

Vert-I-Pak Installation Recommendations

For proper unit performance and maximum operating life please refer to the minimum installation clearances below.

Figure 1

VERT-I-PAK® units must be installed on an outside wall. Confined spaces and/or covered areas should be avoided. Units should be installed no closer than 12" apart when two units are side by side. If three or more units are to operate next to one another allow a minimum of 60" between units or pairs of units. Also, a vertical clearance of 60" should be maintained between units. Units installed on the bottom floor should be mounted at least 6" off of the ground.

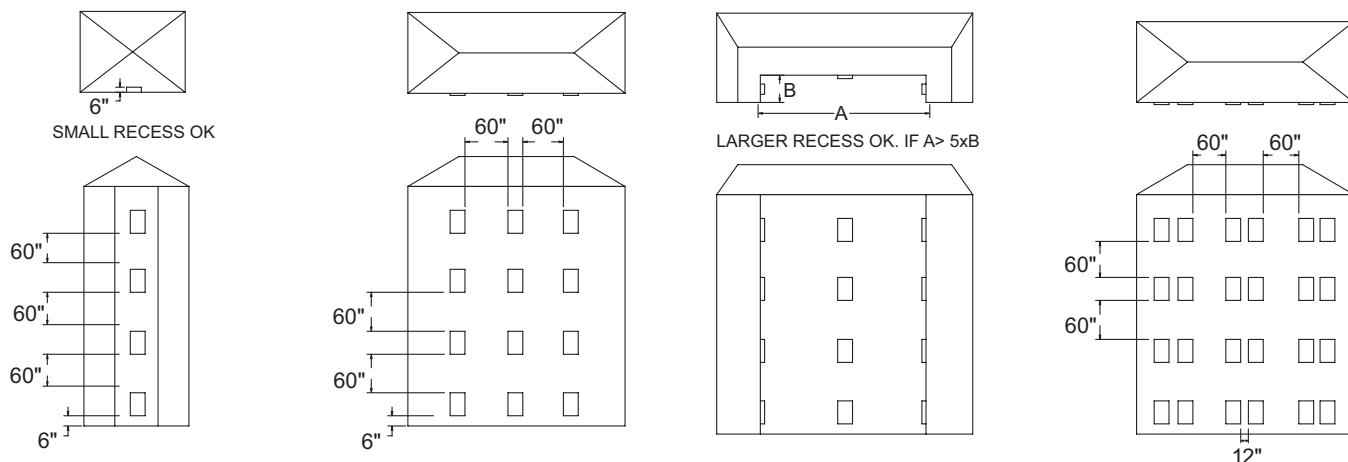
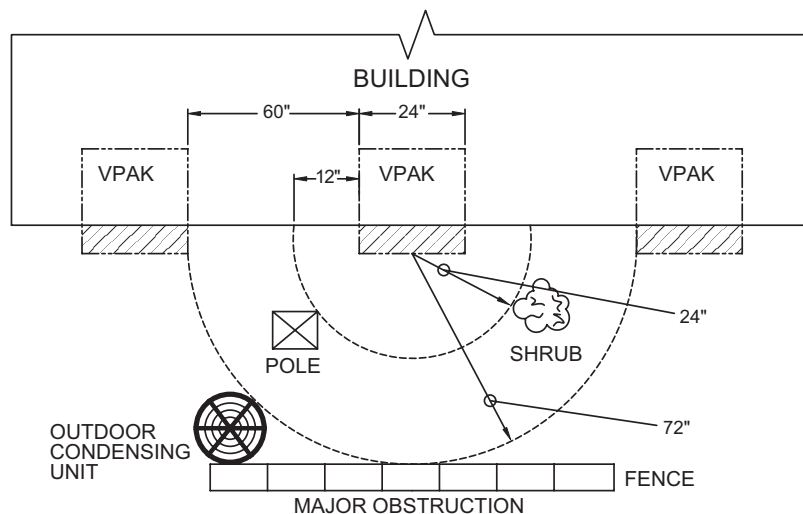


Figure 2

Any time obstructions are present use the following guidelines for proper spacing from the VERT-I-PAK louver:

- For minor obstruction such as lamp poles or small shrubbery a clearance of 24" from the outdoor louver should be maintained.
- For major obstructions such as a solid fence, wall or other heat rejecting device like a condensing unit, a minimum distance of 72" should be kept.



The above suggestions are for reference only and do not represent all possible installations. Please contact Friedrich Air Conditioning (see contact information on back cover) for information regarding affects of other installation arrangements.

By following these simple recommendations you can be confident that your Friedrich Vert-I-Pack® will provide years of worry-free operation.

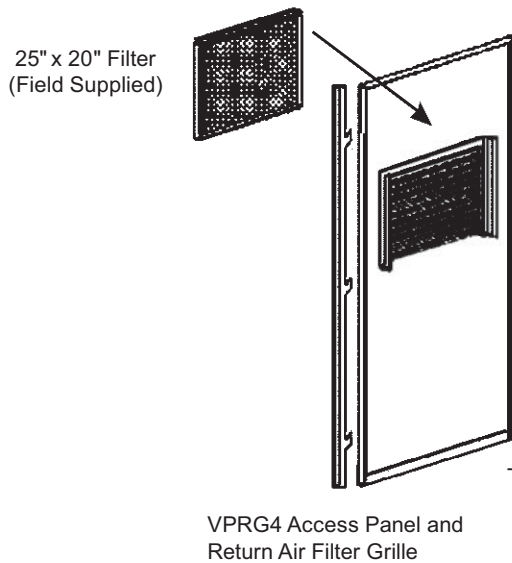
Installation

Utility Closet Dimensions

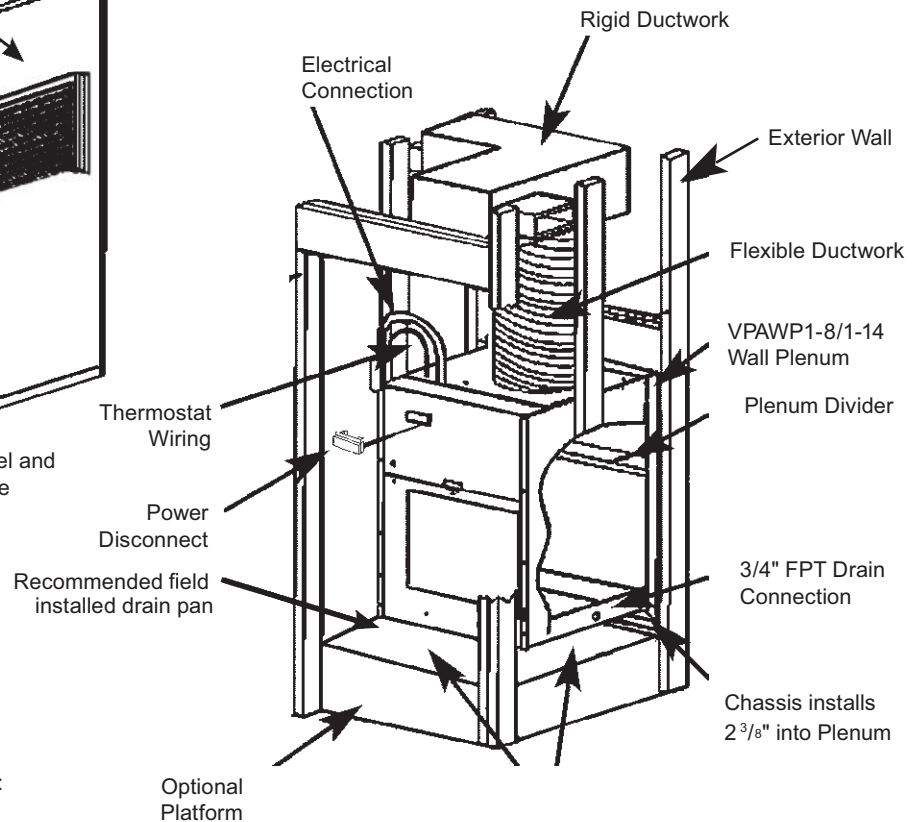
Recommended utility closet dimensions and a typical indoor installation are illustrated in Figure 3. Three inches minimum clearance on three sides of the unit must be allowed for return airflow, installation access and service access. See Figures 3 & 4 for clearances and reference dimensions.

Figure 3

Typical Utility Closet

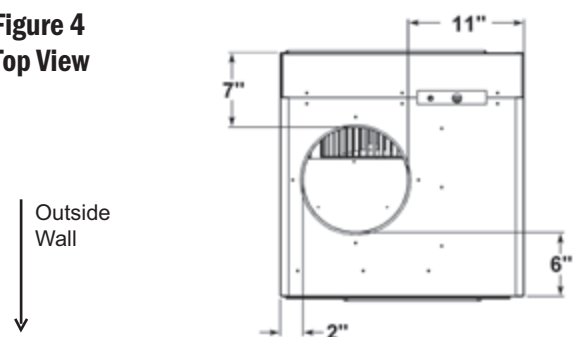


Chassis Shown in Closet, on Optional Platform



- Vert-I-Pak Chassis dimensions:
23 ¹/₈" wide x 23 ¹/₈" deep x 32 ¹/₄" high.
- VPAWP1-8/1-14 Wall Plenum cut-out
dimensions 24 ⁵/₈" wide x 30 ⁷/₈" high.
- VPRG4 Access Panel cutout dimensions:
27" wide by 55 ³/₄" high.
- See Figure 13, Page 11 for proper chassis
installation.

Figure 4
Top View



Wall Plenum and Architectural Louver Installation

Install the wall plenum components in accordance with the installation instructions provided.

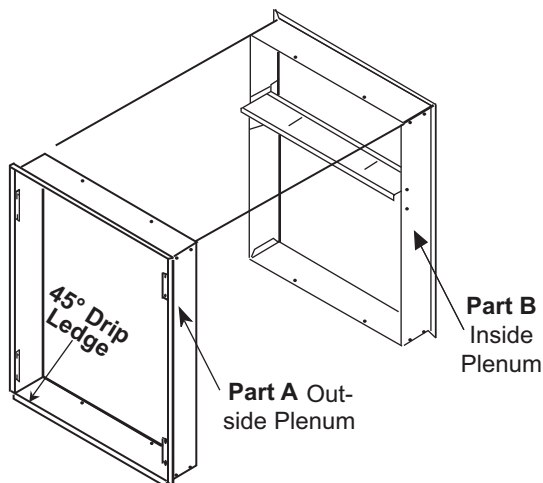
NOTE: IMPORTANT REMINDER FRIEDRICH WALL PLENUM IS NOT DESIGNED TO CARRY STRUCTURAL LOADS. PROPER WALL HEADER CONSTRUCTION IS REQUIRED. THE PLENUM REQUIRES PROPER FLASHING, SHIM AND CAULK FOR A WEATHER RESISTANT INSTALLATION.

YOUR WALL PLENUM WILL WORK ONLY IF INSTALLED CORRECTLY. TAKE NOTICE TO INSTALL IT IN THE CORRECT ORIENTATION AS SHOWN IN THE ILLUSTRATIONS. ALWAYS FOLLOW LOCAL AND NATIONAL CODES FOR PROPER INSTALLATION.

Figure 5
Included Parts

There are two parts to a Wall Plenum:

- A) 1-Outside Assembly (Part A)
- B) 1-Inside Assembly (Part B)



PART A CORRECT ORIENTATION:

● LOUVER ATTACHMENT FLANGES TOWARD THE BUILDING OUTSIDE, 45° DRIP LEDGE AT THE BOTTOM.

PART B CORRECT ORIENTATION:

● LARGE OPENING TO BOTTOM 3/4" FLANGE TOWARD THE INSIDE OF THE BUILDING.

Figure 6
Field Supplied Parts

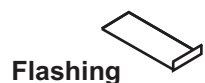
Caulk, Attachment screws and Flashing are field supplied. Silicone caulk is recommended.

VPAWP1-8 adjusts for walls 5.5 - 8.0" thick.
VPAWP1-14 adjusts for walls 8 - 14.0" thick.

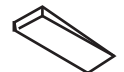
Both installations are similar.



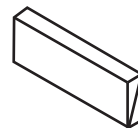
Caulk



Flashing



Shim



Header materials / wall studs



1" -3" Screws to attach the plenum assembly to the wall studs

Figure 7

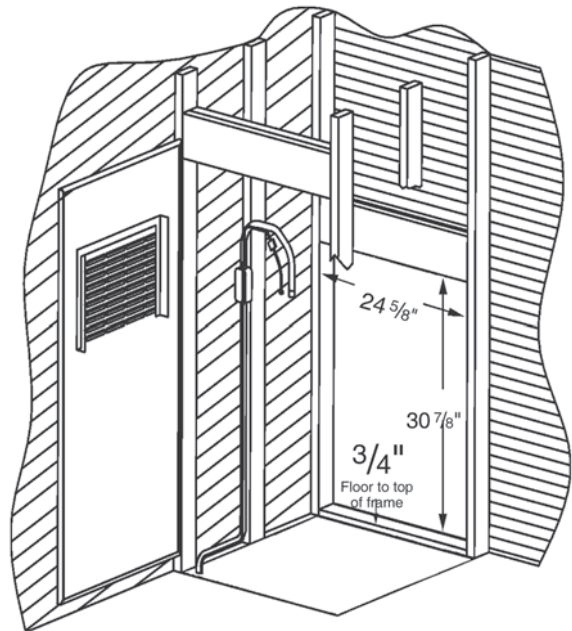
Measure and frame out the outside wall plenum opening

9000 / 12000 / 18000 BTU/h

The plenum cut out dimensions are 24 5/8" wide x 30 7/8" high. The bottom of the rough in opening must be 3/4" from the surface the unit will sit on.

Measure your outside wall as shown in the illustration. Cut, frame, and square rough opening. The Wall plenum has a 3/4" break all the way around to cover the rough cut opening or required shim.

If the installation will utilize an auxiliary drain pan the drain pan must be a maximum of 3/4" tall. If the drain pan to be used is taller, the unit must be raised within the auxiliary pan by the difference in height of the drain pan and 3/4".



IMPORTANT: THE WALL PLENUM IS NOT DESIGNED TO CARRY STRUCTURAL LOADS. A PROPER HEADER OPENING MUST BE BUILT INTO THE ROUGH OPENING. THE PLENUM REQUIRES FLASHING, SHIM AND CAULK FOR A WEATHER-RESISTANT INSTALLATION.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROPERLY INSTALL THE PLENUM AND MEET BUILDING CODE REQUIREMENTS.

Figure 8

Install Architectural Louver on the Outside Plenum

NOTE: The VPAL2 Architectural Louver is best installed onto the Outside Plenum (Part A) prior to Wall Plenum installation. Louver installation is easier at this point, and it will help keep the Wall Plenum square during installation.

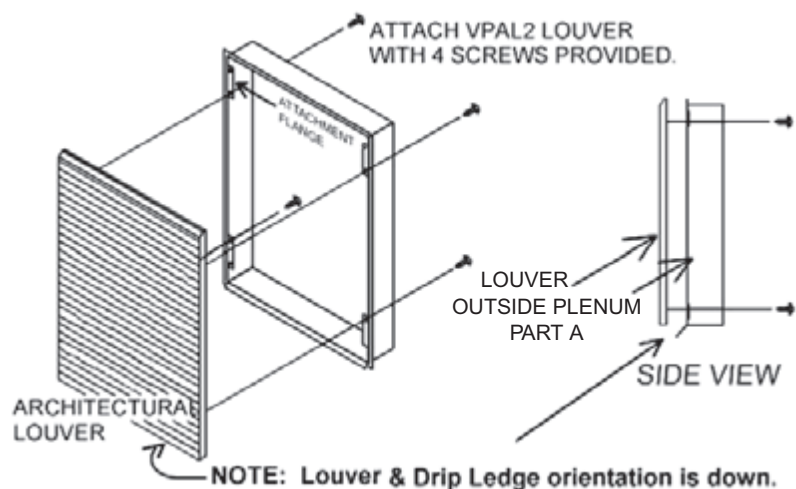
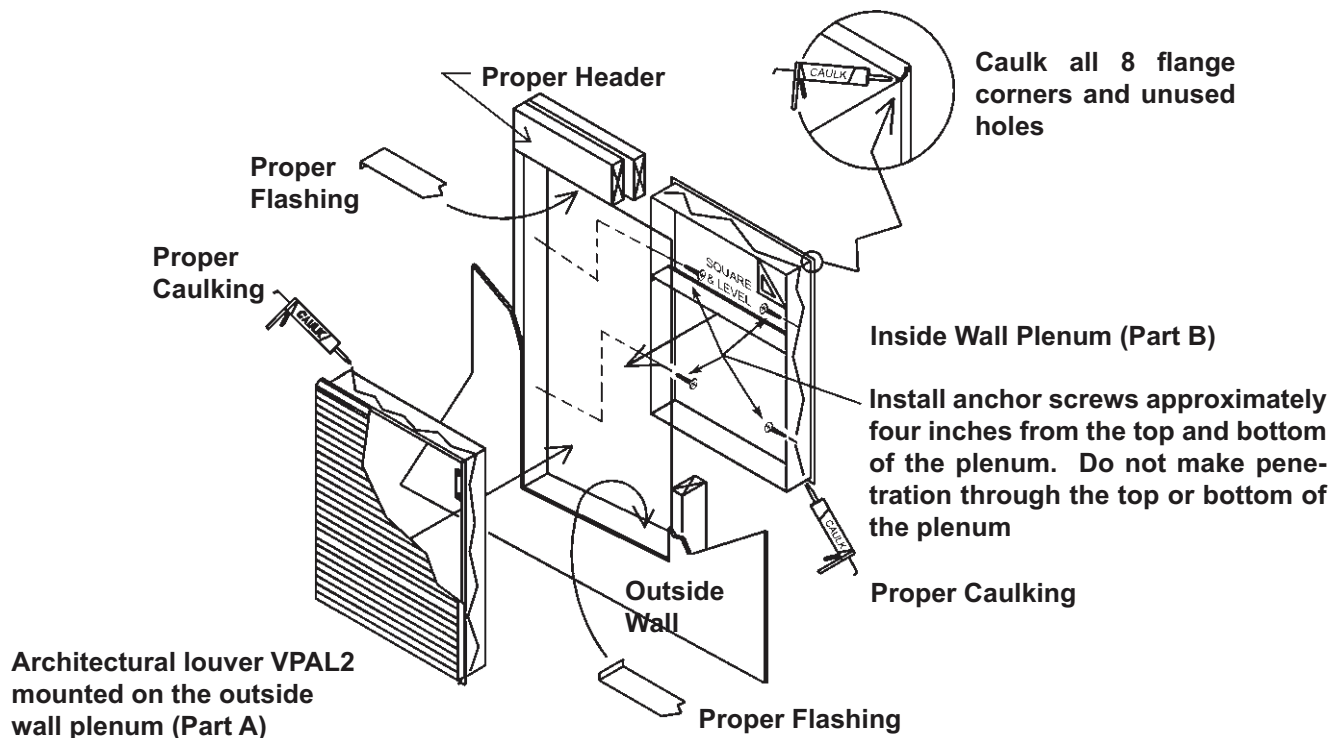


Figure 9
Plenum Installation

Note: Proper header and wall penetration must conform to all national and local building codes.



After the rough cut opening is prepared, you are ready to assemble the two wall plenum parts. Before caulking and permanent attachment, dry fit the outside plenum into the rough opening and check for fit and level. Caulk (silicone recommended) the parts well and insert them into the wall as shown.

A) Apply caulk and insert Outside Part A into the hole.

B) Apply caulk and insert Inside Part B into Part A. Be sure that Part A does not back out of the wall hole.

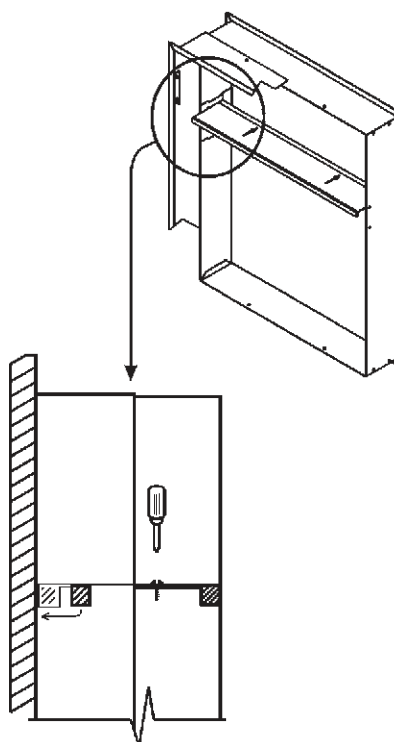
Figure 10

Adjust the Divider

Adjustment

Loosen the two screws located on the top side of the divider. Slide the top part of the divider toward the outside until the sealing strip makes contact with the outdoor louver. Tighten the divider screws to complete the adjustment.

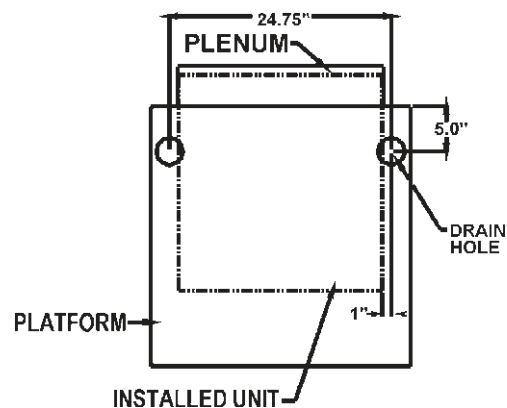
NOTE: Let the caulk cure completely before installing the chassis. This completes the plenum installation.



**Condensate Disposal Preparation
for 9000 / 12000 / 18000 Models ONLY**

IMPORTANT: This step must be performed to ensure that the chassis installs and seals properly in the wall plenum.

If provisions for condensate disposal are made prior to chassis installation and the drain is to be located beneath the platform for the unit, use the accompanying drawing as a guide for cutout locations. Only one drain per unit is required.



Condensate Disposal System

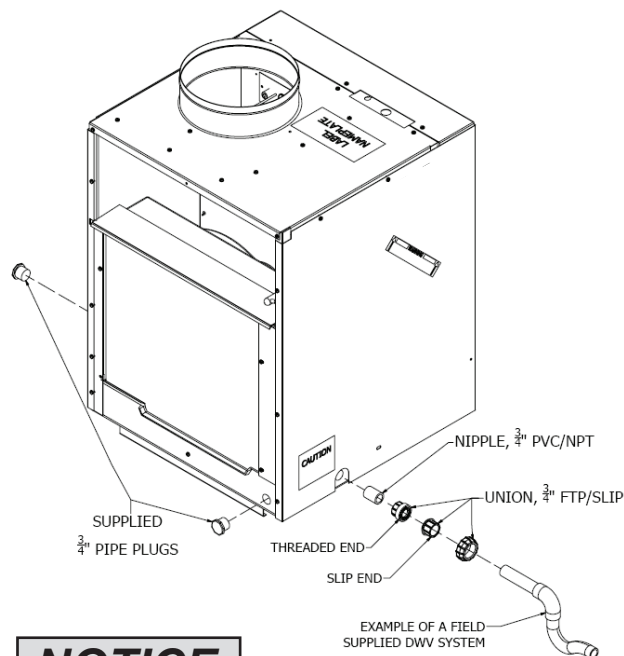
The Condensate Disposal System increases energy efficiency utilizing a factory installed fan that sling the cold condensate onto the hot outdoor coil.

When high outdoor humidity prevents the slinger from disposing of all the 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.

Figure 11

**Drain Connection
and Location**



NOTICE

- 1) The unit basepan has three (3) provisions (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) $\frac{3}{4}$ " FPT connections on the unit basepan. Use of rear fitting without connection to DWV system (drain, waste, vent) may result in staining of the outside wall.
- 3) Insert the provided $\frac{3}{4}$ " nipple into the determined connection using field supplied teflon tape or pipe joint compound.
- 4) With the threaded end of the supplied $\frac{3}{4}$ " union, connect to the nipple with teflon tape or pipe joint compound.
- 5) Hand-tighten all fittings to prevent damage to unit or fittings.
- 6) A field supplied drain system must now be installed to the slip end of the union. A trap is recommended and drain connections should be connected to building DWV system.
- 7) Pitch the drain line on a $\frac{1}{4}$ " downward slope for every foot (1') of lateral horizontal run to the DWV.
- 8) The remaining two connections must be plugged using the two $\frac{3}{4}$ " pipe plugs (provided) and field supplied teflon tape or pipe joint compound. Hand-tighten to prevent damage to unit or fittings.
- 9) Do not thread metal or copper pipe fittings directly into unit.
- 10) Check system for leaks.
- 11) Failure to follow these procedures may result in serious property damage.
- 12) A field supplied secondary condensate pan may be required. Check with local codes.

Indoor Return Air Grille Installation

There are two Indoor Return Air Grille options as shown in Figure 12. Choose the option that best suits your needs. Use the installation instructions provided with accessories for installation details.

Figure 12

Return Air Grille Options

NOTE: All Vert-I-Pak chassis are shipped with a 20" x 14" filter installed. If an accessory filter holder is to be used, you **MUST** remove the factory shipped filter from the chassis. Do **NOT** use two filters.

Option 1

**VPRG4 Return Air Grille
with Access Panel**

A field-supplied (25" x 20") filter is mounted inside the hinged access door.

Kit contains hinge bracket for mounting the door with the return air openings high or low on the door for optimal sound attenuation.

It is recommended to install the door with the hinge on the right side and the return air openings high on the door.



Option 2

**Field Supplied
Return Air Grille**

Must have a minimum of 250 square inches of free area.



NOTES:

There are the Friedrich recommended return air grille/filter/access panel arrangements. Consult Friedrich on other arrangements. Improper return air arrangements will cause performance problems.

Return air arrangements are shown from the front, but can also be installed from the right or left side of the unit.

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 Vert-I-Pak "A" series units **MUST NOT** be ducted, and all units **MUST** have a free return air configuration to perform properly.

WARNING



Moving parts hazard

Turn off electric power before servicing this component.

Fan can start automatically.

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

CAUTION



Excessive Weight Hazard

Use two or more people when installing your air conditioner.

Failure to do so can result in back or other injury

CAUTION



Cut/Sever Hazard

Some edges may be sharp, use gloves or other hand protection when handling unit.

Failure to do so can result in minor to moderate personal injury.

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 Vert-I-Pak equipment be operated at an external static pressure in excess of .30" W.C. Operation of the Vert-I-Pak under these conditions will result in inadequate air flow leading to poor performance and/or premature component failure.

For LOW speed operation, connect the fan output terminal from the thermostat to the GL terminal of the electronic control. For HIGH speed operation, connect the fan output terminal from the thermostat to the GH terminal of the electronic control. For thermostats with two-speed fan capabilities, connect the LOW speed output to the GL terminal, and the HIGH speed output to the GH terminal.

Determining the Indoor CFM: Chart A – CFM

	Model					
	VEA09		VHA09/VEA12/VHA12		VEA18/VHA18	
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:

VEA09/VHA09.....325

VHA12/VEA12.....390

VEA18/VHA18.....400

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.

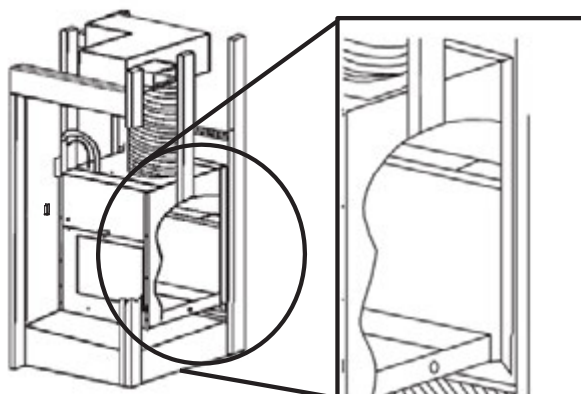
Chassis Installation

Install the following components

- Ensure that the wall plenum is installed in accordance with the instructions listed on Pages 6-10.
- Place the chassis into the closet with the outdoor side facing the wall plenum opening.
- Slide the chassis into the wall plenum until the plenum divider seal is established. (See Figure 13)

Figure 13
**Chassis Installation/
Installed View**

The Vert-I-Pak chassis must be inserted into the wall plenum so that the plenum divider gasket makes contact with the plastic condenser baffle on the unit. The chassis will fit approximately 2 3/8" into the wall plenum.



Remote Thermostat and Low Voltage Control Connections

Remote Thermostat

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

To connect the wall-mounted thermostat:

1. Pull the disconnect switch.
2. Unscrew and remove the control box panel.
3. After selecting which side you want to run your thermostat wire through, run the wires through the side hole in the box to reach the connection terminal for the wiring.
4. Make the wire connections, appropriately matching the wires as shown in the wiring diagram.
5. Once each wire is matched and connected, the unit is now ready for operation.
6. Reattach the control box cover.

Desk Control Terminals

The Friedrich VERT-I-PAK 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 (See figure 15). 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.

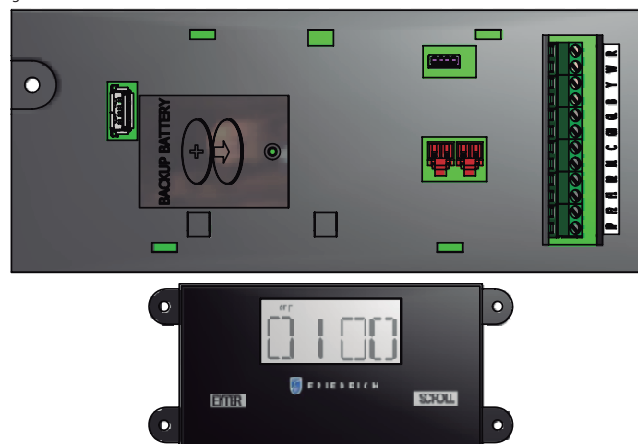
To connect the relay, simply wire one side of the relay to F1 and the other side to F2. Anytime that the fan runs, the terminals will send a 24VAC signal to the relay. The relay must be 24VAC, 100mA or less.

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. Other manufacturer's units and even older Friedrich models may have different control wiring connections. Questions concerning proper connections to the unit should be directed to the factory.

Control Board

Figure 14



Interface Definition	
Terminal Code	Wire Connection Function
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

A white electronic thermostat by Friedrich. It features a digital LCD display showing the number '72'. To the right of the display are two small square buttons with upward and downward arrows. Below the display is the 'FRIEDRICH' logo. At the bottom, there are four buttons labeled 'Fan', 'Cool', 'Heat', and 'Hold'. The text 'Electronic Thermostat' is printed above the bottom buttons.

WIRING DIAGRAM HEAT PUMP EH
2.5KW, 3.4KW, 5.0KW
VHA 12/18K

COMPONENTS:
HARNES COMPRESSOR
COMPRESSOR
SERVICE DISPLAY
BLOWER MOTOR
CAPACITOR
COIL SOLENOID
HEATER (2.5 KW & 3.5 KW, 5.0 KW)
ELECTRONIC CONTROL
PRESSURE SWITCH
OUTDOOR COIL SENSOR
INDOOR COIL SENSOR

WIRING DETAILS:
WASHER, NUT, GASKET, TERMINAL COVER, TERMINAL DETAIL
WHITE QUICK DISCONNECT
BLACK (TO L1)
RED
BLUE
GREEN
WHITE
BROWN
BLACK
BLUE
BLACK
RED
BROWN

TERMINAL BLOCK:
R Y W B GL GH C D1 D2 F1 F2


LEGEND:
THERMOSTAT CONNECTIONS
LEGEND
REV 00
PART NO.
R 24VAC Power From Unit
Y Call for Cooling
W Call for Heating
B Reversing valve Energized in heating mode
GL Call for Low Fan
GH Call for High Fan
RT5-Two Speeds Fan T-STAT-Field Provided
Field Wiring

14

Chassis Final Connections

With the chassis in place, you are now ready to begin chassis connections:

- A. Move the thermostat switches to “OFF” and “AUTO”. This will keep the thermostat from cycling the chassis until final connections are complete.
- B. Connect the duct work onto the 10” collar. Plastic wire ties (field supplied) are suggested to secure the duct work in place. Use 2 wire ties, one for each inner and outer flex duct sleeve.
- C. Review the Final Installation Checklist before replacing the power quick disconnect, reconnecting power to the chassis or operating the chassis.

⚠ WARNING	
	Electrical Shock Hazard
	Pull out electrical disconnect on front of the chassis and turn off all power to the unit before servicing.
	Failure to do so can result in property damage, personal injury and/or death.

Final Installation Checklist

- ☐ Inspect and ensure that all components and accessories have been installed properly and that they have not been damaged during the installation process.
- ☐ Ensure that all installation instructions concerning clearances around the unit have been adhered to.
- ☐ Check to ensure that the unit air filter, indoor coil, and outdoor coil are free from any obstructions.
- ☐ Ensure that the circuit breaker(s) or fuse(s) and supply circuit wire size have been sized correctly.
- ☐ Check the condensate water drain(s) to ensure that they are adequate for the removal of condensate water, and that they meet approval of the end user.
- ☐ Ensure that the entire installation is in compliance with all applicable national and local codes and ordinances having jurisdiction.
- ☐ Secure all access panels (i.e. front cover and/or control box), apply power to the unit, then start the unit, and 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.

Present the owner or operator of the equipment with the Installation & Operation Manual, all accessory installation instructions, and the name, address and telephone number of the Authorized Friedrich Warranty Service Company in the area for future reference if necessary.

Chassis Operation

Fresh Air Door

The Fresh Air Door is an “intake” system. The fresh air door is opened via a slide on the front of the chassis located just above the indoor coil. Move the slide left to open and right to close the fresh air door. The system is capable of up to 60 CFM of fresh air at .3" H2O internal static pressure.

Low Ambient Compressor Cut Out

Each chassis is equipped with low ambient protection in the form of a thermistor, which will prevent compressor operation at low suction temperature.

Room Freeze Protection

This feature will monitor the indoor room conditions and in the event that the room falls below 40°F the unit will cycle on high fan with the electric heater. This occurs regardless of mode.