Installation Preparation

Questions? Call 844-GE4-PTAC (or 844-434-7822) or Visit our Website at: GEAppliances.com

BEFORE YOU BEGIN

Read these instructions completely and carefully.

- **IMPORTANT –** Save these instructions for local inspector's use.
- **IMPORTANT –** Observe all governing codes and ordinances.
- **Note to Installer –** Be sure to leave these instructions with the owner.
- **Note to Owner –** Keep these instructions for future reference.
- Proper installation is the responsibility of the installer.
- Product failure due to improper installation is not covered under the Warranty.
- You must use all supplied parts and use proper installation procedures as described in these instructions when installing this air conditioner.

IMPORTANT ELECTRICAL SAFETY—READ CAREFULLY

⚠ WARNING

- **All electrical connections and wiring MUST be installed by a qualified electrician.**
- **Follow the National Electrical Code (NEC) and local codes and ordinances.**
- **For personal safety, this Zoneline must be properly grounded.**
- **Protective devices (fuses or circuit breakers) acceptable for Zoneline installations are specified on the nameplate of each unit.**
- **Do not use an extension cord with this unit.**
- **Aluminum building wiring may present special problems—consult a qualified electrician.**
- **When the unit is not running there is still voltage to the electrical controls.**
- **Disconnect the power to the unit before servicing by removing the branch circuit fuses or turning the circuit breakers off at the panel.**

ELECTRICAL REQUIREMENTS

Wire Size	Use **ONLY** wire size recommended for single outlet branch circuit
Fuse/Circuit Breaker	User ONLY type and size fuse or HACR circuit breaker indicted on units rating plate. Proper over current protection to the units is the responsibilty of the owner.
Grounding	Unit MUST be grounded from branch circuit to unit, or through separate ground wire provided on permanently connected units. Be sure that branch circuit is grounded.
Wire Sizing	Use recommended wire size given in tables and install a single branch circuit. All wiring must comply with local and national codes. **NOTE: Use copper conductors only.**

NOTE: All field wiring must comply with NEC and local codes. It is the responsibility of the installer to insure that the electrical codes are met.

- Use ONLY the wiring size recommended for single outlet branch circuit.
- Proper current protection is the responsibility of the owner.

Recommended branch circuit wire sizes*	
Nameplate maximum circuit breaker size	**AWG Wire size****
15A	14
20A	12
30A	10

AWG – American Wire Gauge
* Single circuit breaker from main box
** Based on 100' or less of copper wire, single insulated conductor at 60° C. Wire sizes are per NEC.

NOTE: Use copper conductors only.

Installation Preparation

Indoor Air Flow Data

Indoor air flow may be determined by measuring the external static pressure (ESP) of the duct system using an inclined manometer or magnehelic gauge, then consulting chart “A” to determine actual air flow. Use the air flow correction multipliers contained in chart “B” to determine accurate air flow under the listed conditions. Under no circumstances should the SPVU equipment be operated at an external static pressure in excess of .30” W.C. Operation of the SPVU under these conditions will result in inadequate air flow leading to poor performance and/or premature component failure.

Chart A - CFM - Determining the Indoor CFM

	Models					
	AZ90E09		AZ91H09/ AZ90E12/ AZ91H12		AZ90E18D*C/ AZ91H18E*S	
Fan Speed	Low	High	Low	High	Low	High
ESP(“)	CFM					
.10”	405	450	420	450	400	480
.15”	375	420	405	425	375	465
.20”	345	385	385	400	350	450
.25”	325	365	355	375	330	390
.30”	305	340	320	350	310	330

ESP = external static pressure in inches water column

Rated CFM at Low Speed:

AZ90E09/AZ91H09 = 325 AZ90E12/AZ91H12 = 390

Rated CFM at High Speed:

AZ90E18D*C/AZ91H18E*S = 480

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.

Chart B - Correction Multipliers Correct CFM (if needed)

Correction Multipliers for:	
230V	1.00
208V	0.97
Heating	1.00
Cooling	0.95

Your airflow should be balanced based on many factors, such as available ESP, room CFM, and ductwork. Consult an HVAC engineer for proper applications. External static pressure (ESP) can be measured with a manometer or pitot tube. Once this ESP is established, you can calculate the CFM using the above chart.

Higher CFMs tend to increase SENSIBLE capacity, enhance room circulation and increase duct noise, while lower CFMs tend to increase LATENT capacity and reduce noise.

Ductwork

The supply duct system should be designed via a recognized method such as the equal friction method, or velocity reduction method, using the appropriate duct calculator(s) for the type(s) of duct (i.e. metal duct, duct board, or flex duct) being used in the system. The duct system should be designed for a maximum friction rate of .30” water column taking into consideration all fittings, registers and/or diffusers. **DO NOT operate unit without a supply duct attached.**

The return air to SPVU series units MUST NOT be ducted, and all units MUST have a free return air configuration to perform properly.

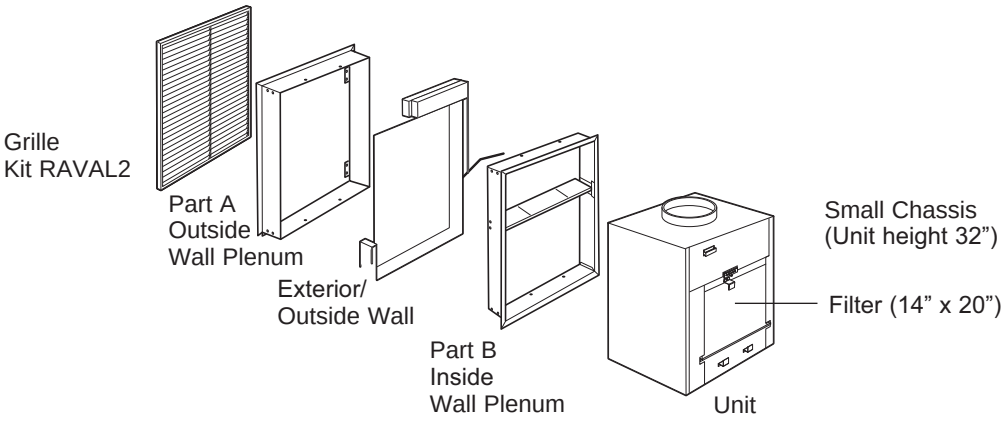
The total flow rate (CFM) and external static pressure (ESP) available can be estimated from the chartsto the left. Use these charts to select your fan speed setting.

The collar on top of the unit accepts standard 10” duct. Pull all duct tight. Extra duct slack can greatly increase static pressure.

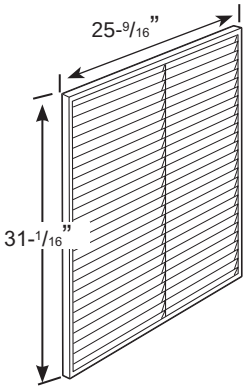
NOTICE: Flex duct can collapse and cause airflow restrictions. Do not use flex duct for 90° bends or unsupported runs of 5 ft. or more.

Installation Accessories

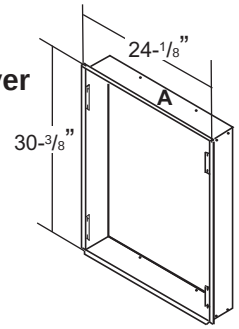
ZONELINE COMPONENTS (Small Chassis)

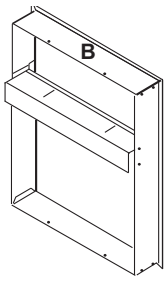


REQUIRED ACCESSORIES



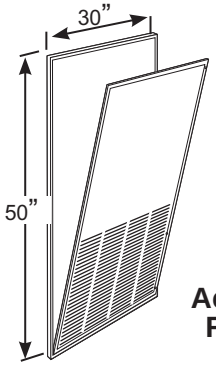
Architectural Louver
RAVAL2





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

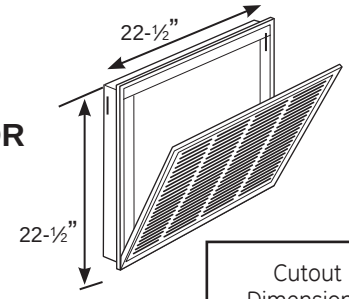
Wall Plenum
RAVWPT8 - telescopes from 5-1/2” to 8”
RAVWPT14 - telescopes from 8” to 14”



Cutout Dimensions:
28”W x 48”H

Access Panel with Return Air Grille
RAVRG1
Filter Size: 20” x 20”
Field Supplied

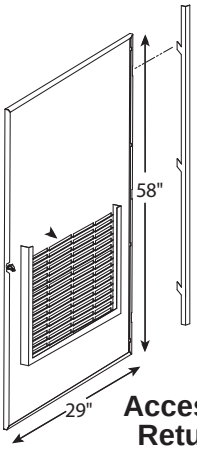
OR



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

Return Air Grille
RAVRG2
Filter Size: 20” x 20”
Field Supplied

OR

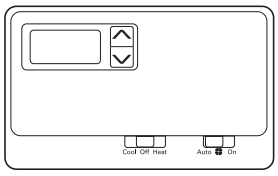


Cutout Dimensions:
27”W x 55-3/4”H

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.

Installation Overview

RETURN AIR GRILLE INSTALLATION OPTIONS

The room return air grille may be installed toward the front or either side of the unit. Improper return air arrangements will cause performance problems.

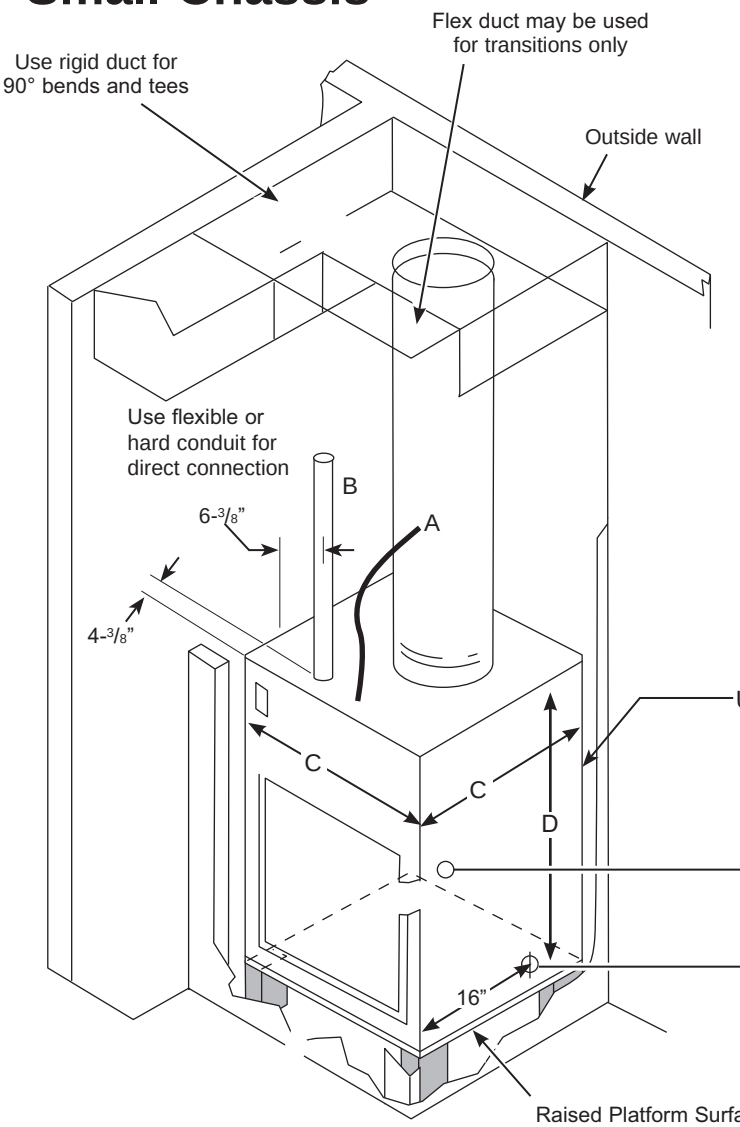
There are four indoor return air grille installation options. Choose the option that best suits your installation requirements. Follow the Installation Instructions provided with the return air grille accessory for installation details.

NOTE: Use only one filter in the installation. The filter may be installed on the unit or in the access panel/door.

UTILITY CLOSET CONNECTION LOCATIONS

IMPORTANT: Plan and locate plenum, electrical connection, drains and thermostat carefully to avoid interference. Hard-to-reach locations will make installation and service difficult!

Small Chassis



Reference Dimensions

- **A** Thermostat cable
- **B** Incoming Power Conduit
- **C** Unit width and depth: 23-1/8"
- **D** Unit height: 30-5/8" (32-3/4" with duct)
- **E** Condensate drains: 3/4" connector

  Choose one of THREE Primary Drain locations:
  - 1 - Right Side
  - 1 - Left Side
  - 1 - Back (Plenum) Side
  - Secondary drain water flows into plenum from the back of the unit.

Primary Drains

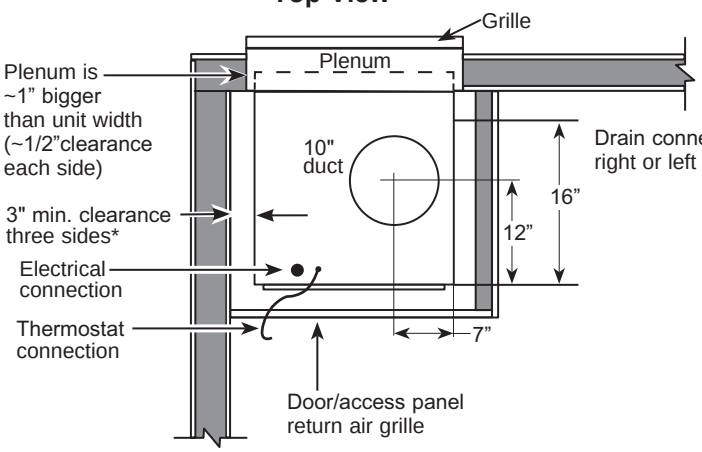
- A drain connection is located on the back of the unit approximately 2" from the left side.
- A drain connection is located on the right and left side of the unit approximately 16" from the front of the unit.

Installation Overview

SMALL CHASSIS TYPICAL UTILITY CLOSET AND DIMENSIONS
(FOR REFERENCE ONLY)

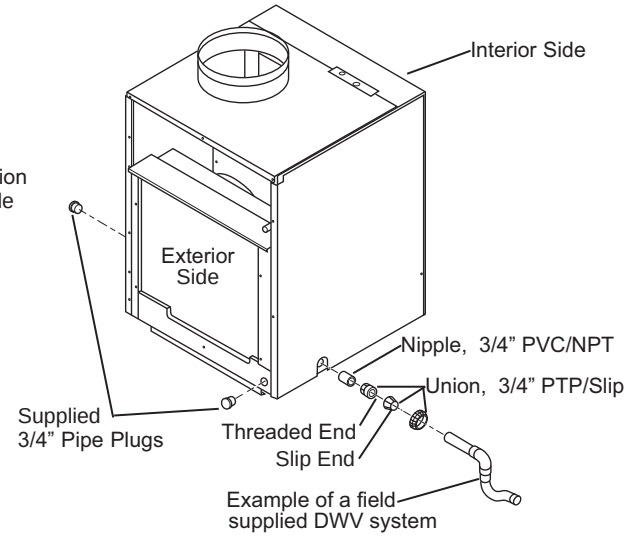
UNIT INSTALLED THROUGH FRONT OF PLENUM

Top View

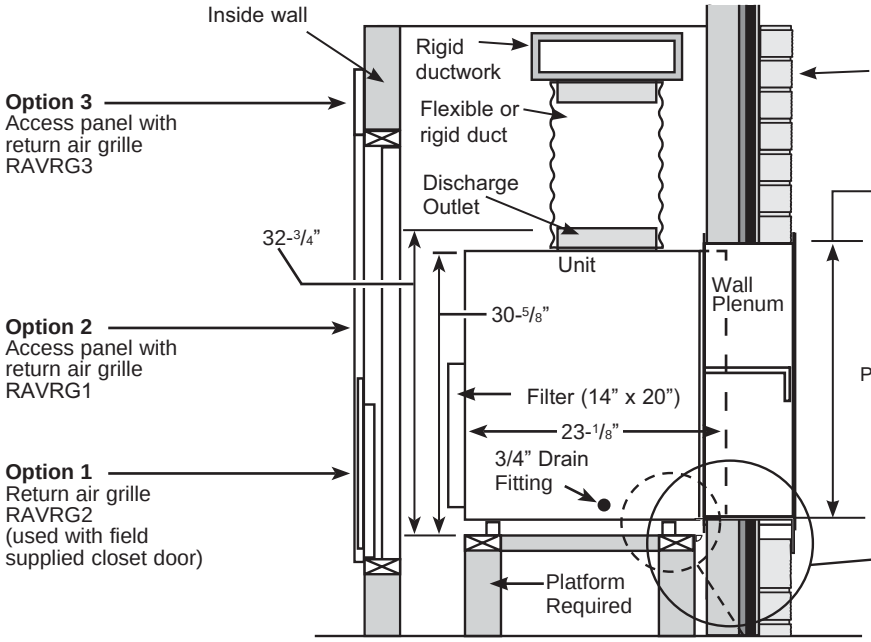


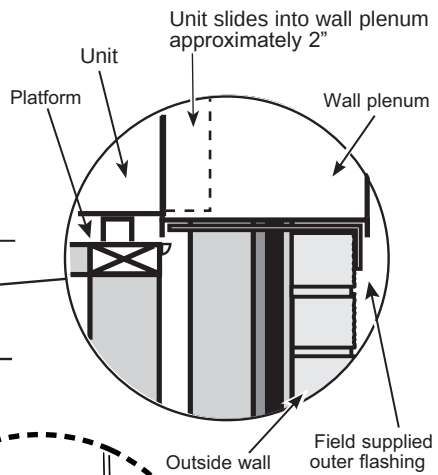
* It is recommended to leave additional space around the unit to ease installation and access for service.

Drain Locations



Side View



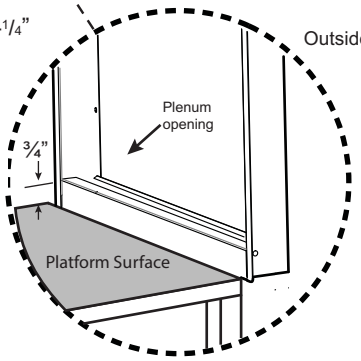


Front Install Clearances
- **3" min.** from front of unit
- **3" min.** from both sides of unit

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.



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)

Installation Instructions

INSTALLATION SEQUENCE

1. Plan for proper electrical supply, drains and ductwork locations.
2. Install wall plenum.
3. Install the grille.
4. Build and install platform.
5. Place unit on the platform and slide the exterior side of the unit into the plenum until it is fully seated.
6. Make drain connections per instructions included in this manual.
7. Connect unit to the ductwork.
8. Connect the thermostat.
9. Connect the electrical power.
10. Install air return grille or access cover.
11. Review the installation checklist.
12. Check operation of the unit.

INSTALLATION INSTRUCTIONS

Install the Wall Plenum

Install the wall plenum. Refer to instructions included in the wall plenum kit RAVWP8 or RAVWPT14 for proper installation procedures.

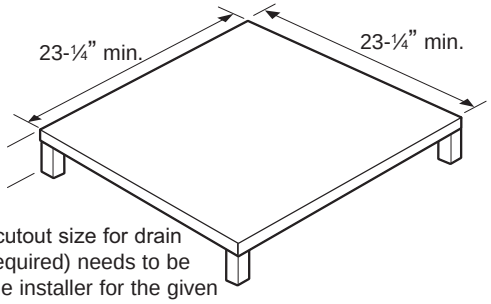
Install the Grille

Install the grille. Refer to instructions included in the grille kit RAVAL2 for proper installation procedures.

Build and Install the Zoneline Base Platform

1. Construct a 23-¼" min. x 23-¼" min. square platform with legs to raise the platform a minimum of 8". NOTE: The platform must have a load-bearing capacity of 175 lbs. minimum.

Recommended platform height: 8" min for drain access. Platform surface should be 3/4" below wall plenum opening. See Plenum Installation Instructions for details



NOTE: Specific cutout size for drain connections (if required) needs to be determined by the installer for the given installation situation.

2. Drain connections can be made to the right, left or rear of the unit. The unit dimensions are 23-1/8" x 23-1/8". If the platform is larger than the unit, drain holes may need to be cut through the platform. Drain cutouts/ connections need to be determined by the installer for the given installation situation.

3. Place the platform in the utility closet with the following clearance between it and the interior surface of the walls/door/panel:
- 3" min. from front of the unit – Unit to be installed through FRONT of case
- 3" min. from two sides of the unit

4. Align the platform with the opening of the wall plenum and secure to the floor using appropriate brackets and bolts.

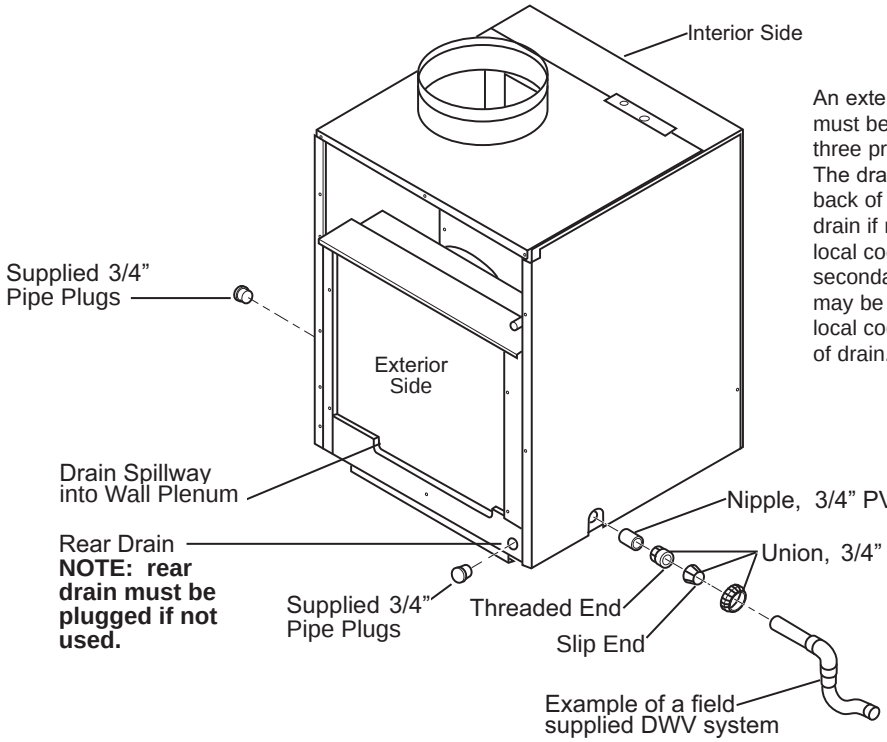
Condensate Disposal System

The Condensate Disposal System increases energy efficiency utilizing a factory installed fan that slings the condensate onto the hot outdoor coil.

When high outdoor humidity prevents the slinger from disposing of all condensate, the excess condensate overflows into the condensate drain pan and out of the 3/4" internal drain connections.

NOTE: If the Condensate Disposal System fails to remove all of the condensate from the unit, any excess condensate will overflow from a spillway in the rear of the unit directly into the wall plenum, and drain outside the building. This is your indication that the chassis or drain requires servicing.

DRAIN CONNECTION AND LOCATION



Making Drain Connections

NOTE: Prior to sliding the unit into the wall plenum determine where to make the drain connections. If the rear drain is not going to be used it must be plugged prior to sliding the unit into the wall plenum.

1 The unit base pan has three (3) previsions (left, right and rear) for connecting an external condensate drain.

2 The supplied drain kit must be connected to one of the three (left, right or rear) 3/4" FPT connections on the unit base pan. Use of rear drain without connecting to DWV system (drain, waste, vent) may result in staining of the outside wall.

3 Insert the provided 3/4" nipple into the determined connection using field supplied Teflon tape or pipe joint compound.

4 With the threaded end of the supplied 3/4" union, connect to the nipple with Teflon tape or pipe joint compound.

5 The remaining two drain connections must be plugged using the two 3/4" pipe plugs (provided) and field supplied Teflon tape or pipe joint compound.

6 Hand-tighten all fittings to prevent damage to unit or fittings.

7 Place unit onto the platform and align the back of the unit with the wall plenum opening. Slide the unit into the plenum approximately 2" (or until unit stops).

8 A field supplied drain system must now be installed to the slip end of the union. A trap is recommended and drain connection should be connected to building DWV system.

9 Pitch the drain line on a 1/4" downward slope for every foot (1') of lateral horizontal run to the DWV.

10 Do not thread metal or copper pipe fittings directly into unit.

11 Check system for leaks.

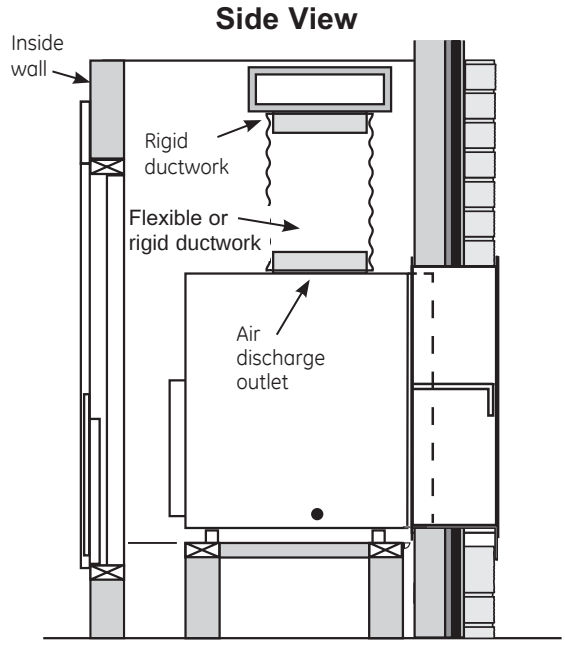
12 Failure to follow these procedures may result in serious property damage.

13 A field supplied secondary condensate pan may be required. Check with local codes.

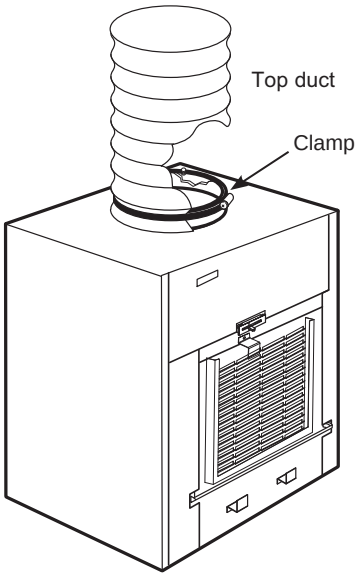
Installation Instructions

Connect the Top Duct

1. Install the duct onto the air discharge outlet.



2. Use a field supplied clamp to secure the top duct to the air discharge outlet.



Remote Thermostat

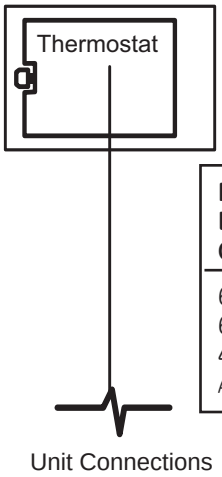
⚠ WARNING **Electric Shock Hazard**

Before servicing, disconnect power to the Zoneline at the fuse box or circuit breaker and pull out electrical disconnect on front of the chassis.

Failure to do so can result in personal injury and/or death.

All SPVU units are factory configured to be controlled by using a single stage heat/cool remote wall mounting thermostat. The thermostat may be auto or manual changeover as long as the control configuration matches that of the SPVU unit.

NOTE: See the *Remote Thermostat and Low Voltage Control Connections* sections of this manual and the manual with the separate thermostat for proper connections and settings.



Maximum Wiring Length for Thermostat Connection to the Unit
66 ft. for AWG 18
60 ft. for AWG 20
40 ft. for AWG 24
AWG – American Wire Gauge

IMPORTANT:

The Zoneline thermostat connections provide 24V AC only.

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

NOTICE:

Damage to a wall thermostat or to the Zoneline electronics can result from improper connections. Exercise extra attention when connecting blue and black wires. No line voltage connections should be made to any circuit in the thermostat. Isolate all wires in building from line voltage.

REMOTE THERMOSTAT AND LOW VOLTAGE CONTROL CONNECTIONS

To Connect the wall-mounted thermostat

Terminal connections are located under the control box panel.

1. Pull the power disconnect located in the front of the chassis.
2. Disconnect the power coming into the unit from the main breaker panel or the closet mounted disconnect.
3. Remove the control box panel by removing the 4 front screws and 3 top screws that secure the panel.
4. Run the thermostat wires through the small hole on the top of the box to reach the terminal connections on the right side of the control.
5. Make the wire connections per the instructions that are included with the thermostat.

6 Once each wire is matched and connected, the unit is now ready for operation.

7. Reattach the control box panel.

Thermostat terminals requirements

For cooling with electric heat units: C, R, GL, Y, W.

For heat pump units: C, R, GL, Y, W, B.

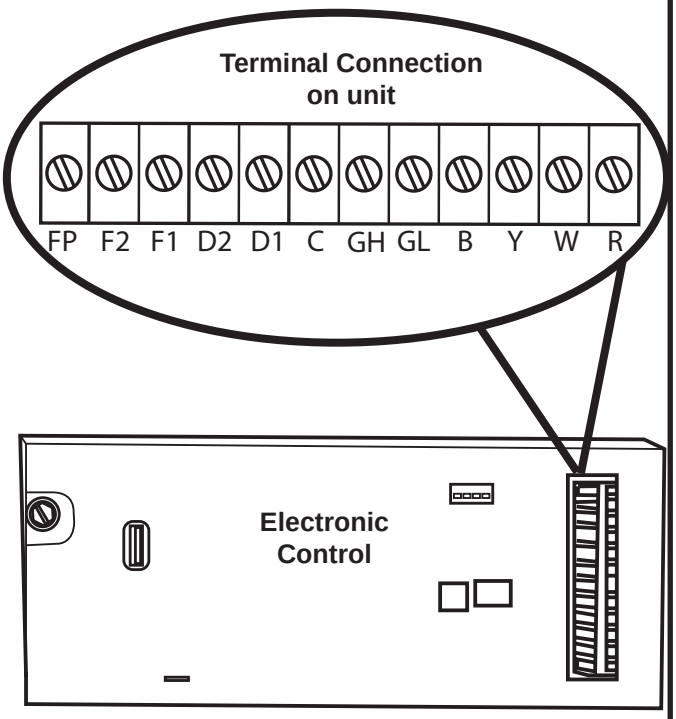
For two fan speeds, thermostat must have 2 fan speed selection.

Heat Pump Units During Heat Mode:

The B terminal must be continuous energized. The W terminal must have 24 VAC output to call for heat. The control board decides on whether to turn on the Heat Pump Heat (compressor) or Electric Heat. The Y terminal should not have 24 VAC output during the Electric Heat mode.

⚠ CAUTION

Improper CDC wiring may damage the Zoneline electronics or cause erratic Zoneline operation. No Common busing is permitted. A separate wire pair must be run from each separate controlling switch to each individual Zoneline.



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

Installation Instructions

REMOTE THERMOSTAT AND LOW VOLTAGE CONTROL CONNECTIONS

Desk Control Terminals

The SPVU has built-in provisions for connection to an external switch to control power to the unit. The switch can be a central desk control system or even a normally open door switch.

For desk control operation, connect one side of the switch to the D1 terminal and the other to the D2 terminal. Whenever the switch closes, the unit operation will stop.

NOTE: The desk control system and switches must be field supplied.

Maximum Wire Length for Desk Control Switch

Wire Size	Maximum Length
#24	400 ft.
#22	600 ft.
#20	900 ft.
#18	1500 ft.
#16	2000 ft.

Auxiliary Fan Control

The Smart Center also has the ability to control a 24VAC relay to activate an auxiliary, or transfer, fan. The outputs are listed as F1 and F2 on the control board.

To connect the relay, simply wire one side of the relay to F1 and the other side to F2. Anytime that the fan runs, the terminals will send a 24VAC signal to the relay. The relay must be 24VAC, 100mA or less.

NOTE: The relay and auxiliary fans must be field supplied.

NOTE: It is the installer's responsibility to ensure that all control wiring connections are made in accordance with the installation instructions. Improper connection of the thermostat control wiring and/or tampering with the unit's internal wiring can void the equipment warranty and may result in property damage, personal injury or death.

Air Return Panel/Grille

Install the air return grille or access cover. Refer to instructions included with the kit chosen.

ELECTRICAL CONNECTIONS

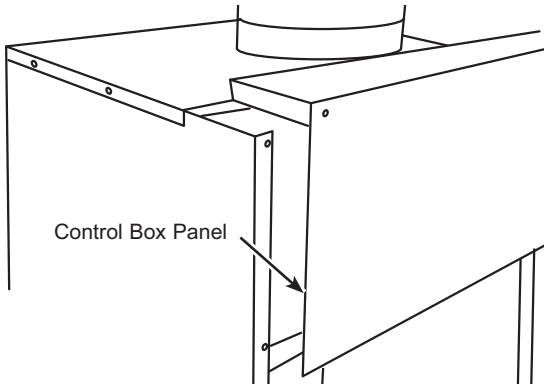
1. REMOVE CONTROL BOX PANEL

⚠ WARNING **Electric Shock Hazard**

Before servicing, disconnect power to the Zoneline at the fuse box or circuit breaker and pull out electrical disconnect on front of the chassis.

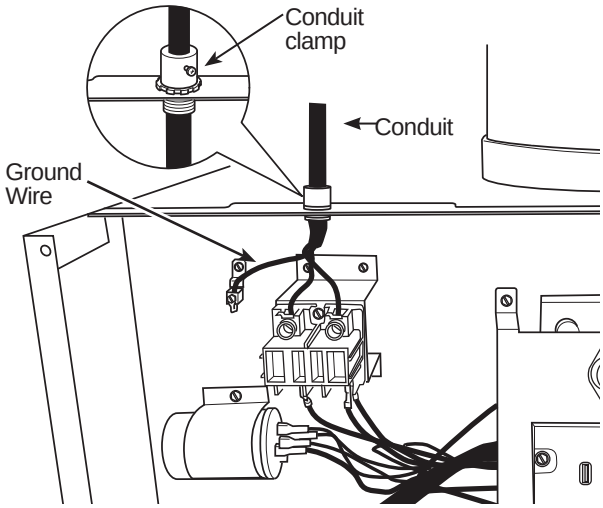
Failure to do so can result in personal injury and/or death.

Remove the control box panel by taking out the front 4 screws and the 3 top screws.



2. ATTACH CONDUIT

Use the round knockout hole at the top of the control box to install conduit coming from the branch circuit. Install and clamp the conduit through the conduit clamp and bring wire leads into the junction box. Leave 8" of wire free from the end of the conduit.



3. MAKE WIRE LEAD CONNECTIONS INSIDE THE CONTROL BOX

⚠ WARNING **RISK OF ELECTRIC SHOCK**

Can cause injury or death. This appliance must be properly grounded.

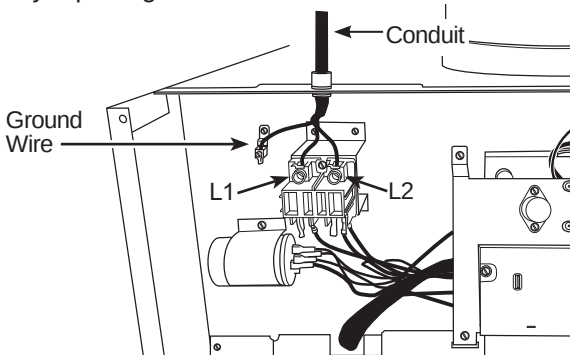
Turn OFF electrical power before service or installation.

Pull the power disconnect located in the front of the chassis. Disconnect the power coming into the unit from the main breaker panel or the closet mounted disconnect.

NOTE:

- All electrical connections and wiring must be installed by a qualified electrician and conform to the National Electric Code (NEC) and all local codes which have jurisdiction.
- All chassis must be hard wired with properly sized breakers. Use HACR type breakers to avoid nuisance trips.
- Unit must be properly grounded.

1. Make all wire connections by using appropriate UL-listed electrical connectors and techniques.
2. Be sure that all wire leads are inside the control box and not pinched between the panel and the unit. The green insulated ground wire from the Zoneline MUST BE connected to the branch circuit ground wire.
3. Replace the control box panel and secure to the unit by replacing the 7 screws removed earlier.



Installation Instructions

ELECTRICAL CONNECTIONS (continued)

DIRECT CONNECTION

Heater Wattage @ 230/208 Volts	Circuit Protective Device
2.50/2.05 KW 3.40/2.78 KW 5.00/4.09 KW	15-Amp Time Delay-Fuse or Breaker 20-Amp Time Delay-Fuse or Breaker 30-Amp Time Delay-Fuse or Breaker
Heater Wattage @ 265 Volts	**Circuit Protective Device**
2.50 KW 3.40 KW 5.00 KW	15-Amp Time Delay-Fuse or Breaker 20-Amp Time Delay-Fuse or Breaker 30-Amp Time Delay-Fuse or Breaker

* See NEC for application for 265 Volts.

FINAL INSTALLATION

FINAL INSTALLATION CHECKLIST

- ☐ Ensure that all installation instructions concerning clearances around the unit have been adhered to.
- ☐ Inspect and ensure that all components and accessories have been installed properly and that they have not been damaged during the installation process.
- ☐ Wall plenum flashing is installed, plenum level and calked.
- ☐ Unit is level, front to back and left to right.
- ☐ Check to ensure that the unit air filter, indoor coil, and outdoor coil are free from any obstructions.
- ☐ Check to make sure only one air filter is installed in the system.
- ☐ Check the condensate water drain(s) to ensure that they are connected and adequate for the removal of condensate water and that they meet approval of the end user.
- ☐ Ductwork is connected and secure to air discharge outlet.
- ☐ Secure all access panels (i.e. front cover and/or control box).
- ☐ Wall thermostat is wired correctly.
- ☐ Unit is wired correctly.
- ☐ Ensure that the circuit breaker(s) /fuse(s) and supply circuit wire size have been sized correctly.
- ☐ Ensure the unit has correct line voltage to it, is on a single circuit and is properly grounded.
- ☐ Ensure that the entire installation is in compliance with all applicable national and local codes and ordinances having jurisdiction.

CONNECT POWER

1. If all the items on the checklist are correct, reinstall the power disconnect on the front of the unit.
2. Turn the power on at the main service panel.
3. Turn on and adjust the thermostat so the unit begins to run.
4. Check for proper operation in each mode. Instruct the owner or operator regarding the unit's operation, and the recommended routine maintenance schedule.

NOTE: Maintaining a log for recording the dates of maintenance and/or service is recommended, and should be suggested to the owner or operator of the equipment.

SERVICING

⚠ WARNING

Risk of Electric Shock, can cause injury or death. Before servicing, switch power off at the service panel and lock the area to prevent power from being switched on accidentally. When the area cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

NOTE: We strongly recommend that any servicing be performed by a qualified individual.

To remove the unit from the closet.

1. Switch the wall thermostat to off.
2. Pull the Power Disconnect located in the front of the chassis.
3. Turn off all power coming into the unit at the main breaker panel or the closet mounted disconnect.
4. Disconnect the electrical connection at the unit.
5. Disconnect the drain system.
6. Disconnect the duct work.
7. Slide the chassis out of the wall plenum.
8. Lift the chassis out of the utility closet.