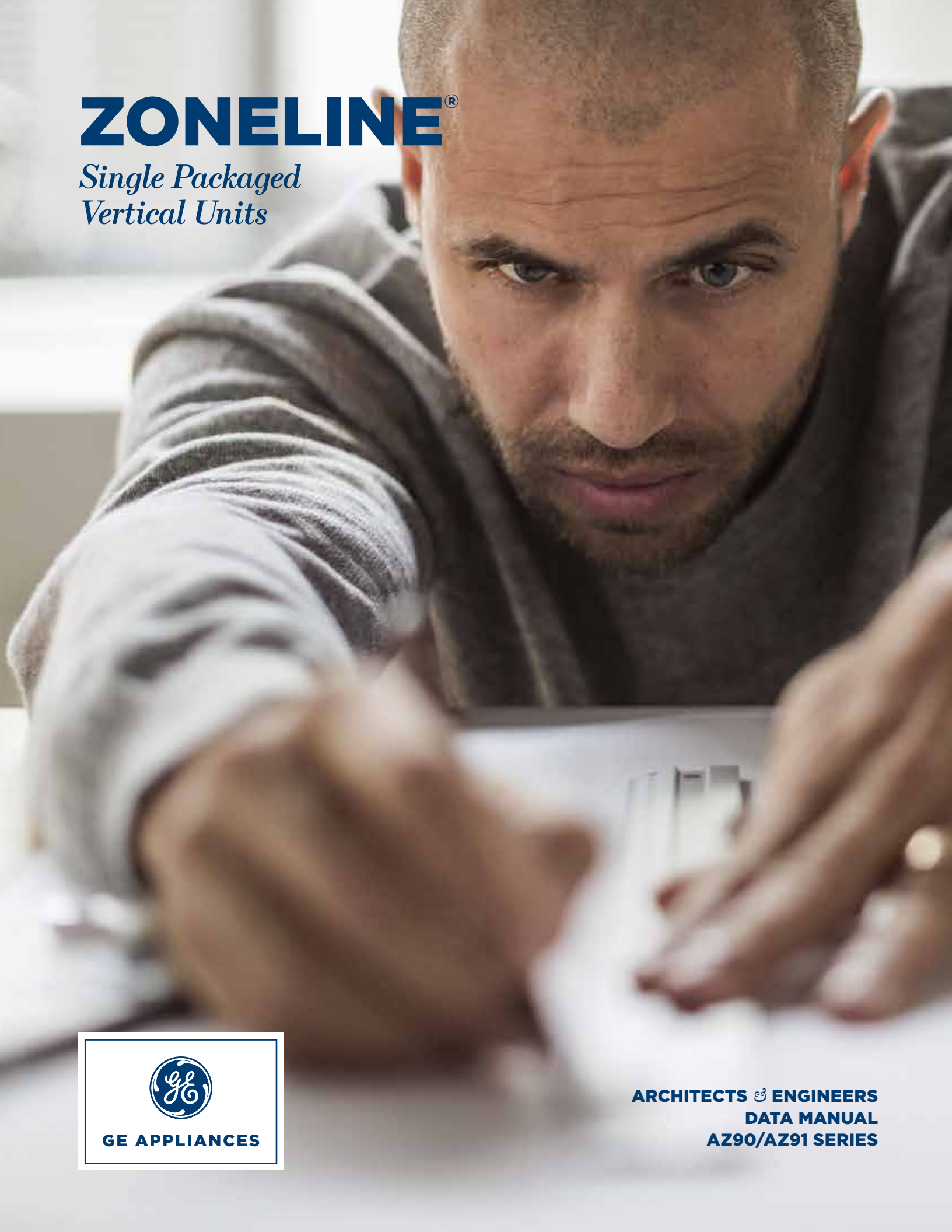


ZONELINE®

Single Packaged Vertical Units

GE APPLIANCES

ARCHITECTS & ENGINEERS
DATA MANUAL
AZ90/AZ91 SERIES

WHY VERTICAL ZONELINE®?

As the first manufacturer to introduce packaged terminal air conditioners (PTACs) to the market, GE Appliances led the way in improving comfort and efficiency in lodging properties, assisted living facilities and apartments. With the single packaged vertical units (SPVUs), we're doing it again. The SPVU offers an excellent alternative to standard PTACs for cooling and heating a variety of rooms—giving guests and travelers home-like comfort wherever they go.

Addressing common complaints, like noise level and precision, the SPVU offers quieter operation with greater temperature control. Closet installation allows for a more home-like appearance with extra room for versatile design. Most importantly, it provides the cost benefits of PTACs with the added flexibility of a central system, as the SPVU can serve a single room or multiple rooms.

THE GE APPLIANCES ZONELINE® SINGLE PACKAGED VERTICAL AIR CONDITIONER

The GE Appliances Zoneline vertical air conditioner is available in ~9,000 BTUh, 12,000 BTUh or 18,000 BTUh cooling capacity, with either resistance heat or heat pump units with resistance heat backup. Each cooling capacity is available in a dual-rated unit that operates on either 230 volts or 208 volts, and in a unit designed to operate on 265 volts. All units are available with 15, 20 or 30 AMP resistance heat configurations.

SYSTEM FEATURES

The single packaged vertical unit, (SPVUs), have a number of features that help distinguish them as the leader in the vertical unit industry. Each feature is discussed in detail in the features and benefits section.

- Excellent efficiency and dehumidification
- Permanently lubricated fan motors
- Standard size air filter (14" x 20" x 1")
- Central desk control capability
- HI and LOW fan speeds controlled by remote thermostat
- Corrosion protection treatment standard
- Slinger ring condensate removal
- Indoor frost control
- Automatic compressor random restart
- Compressor restart delay
- Warranty (including both parts and labor)
- Electronic control diagnostics
- Room air sampling

SYSTEM ESSENTIAL COMPONENTS

- Installation platform (field supplied)
- Wall plenum
- Exterior grille
- Chassis (two sizes)
- Drain connection
- RAVDP18 drain pan (Large chassis 18,000 only)
- Remote thermostat
- Filter (field supplied)
- Return air grille
- Ductwork
- Supply register (field supplied)

Small chassis

Large chassis

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.

FEATURES & BENEFITS

EXCELLENT EFFICIENCY AND DEHUMIDIFICATION

GE Appliances recognizes the importance of energy efficiency and dehumidification in an air conditioning system and uses EER (Energy Efficiency Rating) as a means of reporting the relative cooling efficiency of the unit.

EER is the cooling rating system used for single packaged vertical air conditioners and heat pumps.

The measurement of the efficiency of the heat pump output, when compared to electric resistance heat, is called the Coefficient of Performance (COP). The GE Zoneline® single packaged vertical heat pump has outstanding COP ratings. This number provides a basis not only for comparing the heat pump output to electric resistance heat, but also the ability to directly compare heat pumps within the same range of capacity to one another.

PERMANENTLY LUBRICATED FAN MOTORS

The small chassis SPVU has one permanently lubricated, totally enclosed fan motor, while the large chassis has two motors. The motor(s) are permanently lubricated to reduce maintenance, and totally enclosed to keep dirt and water out of the motor windings.

STANDARD SIZE AIR FILTER

A number of filters, providing varying degrees of filtering efficiency, are available on the market today. GE Appliances has designed the SPVU to accommodate a number of filter placement options. The filter provided with the unit is a standard size 14" W x 20" H x 1" D filter.

The unit must not be operated without a filter in place, even during construction.

GE Appliances provides three filter placement options for design and installation flexibility. A filter bracket is provided in the front panel of the Zoneline vertical unit case (14" x 20" x 1"), which allows the use of a louvered closet door. The top bracket can be loosened to allow the filter to be inserted from the top of the bracket rather than sliding in from the side, where the enclosure wall may interfere with filter removal.

An access panel, accessory model number RAVRG1, for the closet enclosure is the second filter placement option (20" x 20" x 1"), or the RAVRG3 access panel uses a 20" x 25" x 1" filter size. The access panel requires a cutout in the unit closet enclosure wall and provides access to the unit for servicing and removal. The access panel should be located in the wall such that the centerline of the access panel matches the centerline of the case to allow for removal of the chassis. The bottom of the access panel should be at least 1" below the unit support platform to allow for easy removal of the Zoneline Vertical Unit.

The third filter placement option (20" x 20" x 1") provided by GE Appliances is incorporated in a return air grille, accessory model number RAVRG2, designed to be mounted in a flat closet access door. The door must have a minimum clear opening of 24" to allow for installation and removal of the unit. GE Appliances recommends a 28" wide door. A 20-3/8" W x 20-3/8" H cutout is required in the door to accommodate the grille and filter bracket.

A different size filter may also be used in a field-supplied frame installed in a return air grille mounted in the closet enclosure door or wall.

Only one filter is to be used in the installation. Multiple filters will reduce the air flow and affect unit performance. A clean filter is essential to efficient unit operation. **The filter should be checked at least every 30 days and replaced if dirty.**

CENTRAL DESK CONTROL (CDC)

Terminals are provided on the unit to allow a central desk control system to be interfaced with the unit. The most common installation of this type of system is a switch mounted at the registration desk; and, upon guest check-in, the switch is activated to allow the air conditioner to operate.

Likewise, when the guest checks out, the device is switched to the "OFF" setting so the unit will not operate when the room is not rented.

In some resort areas, devices are connected to sliding glass doors, and opening the doors causes a contact to close, turning the air conditioner off. This prevents the unit from running and wasting energy with the sliding glass door open.

IMPORTANT CDC NOTES:

1. The unit requires the use of a normally open switch. Closing the circuit interrupts power to the unit.
2. Both wires comprising the circuit must connect to the CDC terminals on the unit and to the controlling switch. **Do not use a common buss (at the unit or at the switch panel) in the wiring.**
3. A 24-volt transformer is contained within the Zoneline Vertical Unit. **No external voltage may be applied to the unit through the CDC terminals.**
4. Minimum wire size for CDC wiring:

WIRE SIZE # AWG	MAXIMUM ALLOWABLE LENGTH
#22	600 Ft.
#20	900 Ft.
#18	1,500 Ft.
#16	2,000 Ft.

HIGH AND LOW FAN SPEEDS

If the SPVU is connected to a wall thermostat without the ability to provide two fan speeds, the fan speed will be determined by connecting the wire controlling the fan to either the low speed fan terminal or the high speed fan terminal on the unit.

2-SPEED INDOOR FAN MOTOR FOR SELECTABLE HIGH AND LOW SPEEDS

Since the SPVU discharge air may be routed through duct work for air distribution into the room and into other rooms, the units are equipped with a 2-speed fan that provides greater air movement to compensate for the additional duct length. GE Appliances recommends an HVAC engineer be consulted to determine the best fan speed for the application.

Higher CFMs tend to increase the operating sound level, both from fan noise and from the air noise in the duct. Higher CFMs also reduce the dehumidification rate of the unit, while lower CFMs provide quieter operation and better dehumidification. However, if the CFMs are not high enough to adequately move the air through the duct system, the unit will not be able to provide a comfortable room.

CORROSION PROTECTION TREATMENT—STANDARD

All SPVUs are protected against damage from seacoast area corrosion. Components that are in contact with the salt air have special coatings or are made of non-corroding materials to help withstand the corrosive effects of the environment. This protection includes the use of totally enclosed outdoor fan motors with painted casings and a special coating on the outdoor coil to extend the life of the unit in a coastal environment. The base pan on the small chassis product is made of durable non-corrosive plastic while the metal base pan of the larger chassis has additional paint coatings.

SLINGER RING CONDENSATE REMOVAL

Condensate water removed from the indoor air is dispersed into the air stream by the outdoor fan slinger ring and deposited on the hot outdoor coil. The water helps cool the refrigerant in the outdoor coil and increases the efficiency of the air conditioner.

INDOOR COIL FROST CONTROL

Under certain operating conditions, frost can form on the indoor coil of an air conditioner, reducing air flow and cooling. In order to prevent frost from forming, the SPVU has an automatic frost control on the indoor coil. When frost begins to form on the coil, the compressor stops until the coil temperature increases and the frost dissipates.

At this time, the compressor resumes operation and cooling continues. The indoor fan remains running during the time the compressor is off to help warm the coil with room temperature air.

AUTOMATIC COMPRESSOR RANDOM RESTART

In the event of a power interruption, all compressors attempting to restart immediately when power is restored can result in a power surge that can cause another power failure. The microprocessor in the SPVU has a random restart logic system that prevents all compressors from restarting at the same instant.

COMPRESSOR RESTART DELAY

SPVUs are designed to provide a minimum of three minutes of compressor off time to allow refrigerant pressures to equalize before attempting to restart. Attempting to restart against a high head pressure shortens compressor and overload protector life.

The units are also designed to provide a minimum of three minutes of compressor run time to prevent short cycling from disturbing the room occupant.

FEATURES & BENEFITS

HEAT PUMP OPERATION

Heat pumps save money compared to electric resistance heat, but if the unit cannot provide room occupant comfort, the savings may be of questionable benefit. GE Appliances has years of experience with designing Zoneline® heat pumps to solve the problem of guest complaints.

The heat pump unit incorporates a two-stage heat/one-stage cooling thermostat. Full electric resistance heat is utilized when the unit is operating in heat pump mode and the temperature in the room falls more than 4°F below the thermostat set point.

Heat exists in the outdoor air at temperatures even below 0°F. Many central systems, with larger outdoor coils, operate in the heat pump mode down to temperatures in the mid-teens or even to single-digit temperatures. Central systems are able to operate at temperatures this low because of the larger outdoor coil area, and because central system heat pumps have a reverse cycle defrost mode that melts accumulated frost off the outdoor coil.

The SPVU will operate in efficient heat pump mode down to a 30°F outdoor coil temperature. At temperatures below this, the unit will automatically switch to electric heat. When the outdoor temperature rises to 45°F, the unit will automatically switch back to heat pump operation. The resistance heater and the heat pump do not operate simultaneously.

MANUAL VENT CONTROL

Open ventilation doors on GE Appliances Zoneline Single Packaged Vertical Air Conditioners and Heat Pumps allow outside air to enter the room through a screen-covered opening in the weather barrier that separates the indoor and outdoor sections of the unit. For each CFM of air to enter the room, an equal amount of air must be removed through exhaust fans in the bathroom or rooftops. Outside ambient air entering the room through this screened vent opening is not conditioned. This unconditioned air becomes mixed with the conditioned air that is circulated by the SPVU indoor fan. This air mixture generates an additional heat load/heat loss that causes the unit to run longer and may translate into higher operating costs.

A lever located on the front cover of the SPVU is used to open and close the vent door. **Zoneline vent openings are not intended to be the source of make-up air for building ventilation systems since there is not a separate fan/system flushing outside air into the system.** The system is capable of up to 60 CFM of fresh air at 0.3" H_2O internal static pressure.

ELECTRONIC CONTROL DIAGNOSTICS

The GE Vertical system continuously monitors the unit operation and in some cases the unit may take action and shut down until conditions are corrected. The electronic control will store/provide error codes to aid in diagnosis and correction to get the unit up and running quickly.

The display has four digits:

- The left two digits indicate the error code
- The right two digits show the historical count of the error code

The display contains a maintenance icon (wrench) that will illuminate to indicate when the unit needs maintenance.

See the product Use & Care/Installation Instructions for specifics on error codes and how to use the system.

To maintain better temperature control and distribution, the GE Zoneline SPVU offers room sampling of air. If the unit is on and set to cooling or heating (and not continuous or "on" fan control), the unit will turn on the indoor fan and circulate the air once every nine minutes for a 90 second time period.

This "sampling of air" provides circulation in the room and around the thermostat to provide the best comfort option to the guest.

System Essential
COMPONENTS & INSTALLATION

Each Zoneline single packaged vertical air conditioner or heat pump requires an installation platform, wall plenum, exterior grille, unit, remote thermostat, filter and a return air grille, ductwork and supply registers.

The installation platform, ductwork and supply registers are field supplied. Each of the other components is ordered separately. The wall plenum and exterior grille are specifically designed to interface with the GE Appliances SPVU and must be purchased from the same source as the unit.

The remote thermostat and the return air grille are offered as accessories by GE Appliances, but may be purchased from a source other than GE Appliances. If a non-GE Appliances thermostat or return air grille is used, they must have the minimum requirements to work properly with the unit. The filter is a standard 20" x 20" x 1" filter, available where air conditioner filters are sold.

WALL PLENUM

Since the unit itself does not install in the wall opening, the use of a plenum is necessary to contain and separate the outdoor air paths. The plenum must be able to hold water in the bottom without leaking into the wall cavity. It also must have a "splitter" to separate the outdoor air paths and prevent the discharge air from being drawn back into the unit.

The wall plenum is the first component to be installed. The wall opening location for the plenum needs to extend ~1" below the top of the installation platform. GE Appliances offers two plenums, and the choice of the correct plenum is determined by the thickness of the building exterior wall.

The plenum is to be installed square and level in the opening and secured to the wall construction with screws or nails in the sides located a minimum of 2" from the bottom of the plenum. No nails or screws may be used in the bottom or top of the plenum to prevent water entering the wall cavity.

The plenum is not load bearing, so a proper header needs to be installed above the plenum the same as over any window opening in the wall. If the building construction is brick, concrete block or other non self-supporting material, a lintel must be installed over the plenum opening. The plenum must be caulked to the wall, both to the outdoor wall face and to the interior wall, along all four sides to prevent air and water infiltration.

WALL PLENUM MODELS:

RAVWPT8—For installations with walls 5.5" to 8" thick
RAVWPT14—For installations with walls 8" to 14" thick

REPLACEMENT OF OLDER GE VERTICAL PRODUCT

When replacing an AZ75/AZ85 series vertical air conditioner with a new AZ90/AZ91 series vertical air conditioner, the RAVTRANS kit is required.

Differences in chassis designs between the AZ75/AZ85 series and AZ90/AZ91 series require careful installation and planning. Changes in drain exit locations, drain routing, electrical connections, platform height, conditioned air duct location and additional space requirements for installation of RAVTRANS kit are all items that need to be considered when replacing an AZ75/AZ85 series unit with an AZ90/AZ91 series unit.

Installation of a new AZ90/AZ91 series unit with a transition plenum will take up approximately 2-1/2" of additional closet space once the unit is fully installed. Before starting the conversion, be sure there is adequate closet space to meet the manufacturers recommend minimum clearance requirements.

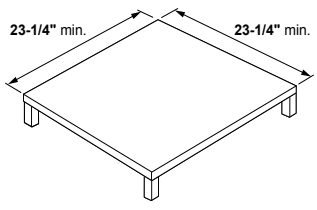
RAVTRANS kit will fit the following GE Appliances plenum kits: RAVWP6, RAVWP8, RAVWP12 and RAVWP15.

New AZ90/AZ91 RAVTRANS Existing GE Plenum and Grille

INSTALLATION PLATFORM

The SPVU requires a field supplied installation platform. The installation platform must be a minimum of 23-1/4" square, with legs to raise the platform a minimum of 8" (12" recommended), and have a minimum load bearing capacity of 175 pounds.

The closet enclosure needs to be large enough to provide a minimum of 3" clearance around the unit.



Height is determined by plenum wall opening. See unit installation instructions.

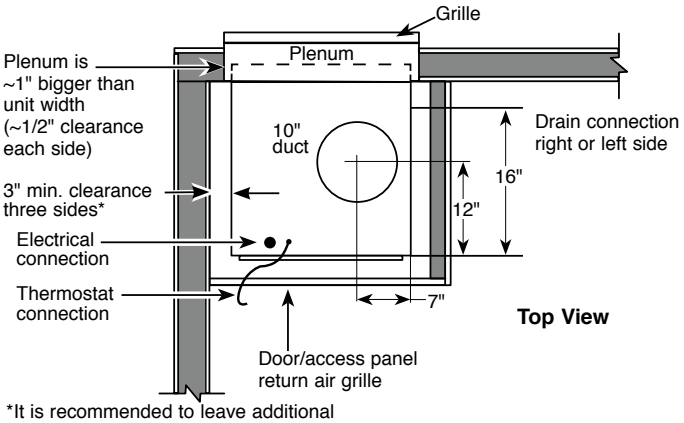
The platform is positioned against the plenum, and secured to the floor with brackets and screws. The platform needs to be secured to the floor to prevent the platform from shifting since the unit is secured to both the plenum and the mounting platform.

System Essential
COMPONENTS & INSTALLATION

CLOSET SIZING GUIDE

Since the most critical aspect of installing a GE Appliances SPVU is the closet size, here are a few hints to prevent installation, application and operational problems.

UNIT INSTALLED THROUGH FRONT OF PLENUM



IMPORTANT NOTES

3" minimum clearance on front and sides.
Dimension minimum for 28" door—33"
Dimension minimum for RAVRG1 Access Panel—30"

NOTE: For easier installation and removal, door or access panel should be centered on Zoneline®.

EXTERIOR GRILLE

The architectural louver exterior grille is mounted to the exterior flange of the plenum and held in place with four screws inserted from inside enclosure closet. The grille is designed specifically for use with the SPVU, and the use of any other grille must be approved by GE Appliances Air Conditioning Applications Engineering.

OUTDOOR CLEARANCES

Since the GE SPVU is an air exchange system, it is critical that the exterior grille, which provides both intake and exhaust, not be covered or impeded in anyway.

Small or minor obstacles, such as poles or small shrubs, should be a minimum of two feet away (radius in all directions). Larger obstructions, such as a solid fence/wall and heat generating sources, like a condensing unit, a minimum distance of six feet should be kept.

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 Appliances 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.

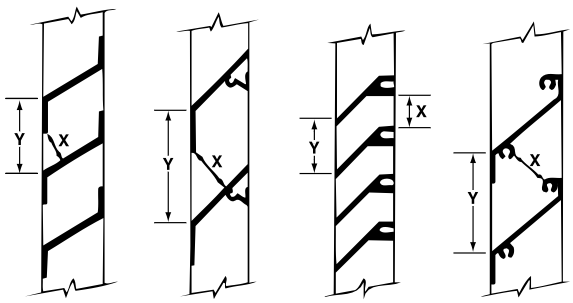
It is important that the above criteria be followed since a louver that is too restrictive or allows recirculation will reduce the unit's capacity and efficiency, increase the electrical current draw, cause intermittent operation due to the compressor overload protector shutting the compressor off, and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

A scale drawing of the louver section should be sent to GE Appliances Application Engineering. To assure the proper performance of the Zoneline unit and comply with Underwriters Laboratories® requirements, it may be necessary to send a full size sample louver section to an independent lab to be tested with the Zoneline unit.

Sample Calculations

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

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



UNIT AND INSTALLATION NOTES

The unit is a one-piece package system that sits directly into the closet enclosure.

Prior to installation, plug the drain holes not used and prepare the drain connection as described in the installation instructions. If you have an internal drain system, make sure that the associated piping or tubing is already installed and laid out in such a manner for you to finish the connection after the unit is installed.

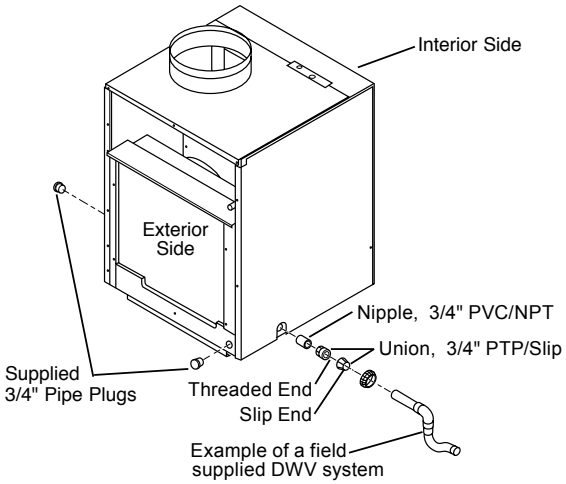
Installation then begins by setting the unit on the field-supplied platform. Tilt the top towards you and slide the bottom of the unit into the wall plenum. Then rock the top back and finish inserting the unit into the plenum (about two inches).

Finish the drain connections and ensure the drain line is sloped downward from the unit until it exits the closet enclosure.

A 10" diameter flange on the top of the unit is used to connect to field-supplied, insulated, flexible or rigid transition duct with an adjustable ring clamp.

Flexible duct may be used for transitions only. Rigid duct must be used for 90-degree bends and tees. Do not use flexible duct for unsupported runs of five feet or more.

Drain Locations (small chassis)



The drain location on the large chassis product is out the back of the unit and requires the use of the RAVDP18 drain pan kit. See installation instructions on both products for more details.

UNIQUE HEATERS

When ordering the AZ90/91 series, note that the electric heat is a unique identifier in the model number (i.e. – you order the specific 15, 20 or 30 amp heater you desire – they no longer come together in a universal package).

Please verify the correct heating and cooling requirements from the mechanical engineer and match the electric heat option against the breaker size in the electrical panel.

POWER CONNECTION/DISCONNECT

The AZ90/91 vertical units do NOT utilize a power cord connection. All units will be hard wired from the local panel to the top of the unit.

NOTE: *Turn off all power to unit and pull out electrical disconnect on front of the chassis before servicing.*

RETURN AIR GRILLE, ACCESS PANEL OR LOUVERED CLOSET DOOR

The return air from the room to the unit may enter the enclosure closet through one of four ways. A louvered door may be installed on the closet to allow return air to enter. When a louvered door is used, the filter would be installed in the filter bracket on the front panel of the unit.

A wall-mounted access panel may be used instead of a louvered door. The return air is through the access panel, model RAVRG1, which requires a 28" W x 48" H cutout in the wall, and there is a filter bracket behind the grille louvers.

For the large chassis product, we offer the RAVRG3 access panel with return air grille (29" W x 58" H).

A return air grille, model RAVRG2, may also be used and is designed to be installed in a 20-3/8" by 20-3/8" cutout in a flush closet door or closet sidewall. In this installation, a filter can fit into the bracket in the RAVRG2.

A field-supplied return air grille, with a minimum dimension of 20" W x 20" H, may be used if mounted in a cutout in the door or wall. When employing this method for return air, the filter is installed in the bracket mounted on the unit.

System Essential
COMPONENTS & INSTALLATION

REMOTE THERMOSTAT

The SPVUs are controlled by a wall-mounted thermostat. GE Appliances offers a complete line of thermostats to interface with the units, or most 24-VAC thermostats may be used. If a non-GE Appliances thermostat is used, the compatibility of the thermostat with the unit is the responsibility of the installer. The unit has an integral transformer, and no external voltage or transformer may be used.

RESISTANCE HEAT—SINGLE STAGE COOLING/ SINGLE STAGE HEATING THERMOSTATS

GE THERMOSTAT MODEL NUMBER	TYPE	LOW VOLTAGE CONDUCTORS
RAK164D2	DIGITAL	5
RAK164P2	PROGRAMMABLE	5
RAK164F2	TWO-SPEED FAN	6

HEAT PUMP—SINGLE STAGE COOLING/ TWO STAGE HEATING THERMOSTATS

GE THERMOSTAT MODEL NUMBER	TYPE	LOW VOLTAGE CONDUCTORS
RAK148P2	PROGRAMMABLE	6
RAK148D2	DIGITAL	6
RAK148F2	TWO-SPEED FAN	7

One of the customer-requested features on the SPVU is the ability for the user to select either HIGH or LOW fan speed operation at the thermostat. See information on page 12.

Maximum wiring length and wire size: AWG 18 up to 66 feet—AWG 20 up to 66 feet; AWG 24 up to 40 feet.

STANDARD SIZE FILTER

The SPVU uses a standard size 14" W x 20" H x 1" D air conditioner/furnace filter. The filter is provided with the unit and replacements (MERV 4) can be purchased at any building supply or maintenance equipment supplier. The standard size filter allows the use of special filters if the owner desires. Regardless of the installation and the return air method, only one filter may be used in the installation.

DUCTWORK & SUPPLY REGISTERS —FIELD SUPPLIED

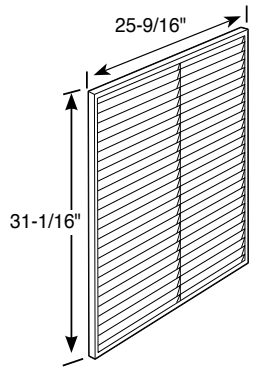
Ductwork and supply registers are mentioned here as System Essential Components, because they are necessary to complete the installation. These components are field supplied since each installation may have different requirements for the ductwork and supply registers.

ELECTRICAL INFORMATION—GENERAL

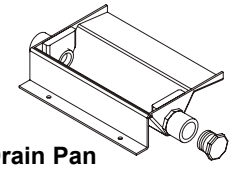
Zoneline® Single Packaged Vertical Air Conditioners are to be connected to a single-phase 60 hertz power. Units with the voltage designator "D" in the 8th character of the model number may be operated on either nominal 230-volt or 208-volt power. Units with the voltage designator "E" in the 8th character of the model number are to be operated on nominal 265-volt power (this unit is also used on 277-volt power). For all installations, feeder, sub-feeder, branch circuit and electrical protective devices must conform to all local codes. In the absence of a local code, the National Electrical Code should be followed.

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

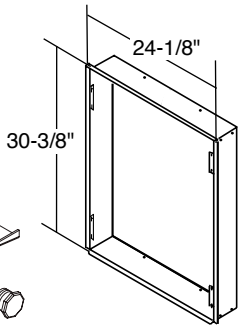
REQUIRED ACCESSORIES

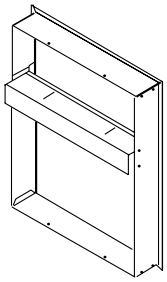


Architectural Louver
RAVAL2



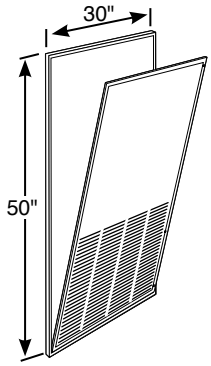
Drain Pan
RAVDP18
(Required on 18,000 large chassis only)





Cutout Dimensions: 24-5/8" W x 30-7/8" H

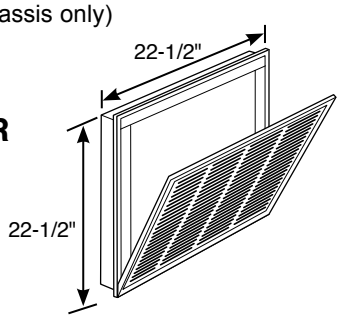
Wall Plenum
RAVWPT8—telescopes from 5-1/2" to 8"
RAVWPT14—telescopes from 8" to 14"



Cutout Dimensions: 28" W x 48" H

Access Panel with Return Air Grille
RAVRG1
Filter size: 20" x 20"
Field supplied

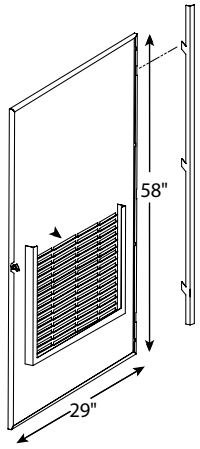
OR



Cutout Dimensions: 20-3/8" W x 20-3/8" H

Return Air Grille
RAVRG2
Filter size: 20" x 20"
Field supplied

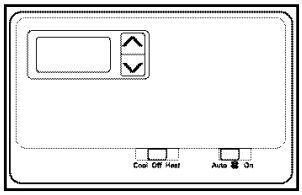
OR



Cutout Dimensions: 27" W x 55-3/4" H

Hinge on left side of door

Access Panel with Return Air Grille
RAVRG3
Filter size: 25" x 20"
Field supplied



Wall Thermostat

Model Type	Electronic Thermostat	Kit Number
Electric Resistance Models	5-wire	RAK164P2 and RAK164D2
Electric Resistance Models	6-wire	RAK164F2
Heat Pump Models	6-wire	RAK148P2 and RAK148D2
Heat Pump Models	7-wire	RAK148F2

Check the thermostat instructions for correct wiring and installation requirements.

COMPLETE ACCESSORY LIST

KIT NUMBER	DESCRIPTION	FOR ADDITIONAL INFORMATION REFER TO PAGES
RAK148D2	Digital Thermostat for Heat Pump—Single Stage Cool—Two Stage Heat	10
RAK148F2	Digital Two-Fan Speed Thermostat for Heat Pump	10
RAK148P2	Digital Programmable T'stat for Heat Pump—Single Stage Cool—Two Stage Heat	10
RAK164D2	Digital T'stat for Resistance Heat Unit—Single Stage Cool—Single Stage Heat	10
RAK164F2	Digital Two-Fan Speed Thermostat for Electric Resistance	10
RAK164P2	Digital Programmable T'stat—Resistance Heat Unit—Single Stage Cool—Single Stage Heat	10
RAVAL2	Exterior Grille	8
RAVDP18	Large Chassis Drain Pan Kit	9 & 11
RAVRG1	Access Panel for Return Air	9 & 11
RAVRG2	Return Air Grille for Flush Door	9 & 11
RAVRG3	Access Panel with Return Air	9
RAVTRANS	Transition Plenum to Adapt Existing GE Wall Plenum to AZ90/AZ91 Series	7
RAVWPT8	Wall Plenum for walls 5.5" to 8" thick	7 & 11
RAVWPT14	Wall Plenum for walls 8" to 14" thick	7 & 11

Zoneline® System

COMPONENTS

AIR FLOW TABLES

RESISTANCE HEAT MODELS

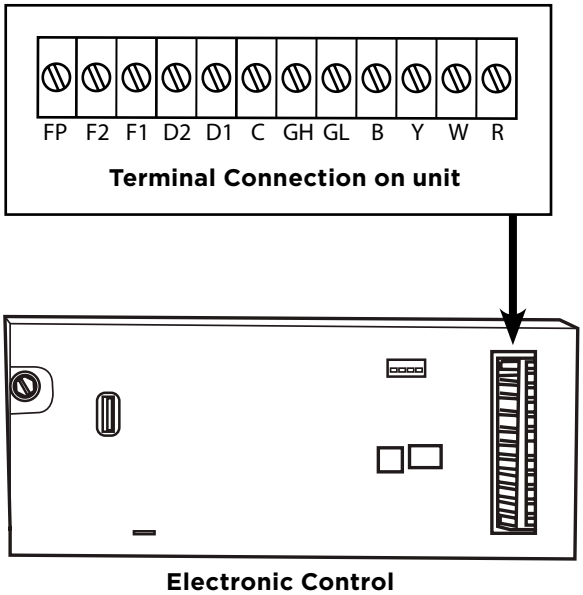
	AZ90E09		AZ90E12		AZ90E18	
Static Pressure (inches H_2O)	High	Low	High	Low	High	Low
0.10″	450	405	450	420	480	465
0.15″	420	375	425	405	465	375
0.20″	385	345	400	385	450	350
0.25″	365	325	375	355	390	330
0.305″	340	305	350	320	330	310

HEAT PUMP MODELS

	AZ91H09		AZ91H12		AZ91H18	
Static Pressure (inches H_2O)	High	Low	High	Low	High	Low
0.10″	450	420	450	420	450	400
0.15″	420	405	425	405	425	405
0.20″	385	385	400	385	400	385
0.25″	365	355	375	355	375	355
0.305″	340	320	350	320	350	320

For single speed thermostats connect to the GL terminal for Low speed or GH terminal for High speed. Two speed control thermostats will use both terminals.

REMOTE THERMOSTAT AND LOW VOLTAGE CONTROL CONNECTIONS



INTERFACE DEFINITION

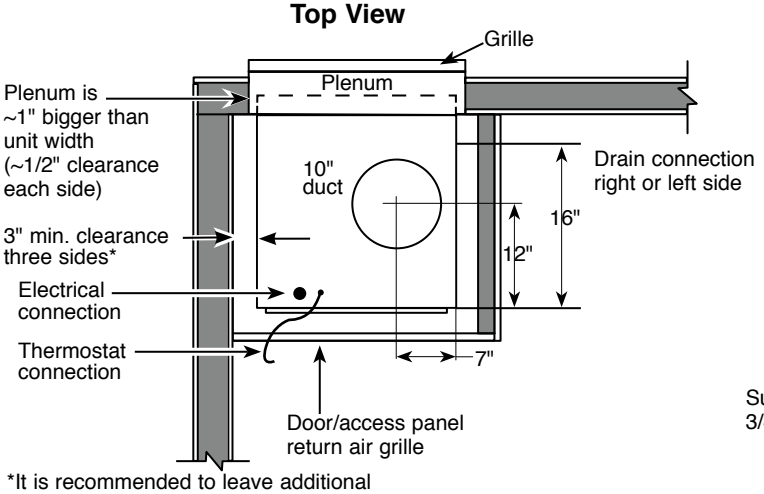
Terminal Code	Wire Connection Function
FP	Factory use only. (Ensure there is not jumper at FP and F2)
F2	Used with F1 to provide 24 VAC to external fan relay. (Ensure there is no jumper at FP and F2)
F1	Used with F2 to provide 24 VAC to external fan relay
D2	Used with D1 for desk control on or off operation
D1	Used with D2 for desk control on or off operation
C	Common Ground Terminal
GH	Call for High Fan
GL	Call for Low Fan
B	Call for Heat Pump Reversing Valve
Y	Call for Compressor
W	Call for Heating
R	24V Power from Electronic Control to Wall Thermostat

SMALL CHASSIS TYPICAL UTILITY CLOSET AND DIMENSIONS

(FOR REFERENCE ONLY)

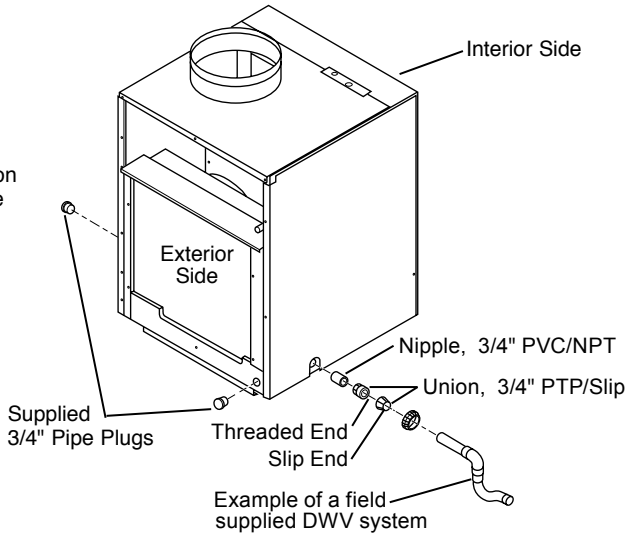
UNIT INSTALLED THROUGH FRONT OF PLENUM

Top View

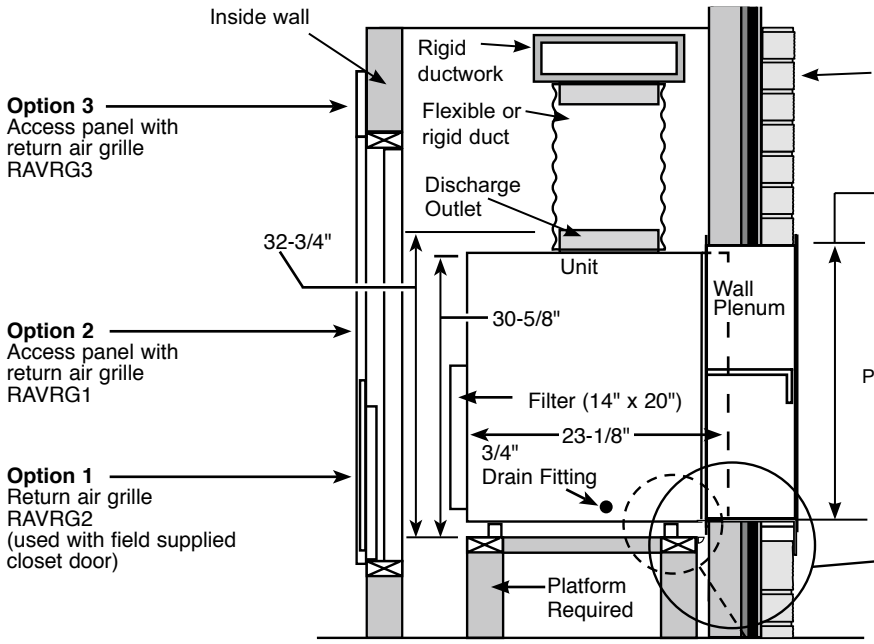


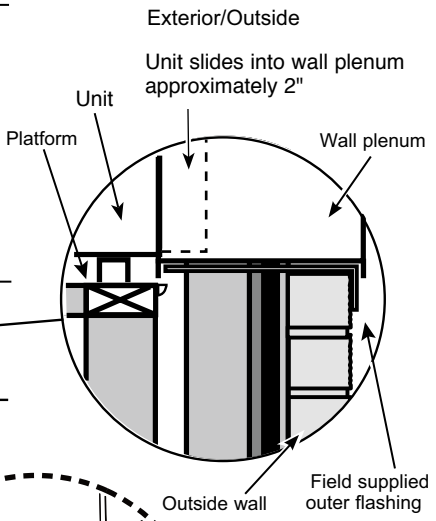
*It is recommended to leave additional space around the unit to ease installation and access for service.

Drain Locations



Side View



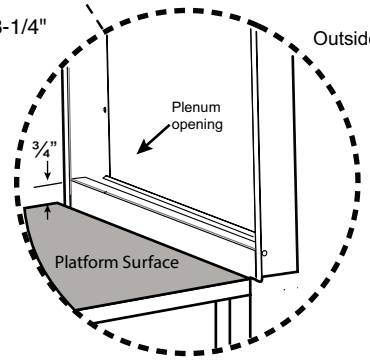


Front Install Clearances

- **3" min.** from front of unit
- **3" min.** from both sides of unit

Side Installs not recommended

Platform—Minimum 8" high platform recommended. Height may be adjusted to accommodate plenum opening and drain access. Platform size minimum 23-1/4" x 23-1/4" minimum load capacity 175 pounds.



Plenum opening must be 3/4" above platform surface for small chassis installation and 1-1/2" for large chassis installation.

Available Accessories

- Architectural Louver—RAVAL2
- Wall Plenum—RAVWPT8—telescopes from 5-1/2" to 8"
- Wall Plenum—RAVWPT14—telescopes from 8" to 14"
- Access Panel with Return Air Grille—RAVRG1
- Return Air Grille—RAVRG2
- Access Panel with Return Air Grille—RAVRG3
- Wall Thermostat (Digital and Programmable)

AZ90/AZ91 Series

COMPONENTS SPECIFICATIONS

The following are suggested specifications for the AZ90/AZ91 Series single packaged vertical air conditioners and heat pumps:

The contractor shall furnish single packaged vertical air conditioners or heat pumps of the sizes and capacities shown on the schedule or in the specifications. The units shall be located as shown on the drawings and each shall consist of a chassis, appropriately sized wall plenum, outdoor grille, remote wall thermostat, support platform, and closet access panel or door.

Units shall be listed by ETL and shall be GE Appliances Vertical Zoneline® models or equal. Unit dimensions shall not exceed 23-1/8" x 23-1/8" x 32" or 23-1/8" x 23-1/8" x 47" (large chassis).

CHASSIS

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

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

The chassis shall be protected against the harmful effects of airborne chemicals and saltwater corrosion.

The chassis shall have a hermetically sealed refrigerant system with an external vibration isolated rotary compressor. Indoor coils shall have copper tubing with aluminum fins. Outdoor coils shall have copper tubing with aluminum fins treated to resist the effects of airborne chemicals and salt-water corrosion. All refrigerant coil fins will have the necessary enhancements to achieve EER and COP ratings of the unit. Refrigerant system metering shall be done with capillaries.

Airflow system for small chassis shall consist of one permanently lubricated and totally enclosed two-speed fan motor.

Airflow system for the large chassis shall consist of one permanently lubricated fan motor for the outdoor side and a separate permanently lubricated two-speed motor for the indoor blower. Outdoor fan shall be multi-blade axial-flow design made of non-corrosive material. Indoor fan shall be blower type to optimize airflow and minimize air noise. All motors on the exterior side of the weather barrier shall be painted and enclosed to reduce the effects of moisture and corrosion.

Units will have a positive cooling condensate disposal system. The disposal system shall have a slinger ring on the outdoor fan to dispose of condensate water and to assist in cooling the outdoor coil.

Unit indoor and outdoor airflows must match the capacity of the coils for efficient heat transfer and meet latent and sensible heat requirements. Water blow-off shall not occur on the indoor coil.

Unit shall have a sensor to prevent indoor coil freeze up.

WALL PLENUM

Wall plenums shall be constructed of heavy gauge, zinc coated, phosphated steel with a baked-on enamel finish.

Plenums shall be installed through the exterior wall where shown on the plans and shall be of correct depth to allow sealing to exterior and interior walls.

EXTERIOR GRILLES

Each unit shall be equipped with a standard exterior grille that has been designed to allow operation in high ambient conditions.

Special exterior grilles or custom louver sections supplied by others will conform to minimum free area requirements and shall be submitted to the manufacturer, if requested, for feasibility and air flow characteristics.

ELECTRICAL

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

Units shall have means of electrical connection listed by Underwriters Laboratories and compatible with the units' required voltage and ampacity in conformance with National Electrical Code (NEC) and all local codes.

FEATURES

Unit must have a positive-closing fresh air ventilation system with a concealed manual control.

Unit must be compatible with 2-wire Central Desk Control systems.

Units must be compatible with Electronic Class-2 remote wall thermostats.

Unit shall be equipped with Freeze Sentinel to automatically activate the electric heaters (at 40°F) and appropriate fan motors to warm and circulate indoor air (to 46°F) to prevent damage due to freezing temperatures. Freeze Sentinel shall operate when unit is connected to a powered electrical circuit.

ADDITIONAL SPECIFICATIONS

Heat pump unit shall automatically switch from heat pump operation to electric resistance heat when it is unable to provide sufficient heat to maintain room temperature or when the outdoor temperature sensor falls below 30°F.

Unit shall be equipped with a temperature activated valve to allow condensate water generated during defrost cycles to drain into the specified drain system.

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

Unit shall have an indoor coil temperature sensor to protect the compressor when the outdoor temperatures are too high for heat pump operation.

ADDITIONAL SPECIFICATIONS 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.

STARTUP, ADJUST, DEMONSTRATE

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

ZONELINE® WARRANTY

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: Gordon Williams Corp. at 1-888-209-0999.

WHAT IS COVERED

LIMITED 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 unit that fails because of a manufacturing defect.

LIMITED ADDITIONAL FOUR-YEAR SEALED REFRIGERATING SYSTEM WARRANTY

For four 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, GE Appliances 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, frost controls, 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.

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: GE APPLIANCES. 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.

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

Unit

SPECIFICATIONS

HEAT PUMP UNIT SPECIFICATIONS

	AZ91H09D2C	AZ91H09D3C	AZ91H09D5C	AZ91H12D2C	AZ91H12D3C	AZ91H12D5C
230/208 VOLT MODELS						
FEATURES						
Voltage	230/208	230/208	230/208	230/208	230/208	230/208
Cooling BTU	9,400/9,400	9,400/9,400	9,400/9,400	12,200/12,000	12,200/12,000	12,200/12,000
EER (minimum)	10.4/10.4	10.4/10.4	10.4/10.4	10.0/10.0	10.0/10.0	10.0/10.0
Cooling power (W)	905/905	905/905	905/905	1,220/1,200	1,220/1,200	1,220/1,200
Cooling current (A)	4.3/4.3	4.3/4.3	4.3/4.3	5.7/5.9	5.7/5.9	5.7/5.9
Sensible Heat Ratio (SHR)	0.76	0.76	0.76	0.75	0.75	0.75
Dehum rate (pints per hour)	2.0	2.0	2.0	2.8	2.8	2.8
HEAT PUMP						
Heating BTU	8,400/8,400	8,400/8,400	8,400/8,400	11,100/10,900	11,100/10,900	11,100/10,900
COP	3.0/3.0	3.0/3.0	3.0/3.0	3.0/3.0	3.0/3.0	3.0/3.0
Heating watts (W)	830/830	830/830	830/830	1,075/1,050	1,075/1,050	1,075/1,050
Heating current (A)	4.0/4.0	4.0/4.0	4.0/4.0	5.0/5.3	5.0/5.3	5.0/5.3
RESISTANCE HEAT						
Heating BTU	8,500/7,000	11,600/9,500	17,000/13,900	8,500/7,000	11,600/9,500	17,000/13,900
Heater watts (W)	2,500/2,050	3,400/2,780	5,000/4,090	2,500/2,050	3,400/2,780	5,000/4,090
Heating current (A)	10.9/9.9	14.8/13.4	21.7/19.7	10.9/9.9	14.8/13.4	21.7/19.7
M.C.A.	15	20	30	15	20	30
M.O.C.P.	15	20	30	15	20	30
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
CFM @ 0.1 ESP (high)	450	450	450	450	450	450
CFM @ 0.1 ESP (low)	420	420	420	420	420	420
Vent CFM (minimum)	60	60	60	60	60	60
Width	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Depth	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Height	32	32	32	32	32	32
Weight (net)	114	114	114	125	125	125
Weight (gross)	125	125	125	136	136	136
Clearances (min.)	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides

All dimensions are in inches and all weights are in lbs.
*Estimated data.

	AZ91H09E2C	AZ91H09E3C	AZ91H09E5C	AZ91H12E2C	AZ91H12E3C	AZ91H12E5C
265 VOLT MODELS						
FEATURES						
Voltage	265	265	265	265	265	265
Cooling BTU	9,400	9,400	9,400	12,400	12,400	12,400
EER (minimum)	10.3	10.3	10.3	10.0	10.0	10.0
Cooling power (W)	915	915	915	1,240	1,240	1,240
Cooling current (A)	3.5	3.5	3.5	5.1	5.1	5.1
Sensible Heat Ratio (SHR)	0.77	0.77	0.77	0.75	0.75	0.75
Dehum rate (pints per hour)	2.0	2.0	2.0	2.8	2.8	2.8
HEAT PUMP						
Heating BTU	8,500	8,500	8,500	11,300	11,300	11,300
COP	3.0	3.0	3.0	3.0	3.0	3.0
Heating watts (W)	820	820	820	1,095	1,095	1,095
Heating current (A)	3.2	3.2	3.2	4.5	4.5	4.5
RESISTANCE HEAT						
Heating BTU	8,500	11,600	17,000	8,500	11,600	17,000
Heater watts (W)	2,500	3,400	5,000	2,500	3,400	5,000
Heating current (A)	9.4	12.8	18.8	10.9	12.8	18.8
M.C.A.	13.14	17.38	28.67	15	17.38	24.93
M.O.C.P.	15	20	25	15	20	25
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
CFM @ 0.1 ESP (high)	450	450	450	450	450	450
CFM @ 0.1 ESP (low)	420	420	420	420	420	420
Vent CFM (minimum)	60	60	60	60	60	60
Width	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Depth	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Height	32	32	32	32	32	32
Weight (net)	114	114	114	124	124	124
Weight (gross)	125	125	125	135	135	135
Clearances (min.)	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides

All dimensions are in inches and all weights are in lbs.
*Estimated data.

Unit

SPECIFICATIONS

LARGE CHASSIS HEAT PUMP UNIT SPECIFICATIONS

	AZ91H18D2C	AZ91H18D3C	AZ91H18D5C	AZ91H18E2C*	AZ91H18E3C*	AZ91H18E5C*
FEATURES						
Voltage	230/208	230/208	230/208	265	265	265
Cooling BTU	18,200/18,000	18,200/18,000	18,200/18,000	18,000	18,000	18,000
EER (minimum)	10.0/10.0	10.0/10.0	10.0/10.0	10.0	10.0	10.0
Cooling power (W)	1,825/1,800	1,825/1,800	1,825/1,800	1,765	1,765	1,765
Cooling current (A)	8.6/9.2	8.6/9.2	8.6/9.2	7.7	7.7	7.7
Sensible Heat Ratio (SHR)	0.66	0.66	0.66	0.66	0.66	0.66
Dehum rate (pints per hour)	5.6	5.6	5.6	TBD	TBD	TBD
HEAT PUMP						
Heating BTU	16,800/16,400	16,800/16,400	16,800/16,400	16,500	16,500	16,500
COP	3.0/3.0	3.0/3.0	3.0/3.0	3	3	3
Heating watts (W)	1,650/1,600	1,650/1,600	1,650/1,600	1,605	1,605	1,605
Heating current (A)	7.8/8.3	7.8/8.3	7.8/8.3	7.1	7.1	7.1
HEAT RESISTANCE						
Heating BTU	8,500/7,000	11,600/9,500	17,000/13,900	8,500	11,600	17,000
Heater watts (W)	2,500/2,050	3,400/2,780	5,000/4,090	2,500	3,400	5,000
Heating current (A)	10.9/9.9	14.8/13.4	21.7/19.7	10.9	14.8	21.7
M.C.A.	15	20	30	15	20	25
M.O.C.P.	15	20	30	15	20	25
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
CFM @ 0.1 ESP (high)	450	450	450	450	450	450
CFM @ 0.1 ESP (low)	400	400	400	400	400	400
Vent CFM (minimum)	60	60	60	60	60	60
Width	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Depth	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Height	47	47	47	47	47	47
Weight (net)	168	168	168	168	168	168
Weight (gross)	220	220	220	220	220	220
Clearances (min.)	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides

All dimensions are in inches and all weights are in lbs.
*Estimated data.

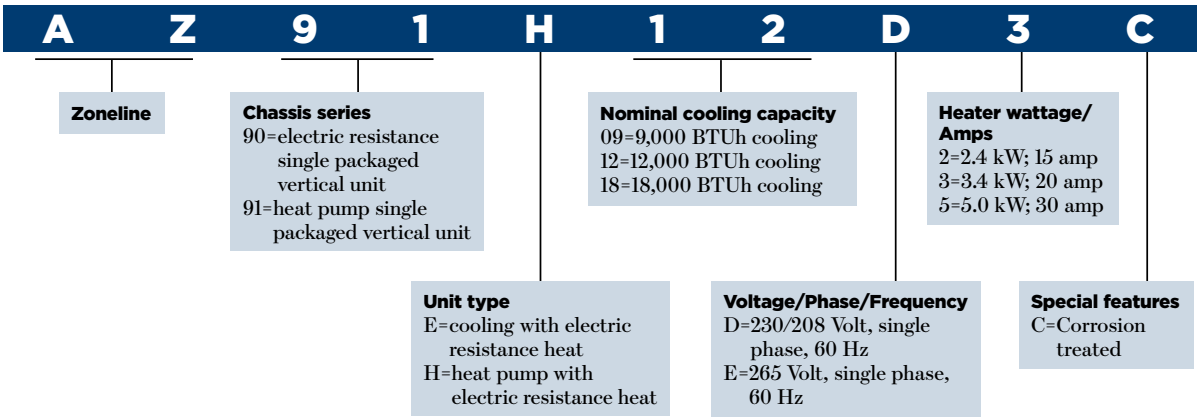
ELECTRIC HEAT UNIT SPECIFICATIONS

	AZ90E09D2C	AZ90E09D3C	AZ90E09D5C	AZ90E12D2C	AZ90E12D3C	AZ90E12D5C	AZ90E18D2C	AZ90E18D3C	AZ90E18D5C
230/208 VOLT MODELS									
FEATURES									
Cooling BTU	9,200/9,000	9,200/9,000	9,200/9,000	12,200/11,900	12,200/11,900	12,200/11,900	17,000/16,800	17,000/16,800	17,000/16,800
EER (minimum)	10.5/10.5	10.5/10.5	10.5/10.5	10.4/10.4	10.4/10.4	10.4/10.4	9.0/9.0	9.0/9.0	9.0/9.0
Cooling power (W)	880/860	880/860	880/860	1,170/1,140	1,170/1,140	1,170/1,140	1,885/1,860	1,885/1,860	1,885/1,860
Cooling current (A)	4.2/4.4	4.2/4.4	4.2/4.4	5.2/5.6	5.2/5.6	5.2/5.6	8.8/9.5	8.8/9.5	8.8/9.5
Sensible Heat Ratio (SHR)	0.76	0.76	0.76	0.72	0.72	0.72	0.67	0.67	0.67
Dehum rate (pints per hour)	2.0	2.0	2.0	3.1	3.1	3.1	5.0	5.0	5.0
RESISTANCE HEAT									
Heating BTU	8,500/7,000	11,600/9,500	17,000/13,900	8,500/7,000	11,600/9,500	17,000/13,900	8,500/7,000	11,600/9,500	17,000/13,900
Heater watts (W)	2,500/2,050	3,400/2,780	5,000/4,090	2,500/2,050	3,400/2,780	5,000/4,090	2,500/2,050	3,400/2,780	5,000/4,090
Heating current (A)	10.9/9.9	14.8/13.4	21.7/19.7	10.9/9.9	14.8/13.4	21.7/19.7	10.9/9.9	14.8/13.4	21.7/19.7
M.C.A.	15	20	30	15	20	30	15	20	30
M.O.C.P.	15	20	30	15	20	30	15	20	30
Refrigerant	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A	R-410A
CFM @ 0.1 ESP (high)	450	450	450	450	450	450	480	480	480
CFM @ 0.1 ESP (low)	405	405	405	420	420	420	400	400	400
Vent CFM (minimum)	60	60	60	60	60	60	60	60	60
Width	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Depth	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8	23-1/8
Height	32	32	32	32	32	32	32	32	32
Weight (net)	114	114	114	124	124	124	144	144	144
Weight (gross)	125	125	125	135	135	135	155	155	155
Clearances (min.)	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides	3" all 3 sides

All dimensions are in inches and all weights are in lbs.
Electric heat units not available in 265 volt.

ZONELINE SINGLE PACKAGED VERTICAL UNIT NOMENCLATURE

The Vertical 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, use of this nomenclature will ensure receiving the correct unit.



Visit Zoneline.com for more information.

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