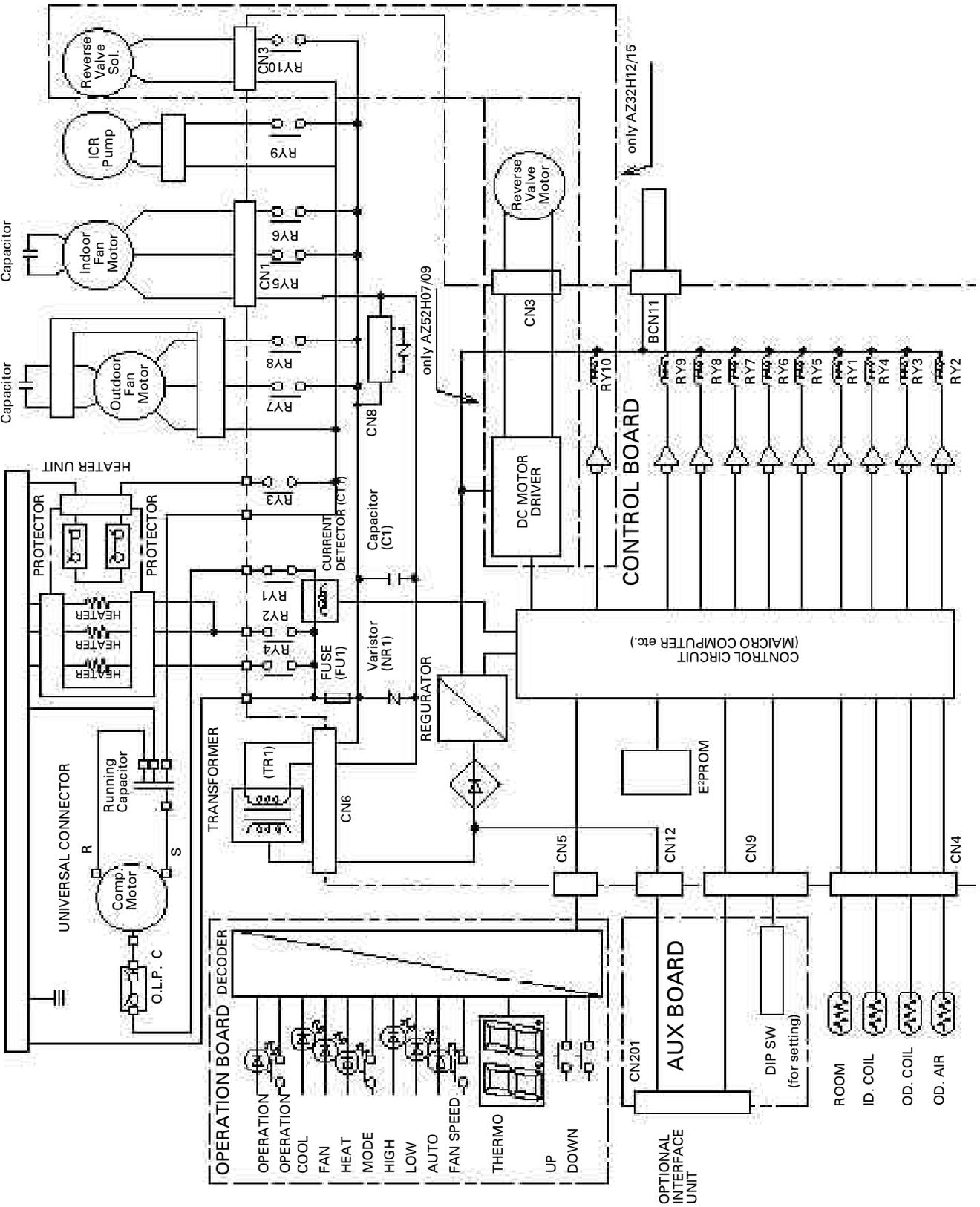
The local power supplier should be consulted for recommended value of C. This factor will vary between 17 and 24.

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

2200 and 3200 Series Typical



5200 Series Typical



Suggested Bid Form Specifications (Standard Microprocessor Control Units)

The following is a suggested specification for the GE Zoneline 2200 Series Packaged Terminal Air Conditioner and the GE Zoneline 3200 Series Packaged Terminal Heat Pump with Solid-State Controls

Items in brackets [] indicate optional items and should be added to specifications if required. Items in parenthesis () indicate one of the choices should be included in the specifications.

The contractor will furnish Packaged Terminal (Air Conditioners) (Heat Pumps) 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,] [direct connect kit] 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, [and 26 1/4" high with duct adapter in place] and not more than 22 3/4" from face of room cabinet to face of exterior grille.

Units shall be designed to operate on _____ volts, 60 Hz., single phase power.

Chassis. Unit (air conditioner) (heat pump) chassis shall be the standard product of the manufacturer and shall be shipped in protective cartons so as to preclude damage. Cartons shall be appropriately marked at the factory with wording sufficient to warn handlers against improper stacking, up-ending, rolling or dropping.

Chassis shall be slide-in type, ready to operate after installation.

Each shall consist of the following sections and components:
Hermetically-sealed refrigerant system with external vibration isolated rotary-type compressor, condenser and evaporator coils and capillary refrigerant control. Cooling shall be possible to outdoor temperature of 35°F. without damage to the compressor. 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 squirrel-cage design with double cut-off scroll to direct air to discharge louvers. All motors on the exterior side of the weather barrier shall be of an enclosed design to reduce the effects of moisture and corrosion.

A fan cycle switch to permit continuous indoor fan operation or, to permit energy saving intermittent indoor fan operation where the fan runs only when the compressor or heater is operating;

A positive cooling condensate disposal system which meets the test requirements of A.R.I. Standard 310-93 (80°F. dry bulb, 75°F. wet bulb, 80% relative humidity) for Packaged Terminal Air Conditioner units or A.R.I.

Standards 380-93 (80°F. dry bulb, 75°F. wet bulb, 80% relative humidity) for Packaged Terminal Heat Pump units;

Condenser and evaporator coils to be constructed of copper tubing and aluminum plate fins with enhancements necessary 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 rotary controls for selection of unit Operation and Thermostat setting. Controls shall be covered by a hinged door;

Slide-out washable filters accessible from top of unit without requiring removal of room cabinet;

Positive-closing fresh air damper located within the chassis operated by a concealed manual control;

Solid state thermostat control to sense room temperature;

Mechanical temperature limiting to restrict movement of thermostat control knob to prevent extreme settings of thermostat control;

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;

Compatible with 2 wire Central Desk Control; (RAKOIM required)

Compatible with Class 2 Remote Thermostat Control utilizing (GE thermostat model RAK163 for Packaged Terminal Air Conditioner) (GE thermostat model RAK147 for Packaged Terminal Heat Pump). (RAKOIM required)

[Heat pumps]

Heat pump units shall automatically change from heat pump operation to electric resistance heat when heat pump operation is unable to produce sufficient heat to maintain room temperature within 2-1/2°F. of thermostat set point, or when the outdoor coil temperature falls below 9°F. - approximately 25°F. outdoor temperature.

Heat pump unit shall automatically begin a passive defrost cycle when the outdoor coil temperature drops below 9°F. Defrosting shall be accomplished by natural defrost with unit automatically reinitiating heat pump operation when outdoor coil reaches 36°F.

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.

Unit shall have means of electrical connection listed by Underwriters Laboratories and compatible with the unit's capacity which shall conform with National Electrical Code® (NEC) and local codes.

[Internal Condensate Removal (ICR) system for Heat Pump Units. Unit shall have a positive Internal Condensate Removal (ICR) system to permit unit to automatically dispose of heat pump generated condensate with no overflow to outdoor to occur 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.]

[Condensate Drain System. To remove condensate from the wall case an (internal) (external) drain adapter shall be installed for connection to the building condensate drain system as shown on the plans.]

Wall Case. (Wall case shall be constructed of heavy gauge, zinc-coated, phosphatized steel, insulated and shall have a protective baked-on enamel finish. Bottom critical points of the steel wall case shall be treated with petroleum microcrystalline wax for added corrosion protection and shall meet ASTM B-117, 1800 hour hot air aerated salt spray test.) (Wall case shall be constructed of a non-corroding glass reinforced polyester compound.)

Cases shall be installed through exterior walls where shown on the plans and shall be level from side to side and from front to rear to ensure proper operation of condensate system(s). They shall be secured to the wall at both sides using nails or other appropriate fastening devices. 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.

[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 and shall include adjustable screws at the bottom corners to permit exact leveling of the wall case. 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.]

Outside Grille. Each unit shall be equipped with a standard (Cyclooy® resin architectural) (extruded aluminum architectural louvered) (stamped aluminum) grille that has been designed to allow unit operation in high ambient conditions.

Special grilles or customer louver sections to be supplied by others will conform to minimum free area requirements for unit performance and shall be submitted to the PTAC/PTHP manufacturer, if requested, for feasibility and airflow characteristics.

Room Cabinet. Each unit shall have a matching, easily removable, textured finish, wrap-around roomside cabinet molded of high temperature styrene to resist corrosion and damage.

Optional Ducting. Units shown on the plans shall be ducted using accessory duct adapters supplied by the manufacturer. Duct extensions (supplied by the manufacturer) (field supplied per the details on the plans) and shown ducted to the right or left of the unit shall not exceed the maximum length of 15 feet. Duct adapters and extensions shall have a protective baked-on enamel and 1/2" of insulation wrapped around the interior of the duct adapter and duct extension.

Weather Resistance. Complete unit including outside louver shall be submitted to an independent agency for weather resistance and water infiltration 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. (Heat Pump units with ICR may not exceed 10 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/ft.²/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, complete address and phone number, including phone number of emergency service personnel.

Start-Up, Adjust, Demonstrate. (Installing contractor) (General contractor) shall be responsible for the initial starting of units, adjustments thereto, etc., to place the units in required operating condition. (Installing contractor) (General 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 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 customer. The warranty shall also include a limited 2nd thru 5th year parts only warranty for 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.

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.

Suggested Bid Form Specifications (Highly Featured Microprocessor Control Units)

The following is a suggested specification for the GE Zoneline 5200 Series Packaged Terminal Heat Pump with Microprocessor Controls

Items in brackets [] indicate optional items and should be added to specifications if required. Items in parenthesis () indicate one of the choices should be included in the specifications.

The contractor will furnish Packaged Terminal (Air Conditioners) (Heat Pumps) 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, power connector kit, wall case, [sub-base,] and outside 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, [and 26 1/4" high with duct adapter in place] and not more than 22 3/4" from face of room cabinet to face of exterior grille.

Units shall be designed to operate on _____ volts, 60 Hz., single phase power.

Chassis. Unit (air conditioner) (heat pump) chassis shall be the standard product of the manufacturer and shall be shipped in protective cartons so as to preclude damage. Cartons shall be appropriately marked at the factory with wording sufficient to warn handlers against improper stacking, up-ending, rolling or dropping.

Chassis shall be slide-in type, ready to operate after installation.

Each shall consist of the following sections and components:
Hermetically-sealed refrigerant system with external vibration isolated rotary-type compressor, condenser and evaporator coils and capillary refrigerant control. Cooling shall be possible to outdoor temperature of 35°F. without damage to the compressor. 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 forward curved cross-flow design. Only the indoor fan shall run during the heating cycle on resistance heat models. All motors on the exterior side of the weather barrier shall be of an enclosed design to reduce the effects of moisture and corrosion.

A fan cycle switch to permit continuous indoor fan operation or, to permit energy saving intermittent indoor fan operation where the fan runs only when the compressor or heater is operating.

A positive cooling condensate disposal system which meets the test requirements of A.R.I. Standard 310-93 (80°F. dry bulb, 75°F. wet bulb, 80% relative humidity) for Packaged Terminal Air Conditioner units or A.R.I. Standards 380-93 (80°F. dry bulb, 75°F. wet bulb, 80% relative humidity) for

Packaged Terminal Heat Pump units;

Condenser and evaporator coils to be constructed of copper tubing and aluminum plate fins with enhancements necessary 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 45° off vertical air pattern with an alternate position to provide a 30° off vertical air pattern;

Easily accessible controls for unit Operation and Thermostat setting. Controls shall be covered by a hinged door;

Slide-out washable filters accessible from top of unit without requiring removal of room cabinet;

Positive closing fresh air damper located within the chassis operated by concealed manual control;

Thermistor temperature sensing device to measure room temperature and control operation of unit;

Electronic temperature limiting, to permit 7 independent heating limits and 7 independent cooling limits;

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;

Compatible with 2 wire Central Desk Control; (RAKOIM required)

Compatible with Class 2 Remote Thermostat Control utilizing (GE thermostat model RAK147 for Packaged Terminal Heat Pump). (RAKOIM required)

[Heat pumps]

Heat pump units shall provide a choice of operation that will allow either: A) automatically phase-in partial electric resistance heat, if outdoor temperature is below 46°F., simultaneously with heat pump if heat pump alone is unable to maintain room temperature; or B) partial electric resistance heat simultaneous with heat pump operation any time the outdoor temperature is below 45°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. 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.

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. Unit shall automatically resume heat pump operation, after pausing to allow refrigerant pressures to equalize, at conclusion of defrost cycle.

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.

Unit shall have means of electrical connection listed by Underwriters Laboratories and compatible with the unit's ampacity which shall conform with National Electrical Code® (NEC) and local codes.

[Internal Condensate Removal (ICR) system for Heat Pump Units. Unit shall have a positive Internal Condensate Removal (ICR) system to permit unit to automatically dispose of heat pump generated condensate with no overflow to outdoor to occur 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.]

[Condensate Drain System. To remove condensate from the wall case an (internal) (external) drain adapter shall be installed for connection to the building condensate drain system as shown on the plans.]

Wall Case. (Wall case shall be constructed of heavy gauge, zinc-coated, phosphatized steel, insulated and shall have a protective baked-on enamel finish. Bottom critical points of the steel wall case shall be treated with petroleum microcrystalline wax for added corrosion protection and shall meet ASTM B-117, 1800 hour hot air aerated salt spray test. (Wall case shall be constructed of a non-corroding glass reinforced polyester compound.)

Cases shall be installed through exterior walls where shown on the plans and shall be level from side to side and from front to rear to ensure proper operation of condensate system(s). They shall be secured to the wall at both sides using nails or other appropriate fastening devices. 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.

[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 and shall include adjustable screws at the bottom corners to permit exact leveling of the wall case. 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.]

Outside Grille. Each unit shall be equipped with a standard

(Cyclooy® resin architectural) (extruded aluminum architectural louvered) (stamped aluminum) grille that has been designed to allow unit operation in high ambient conditions.

Special grilles or customer louver sections to be supplied by others will conform to minimum free area requirements for unit performance and shall be submitted to the PTAC/PTHP manufacturer, if requested, for feasibility and airflow characteristics.

Room Cabinet. Each unit shall have a matching, easily removable, textured finish, wrap-around roomside cabinet molded of high temperature styrene to resist corrosion and damage.

Weather Resistance. Complete unit including outside louver shall be submitted to an independent agency for weather resistance and water infiltration 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/ft.²/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, complete address and phone number, including phone number of emergency service personnel.

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

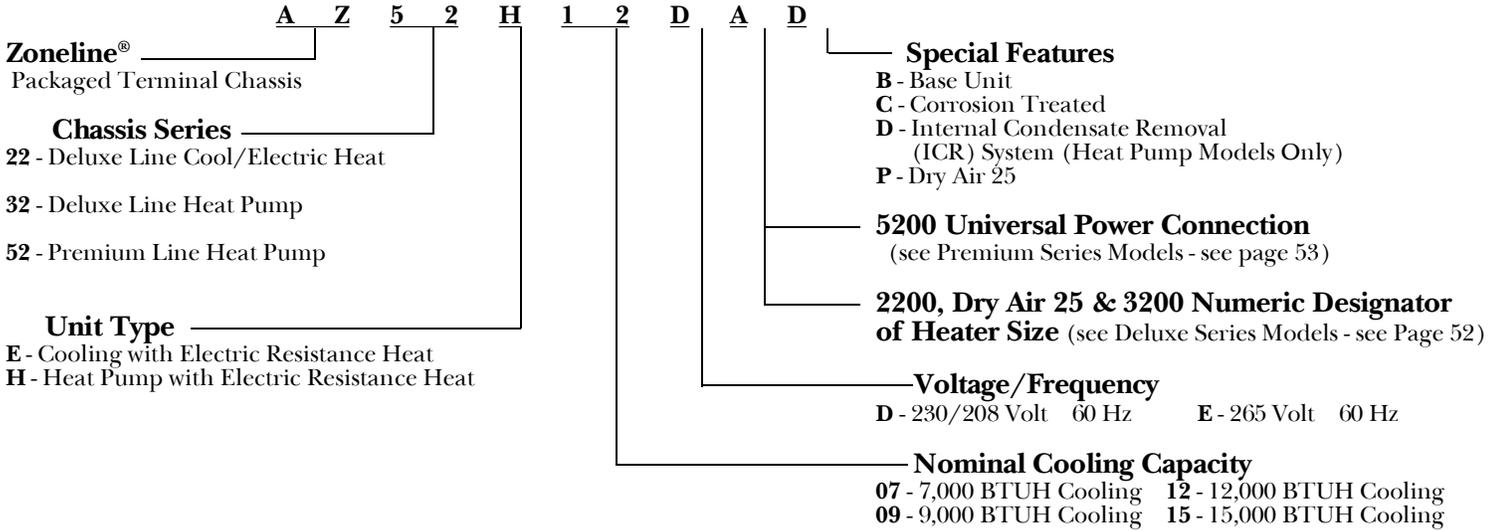
Warranty. The warranty shall be a full one year parts and labor on entire unit plus an additional full four years parts and labor for the sealed refrigerating system, including service call for diagnosis, and transportation to and from service shop, if necessary, at no charge to customer. The warranty shall also include a limited 2nd thru 5th year parts only warranty for 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.

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.

Zoneline® Chassis Nomenclature

The Zoneline 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 Zoneline chassis the use of this nomenclature will assure receiving the correct unit.

Example



Deluxe Line: 2200, Dry Air 25 & 3200 Series -

Models are manufactured with fixed heater wattages with the appropriate power cord attached (all 265 volt models are permanently connected). 5.0 KW heaters are not available on 7,000 BTUH models.

Heater Table

Voltage	Heater Amps	Heater Designator	Watts	KWH	Minimum Ampacity	BTUH
230/208	11.1/10.0	2	2550/2090	2.55/2.09	15	8,600/7,100
230/208	15.0/13.6	3	3450/2820	3.45/2.82	20	11,700/9,600
230/208	21.7/19.7	5	5000/4090	5.00/4.09	30	17,000/13,900
265	7.5	2	2000	2.0	15	6,800
265	11.3	3	3000	3.0	15	10,200
265	15.1	4	4000	4.0	20	13,600
265	18.9	5	5000	5.0	30	17,000

Deluxe Series - Cooling & Electric Heat

Dry Air 25

	2200 Series Units				Dry Air 25		
	AZ22E07D	AZ22E09D	AZ22E12D	AZ22E15D	AZ22E07D*P	AZ22E09D*P	AZ22E12D*P
230/208V Models							
Capacity							
Cooling BTUH	7,100/6,900	9,000/8,800	11,700/11,500	14,600/14,300	6,800/6,600	8,600/8,400	11,200/11,000
EER (BTU/Watt)	11.6/11.6	11.3/11.3	10.7/10.7	9.6/9.6	11.1/11.1	10.8/10.8	10.2/10.2
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	2.2	3.4	4.5
Features							
CFM, Indoor Fan High	240	260	270	310	230	230	240
CFM, Indoor Fan Low	210	230	240	280	200	200	210
Vent CFM	40/35	65/60	70/65	70/65	40/35	65/60	70/65
Power/Ratings							
Power Factor	95	96	97	94	95	96	97
Sensible Heat Ratio @ 230 Volts	75%	68%	67%	67%	66%	58%	57%
Watts	610/595	795/780	1095/1075	1520/1490	610/595	795/780	1095/1075
Amperes, F.L.	2.8/3.0	3.6/3.9	4.9/5.3	7.0/7.5	2.8/3.0	3.6/3.9	4.9/5.3
Amperes, L.R.	19.0	21.0	33.0	38.0	19.0	21.0	33.0
Weight (Ship/Net)**	119/103	122/105	131/114	138/122	124/108	127/110	136/119
265V Models							
Capacity							
Cooling BTUH	7,100	9,000	11,700	14,600	6,800	8,600	11,200
EER (BTU/Watt)	11.6	11.3	10.7	9.6	11.1	10.8	10.2
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	2.2	3.4	4.5
Features							
CFM, Indoor Fan High	240	260	270	310	230	230	240
CFM, Indoor Fan Low	210	230	240	280	200	200	210
Vent CFM	40	65	70	70	40	65	70
Power/Ratings							
Power Factor	90	94	94	96	96	94	94
Sensible Heat Ratio @ 265 Volts	75%	68%	67%	67%	66%	58%	57%
Watts	610	795	1095	1520	610	795	1095
Amperes, F.L.	2.4	3.2	4.4	6.0	2.4	3.2	4.4
Amperes, L.R.	16.0	18.0	24.0	31.0	16.0	18.0	24.0
Weight (Ship/Net)**	119/103	122/105	131/114	138/122	124/108	127/110	136/119

*For Dry Air 25 model number, designate respective heater number using chart above, followed by the letter P.

** ICR adds 3 pounds to unit weight

Receptacles/Sub-Bases



Tandem
230/208V 15 Amp
NEMA6-20R



Perpendicular
230/208V 20 Amp
NEMA6-20R



Large Tandem
230/208V 30 Amp
NEMA6-30R



265V 15 Amp
NEMA7-15R;
receptacle used on
265V sub-base
GEO715



265V 20 Amp
NEMA7-20R;
receptacle used on
265V sub-base
GEO720-3



265V 30 Amp
NEMA7-30R;
receptacle used on
265V sub-base
GEO73

Sub-bases

	RAK204U	RAK204D20	RAK204D30	RAK204E15	RAK204E20	RAK204E30
Voltage	N/A	230/208	230/208	265	265	265
Amps	N/A	15/20	30	15	20	30
Receptacle	N/A	NEMA6-20R	NEMA6-30R	NEMA7-15R	NEMA7-20R	NEMA7-30R

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

230/208 Volt Line Cord Connected Units

Power Connection Kit	RAK3152	RAK3202	RAK3302
Heater KW	2.55/2.09	3.45/2.82	5.00/4.09
Watts	2,550/2,090	3,450/2,820	5,000/4,090
BTUH	8,600/7,100	11,700/9,600	17,000/13,900
Amps	11.1/10.0	15.0/13.6	21.7/19.7
Min. Circuit Amps	15	20	30
Recommended Protective Device	15 Amp Time Delay Fuse or Breaker	20 Amp Time Delay Fuse or Breaker	30 Amp Time Delay Fuse or Breaker

Premium Line: 5200 Series - Power Connection Kits

are **REQUIRED** on Premium 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 premium models. See specification sheet for heater KW and branch circuit ampacity.



RAK3152/3202/3302
230/208 volt Line Cord Connection Kit

265 Volt Permanent Connected Units** (Cord Set)

Power Connection Kit	RAK5152	RAK5172	RAK5202	RAK5302
Heater KW	1.7	3.0	3.7	5.0
Watts	1,700	3,000	3,700	5,000
BTUH	5,800	10,200	12,600	17,000
Amps	6.4	11.3	14.0	18.9
Min. Circuit Amps	15	15	20	30
Recommended Protective Device	15 Amp Time Delay Fuse	15 Amp Time Delay Fuse	20 Amp Time Delay Fuse	30 Amp Time Delay Fuse

**To Be Used With Sub-base

	Deluxe Series - Heat Pump Units				Premium Series - Heat Pump Units			
	3200 Series Units				5200 Series Units			
230/208V Models	AZ32H07D	AZ32H09D	AZ32H12D	AZ32H15D	AZ52H07D	AZ52H09D	AZ52H12D	AZ52H15D
Capacity								
Cooling BTUH	7,100/6,900	9,000/8,800	11,700/11,500	14,600/14,300	7,100/6,800	9,000/8,800	11,800/11,600	14,700/14,400
EER (BTU/Watt)	11.6/11.6	11.3/11.3	10.7/10.7	9.6/9.6	12.0/12.0	11.3/11.3	10.7/10.7	10.0/10.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	1.7	2.8	3.6	4.8
Features								
CFM, Indoor Fan High	250	260	280	310	240	290	330	350
CFM, Indoor Fan Low	220	230	250	280	220	270	310	330
Vent CFM	40/35	65/60	70/65	70/65	40/35	65/60	70/65	70/65
Power/Ratings								
Power Factor	95	96	97	94	95	96	94	95
Sensible Heat Ratio @ 230 Volts	75%	68%	67%	67%	75%	67%	68%	65%
Watts	610/595	795/780	1095/1075	1520/1490	590/565	795/780	1105/1085	1470/1440
Amperes, F.L.	2.8/3.0	3.6/3.9	4.9/5.3	7.0/7.5	2.7/2.9	3.6/3.9	5.1/5.5	6.7/7.3
Amperes, L.R.	19.0	21.0	33.0	38.0	19.0	21.0	33.0	38.0
Reverse Cycle Heat BTUH	6400/6200	8400/8200	10900/10700	13400/13200	6400/6200	8400/8200	10900/10700	13400/13200
COP	3.5/3.5	3.5/3.5	3.3/3.3	3.1/3.1	3.5/3.5	3.5/3.5	3.3/3.3	3.1/3.1
Watts	535/520	705/685	970/950	1265/1250	535/520	700/685	970/950	1265/1250
Amps	2.4/2.6	3.1/3.4	4.3/4.7	5.8/6.3	2.4/2.6	3.1/3.3	4.3/4.7	5.8/6.3
Weight (Ship/Net)**	125/109	127/111	131/121	145/129	129/104	122/106	132/116	143/127
265V Models	AZ32H07E	AZ32H09E	AZ32H12E	AZ32H15E	AZ52H07E	AZ52H09E	AZ52H12E	AZ52H15E
Capacity								
Cooling BTUH	7,100	9,000	11,700	14,600	7,100	9,000	11,800	14,700
EER (BTU/Watt)	11.6	11.3	10.7	9.6	12.0	11.3	10.7	10.0
Dehumidification Pts/Hr	1.7	2.7	3.6	4.5	1.7	2.8	3.6	4.8
Features								
CFM, Indoor Fan High	250	260	280	310	240	290	330	350
CFM, Indoor Fan Low	220	230	250	280	220	270	310	330
Vent CFM	40	65	70	70	40	65	70	70
Power/Ratings								
Power Factor	96	94	94	96	97	94	93	96
Sensible Heat Ratio @ 265 Volts	75%	68%	67%	67%	75%	67%	68%	65%
Watts	610	795	1095	1520	590	795	1105	1470
Amperes, F.L.	2.4	3.2	4.4	6.0	2.3	3.2	4.5	5.8
Amperes, L.R.	16.0	18.0	24.0	31.0	16.0	18.0	24.0	31.0
Reverse Cycle Heat BTUH	6,400	8,400	11,900	13,400	6,400	8,400	10,900	13,400
COP	3.5	3.5	3.3	3.1	3.5	3.5	3.3	3.1
Watts	535	700	970	1265	535	700	970	1265
Amps	2.2	2.8	3.9	5.0	2.2	2.7	3.9	5.0
Weight (Ship/Net)**	125/109	127/111	131/121	145/129	120/104	122/106	132/116	143/127

** ICR adds 3 pounds to unit weight

Maximum Connected Load For Deluxe Series (2200 and 3200)

The maximum connected load of a Zoneline 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 fan motor.

In the tables below, the heater designator in the model number is represented by an * in the model number

column. To find the maximum connected load, locate the model in the left column and go across the row to the column headed by the 9th character in the model number or the heater watts.

The sum of the fan motor requirements TABLE A and the heater requirements TABLE B equal the Maximum Connected Load of the unit.

Heating Operation - Indoor Fan Motor Electrical Data

Table A - 230/208 Volt Units

Model Number	230 Volt			
	230 V		208 V	
	Watts	Amps	Watts	Amps
AZ22E07D*C	50	0.22	40	0.20
AZ22E09D*C	60	0.27	50	0.25
AZ22E12D*C	70	0.31	60	0.30
AZ22E15D*C	80	0.36	70	0.35
AZ32H07D*C / D*D	50	0.22	40	0.20
AZ32H09D*C / D*D	60	0.27	50	0.25
AZ32H12D*C / D*D	70	0.31	60	0.30
AZ32H15D*C / D*D	80	0.36	70	0.35

Table A - 265 Volt Units

Model Number	265 Volt	
	Watts	Amps
	AZ22E07E*C	50
AZ22E09E*C	60	0.22
AZ22E12E*C	70	0.26
AZ22E15E*C	80	0.30
AZ32H07E*C / E*D	50	0.19
AZ32H09E*C / E*D	60	0.22
AZ32H12E*C / E*D	70	0.26
AZ32H15E*C / E*D	80	0.30

Outdoor Fan Motor Electrical Data For Deluxe 2200 & 3200 Series Two Fan Motor Models

For Information Only. Do Not Include In Maximum Connected Load Calculations.

Model Number	Fan Motor- 230 Volts		Fan Motor- 208 Volts		Model Number	Fan Motor - 265 Volts	
	Watts	Amps	Watts	Amps		Watts	Amps
AZ*2H07DAB/DAD	65	0.3	60	0.3	AZ*2H07EAB/EAD	75	0.3
AZ*2H09DAB/DAD	65	0.3	60	0.3	AZ*2H09EAB/EAD	75	0.3
AZ*2H12DAB/DAD	90	0.4	80	0.4	AZ*2H12EAB/EAD	100	0.4
AZ*2H15DAB/DAD	135	0.6	125	0.6	AZ*2H15EAB/EAD	135	0.5

Heating Operation - Resistance Heater Electrical Data

Table B - 230/208 Volt Units

Model Number	230 Volt						208 Volt							
	* = 2		* = 3		* = 5		* = 2		* = 3		* = 5			
	Heater Watts - 2550	Heater Watts - 3450	Heater Watts - 5000	Watts	Amps	Watts	Amps	Heater Watts - 2090	Heater Watts - 2820	Heater Watts - 4090	Watts	Amps	Watts	Amps
AZ22E07D*C	2550	11.1	3450	15.0				2090	10.0	2820	13.6			
AZ22E09D*C	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ22E12D*C	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ22E15D*C	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ32H07D*C / D*D	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ32H09D*C / D*D	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ32H12D*C / D*D	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	
AZ32H15D*C / D*D	2550	11.1	3450	15.0	5000	21.7		2090	10.0	2820	13.6	4090	19.7	

Table B - 265 Volt Units

Model Number	265 Volt							
	* = 2		* = 3		* = 4		* = 5	
	Heater Watts - 2000	Heater Watts - 3000	Heater Watts - 4000	Heater Watts - 5000	Watts	Amps	Watts	Amps
AZ22E07E*C	2000	7.6	3000	11.3	4000	15.1		
AZ22E09E*C	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ22E12E*C	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ22E15E*C	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ32H07E*C / E*D	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ32H09E*C / E*D	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ32H12E*C / E*D	2000	7.6	3000	11.3	4000	15.1	5000	18.9
AZ32H15E*C / E*D	2000	7.6	3000	11.3	4000	15.1	5000	18.9

Maximum Connected Load For Premium Series (5200)

The maximum connected load of a Zoneline unit occurs when the unit is in resistance heating operation. To determine the maximum amperage draw or wattage consumption of the unit: **First**, find the chassis model number in **TABLE A** and read the amperage or wattage of the unit in the appropriate column; **Second**, find the power

connection kit to be used in **TABLE B** and read the amperage or wattage of the heater in the appropriate column.

The sum of the fan motor requirements TABLE C and the heater requirements TABLE D equal the Maximum Connected Load of the unit.

Table C
Heating Operation - Indoor Fan Motor Electrical Data

Model Number	Fan Motor - 230 Volts		Fan Motor - 208 Volts		Model Number	Fan Motor - 265 Volts	
	Watts	Amps	Watts	Amps		Watts	Amps
AZ52H07DAB/DAD*	25	0.1	20	0.1	AZ52H07EAB/EAD*	30	0.1
AZ52H09DAB/DAD*	25	0.1	20	0.1	AZ52H09EAB/EAD*	30	0.1
AZ52H12DAB/DAD*	25	0.1	20	0.1	AZ52H12EAB/EAD*	30	0.1
AZ52H15DAB/DAD*	45	0.2	40	0.2	AZ52H15EAB/EAD*	50	0.2

* These models have 2 fan motors. Information shown is for the indoor fan motor only.

Outdoor Fan Motor Electrical Data Two Fan Motor Models

For Information Only. Do Not Include In Maximum Connected Load Calculations.

Model Number	Fan Motor - 230 Volts		Fan Motor - 208 Volts		Model Number	Fan Motor - 265 Volts	
	Watts	Amps	Watts	Amps		Watts	Amps
AZ52H07DAB/DAD	65	0.3	60	0.3	AZ52H07EAB/EAD	75	0.3
AZ52H09DAB/DAD	65	0.3	60	0.3	AZ52H09EAB/EAD	75	0.3
AZ52H12DAB/DAD	90	0.4	80	0.4	AZ52H12EAB/EAD	100	0.4
AZ52H15DAB/DAD	135	0.6	125	0.6	AZ52H15EAB/EAD	135	0.5

Table D
Heating Operation - Resistance Heater Electrical Data

Power Connection Kit	Heater - 230 Volts		Heater - 208 Volts		Power Connection Kit	Heater - 265 Volts	
	Watts	Amps	Watts	Amps		Watts	Amps
RAK3152	2550	11.1	2085	10.0	RAK5152	1700	6.4
RAK3202	3450	15.0	2820	13.6	RAK5172	3000	11.3
RAK3302	5000	21.7	4090	19.7	RAK5202	3700	14.0
					RAK5302	5000	18.9

Complete Accessory List

Kit Number	Description	For Additional Information Refer to Page
RAA62	Spare Filters for AZ22, AZ32 and AZ52 Models (10 pairs per box)	11
RAB71	Standard Wall Case	21
RAB77A4	SMC Wall Case	21
RAD10	Interior/Exterior Drain Kit	33/34
RAG60	Stamped Aluminum Exterior Grille	41
RAG61	Architectural Rear Grille, Beige Molded G.E. Cycology® High Impact Plastic	41
RAG62	Architectural Rear Grille, Maple Molded G.E. Cycology® High Impact Plastic	41
RAG63	Architectural Rear Grille, Dark Brown Molded G.E. Cycology® High Impact Plastic	41
RAG64	Architectural Rear Grille w/Flange, Beige Molded G.E. Cycology® High Impact Plastic	41
RAG65	Architectural Rear Grille w/Flange, Maple Molded G.E. Cycology® High Impact Plastic	41
RAG66	Architectural Rear Grille w/Flange, Dark Brown Molded G.E. Cycology® High Impact Plastic	41
RAG67	Aluminum Architectural Grille (can be special ordered in Colors)	41
RAK40	Air Deflector Kit (when using existing architectural grille)	41
RAKOIM	Optional Interface Module - needed for Central Desk Control and Remote Thermostat Control	16
RAK147	Wall Thermostat for Heat Pumps	19
RAK163A1	Vertical Wall Thermostat for Resistance Heat Models	18
RAK165	See-through Locking Cover for Wall Thermostat	19
RAK201	Sub-base Adapter with Knockouts (front cover plate for sub-base)	39
RAK204D20	208/230 volt 15/20 Amp. Receptacle. (Receptacle NEMA6-20 GE4181-2) (18 inch #12AWG wires attached to the receptacle.) Chaseway is included.	21
RAK204D30	208/230 volt 30 Amp. Receptacle. (Receptacle NEMA6-30 GE4139-3) (18 inch #12AWG wires attached to the receptacle.) Chaseway is included.	21
RAK204E15	265 volt 15 Amp. Receptacle. (Receptacle NEMA7-15R GE716-6) (18 inch #12AWG wires attached to the receptacle.) Chaseway is included.	21
RAK204E20	265 volt 20 Amp. Receptacle. (Receptacle NEMA7-20R GE720-3) (18 inch #12AWG wires attached to the receptacle.) Chaseway is included.	21
RAK204E30	265 volt 30 Amp. Receptacle. (Receptacle NEMA7-30R GE0730) (18 inch #12AWG wires attached to the receptacle.) Chaseway is included.	21
RAK204U	No Receptacle, No Wiring, Will accept any 15, 20, 30 amp Receptacle & Wiring. No Chaseway is included. Note: RAK205CW is the chaseway and can be ordered separately.	21
RAK205CW	Chaseway	22
RAK3152	Universal Power Cord, 15 Amp, 230/208V, 2.55/2.09 KW	38
RAK3202	Universal Power Cord, 20 Amp, 230/208V, 3.45/2.82 KW	38
RAK3302	Universal Power Cord, 30 Amp, 230/208V, 5.00/4.09 KW	38
RAK4002	Direct Connect Junction Box, 230/208 Volts	40
RAK5152	Universal Permanent Connection, 15 Amp, 265V, 1.70 KW, with 15 Amp fuse	39
RAK5172	Universal Permanent Connection, 15 AMP, 265V, 3.00 KW, with 15 Amp fuse	39
RAK5202	Universal Permanent Connection, 20 Amp, 265V, 3.70 KW, with 20 Amp fuse	39
RAK5302	Universal Permanent Connection, 30 Amp, 265V, 5.00 KW, with 30 Amp fuse	39
RAK601	Duct Extension, 44 Long, Insulated, Register and Trim Flange	35
RAK602	Register and Trim Flange	35
RAK6052	Duct Adapter for AZ22 and AZ32 Models Only	35
RAK7012	Duct Adapter for AZ22 and AZ32 Chassis Replacing A-B Chassis	35
RAK7022	Duct Transition for AZ22 and AZ32 Chassis Replacing AZC and AZ Chassis	35
RAK8022	Locking Door Kit for Zoneline™ Units	10
RAK806	Universal Control Cover Label	18
RAK901L	Wall Case Insulation Kit	21

Replacement of Existing Heat/ Cool Zoneline or Similar Unit

Is the existing unit GE or other manufacture?

GE model number _____

Air conditioner model number and brand
(other than GE) _____

Capacity ____ Voltage ____ Amp ____ Other ____

COOLING

Should a change in unit BTU cooling or heating be considered?

Did the existing unit cool the room quickly on a hot day?
And cycle OFF/ON thermostat on the hottest day. This is an indication that unit is larger capacity than required
Is the room being remodeled and any of the following changed.

Changing the windows from single pane to double or triple pane design. Tinting, low e glass etc.?
Are windows being made smaller?
Is insulation being added to outside wall?
Room vent air being changed?

Should engineering calculations be made to determine BTUs necessary for cooling and heating?

When engineering calculations are made to determine the correct BTU size for cooling operation, a smaller BTU model is often recommended. A smaller BTU model will run longer to cool the room but less power (KWH) will be used. Money is saved when less KWH (kilowatt hours) are consumed.

Smaller BTU models are generally quieter during cooling and heating operations.
With the smaller BTU model running longer the room is generally less humid. Humidity control is very important in the warm humid areas, and normally guests will be more comfortable in rooms with lower humidity.

WALL CASE

New GE model will install into existing GE Zoneline wall case. (First Zoneline made in 1961) (Consider using wall case insulation RAK901L in existing wall cases.)

Zoneline may fit into existing competitive wall case. (If wall case extends into room and is not insulated consider using insulation kit RAK901L)

If a case extension is used on the existing wall cases, the air splitters installed in these case extensions must mate and seal to the ends of the outdoor coil of the new unit. This may require moving the splitters.

OUTDOOR GRILLE

Existing outdoor grille may need to be changed or modified when an old chassis is replaced. Outdoor air flow patterns have changed and this may dictate the need for outdoor grille replacement or modification.

SAVINGS

New unit with higher EER (Energy Efficiency Ratio) than older existing unit should provide energy savings. Calculations can be made to estimate annual savings.

Reduce demand charges with high efficiency models.

Some utility companies may offer rebates/incentives for installing heat pump models - check with serving utility company.

When engineering calculations are made to determine the correct BTU size for cooling operation, a smaller BTU model is often recommended as the replacement model. A smaller BTU model will run longer to cool the room but less power (KWH) is used. Money is saved when less KWH (kilowatt hours) are consumed.

Smaller BTU models are generally quieter during cooling and heating operation.

With the smaller BTU model running longer, the room is generally less humid. Humidity control is very important in the warm humid areas.

HEATING

In most areas of the U.S.A., the greatest operational costs are in heating operation. Analyzing the cost of heating with a heat pump vs electric heat may show strong incentives to replace older electric heat models with new higher efficiency heat pump models. Seasonal performance (SPF) reports can be provided to estimate the annual savings. Contact your General Electric (Zoneline) sales person to obtain this report.

OTHER POSSIBLE SAVINGS

Minimize the electrical total connected load (use correct heater size).

Reduce demand charges using heat pump models with the proper electric heater size and resistance heat lockout, and heat pump operation to approx. 25°F.

New Construction/Retrofit (Old Multi Pipe Sys-Etc. No Existing Wall Case.)

Determine type of Zoneline to be used on the project

Cooling with electric heat	pages 8,52
Heat pump	pages 8,52,53
Remote Control (cooling with electric heat/heat pump)	pages 18,19
Ducted application - two rooms (side-by-side) RAK6052 and RAK601	page 35
Voltage 208/230 or 265 volt	
Wall case RAB71 or RAB77	page 21
Type/style of outdoor grille	page 41
Custom Grille	page 41
How thick is outdoor wall. Thicker walls may need special consideration (see Design Data Manual for details)	page 28

Don't hesitate to ask for information or assistance from your General Electric Zoneline salesperson.

IMPORTANT

Correct BTU size for cooling and heating needs to be determined. Most modern construction utilizes thermal efficient materials and components. In most new construction motel rooms, the smallest BTU Zoneline is adequate for the cooling needs. This is contrary to common practice. An accurate engineering study and calculation should be made to determine the cooling and heating requirements.

Smaller BTU models are generally quieter during cooling and heating operation.
With a smaller BTU unit running longer the room is generally less humid. Humidity control is very important in warm humid areas.
Smaller units minimize the electrical total connected load (use the correct heater size and BTU cooling size unit).
Using the correct size resistance heater may reduce utility demand charges.
Reduce operating cost by using properly sized units.
Consider using heat pump models with properly sized heaters with resistance heat lockout and heat pump operation to approx. 25°F.

Is first cost for cooling and heating equipment very important?

Is operational cost of equipment very important? Seasonal Performance Factor Analysis report may more than justify cost differences to go to heat pump models.

Does your utility company offer a rebate program for installing high EER units?

Does your utility company offer rebates for installing heat pump units?

DUCT ADAPTER/EXTENSION

RAK6052	Duct Adapter	page 35
RAK601	Duct Extension	page 35
RAK602	Register and Trim Flange	page 35

REMOTE CONTROL THERMOSTAT

RAK163	For cooling with electric heat	page 18
RAK147	For heat pump models	page 19

DRAIN KIT

RAD10 attaches to wall case for external or internal draining of water.
(see Design Data Manual for details) page 33,34

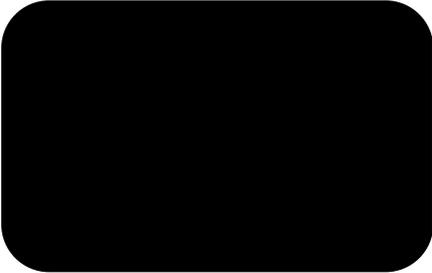
ELECTRIC HEAT VS HEAT PUMP

In most areas of the U.S.A., the greatest operational costs are in heating operation. Analyzing the cost of heating operation by heat pump vs. electric heat may show strong incentives to choose heat pump models.

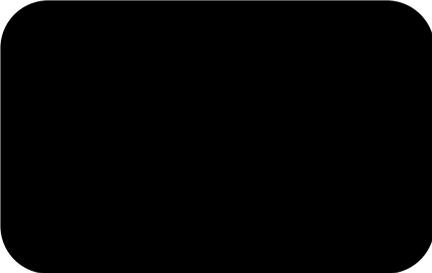
Seasonal performance reports (SPF) can be provided to estimate the annual saving. Contact your General Electric (Zoneline) sales person to obtain this report for both new and replacement markets.



Exterior Grille Color Samples



RAG61 RAG64 Warm Gray Beige



RAG62 RAG65 Maple



RAG63 RAG66 Bittersweet Chocolate

Colors may vary slightly due to printing process.



ZONELINE[®] WARRANTY

Staple sales slip or cancelled check here. Proof of original purchase date is needed to obtain service under warranty. For service in the U.S., call 800-GE-CARES. In Canada, contact: Manager, Consumer Relations, Camco Inc., 5800 Keaton Crescent, Mississauga, Ontario, Canada L5R 3K2.

WHAT IS COVERED

FULL ONE-YEAR WARRANTY

For one year from date of original purchase, we will provide, free of charge, parts and service labor on site to repair or replace **any part of the Zoneline** that fails because of a manufacturing defect.

FULL FIVE-YEAR WARRANTY

For five years from the date of original purchase, we will provide, free of charge, parts and on-site service labor to repair or replace **any part of the sealed refrigerating system** (the compressor, condenser, evaporator and all connecting tubing) that fails because of a manufacturing defect.

LIMITED 2ND THROUGH 5TH YEAR PARTS WARRANTY

For the second through the fifth year from date of original purchase, General Electric will provide, free of charge, parts that fail as a result of a manufacturing defect. Parts covered are 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. This is a limited parts-only warranty, and does not include labor or transportation to and from the service shop.

All warranty service will be provided by our Factory Service Centers or by our authorized Customer Care[®] servicers during normal working hours.

WHAT IS NOT COVERED

Service trips to your site to teach you how to use the product.

Improper installation.

If you have an installation problem, or if the air conditioner is of improper cooling capacity for the intended use, contact your dealer or installer. You are responsible for providing adequate electrical connecting facilities.

Replacement of fuses or resetting of circuit breakers.

In commercial locations, labor necessary to move the unit to a location where it is accessible for service by an individual technician.

Failure of the product resulting from

modifications to the product or due to unreasonable use including failure to provide reasonable and necessary maintenance.

Failure or damage resulting from corrosion due to installation in an environment containing corrosive chemicals.

Failure or damage resulting from corrosion due to installation in a coastal environment, except for models treated with special factory-applied anti-corrosion protection as designated in the model number.

Damage to product caused by improper power supply voltage, accident, fire, floods or acts of God.

Incidental or consequential damage to personal property caused by possible defects with this air conditioner.

Warrantor: General Electric Company. Louisville, KY 40225

This warranty is extended to the original purchaser and any succeeding owner for products purchased for use within the USA and Canada. In Alaska, the warranty excludes the cost of shipping or service calls to your site.

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

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 this 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. See page 42.

GE has a policy of continuous improvement on its products and reserves the right to change materials and specifications without notice.



Listed by
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GE Appliances