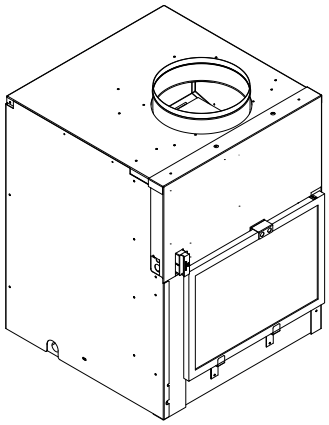
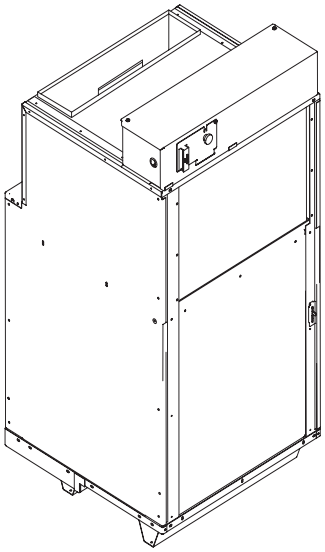
Installation & Operation Manual

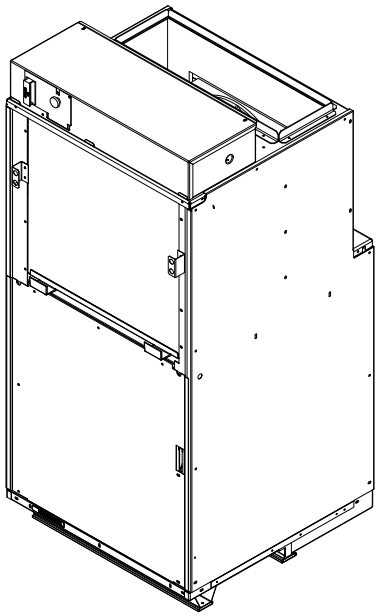
FRIEDRICH

VERT-I-PAK®

Single Package Heat Pump







LOW GWP Refrigerant

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⚠ WARNING

Please read this manual thoroughly prior to equipment installation or operation. It is the installer's responsibility to properly apply and install the equipment. Installation must be in conformance with the NFPA 70-2008 National Electric Code or current edition, International Mechanic code 2009 or current edition and any other applicable local or national codes.

⚠ WARNING

Refrigeration system under high pressure. Do not puncture, heat, expose to flame or incinerate. Only certified refrigeration technicians should service this equipment. R32 systems operate at higher pressures than R22 equipment. Appropriate safe service and handling practices must be used. Only use gauge sets designed for use with R32. Do not use R22 gauge sets. Failure to do so can result in property damage, personal injury, or death.

⚠ WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for thier safety.

Children should be supervised to ensure that they do not play with the appliance.

⚠ WARNING

The maximum altitude for this appliance is 2,000m (6,562 ft).

Do not use above an altitude of 2,000m (6,562 ft)

⚠ WARNING

Electric Shock Hazard

TURN OFF ELECTRIC POWER BEFORE SERVICE OR INSTALLATION.

Unit must be properly grounded. Other methods of grounding are permitted if performed in accordance with the "National Electric Code"(NEC)/"American National Standards Institute" (ANSI)\National Fire Protection Association (NFPA) 70 and Local/State Codes.

In Canada, Electrical Grounding is to be in accordance with the Canadian Electrical Code CSA C22.1.

Unit must have correct Fuse or Circuit Breaker Protection. Unit's supply circuit must have the correct wire conductor size. All electrical connections and wiring must be installed by a qualified electrician and conform to the National Electrical Code and all Local Codes which have jurisdiction. Failure to do so can result in property damage, personal injury and/or death

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety alert symbol.
This symbol alerts you to potential hazards that can kill or hurt you and others.
All safety messages will follow the safety alert symbol with the word "WARNING" or "CAUTION".
These words mean:

WARNING

Indicates a hazard which, if not avoided, can result in severe personal injury or death and damage to product or other property.

CAUTION

Indicates a hazard which, if not avoided, can result in personal injury and damage to product or other property. All safety messages will tell you how to reduce the chance of injury, and tell you what will happen if the instructions are not followed.

NOTICE

Indicates property damage can occur if instructions are not followed.

This symbol indicates that this appliance uses flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.

This symbol indicates that the Operation Manual should be read carefully.

This symbol indicates that a service personnel should be handling this equipment with reference Installation Manual

This symbol indicates that information is available such as a operationing/Installation manual

THINK SAFETY FIRST	⚠ WARNING	⚠ AVERTISSEMENT	⚠ ADVERTENCIA
	Do not remove, disable or bypass this unit's safety devices. Doing so may cause, fire, injuries or death.	Ne pas supprimer, désactiver ou contourner cette l'unité des dispositifs de sécurité. faire vous risqueriez de provoquer, le feu, les blessures ou la mort.	No eliminar, desactivar o pasar por alto los dispositivos de seguridad de la unidad. Si lo hace podría producirse fuego, lesiones o muerte.

Important Safety and General Information

CAUTION : Risk of fire flammable materials
Important Note : Read this manual carefully before installing or operating your new air conditioning unit.Make sure to save this manual for future reference

R32 A2L

Warning

Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.

The appliance shall be stored in a room without continously operating ignition sources like open flames, operating gas appliance or an operating electric heater.

Do not pierce or burn

Be aware that refrigerants may not contain an odour.

Importance of Quality Installation

Optimal system performance and longevity depend upon a quality and proper installation. Failure to properly install this unit could result in undesirable operation and subsequent faults and potential failures.

Carefully follow all guidelines listed in the manual and industry best practices. Conform to all local code requirements. Contact your local technical representative with any questions or concerns.

Upon receiving the unit, inspect it for any damage from shipment. Claims for damage, either shipping or concealed, should be filed immediately with the shipping company. IMPORTANT: Check the unit model number, Cooling size, electrical characteristics, and accessories to determine if they are correct.

WARNING: If the unit appears damaged, or if a refrigerant leak is suspected, do not install . Contact a licensed repair person to per form a leak check on the unit.

Scan this QR code to be linked to the Friedrich professional support page where you can locate the Service Manual.

Unventilated areas

WARNING : APPLIANCE shall be stored in a room without continuously operating open flames (for example an operating gas appli ance) or other POTENTIAL IGNITION SOURCES (for example an operating electric heater, hot surfaces).

WARNING:"Auxiliary devices which may be a POTENTIAL IGNITION SOURCE shall not be installed in the duct work. Examples of such POTENTIAL IGNITION SOURCES are hot surfaces with a temperature exceeding 700 F and electric switching devices".

WARNING: Do not use of install unapproved devices in the ductwork. Only use auxiliary devices approved by Friedrich or declared suitable with R-32 . If in doubt, Friedrich should be consulted.

WARNING: Do not drill on panels. Before any progress, Friedrich should be consulted.

WARNING: The appliance shall be stored so as to prevent mechanical damage from occurring.

Important Safety and General Information

Qualification of Workers

WARNING: Any person who is involved with working on or breaking into a refrigerant circuit should be documented by a current valid certificate from a national training organization or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation to handle refrigerants safely in accordance with an industry recognized assessment specification.

Every working procedure that affects safety shall only be carried out by a competent person.

Examples for such working procedures are:
- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

Cabling

WARNING: Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as com pressors or fans.

Detection of Flammable Refrigerant

WARNING: Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.
The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.
Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

Examples of leak detection fluids are
– bubble method,
– fluorescent method agents.
If a leak is suspected, all naked flames shall be removed/extinguished.
If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to national training organization or manufacturers.

Charging Procedures

The following requirements shall be followed.
- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATING SYSTEM is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Important Safety and General Information

Recovery

WARNING: When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, FLAMMABLE REFRIGERANTS. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that FLAMMABLE REFRIGERANT does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

General work area

Warning: All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

Presence of fire extinguisher

Warning: If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

Checks to the refrigerating equipment

Warning: Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times Friedrich AC maintenance and service guidelines shall be followed If in doubt, consult Friedrich AC technical department for assistance.
The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:
– the actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
the ventilation machinery and outlets are operating adequately and are not obstructed;
– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

Important Safety and General Information

Checks to electrical devices

Warning: Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.
Initial safety checks shall include:
• that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
• that no live electrical components and wiring are exposed while charging, recovering or purging the system;
• that there is continuity of earth bonding.

Repairs to sealed components

Warning: Do not repair. Sealed components must be replaced.

Repair to intrinsically safe components

Warning: Do not repair. Intrinsically safe components must be replaced.

Decommissioning

Warning: Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.
a)Become familiar with the equipment and its operation.
b)Isolate system electrically.
c)Before attempting the procedure, ensure that:
- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- all personal protective equipment is available and being used correctly;
- the recovery process is supervised at all times by a competent person;
- recovery equipment and cylinders conform to the appropriate standards.

d)Pump down refrigerant system, if possible.
e)If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f)Make sure that cylinder is situated on the scales before recovery takes place.
g)Start the recovery machine and operate in accordance with instructions.
h)Do not overfill cylinders (no more than 80 % volume liquid charge).
i)Do not exceed the maximum working pressure of the cylinder, even temporarily.
j)When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k)Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Labelling

Warning: Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Model Identification Guide

MODEL NUMBER	V	H A	09	K	34	RC	Q

Marketing Revision

Series
V = Friedrich® Series

RT = R410a Refrigerant
RC = R32 Refrigerant

HA = Air-Source Heat Pump

Nominal Capacity
09 = 9,000 Btu/hr 18 = 18,000 Btu/hr
12 = 12,000 Btu/hr 24 = 24,000 Btu/hr

Electric Heater Size
A Series
25 = 2.5 kW
34 = 3.4 kW
50 = 5.0 kW
75 = 7.5 kW*
10 = 10.0 kW**

Voltage
K = 208/230V-1Ph-60Hz
R = 265V-1Ph-60Hz

*** ONLY AVAILABLE ON THE 18 & 24 K/R MODELS**
****ONLY AVAILABLE ON THE 24 K/R MODELS**

General Specifications

MODEL	VHA09K	VHA09R	VHA12K	VHA12R	VHA18K	VHA18R	VHA24K	VHA24R
COOLING DATA								
TOTAL COOLING CAP. (Btu/hr) @95°F	9,400	9,400	11,200	11,200	17,800	17,800	22,600	22,600
SENSIBLE COOLING CAP. (Btu/hr)	7,100	7,100	8,800	8,800	13,100	13,100	14,700	14,700
SEER2	12.3	12.3	12.3	12.3	12.1	12.1	12.1	11.9
EER2	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
POWER (W)	887	887	1057	1057	1679	1679	2132	2132
VOLTAGE	208/230	265	208/230	265	208/230	265	208/230	265
HEATING DATA								
HEAT PUMP CAP. (Btu/hr) @ 47°F	8,600	8,600	10,400	10,400	16,200	16,200	19,500	19,500
HEAT PUMP CAP. (Btu/hr) @ 17°F	4,900	4,900	6,000	6,000	9,800	9,800	12,400	12,400
HSPF2	6.3	6.3	6.3	6.3	6.7	6.7	6.7	6.7
HEATER SIZE (kW)	2.5/3.4/5.0	2.5/3.4/5.0	2.5/3.4/5.0	2.5/3.4/5.0	2.5/3.4/5.0/7.5	2.5/3.4/5.0/7.5	2.5/3.4/5.0/7.5/10.0	2.5/3.4/5.0/7.5/10.0
PHYSICAL								
DIMENSIONS (W X D X H)	23"x23"x32"	23"x23"x32"	23"x23"x32"	23"x23"x32"	23"x23"x47"	23"x23"x47"	23"x23"x52"	23"x23"x52"
REFRIGERANT	R32							
VOLUME (OZ)	26	26	28.7	28.7	40	40	44	44
AIRFLOW (CFM)	360		420		560		580	
VENTILATION AIR								
CFM	UPTO 60							

NOTES:
Due to continuing research in new energy-saving technology, specifications are subject to change without notice.

Electrical Specifications

Vert-I-Pak Family	Model Number	Total Refrigeration Amps	Total Electric Heat Amps	Electric Heat Watts	Electric Heat Amps	Compressor RLA LRA	Blower Motor FLA/HP	Condenser Motor FLA/HP	MCA	MOP/ MOCP
VHA09K (230v/208v)	25RCQ	5.6/5.3	11.5/10.4	2450/2000	10.7/9.6	4.1/3.8 20	0.8 1/8	0.7 1/4	14.4	15
	34RCQ	5.6/5.3	15.4/14.0	3350/2740	14.6/13.2				19.3	20
	50RCQ	5.6/5.3	22.5/20.5	5000/4090	21.7/19.7				28.2	30
VHA09R (265v)	25RCQ	6.1	10	2450	9.2	4.6 20			12.5	15
	34RCQ	6.1	13.4	3350	12.6				16.8	20
	50RCQ	6.1	19.7	5000	18.9				24.7	25
VHA12K (230v/208v)	25RCQ	6.4/6.0	11.5/10.4	2450/2000	10.7/9.6	4.1/3.8 20		0.9 1/4	14.4	15
	34RCQ	6.4/6.0	15.4/14.0	3350/2740	14.6/13.2				19.3	20
	50RCQ	6.4/6.0	22.5/20.5	5000/4090	21.7/19.7				28.2	30
VHA12R (265v)	25RCQ	5.8	10	2450	9.2	4.6 20		0.7 1/4	12.5	15
	34RCQ	5.8	13.4	3350	12.6				16.8	20
	50RCQ	5.8	19.7	5000	18.9				24.7	25
VHA18K (230v/208v)	25RCQ	9.9/9.5	11.5/10.4	2450/2000	10.7/9.6	7.8/7.4 40	0.8 1/5	1.3 1/4	15	15
	34RCQ	9.9/9.5	15.4/14.0	3350/2740	14.6/13.2				19.2	20
	50RCQ	9.9/9.5	22.5/20.5	5000/4090	21.7/19.7				28.5	30
	75RCQ	9.9/9.5	33.4/30.3	7500/6135	32.6/29.5				41.8	45
VHA18R (265v)	25RCQ	9.1	10	2450	9.2	7.2 40	0.6 1/5		13.9	15
	34RCQ	9.1	13.4	3350	12.6				16.9	20
	50RCQ	9.1	19.7	5000	18.9				25.6	30
	75RCQ	9.1	29.1	7500	28.3				36.4	40
VHA24K (230v/208v)	25RCQ	12.1/11.2	11.5/10.4	2450/2000	10.7/9.6	9.4/8.5 43	0.8 1/5	1.9 1/4	17.1	20
	34RCQ	12.1/11.2	15.4/14.0	3350/2740	14.6/13.2				20.3	25
	50RCQ	12.1/11.2	22.5/20.5	5000/4090	21.7/19.7				30	30
	75RCQ	12.1/11.2	33.4/30.3	7500/6135	32.6/29.5				41.8	45
	10RCQ	12.1/11.2	44.3/40.1	10000/8180	43.5/39.3				55.4	60
VHA24R (265v)	25RCQ	10.9	10	2450	9.2	8.5 43	0.6 1/5	1.8 1/4	15.5	20
	34RCQ	10.9	13.4	3350	12.6				18.5	20
	50RCQ	10.9	19.7	5000	18.9				27.3	30
	75RCQ	10.9	29.1	7500	28.3				36.2	40
	10RCQ	10.9	38.5	10000	37.7				47.9	50

NOTES:

All units must be hard wired with a properly sized breaker. See unit nameplate for specific electrical requirements. Use HACR type breakers to avoid nuisance trips. All field wiring must be done in accordance with NEC and local codes. It is the installer's responsibility that the electrical codes are met. The electrical requirement may change without notice.

Electrical Requirements	
Wire Size	Use **ONLY** wire size recommended for single outlet branch circuit.
Fuse/Circuit Breaker	Use **ONLY** type and size fuse or HACR circuit breaker indicated on unit's rating guide. Proper over current protection to the units is the responsibility of the owner.
Grounding	Unit **MUST** be grounded from branch circuit to unit, or through separate ground wire provided on permanently connected units. Ensure that branch circuit or general purpose outlet 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.

⚠ WARNING

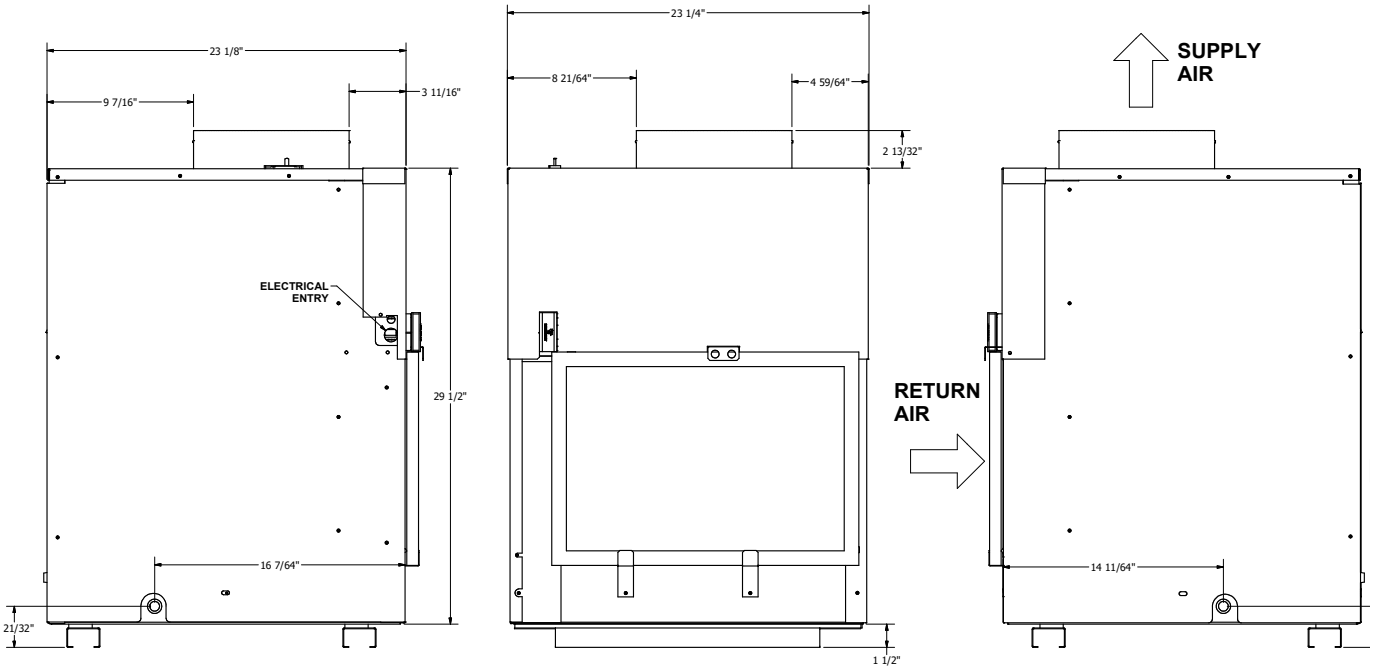
Electrical Shock Hazard.

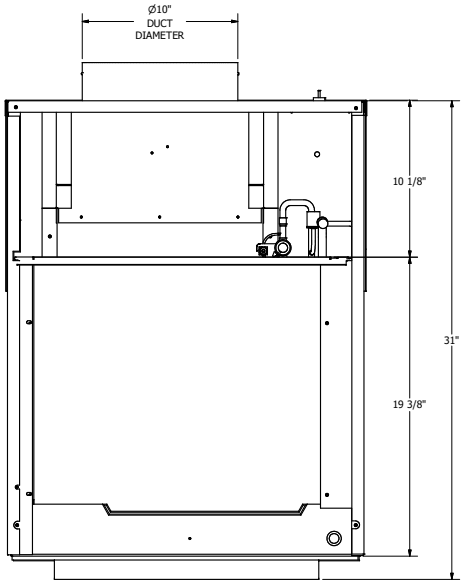
Turn OFF electric power before service or installation.

Unit must be properly grounded.

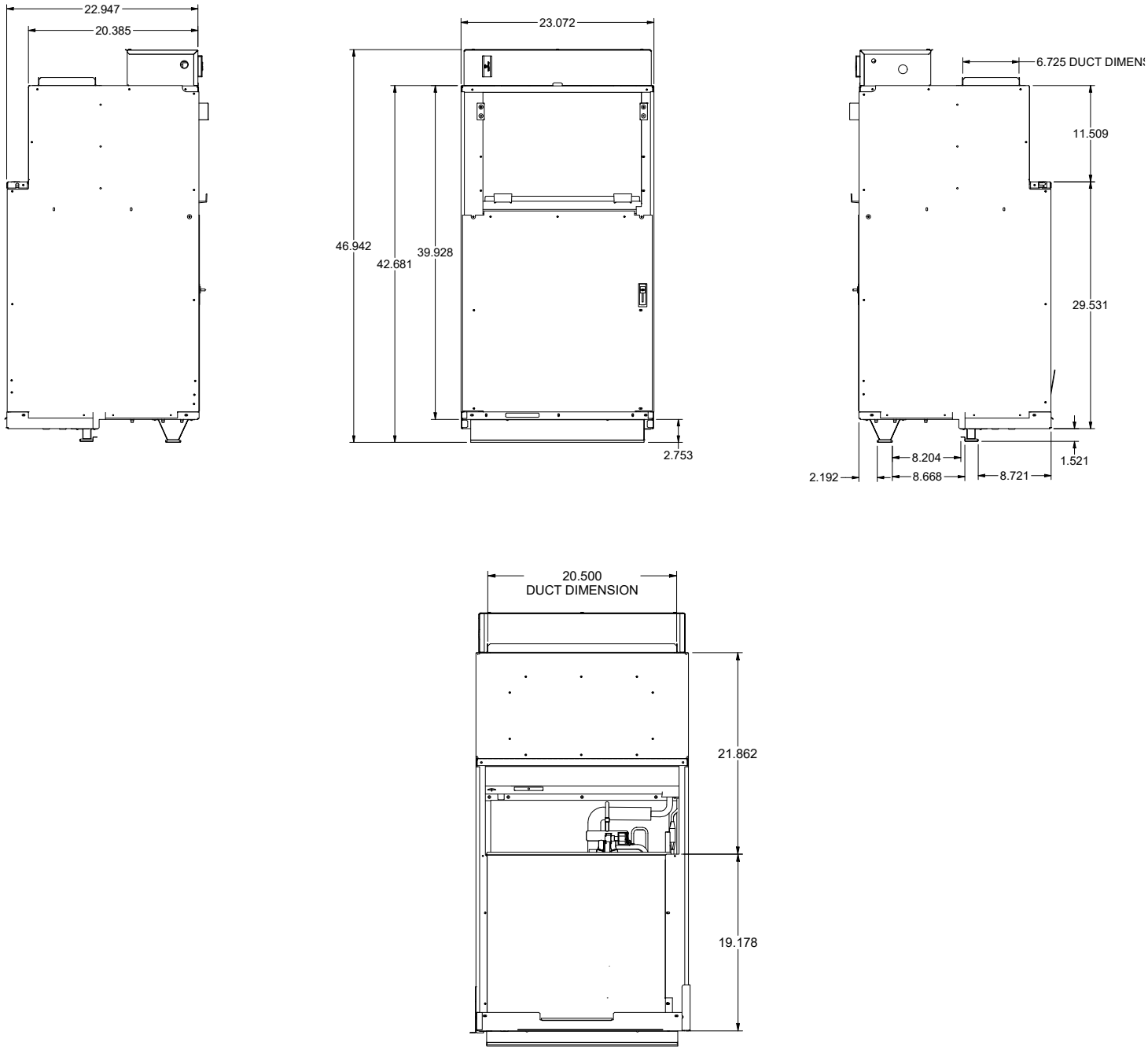
Unit must have correct fuse or circuit breaker protection. Unit's supply circuit must have the correct wire conductor size. All electrical connections and wiring must be installed by a qualified electrician and conform to the National Electrical Code and all local codes which have jurisdiction. Failure to do so can result in property
damage, personal injury and/or death.

Chassis Dimensions - VHA09/VHA12

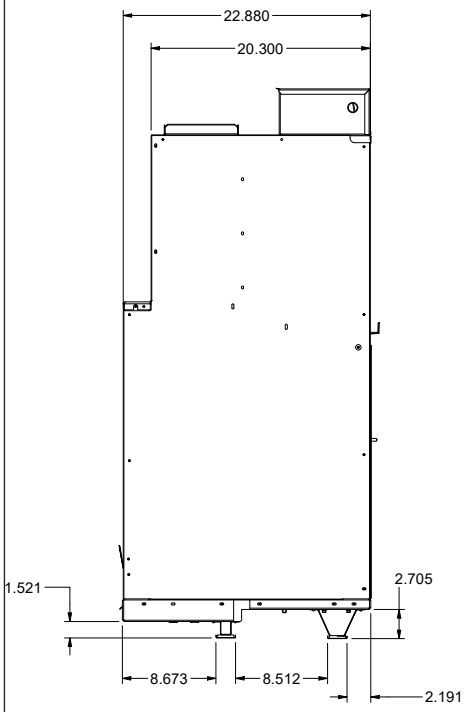


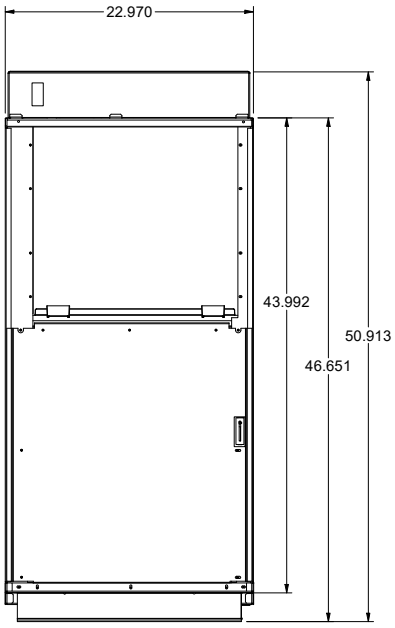


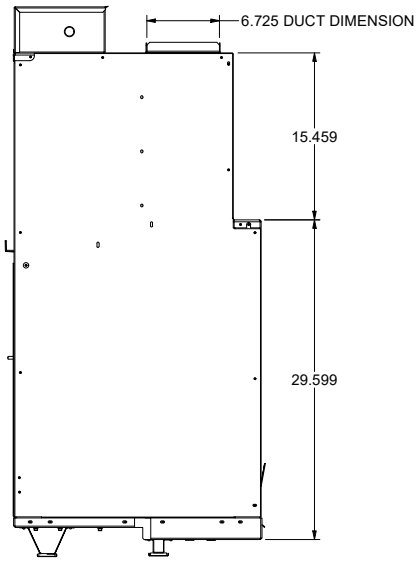
Chassis Dimensions - VHA18

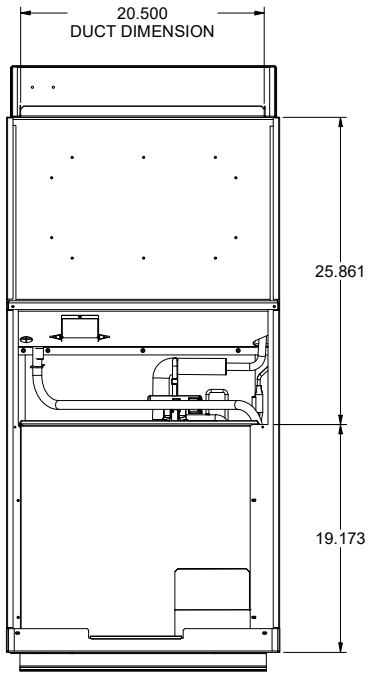


Chassis Dimensions - VHA24









Air Flow Data

Indoor CFM & External Static Pressure

MODEL	VHA09		VHA12		VHA18		VHA24	
Fan Speed	Low	High	Low	High	Low	High	Low	High
ESP (")	SCFM							
0.0"	400	490	400	490	620	705	675	765
0.05"	370	475	370	475	580	675	635	735
0.10"	355	460	355	460	550	640	600	700
0.15"	335	450	335	450	510	610	560	670
0.20"	315	435	315	435	480	585	525	635
0.25"	300*	425	300*	425	450	570	490	615
0.30"	280	420*	280	420*	400*	560	440*	580
0.35"	--	--	--	--	365	500	400	540
0.40"	--	--	--	--	320	450*	350	490*

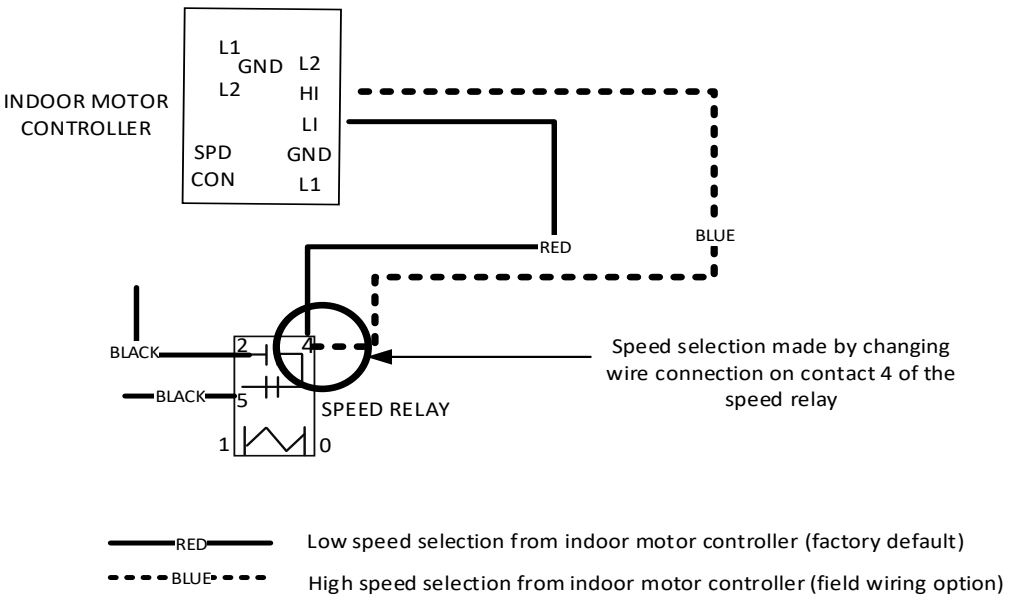
*Maximum Allowable Static. Units rated at 0.3" ESP.

Indoor airflow may be determined by measuring the external static pressure (ESP) of the duct system using an inclined manometer or magnahelic gauge and consulting the above chart to derive actual air flow. Under no circumstances should the Vert-I-Pak be operated at an higher external static pressure than indicated above. Operation of the Vert-I-Pak over the recommended ESP will result in inadequate airflow, leading to poor performance and/or premature component failure.

Blower Control

All Vert-I-Paks, by default, will be configured to low speed blower operation. The speed setting can be changed to high speed by updating the speed tap settings on the fan control relay. **Thle blower fan speed setting cannot be changed at the thermostat**. Regardless of wiring GH and/or GL, the unit will continue to operate at the speed setting at the fan control relay.

Note: Any non-Friedrich thermostat or low voltage device being powered by the Vert-I-Pak will need to be reviewed and approved for use.



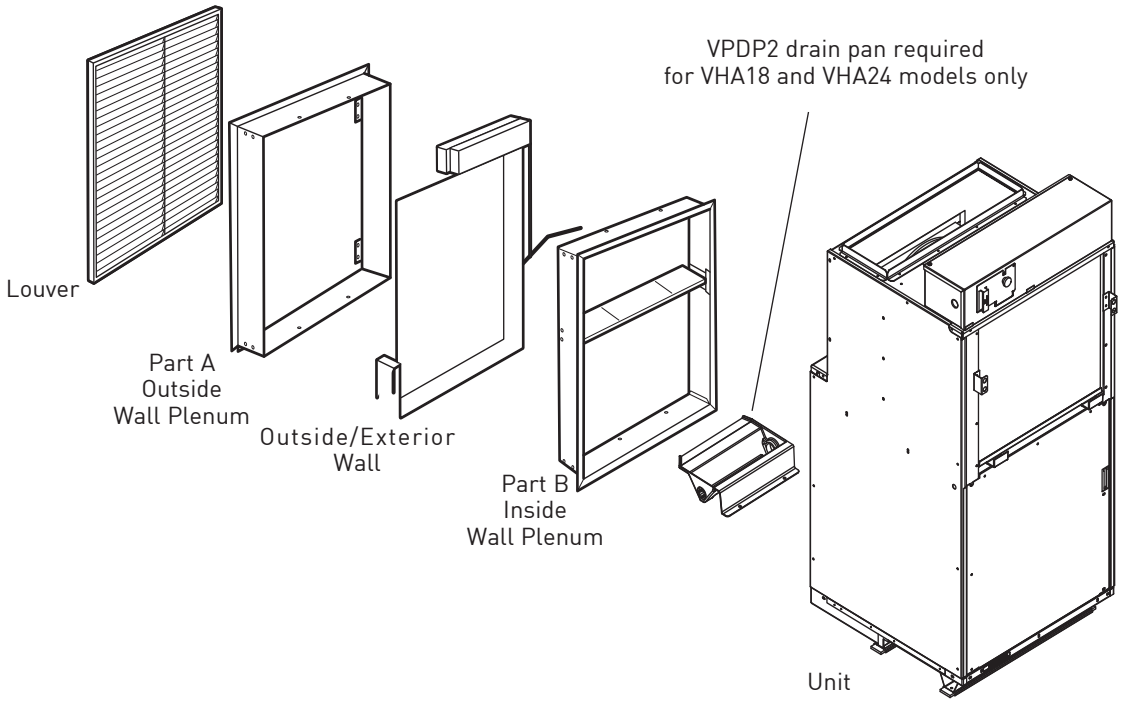
Condenser CFM & External Static Pressure

Vert-I-Pak is designed to install through an exterior wall with a plenum (VPAWP-8, VPAWP-14) and a Friedrich external louver .

Condenser External Static Pressure			
Model	Design		Maximum
	CFM	ESP ("WC)	ESP ("WC)
VHA09	650	0.03	0.12
VHA12	650	0.03	0.12
VHA18	950	0.03	0.12
VHA24	980	0.03	0.12

If the Friedrich designed plenum and louver combinations are not used, the selections and design must be evaluated by Friedrich to ensure the total pressure drop does not exceed the maximum allowable limits.

Typical Installation Overview



VPAWP1-8 = 5 1/2" - 8" D x 24 1/8" W x 30 3/8" H
VPAWP1-14 = 8" - 14" D x 24 1/8" W x 30 3/8" H

Vert-I-Pak Required Minimum Clearances

Building Exterior Unit Opening Requirements

Vert-I-Pak units must be installed on an outside wall. Confined spaces and/or covered areas should be avoided. Units must 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, maintain a minimum of 60" between units or pairs of units (Figure B). If more than two units are sharing a floor with adjacent, outset units, a minimum distance of 64" must be kept between units (Figure C). Also, a vertical clearance of 60" must be maintained (Figure A) between units. Units installed on the bottom floor must be mounted at least 6" off of the ground.If two units are facing each other, a minimum distance of 108" must be kept between units (Figure D).

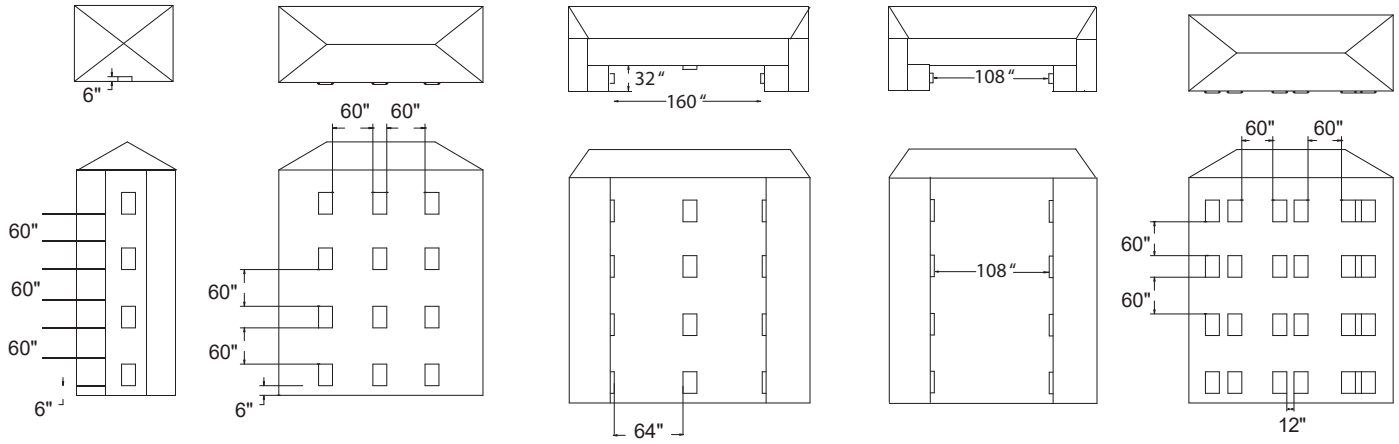


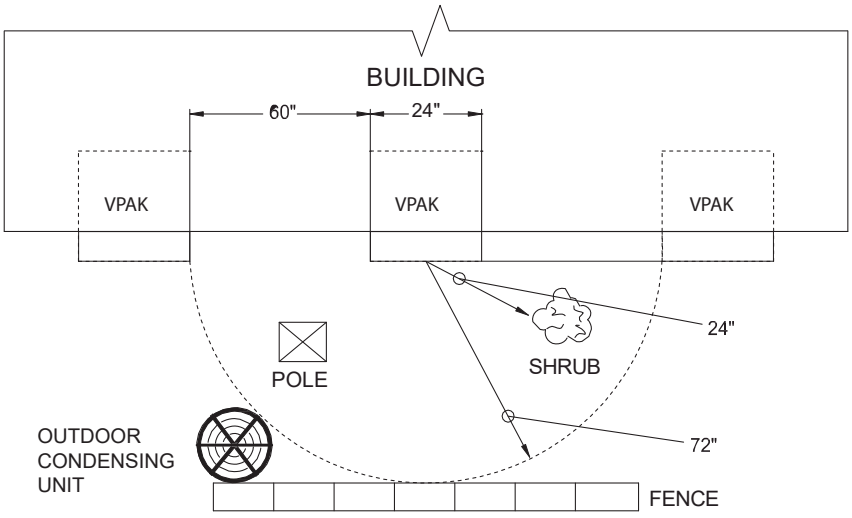
Figure A Figure B Figure C Figure D Figure E

Grill Clearance Requirements

Where obstructions are present use the following guidelines for proper spacing from the Vert-I-Pak exterior louvered grill. Friedrich recommends that ALL obstructions are a minimum of 72" from the exhaust.

For minor obstruction(s) such as lamp poles or small shrubbery, a clearance of 24" from the outdoor louver must be maintained.

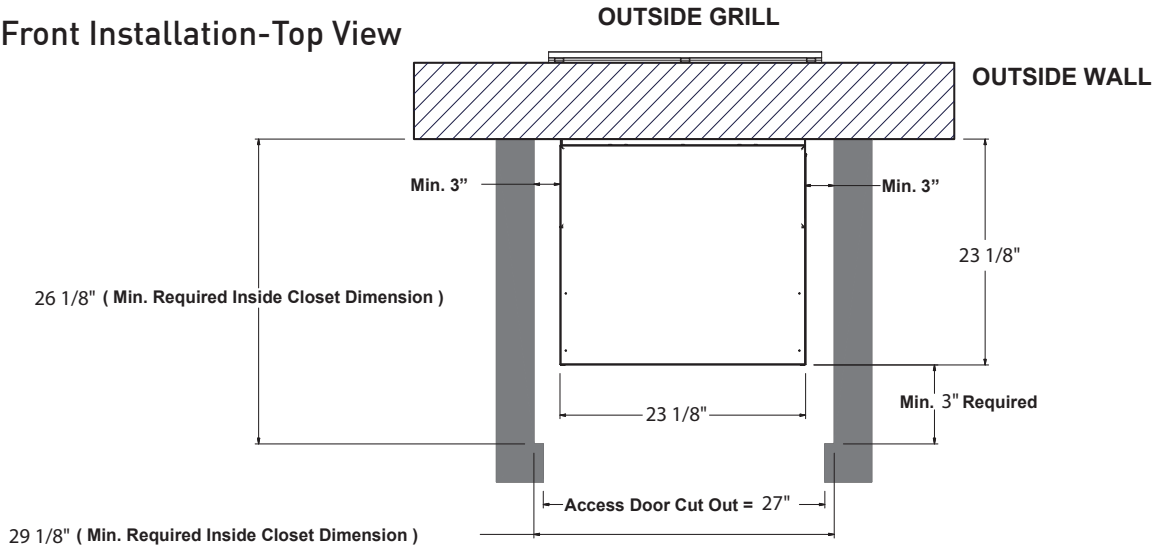
For major obstructions such as a solid fence, wall, or other heat rejecting devices like a condensing unit, a minimum distance of 72" must be kept.



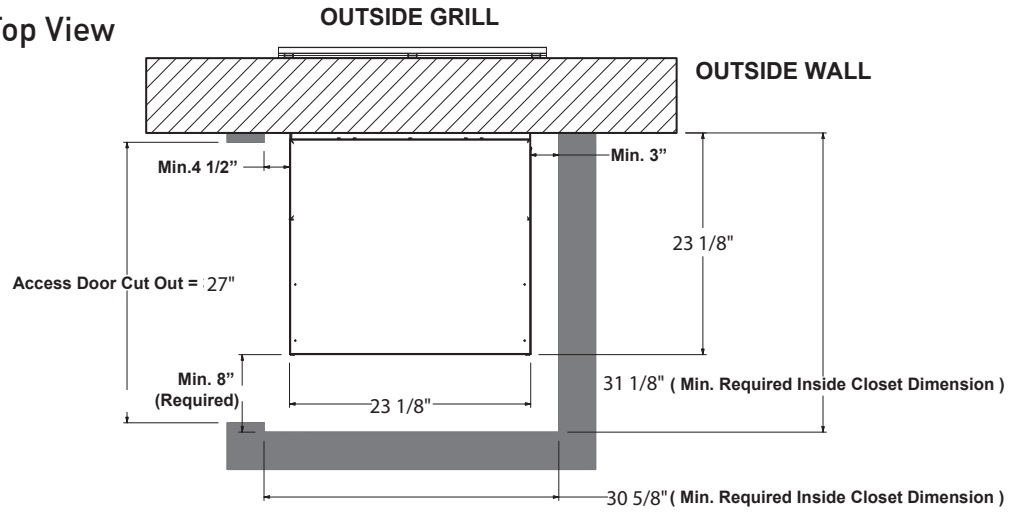
The the example pictured above is for reference only and does not represent all possible installations. Please contact Friedrich Air Conditioning for information regarding effects of other installation arrangements.

Closet Orientations & Dimensions

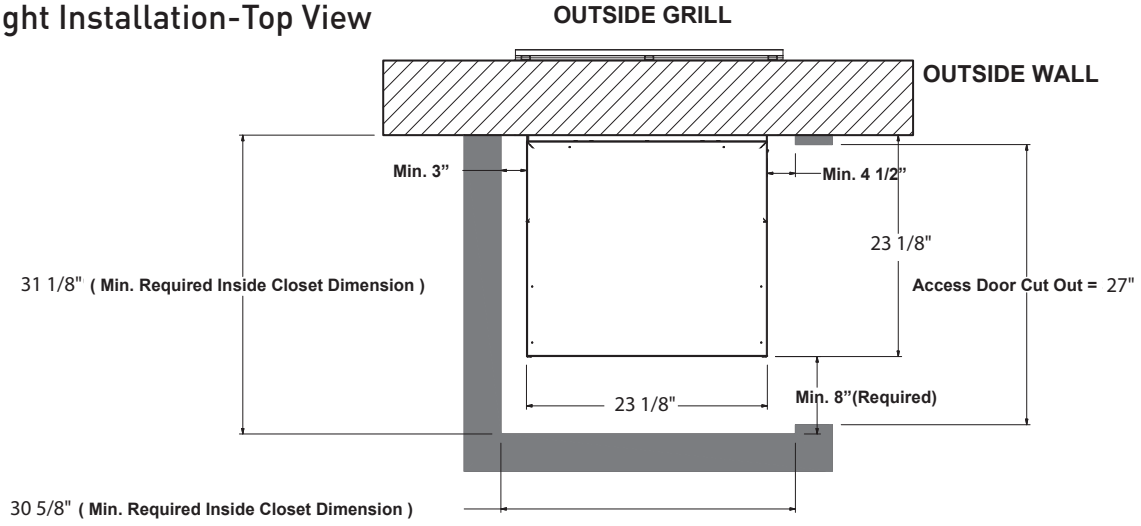
Front Installation-Top View



Left Installation-Top View

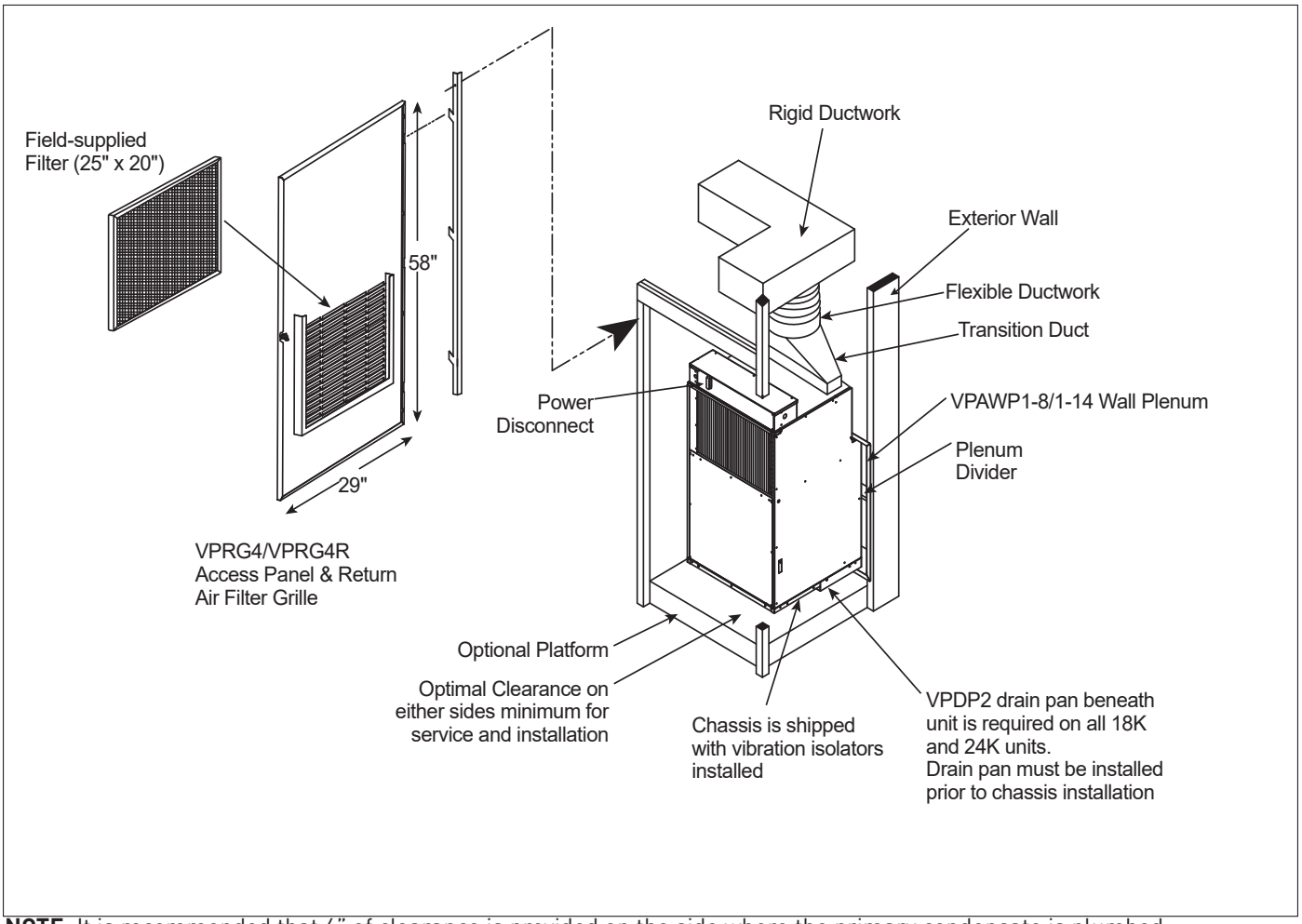


Right Installation-Top View



While all installation orientations are feasible, for the ease of installation and serviceability, Friedrich recommends Front Installation.

Closet View

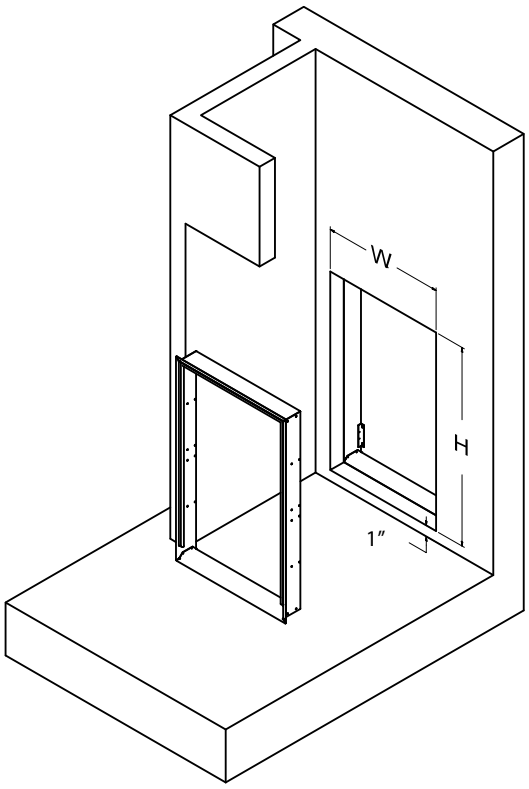


NOTE: It is recommended that 6" of clearance is provided on the side where the primary condensate is plumbed.

Wall Opening Dimensions

Exterior Wall Plenum Cut-Out

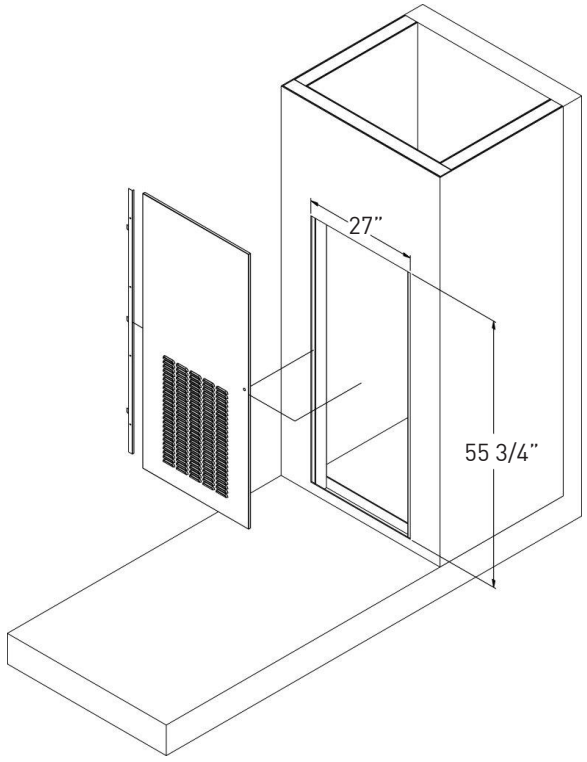
Dimensions (W x H):
24 5/8” x 30 7/8”



NOTE: The distance between the rough opening and the finished floor/platform must be 1”.

Return Air Access Door Wall Cut-Out

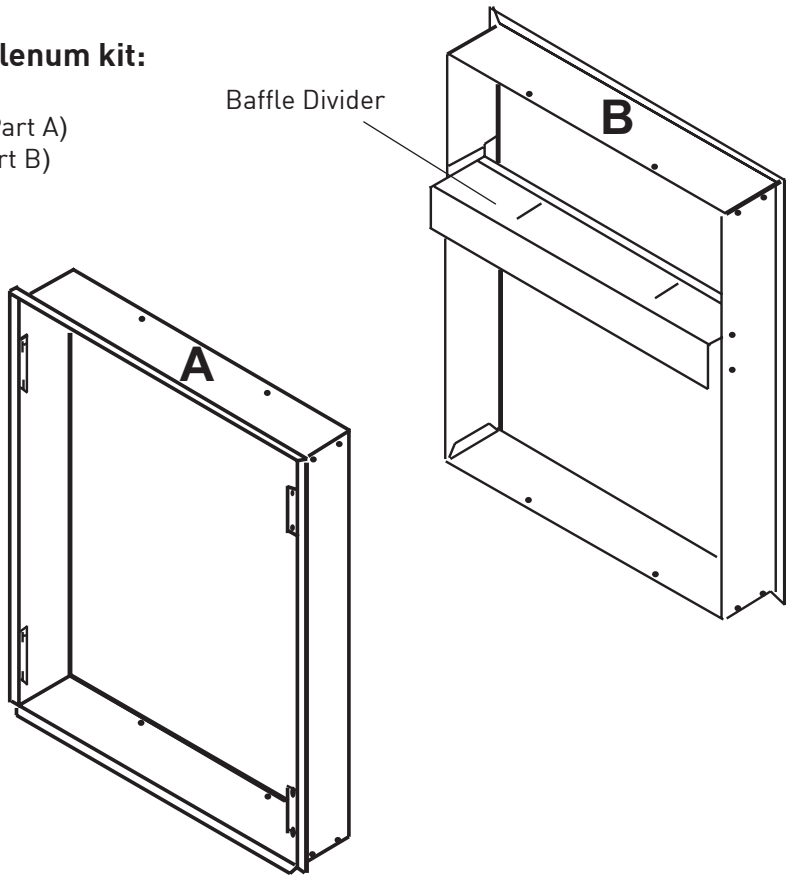
Dimensions (W x H):
27” x 55 3/4”



Wall Plenum Installation

Parts included in Plenum kit:

Outside Plenum Half (Part A)
Inside Plenum Half (Part B)



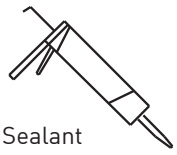
Field Supplied Parts:

Sealant, attachment screws, and flashing are field supplied. Silicone sealant is recommended.

VPAWP-8 adjust for walls up to 4”- 8” thick.

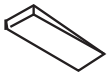
VPAWP-14 adjust for walls up to 8” - 14” thick

All installations are similar.



Sealant

Flashing

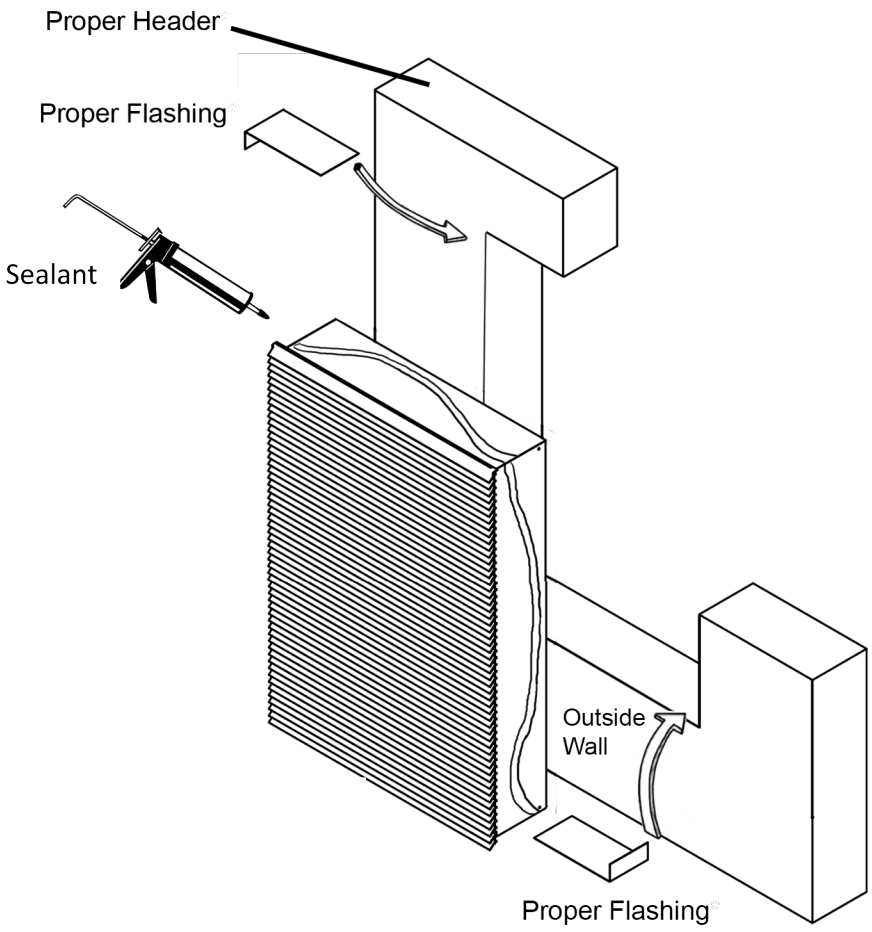


Shim

1”-3” screws to attach the plenum assembly to the wall studs

Wall Plenum Installation

Step 1 - Outside Wall Plenum Half

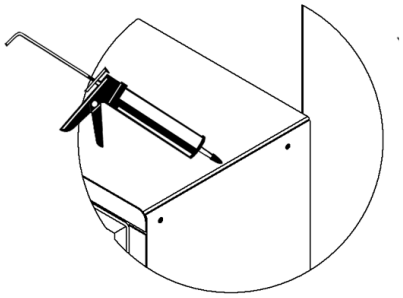


Note: The wall plenum is not designed to carry any structural load. A load bearing header must be built above the rough opening.

1. Prepare the rough opening. The rough opening should be lined with metal or wood. The plenum will warp if sealed against concrete or brick.
2. Dry fit the outside plenum half into the rough opening and check the fit and level.
3. Remove the outside plenum half, flash the rough opening to ensure proper fit and level.
4. Pre-installing the exterior louver (VPAL2) as shown above is optional (See Page 17).
5. Apply sealant to the outside plenum half and insert into the rough opening to ensure a water-tight seal. Ensure that the outside plenum half is securely attached to the framed opening.

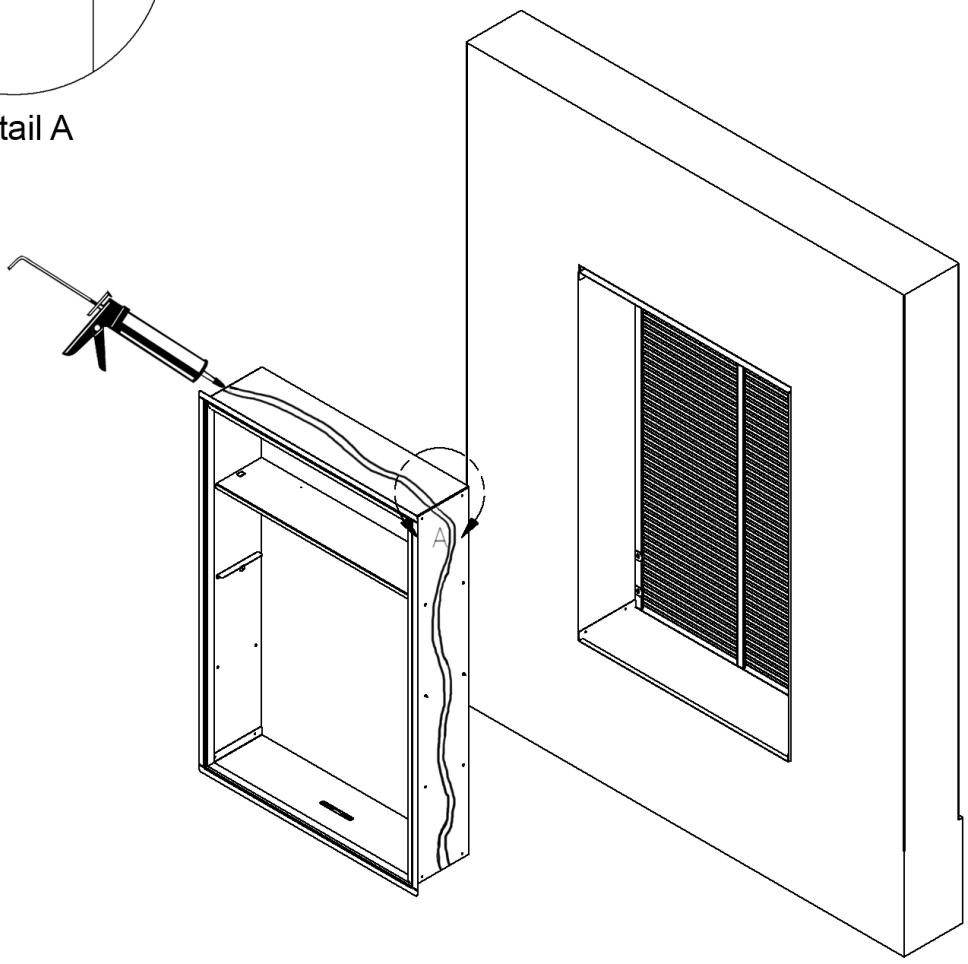
Wall Plenum Installation

Step 2 - Inside Wall Plenum Half



Apply Sealant to all
4 flange corners and
unused holes.

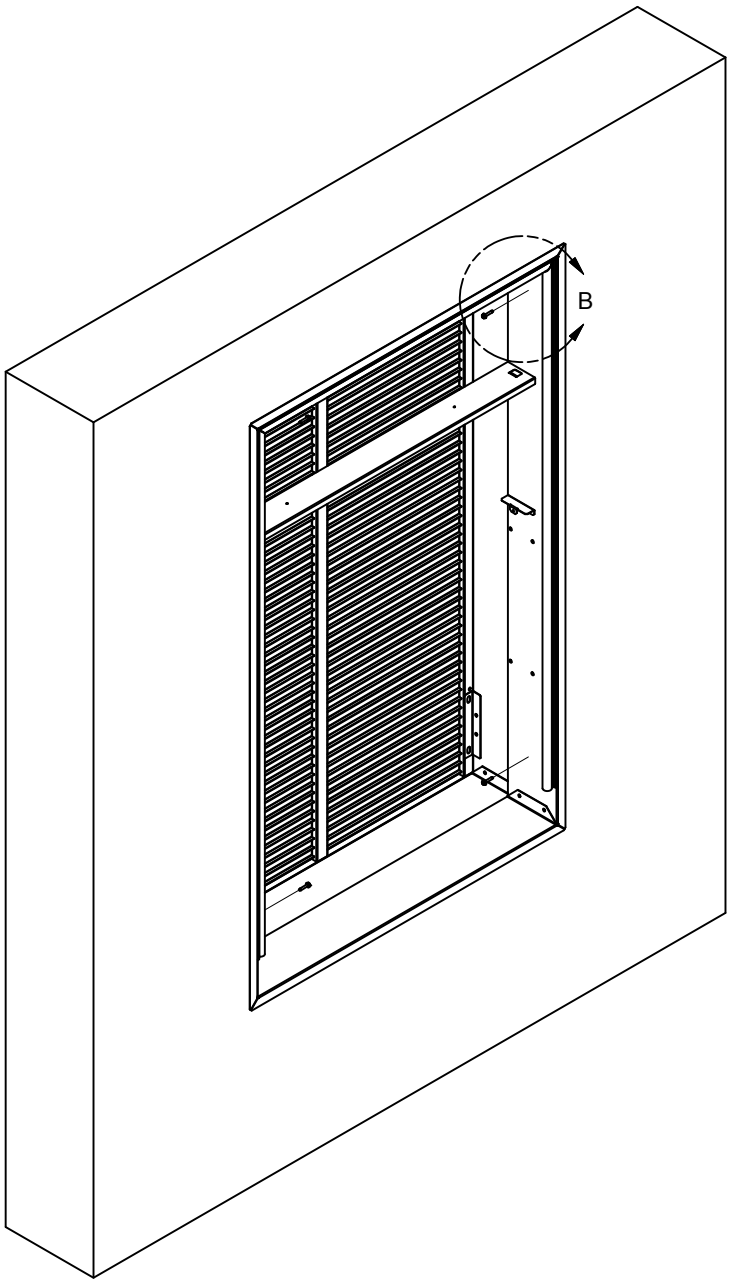
Detail A

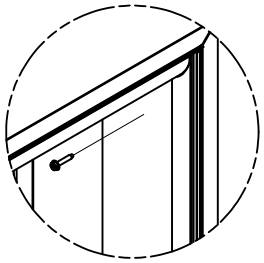


1. Apply sealant to all 4 flange corners and unused holes. See Detail A.
2. Flash the inside of the rough opening to ensure the proper fit and level.
3. Insert inside plenum half (Part B) into outside plenum half (Part A). Ensure that Part A does not back out of the rough opening.
4. Remove the inside plenum half.
5. Apply sealant to the inside plenum half and insert inside the outside plenum to ensure a water-tight seal.

Wall Plenum Installation

Step 3 - Inside Wall Plenum (cont.)





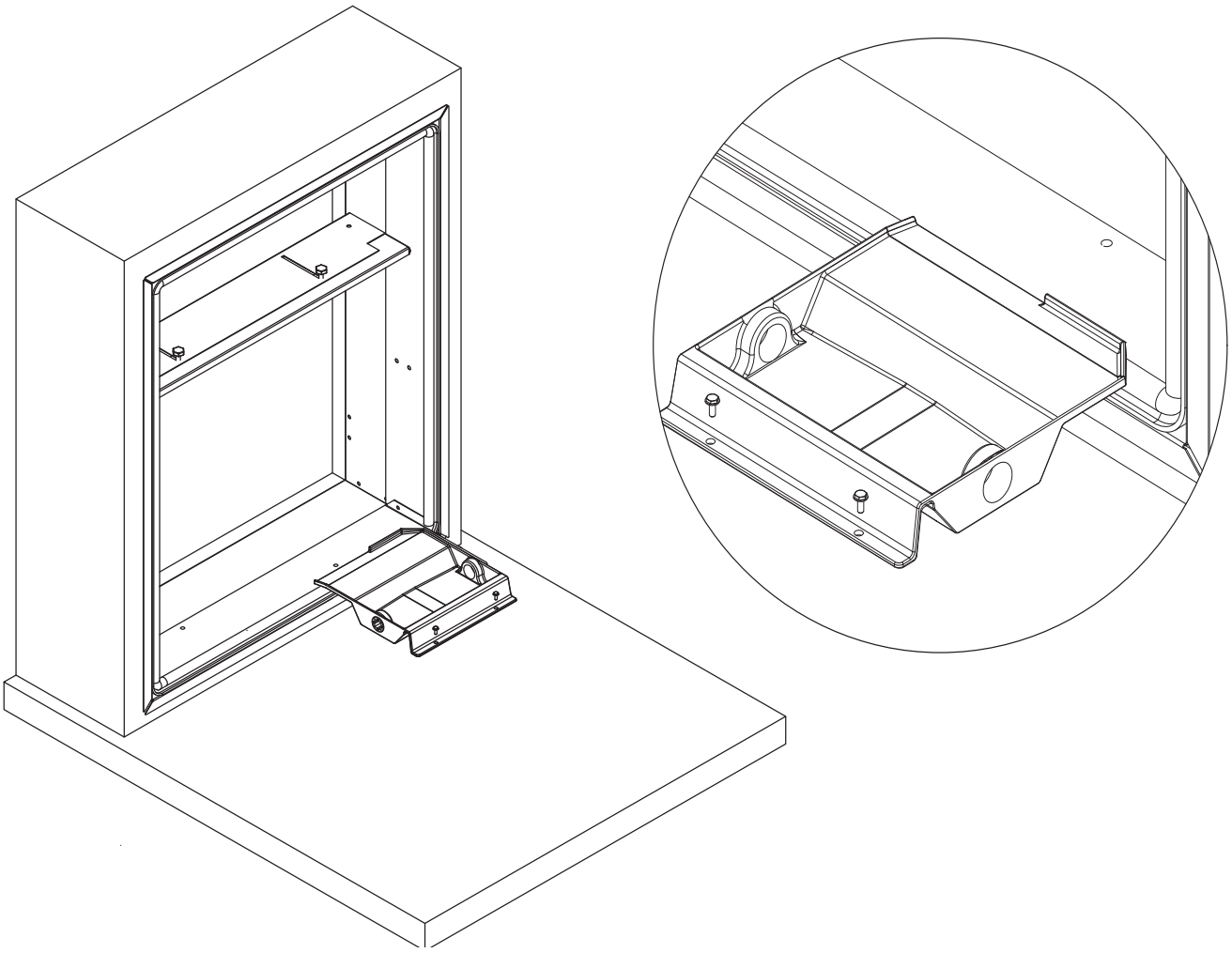
Detail B

NOTE: Do not place any screws, fasteners, or penetrating holes through the top or bottom of the plenum assembly.

1. Drill pilot holes on the interior of the inside plenum half (Part B) as show in Detail B. Pilot holes should be located approximately 4" from the top and bottom of the inside plenum half, on both the left and right sides.
2. Install fasteners through each pilot hole. Fastener must pass through both Part A and Part B. If the inside and outside plenum halves do not overlap at fastening point, be certain to drill extra holes where needed to secure both Part A and Part B to the rough opening.

Wall Plenum Installation

Step 3a - Inside Wall Plenum Half VHA18 & VHA24 Drain Kit Installation

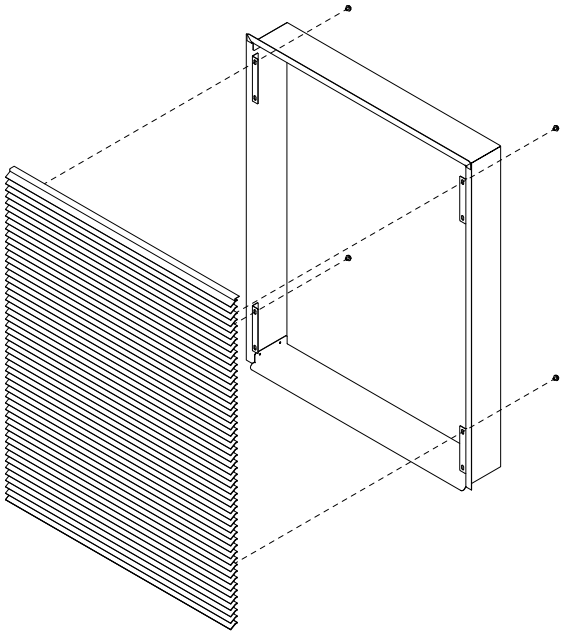


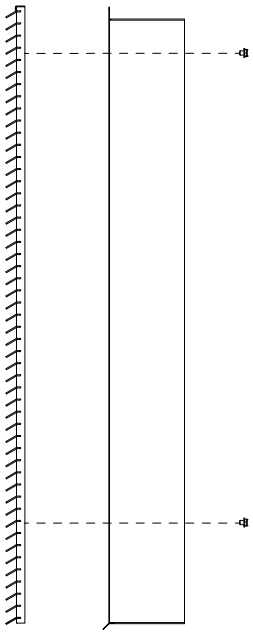
Note: The VHA18 and VHA24 models require installation of the large chassis drain kit (VPDP2). Please reference the VPDP2 installation manual for more detailed instructions.

1. Cut away gasket from the of the base of the inside wall plenum half the length of the drain kit beginning from the bottom right corner.
2. Place the VPDP2 where the gasket has been removed as shown above.
3. Ensure that the back lip of the VPDP2 is inserted no deeper than 1.5” into the exterior opening.
4. Secure the VPDP2 to the finished floor or platform.

Louver Installation

Installation of the louver PRIOR to wall plenum installation



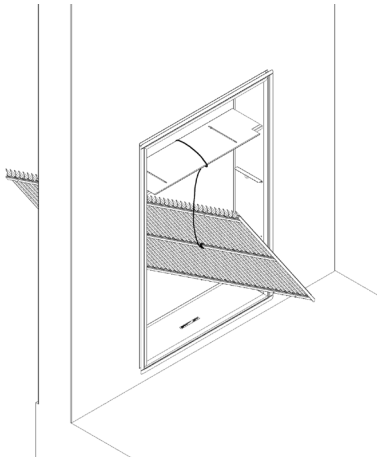


1. Hold the louver up to the outside plenum half (Part A) and line up the louver top with the very top edge of the ¾" flange.
2. Line up the wall plenum holes with the threaded holes in the louver and securely tighten fasteners.

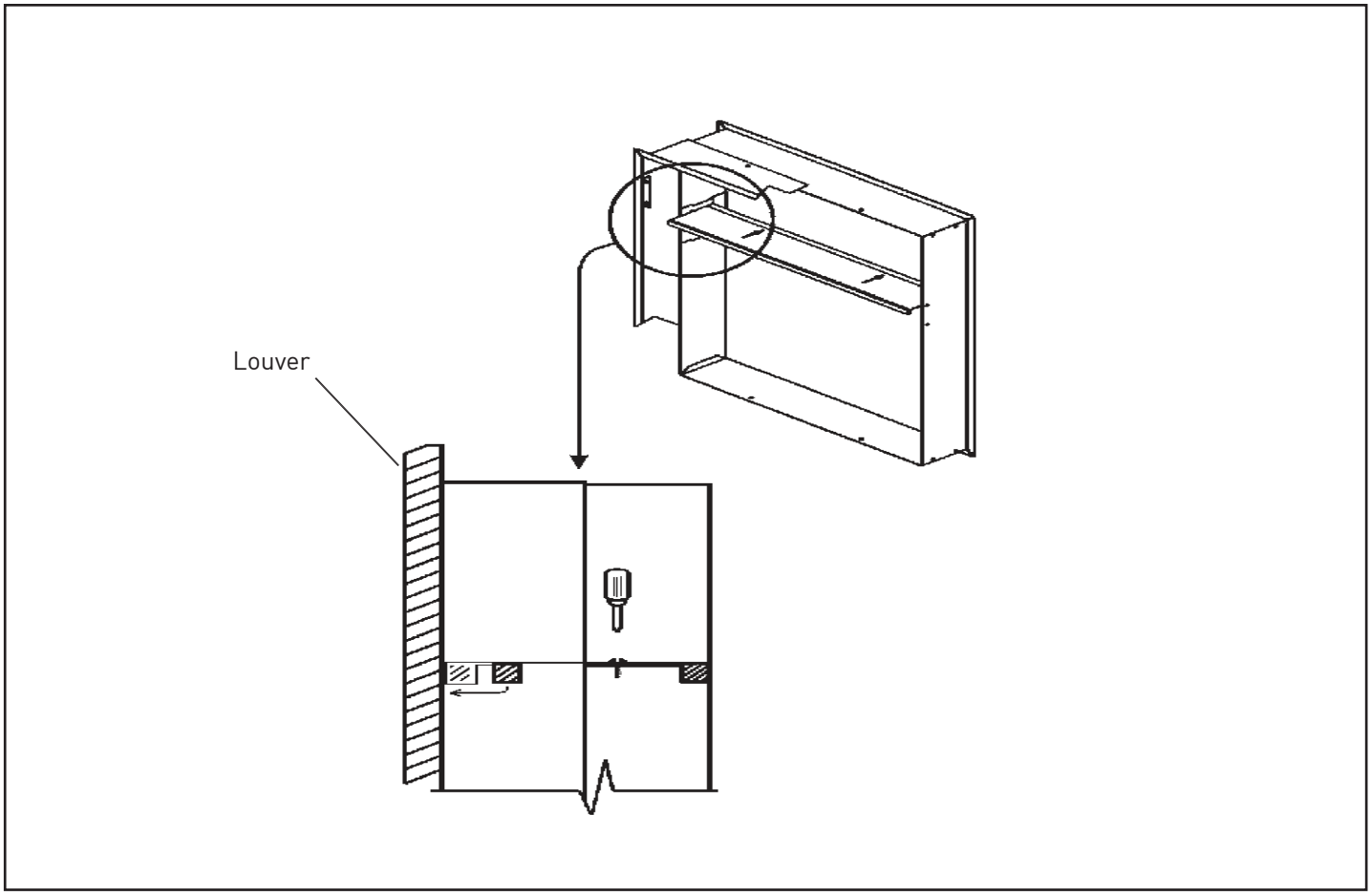
Installation of the louver AFTER the installation of wall plenum on elevated floors

From the interior of the utility closet:

1. Tie a rope or tether to the architectural louver and the divider in the wall plenum to prevent it from falling if dropped.
2. Turn the louver sideways and push the louver out below the divider in the wall plenum.
3. Pull the louver back against the wall plenum and align the holes.
4. Insert and tighten all eight provided fasteners. When the louver is secured, remove the safety tether.



Final Wall Plenum and Architectural Louver Installation



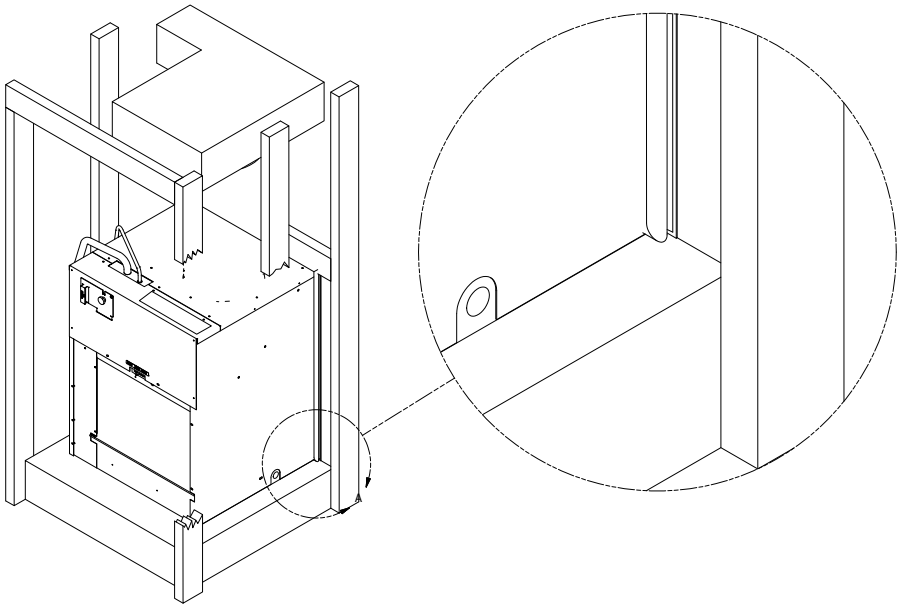
NOTE: Ensure that the weather strip is undamaged and provides a continuous seal around the inner perimeter of the plenum.

Apply silicone grease or other non-petroleum-based lubricants to the weather strip to enhance the sealing capability of the weather strip and ease installation of the air conditioner chassis.

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

NOTE: Let all flashing cure completely before installing the chassis.

Chassis Installation



1. Ensure that the wall plenum and louver are installed in accordance with the instructions listed on pages 13-18.
2. Place the chassis into the closet with the outdoor side facing the wall plenum opening.
3. Slide the chassis into the wall plenum until the plenum divider seal is established.

Note: 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.

⚠ CAUTION

Cut/Sever Hazard

Some edges may be sharp.

Use gloves or other hand protection when handling the unit.

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

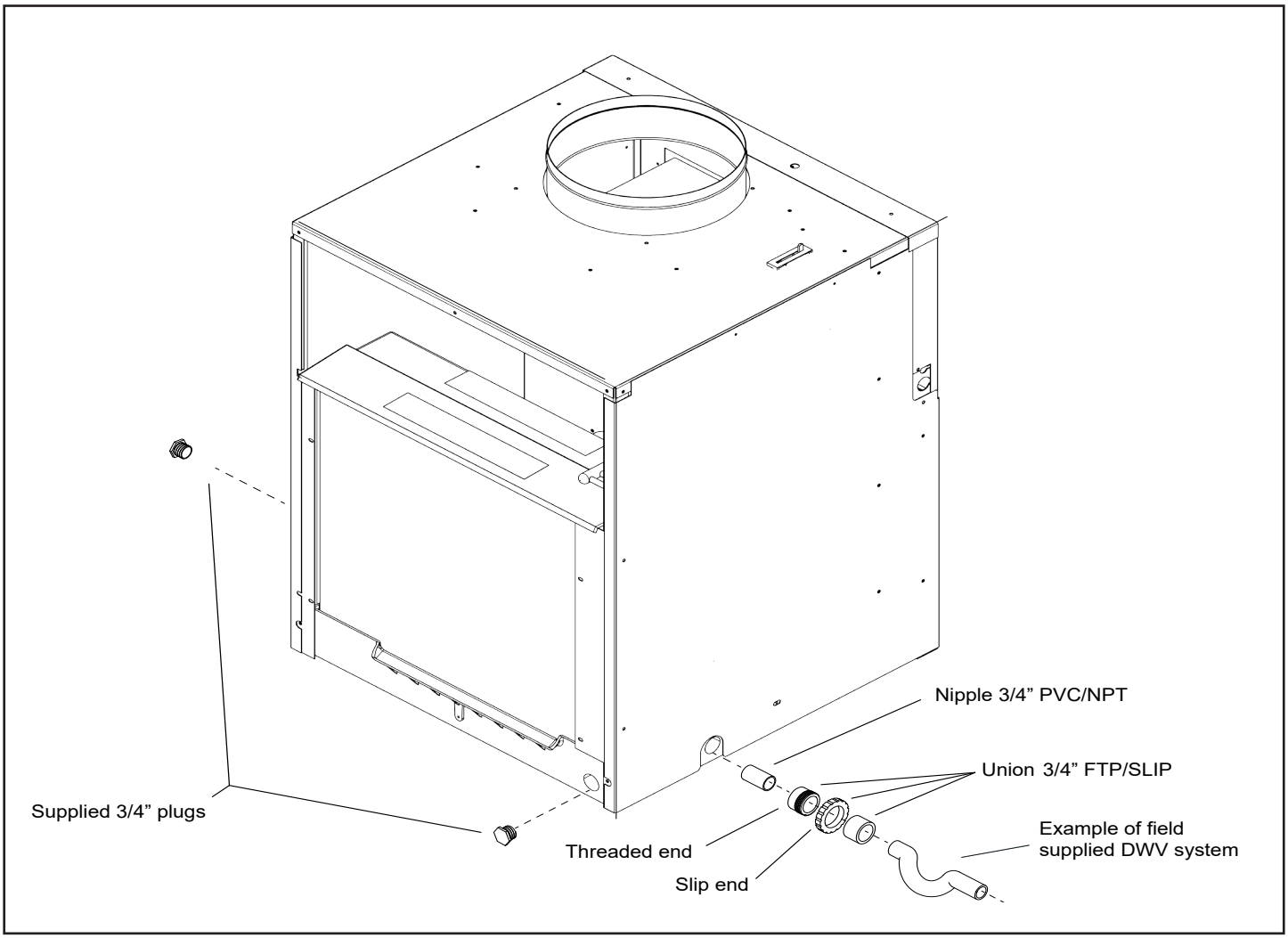
⚠ CAUTION

Excessive Weight Hazard

Use two or more people when installing your air conditioner.

Failure to do so can result in back or other injury.

Primary Drain Installation



Failure to follow the following procedures may result in serious property damage. A field supplied secondary condensate pan or P-trap may be required. Check with local codes. In case of drainage system blockage, the unit base will allow excess water to flow out of the unit through the plenum and the architectural louver. It is critical to ensure that the drainage path is not blocked or obstructed in any way during installation.

1. 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 fitting without connection to DWV system (drain, waste, vent) may result in staining of the outside wall.
2. Insert the provided 3/4" nipple into the determined connection using field-supplied Teflon tape or pipe joint compound.
3. With the slip end of a 3/4" union, connect to the nipple with Teflon tape or pipe joint compound.
4. **Hand-tighten all fittings to prevent damage to unit or fittings.**
5. Install a field-supplied drain system to the slip end of the union. A trap is recommended and drain connections should be connected to building DWV system. Pitch the drain line of a 1/4" downward slope for every foot (1') of lateral horizontal run to the DWV.
6. Plug the two unused connection ports with the two provided 3/4" pipe plugs with field-supplied Teflon tape or pipe joint compound. Hand tighten to prevent damage to the unit or fittings. Do not thread metal or copper pipe fittings directly into unit.
7. Check the system for leaks.

Indoor Return Air Grille and Ductwork Installation

Option 1

VPRG4/R Return Air Grille with Access Panel
A field-supplied (25" x 20") can be mounted inside the hinged access door. The door can be installed with the grille oriented at the top of the panel for improved sound attenuation.

Option 2

Field Supplied Return Air Grille
A field supplied return air grille divorced from the access panel must have a minimum 250 square inches of free area.

Note: All Vert-I-Pak units are shipped with a 20" x 14" x 1"(VHA09/VHA12/VHA18) or 20" x 18" x 1"(VHA24) fiberglass filter installed. If a different filter holder or location is to be used, the filter on the chassis MUST be removed.

Ductwork

The supply duct system should be designed using a recognized method such as the equal fraction or velocity reduction method, using the appropriate duct calculator(s) for the type(s) of duct being used in the system. The duct system should be designed for a maximum friction rate of 0.3" with the VHA09 & VHA12, and 0.4" with the VHA18 & VHA24 water column taking into consideration all fittings, registers and/or diffusers.

Note: Do not operate the unit without a supply duct attached. The return air to the Vert-I-Pak unit MUST NOT be ducted and all units must have a free return air configuration to perform properly.

Note: For retrofit jobs, additional clearance may be required for the field supplied 10" round to rectangule transition duct for VHA18.

Remote Thermostat Connection

Remote Thermostat

All Friedrich Vert-I-Pak units are configured to be controlled by using a dual 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. Select which side to run your thermostat wire.
4. Run the wires through the side hole in the box to reach the connection terminal wiring.
5. Make the connections, appropriately matching the wires as shown in the wiring diagram.
6. Reattach the control box cover.

Terminal Code	Wire Connection Function
C	Common Ground Terminal
G	Call for Fan*
B	Call for Heat Pump (Reversing Valve)
Y	Call for Compressor
W2	Emergency Heat
R	24VAC to Wall Thermostat

*Fan control as per page 12 of this IOM

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. Questions concerning proper connections to the unit should be directed to the factory.

Note: Any non-Friedrich thermostat or low voltage device being powered by the Vert-I-Pak will need to be reviewed and approved for use.

Note: For additional information, please review the latest Friedrich Vert-I-Pak Service Manual.

Final Installation Checklist

⚠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.

- 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.
- **ENSURE THAT THE SUPPLY VOLTAGE TO THE UNIT IS WITHIN THE OPERATING RANGE**
- Secure all access panels (i.e. front cover and/or control box), apply power to the unit.
  The unit commissioning should be done at this time to ensure unit function.

  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.

  NOTE: The unit is not designed to guarantee continuous operation with outdoor ambient conditions greater than 120F.

Unit Operation

Fresh Air Door

The fresh air door is an "intake" system. It is opened via a slide mechanism on the front of the chassis located just above the indoor coil. Move the slide left to open and right to close the door. The system is capable of delivering up to 60 CFM of outdoor air.

Low Ambient Compressor Cut Out

Each chassis is equipped with low ambient protection that is protected with a low pressure switch. The feedback will prevent the compressor from operating at low suction temperatures.

Heat Pump Operation

The unit is designed to operate heat pump as the primary source of heating without a cutoff temperture. The cutoff temperature can be set at the thermostat ,depeding on the type of thermostat used. The unit will operate as heat pump until the thermostat sends an emergency heat (W2) signal to the equipment.

Defrost Mode

When the outdoor coil accumulates enough frost, the unit will cycle through a defrost mode, during which the compressor and partial electric heat will operate concurrently so that the conditioned space is not compromised. Once the outdoor coil rises above 60F, the unit will resume its normal operation.

⚠ WARNING

This equipment is not intended for use during construction. The use of equipment during construction could result in premature failure of the components and/or system and is in violation of our standard warranty guidelines and may result in the suspension or termination of the warranty.

Service & Warranty

Servicing / Chassis Quick Change Outs

The chassis is designed for quick disconnect and change out. For minor electrical service, the control box cover lifts straight up after the screws and disconnect pull-out are removed. For major electrical,refrigeration, and fan service the chassis should be removed from the utility closet.

⚠WARNING

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

Routine Maintenance Performing Routine Maintenance

With proper maintenance and care, your system will operate economically and dependably. Maintenance can be accomplished easily by referring to the following directions. However, before performing any maintenance, see above stated WARNING.

⚠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.

Replace Air Filter

A dirty air filter reduces the efficiency of your Vert-I-Pak unit and allows lint and dirt to accumulate on the indoor coil. Lint and dirt on the indoor coil can damage your unit. The air filter should be replaced as it becomes dirty. To replace the chassis mounted return air filter:

1. Slide the holders away from the filter.
2. Remove the filter.
3. Install a new disposable filter.
4. The unit filter sizes are
20" x 14" x 1" or 20" x 18" x 1" (VHA24)

NOTE: DO NOT OPERATE YOUR SYSTEM WITHOUT A FILTER IN PLACE OR BLOCK THE FRONT OF THE UNIT RETURN AIR OPENING.

Inspect and Clean Indoor Air Coil

Eventually, minor amounts of lint and dirt may pass through the filter and collect on the indoor-air coil. These minor accumulations can be carefully vacuumed away with a brush attachment on a vacuum cleaner. Care must be taken to avoid bending the aluminum fins on the coil. Bent fins should be straightened using a special fin tool available from most HVAC supply depots.

Inspect Outdoor Air (OA) Intake and Exhaust

The unit's outdoor-air intake and outdoor-air exhaust paths must remain clear. Keep it free of all debris, snow, or ice. The OA intake should also be kept free of obstructions. Blocking the OA exhaust or OA intake opening will reduce the efficiency of your unit and could damage it.

Inspect and Clean Condensate Drain

The condensate drain must be routed to a suitable drainage area. Check the unit condensate drain periodically. Keep it free of anything that may block or impede the flow of condensate water. If there is any accumulation of foreign matter in the drain pipe, it should be removed and cleaned. The entire drain line must be protected from freezing.

Warranty

All warranty service work must be done by an authorized servicer. See Product Warranty, and consult your dealer or contractor for details.

To Remove the Chassis from the Closet:

1. Switch the unit off at the thermostat.
2. Disconnect the power coming into the unit from the main breaker panel or the closet mounted disconnect.
3. Disconnect the electrical connection.
4. Disconnect the duct work.
5. Slide the chassis out of the wall plenum.
6. Slide and slightly lift the chassis out of the utility closet.

VERT-I-PAK®
SINGLE PACKAGE HEAT PUMPS
LIMITED WARRANTY

SAVE THIS CERTIFICATE. It gives you specific rights. You may also have other rights which may vary from state to state and province to province.

In the event that your unit needs servicing, contact your nearest authorized service center. If you do not know the nearest service center, ask the company that installed your unit or contact use - see address and telephone number above. To obtain service and/or warranty parts replacement, you must notify an authorized FRIEDRICH Air Conditioning Co. service center, distributor, dealer, or contractor of any defect within the applicable warranty period.

When requesting service: please have the **model** and **serial number** from your unit readily available.

Unless specified otherwise herein, the following applies:
FRIEDRICH VERT-I-PAK HEAT PUMPS

LIMITED WARRANTY - FIRST YEAR (Twelve (12) months commencing on the date of installation or 120 days after original end-user purchase, whichever comes first). Any part found to be defective in the material or workmanship will be repaired or replaced free of charge by our authorized service center during the normal working hours; and

LIMITED WARRANTY - SECOND THROUGH FIFTH YEAR (Sixty (60) months commencing on the date of installation or 120 days after original end-user purchase, whichever comes first). ON THE SEALED REFRIGERATION SYSTEM. Any part of the sealed refrigeration system that is defective in material or workmanship will be repaired or replaced free of charge (excluding freight charges) by our authorized service center during normal working hours. The sealed refrigeration system consists of the compressor, metering device, evaporator, condenser, reversing valve, check valve, and the interconnecting tubing.

These warranties apply only while the unit remains at the original site and only to units installed inside the continental United States, Alaska, Hawaii, Puerto Rico, Mexico and Canada. The warranty applies only if the unit is installed and operated in accordance with the printed instructions and in compliance with applicable local installation and building codes and good trade practices. For international warranty information, contact the Friedrich Air Conditioning Company - International Division.

Any defective part to be replaced must be made available to **FRIEDRICH** in exchange for the replacement part. Reasonable proof must be presented to establish the date of install, otherwise the beginning date of this certificate will be considered to be our shipment date plus sixty days. Replacement parts can be new or re-manufactured. Replacement parts and labor are only warranted for any unused portion of the unit's warranty.

We will not be responsible for and the user will pay for:

1. Service calls to:
   A) Instruct on unit operation. B) Replace house fuses or correct house wiring. C) Clean or replace air filters. D) Remove the unit from its installed location when not accessible for service required. E) Correct improper installations.

2. Parts or labor provided by anyone other than an authorized service center.

3. Damage caused by:
   A) Accident, abuse, negligence, misuse, riot, fire flood or acts of God. B) Operating the unit where there is a corrosive atmosphere containing chlorine, fluorine, or any damaging chemicals (other than in a normal residential environment). C) Unauthorized alteration or repair of the unit, which in turn affects its stability or performance. D) Failing to provide proper maintenance and service. E) Using and incorrect power source. F) Faulty installation or application of the unit. G) Operation of the unit during construction.

We shall not be liable for any incidental, consequential, or special damages or expenses in connection with any use or failure of this unit. We have not made and do not make any representation or warranty of fitness for a particular use or purpose and there is no implied condition of fitness for a particular use or purpose. We make no expressed warranties except as stated in this certification No one is authorized to change this certificate or to create for us any other obligation or liability in connection with this unit. Any implied warranties shall last for one year after the original purchase date. Some states and provinces do not allow limitations on how long an implied warranty or condition lasts, so the above limitation or exclusions may not apply to you. The provisions of this warranty are in addition to and not a modification of or subtraction from the statutory warranties and other rights and remedies provided by law.

Performance of Friedrich's Warranty obligation is limited to one of the following methods:

1. Repair of the unit
2. A refund to the customer for the prorated value of the unit based upon the remaining warranty period of the unit.
3. Providing a replacement unit of equal value

The method of fulfillment of the warranty obligation is at the sole discretion of Friedrich Air Conditioning.

In case of any questions regarding the provisions of this warranty, the English version will govern.