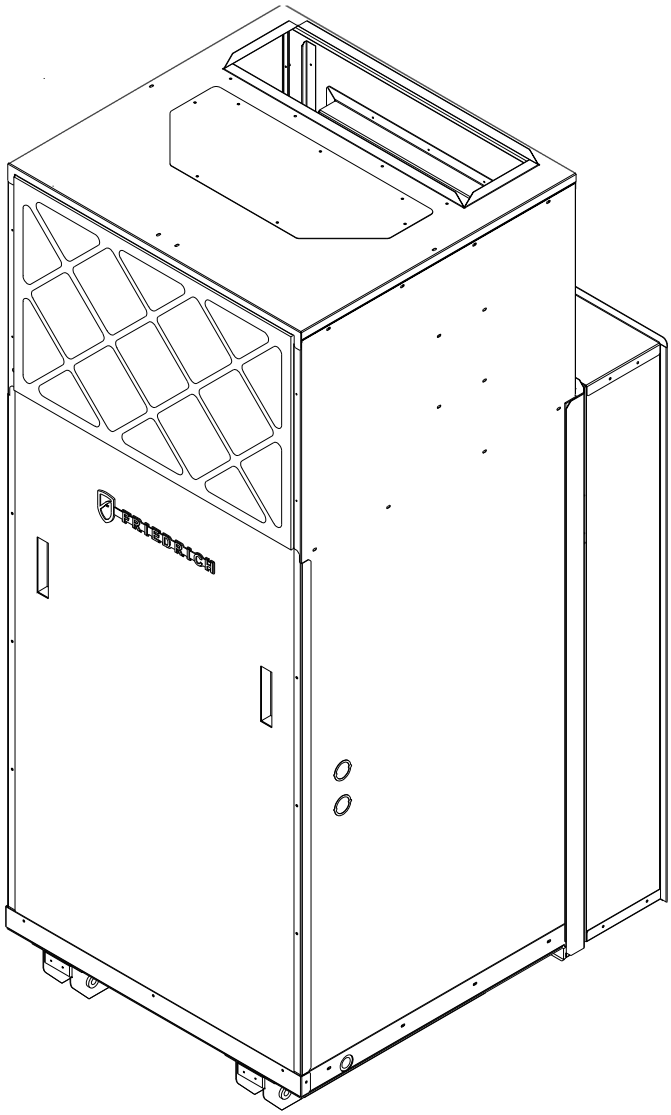
Installation & Operation Manual

FRIEDRICH

# VRP® Variable Refrigerant Packaged Heat Pump

*Innovative | Intelligent | Inverter*




## VRP36K

For Commercial and Residential Applications

One or more of the following patents may apply:

10408504
10436457
10488083
10731899

Additional patents pending

PRECISION INVERTER™ FreshAire™ Intertek AHRI CERTIFIED™ www.ahridirectory.org Unitary Small HP AHRI Standard 210/240 Certification applies only when the complete system is listed with AHRI

# Table of Contents

### ⚠ WARNING

Disconnection from supply voltage for all poles must be incorporated into the fixed wiring. It is the installer's responsibility to thoroughly read the manual and to properly install the equipment in conformance with NFPA 70-2008 National Electric Code or current edition, International Mechanic code 2009 or current edition and any other applicable local and 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 capabil-lities, 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 Lo-cal/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

# Important Safety and General Information

R32 A2L

**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

## 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

**FOR INSTALLATION ONLY IN LOCATIONS NOT ACCESSIBLE TO THE GENERAL PUBLIC**

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.

# 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-calibra tion. (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.

# General Specifications

## Nomenclature

| V | R | P | 3 | 6 | K | 0 | 0 | S | S | C | S | C | -A00 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Series

VRP Heat Pump

Nominal Capacity (Btu /Hr.)

36 = 20,000 - 36,000

Voltage

K = 230/208 V

Heater watts

10 = 10.0 kW

15 = 15.0 KW

Outdoor Air/ Ventilation** S = Standard unit. No FreshAire™

F = Single OA Fan Powered FreshAire System 80 CFM

D = Single OA Fan Powered FreshAire System 130 CFM

S= Standard

R = Reheat

Plenum and louver configuration

C= Only for 36000 Btu units

S = Standard

L = Low Ambient Heat

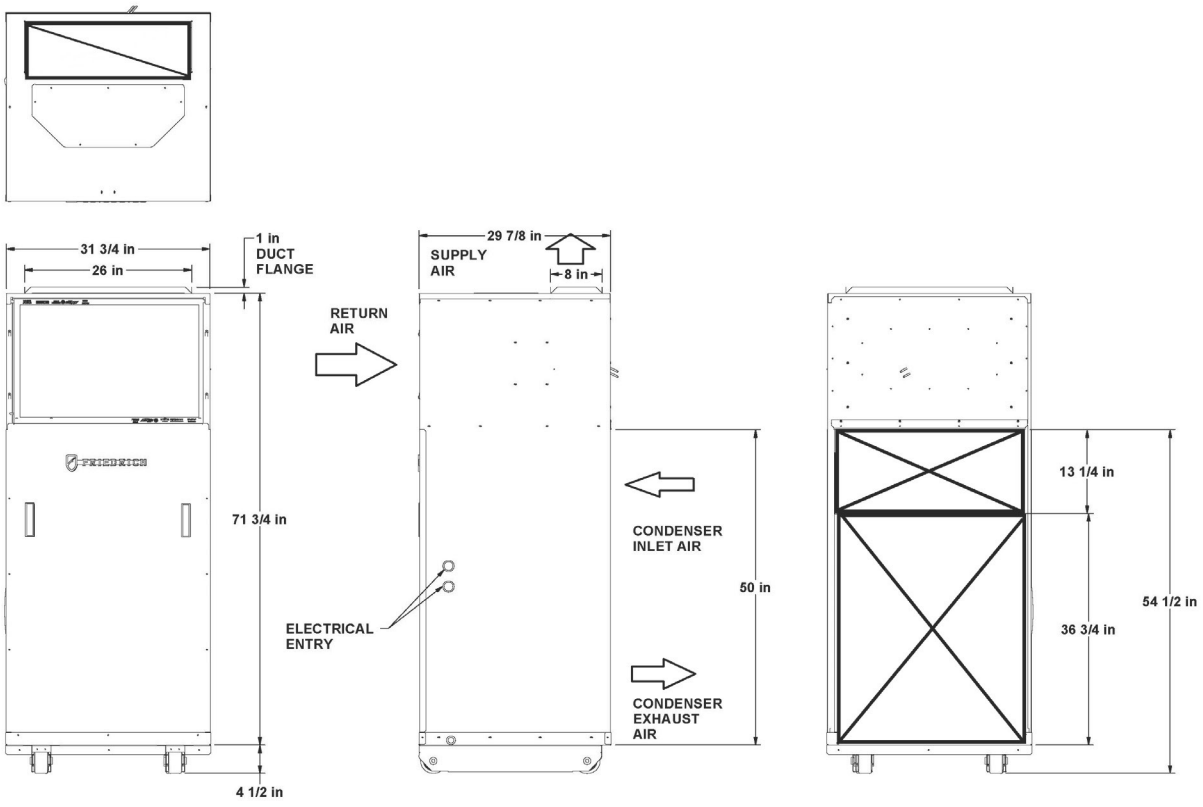
Marketing Revision

Engineering Revision

| Model | VRP36K |
|---|---|
| **Cooling Performance Data (Cooling Standards: 95°F DB/75°F WB outdoor, 80°F DB/67°F WB indoor)** | |
| Voltage | 230/208 |
| Cooling Btu (Rated) | 35,500 |
| Cooling Btu (Min. - Max) | 12,000 - 35,500 |
| Outdoor Operating Range (°F ) | 55 - 115 |
| Power (W) | 3,380 |
| SEER2 | 17.0 |
| EER2 | 10.5 |
| Sensible Heat Ratio | 0.72 |
| Cooling Amps | 14.8 |
| **Heat Pump Performance Data** | |
| Voltage | 230/208 |
| Heating Btu ( Rated @ 47° F ) | 33,000 |
| Heating Btu ( @ 17° F ) | 21,000 |
| Heating Btu (Min. - Max.) | 9,000 - 33,000 |
| Heat Pump Outdoor Operating Range (°F )* | 0 - 70 |
| COP (Rated @ 47 DegF) | 3.3 |
| HSPF2 | 7.80 |
| Heating Power (W) | 2,920 |
| Heating Amps | 12.8 |

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

# Dimensions




| Model | VRP36K |
|---|---|
| Dimensions (W x D x H) | 31 3/4" x 29 7/8" x 77 1/4" |
| Shipping Dimensions (W x D x H) | 34" x 35" x 81" |
| Net Weight (lbs.) | 342 |
| Shipping Weight (lbs.) | 369 |
| R32 Charge (oz.) | 60 |

# Electrical Data

| VRP Model | Voltage | Electric Heater Watts | Electric Heating Btu/Hr | Electric Heater Amps | MCA | MOP / MOCP |
|---|---|---|---|---|---|---|
| VRP36K10 | 230 | 8820 | 30090 | 39.4 | 49.9 | 50 |
| | 208 | 7210 | 24600 | 35.9 | | |
| VRP36K15 | 230 | 8820/4410 | 45120 | 39.4/19.2 | 49.9/24.0 | 50 / 25 |
| | 208 | 7210/3610 | 36900 | 35.9/17.4 | | |

MCA = Minimum Circuit Ampacity

MOP / MOCP - Maximum Over-current Protection / Breaker Size

Minimum Circuit Amps (MCA) and MOCP values in the above table are calculated in accordance with The NEC Article 440

**NOTE:** 15 kW electric heat models require dual service (50A + 25A)

| 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. |

## Electrical Rating Table

NOTE: Use copper conductors **ONLY.** Wire sizes are per NEC.

| Recommended Branch Circuit Sizes* | |
|---|---|
| Nameplate Maximum Circuit Breaker Size | AWG Wiring Size** |
| 25A | 10 |
| 30A | 10 |
| 50A | 6 |

AWG - American Wire Gauge

* Single circuit from main box.

** Based on 100' or less of copper, single insulated conductor at 60℃

**Note to Specifying Engineers:** please ensure that your electric heat kit selection is sufficient for your area/application and takes into account the utilization voltage. Please refer to the electrical data section above for electric heat capacities versus utilization voltage. Friedrich recommends ASHRAE 99.6 when sizing electrical heaters. VRP does not have simultaneous heat pump/heater kit operation. During single digit temperatures, heat pump operation will likely not satisfy the heating demand unless the specifying engineer has designed the BTU output for heat. At times when the load is within 5% of the calculated output, it is recommended that the heater kit be upsized.

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

# Air Flow Data

## Indoor CFM & External Static Pressure

| Air Flow Data | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | Speed Select | Airflow Setting | Static Pressure (in. WC) | | | | | | | | | |
| | | | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 | 0.50 |
| VRP36K* | 1 | High | 1140 | 1100 | 1060 | 1000 | 950 | 890 | 820 | 750 | 670 | | |
| | | Low | 1040 | 980 | 920 | 850 | 780 | 710 | 630 | | | | |
| | 2 | High | 1190 | 1150 | 1110 | 1070 | 1020 | 960 | 900 | 830 | 760 | 680 | |
| | | Low | 1040 | 980 | 920 | 850 | 780 | 710 | 630 | | | | |
| | 3 | High | 1300 | 1260 | 1220 | 1180 | 1130 | 1080 | 1020 | 960 | 900 | 830 | 760 |
| | | Low | 1040 | 980 | 920 | 850 | 780 | 710 | 630 | | | | |
| | 4 | High | 1400 | 1360 | 1320 | 1270 | 1220 | 1170 | 1120 | 1060 | 1010 | 950 | 890 |
| | | Low | 1040 | 980 | 920 | 850 | 780 | 710 | 630 | | | | |
| | 5 | High | 1470 | 1440 | 1400 | 1360 | 1310 | 1270 | 1220 | 1170 | 1120 | 1060 | 1000 |
| | | Low | 1040 | 980 | 920 | 850 | 780 | 710 | 630 | | | | |

## VRP Configurator

All units are shipped with Speed Select 1 High as the default airflow. In higher static applications, it is necessary to increase the airflow to a higher Speed Select setting. Using the VRP Configurator tool and associated instructions, the speed settings can be changed on units with a firmware 3.7.0.0 or later.

## Condenser CFM & External Static Pressure

VRP is designed to install through an exterior wall with a plenum (VRPXWP*-8, VRPXWP*-14) and a Friedrich external louver .

| Condenser External Static Pressure | | | |
|---|---|---|---|
| VRP Model | Design | | Maximum |
| | CFM | ESP ("WC) | ESP ("WC) |
| VRP36K | 2030 | 0.03 | 0.20 |

**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.**

# VRP® Required Minimum Clearances

### Building Exterior Unit Opening Requirements

VRP 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).

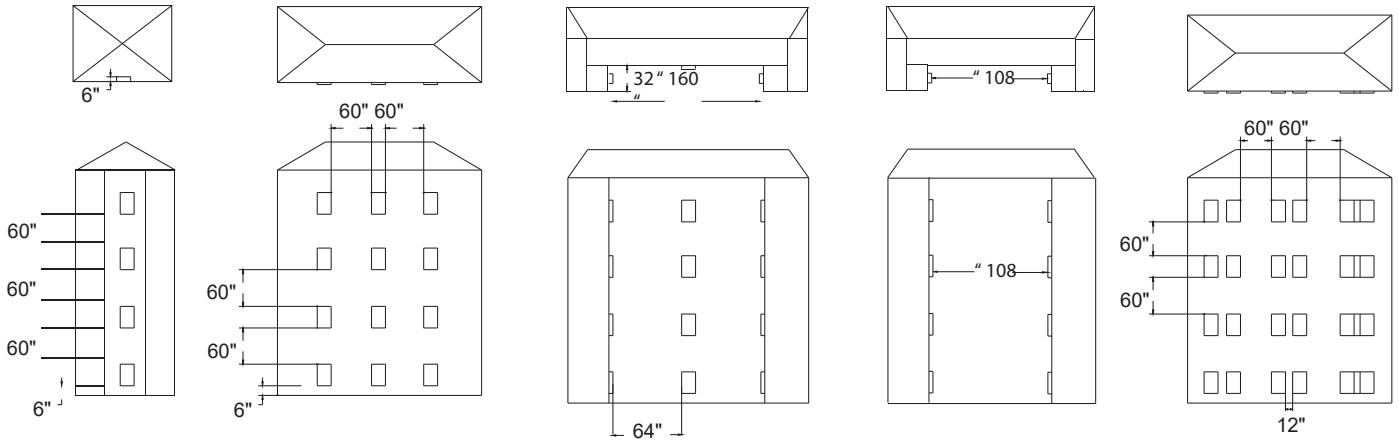


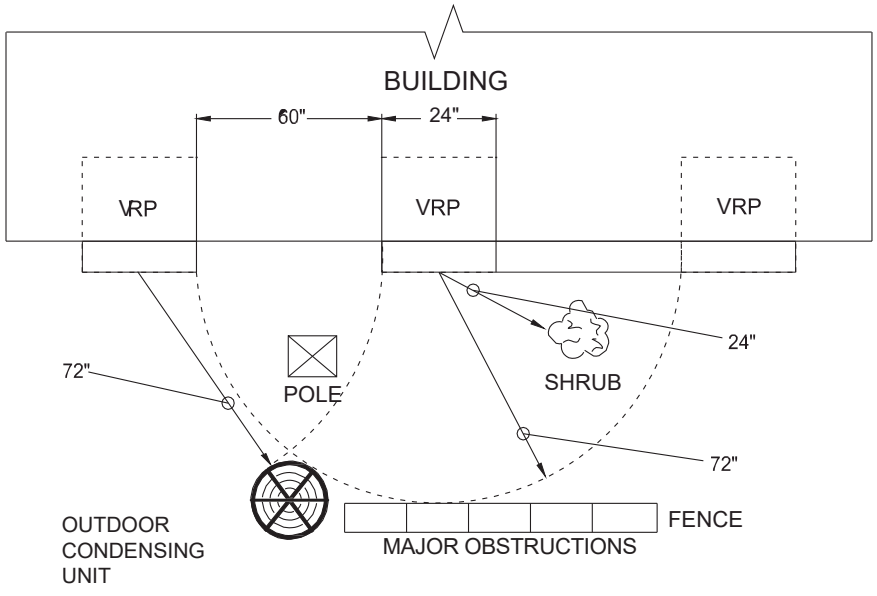

Figure A Figure B Figure C Figure D Figure E

### Grill Clearance Requirements

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

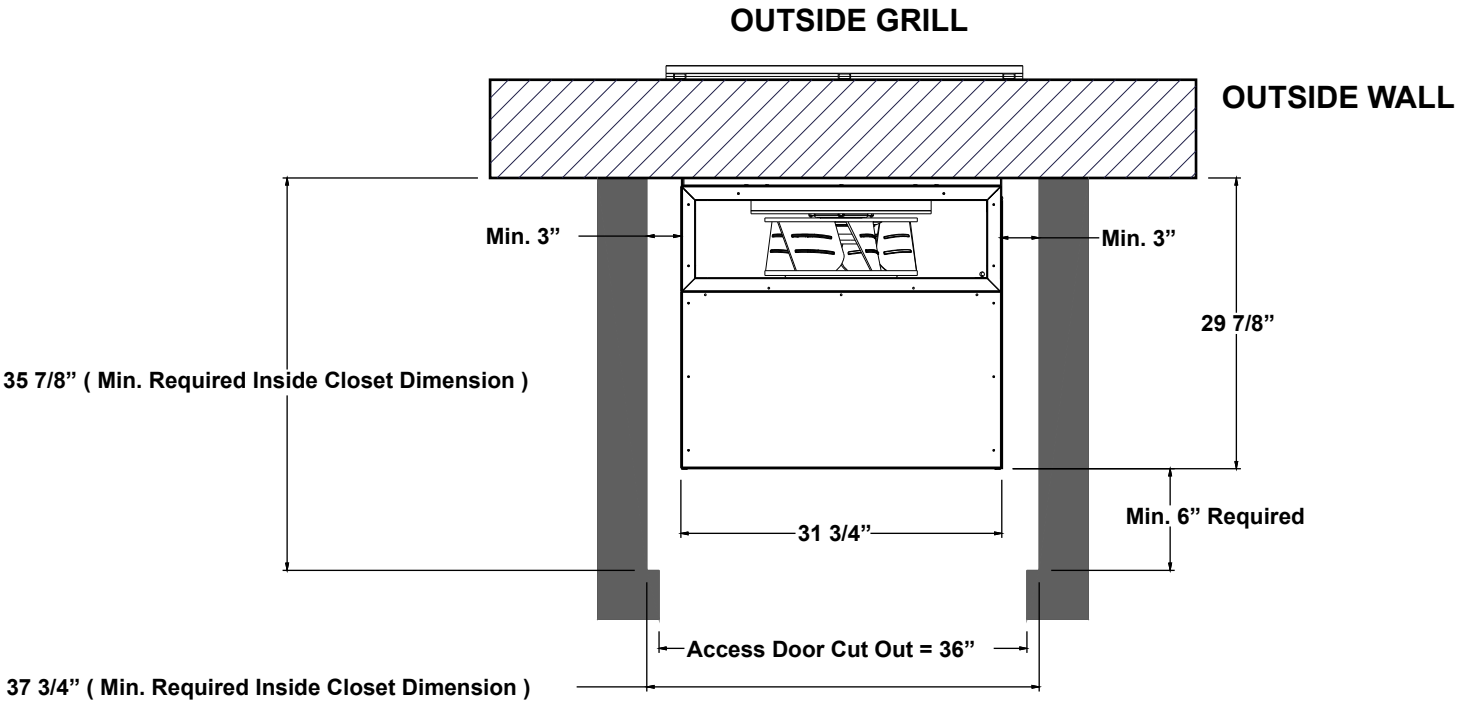
For minor obstruction(s) such as lamp poles or small shrubbery, a clearance of 24" from the outdoor louver must be maintained.

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.

# Installation Orientation

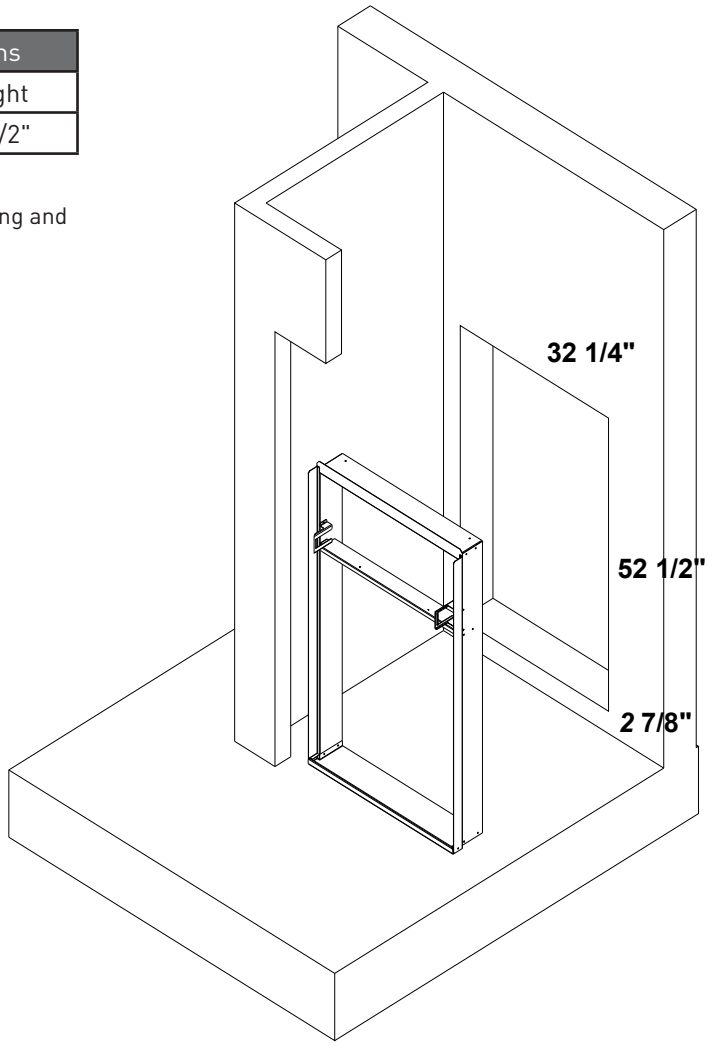



**NOTE:** The VRP 3-ton unit comes equipped with bi-directional casters for ease of movement. The casters only allow for movement forward and backward. The VRP 3-ton should be installed with the access door positioned in front of the unit.

# Exterior Wall Opening Dimensions

| Exterior Wall Rough Opening Dimensions | | |
|---|---|---|
| Unit | Width | Height |
| VRPXWPC-* | 32 1/4” | 52 1/2" |

NOTE: The distance between the rough opening and the finished floor/platform must be 2 7/8”.

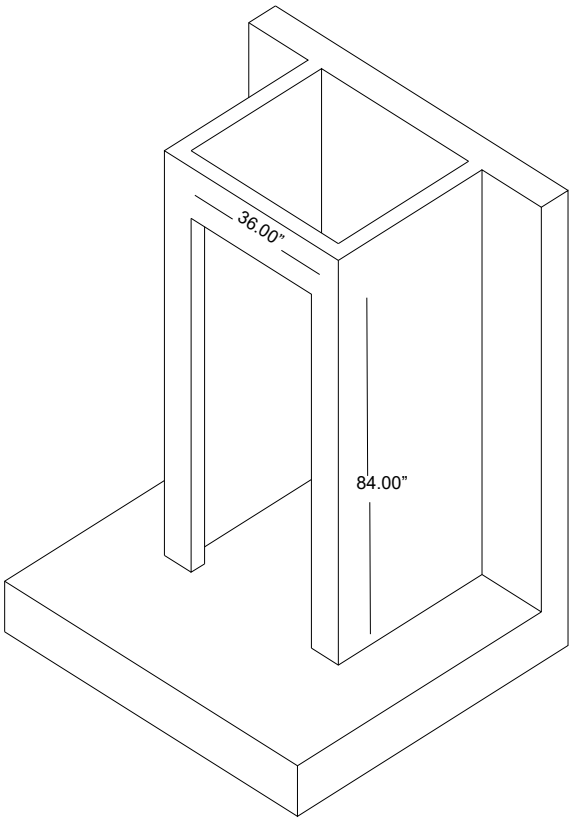


# Interior (Closet) Wall Opening Dimensions

### Return Air Access Door Wall Cut-Out

| Interior Wall Rough Opening Dimensions | | |
|---|---|---|
| Unit | Width | Height |
| VRP36 | 36" | 84" |

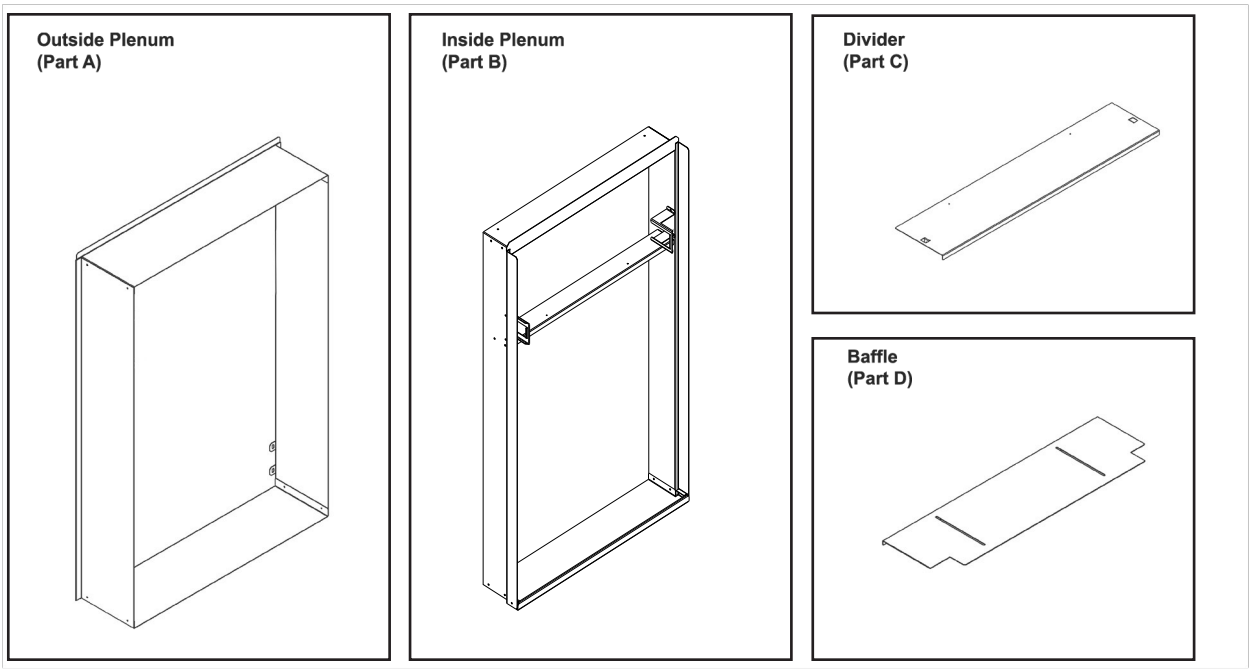
**NOTE**: Dimensions based on standard 36" door frame.



# Wall Plenum Installation

### Parts included in Plenum kit:

Outside Plenum (Part A)
Inside Plenum (Part B)
Divider (Part C)
Baffle (Part D)



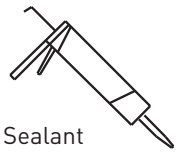

**Field Supplied Parts:**

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

VRPXWPC-8 adjusts for walls 4”- 8” thick.

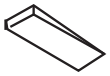
VRPXWPC-14 adjusts for walls 8” - 14” thick

All installations are similar.



Sealant

Flashing

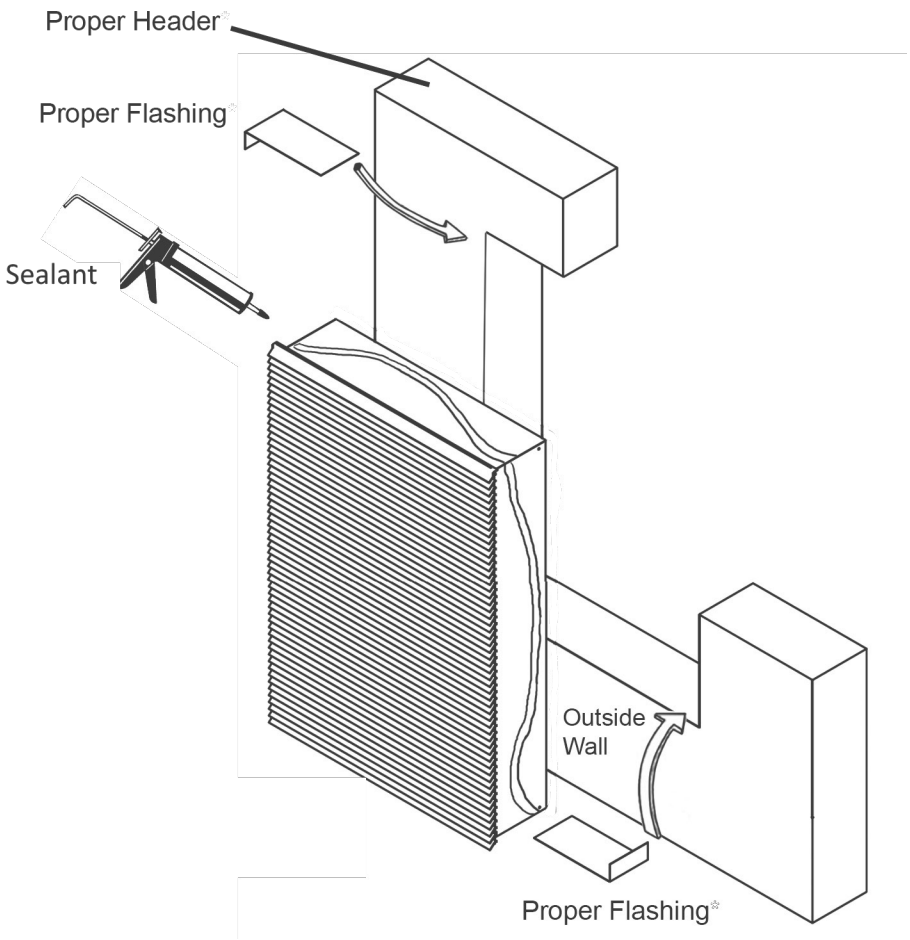


Shim

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

# Wall Plenum Installation

### Step 1 - Outside Wall Plenum Half

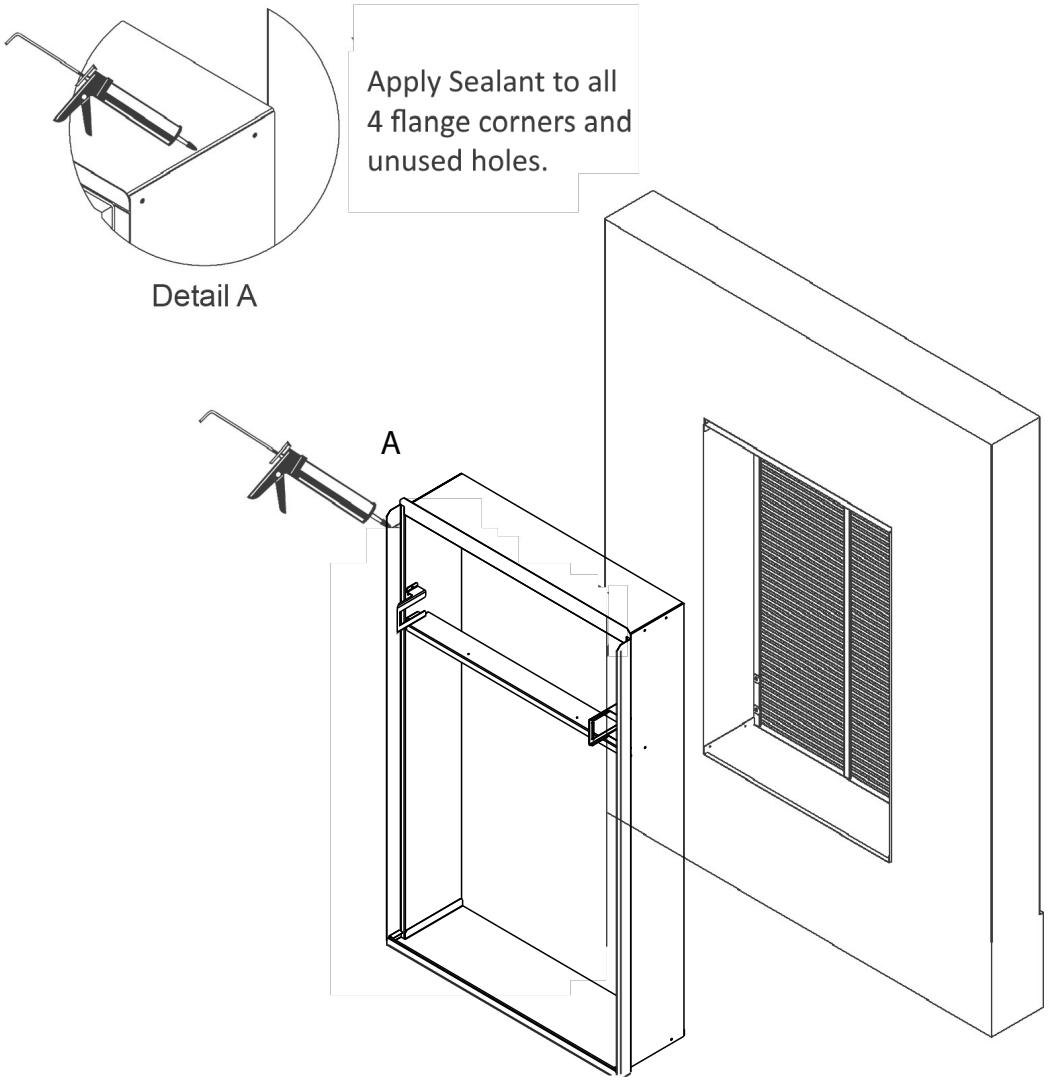



**Note: The wall plenum is not designed to carry any structural load. A load bearing header must be built above the rough opening.**

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 as shown above is optional (See Page 20).
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

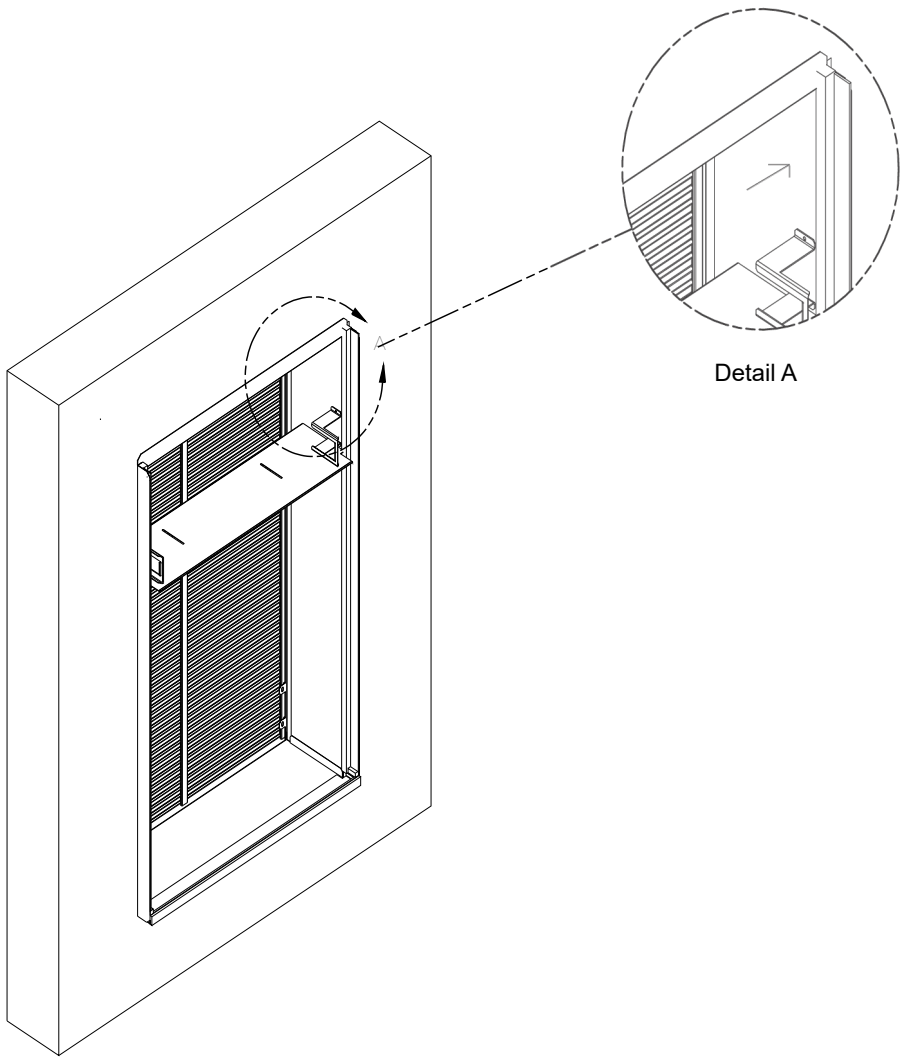



1) Apply sealant to all 4 flange corners and unused holes. See Detail A.
2) Flash the inside of the rough opening to ensure the proper fit and level.
3) Insert inside plenum half (Part B) into Outside Plenum Half (Part A). Ensure that Part A does not back out of the rough opening.
4) Remove the inside plenum half.

5) Apply sealant to the inside plenum half and insert into the rough opening to ensure a water-tight seal.

# Wall Plenum Installation

**Step 3 - Inside Wall Plenum (cont.)**

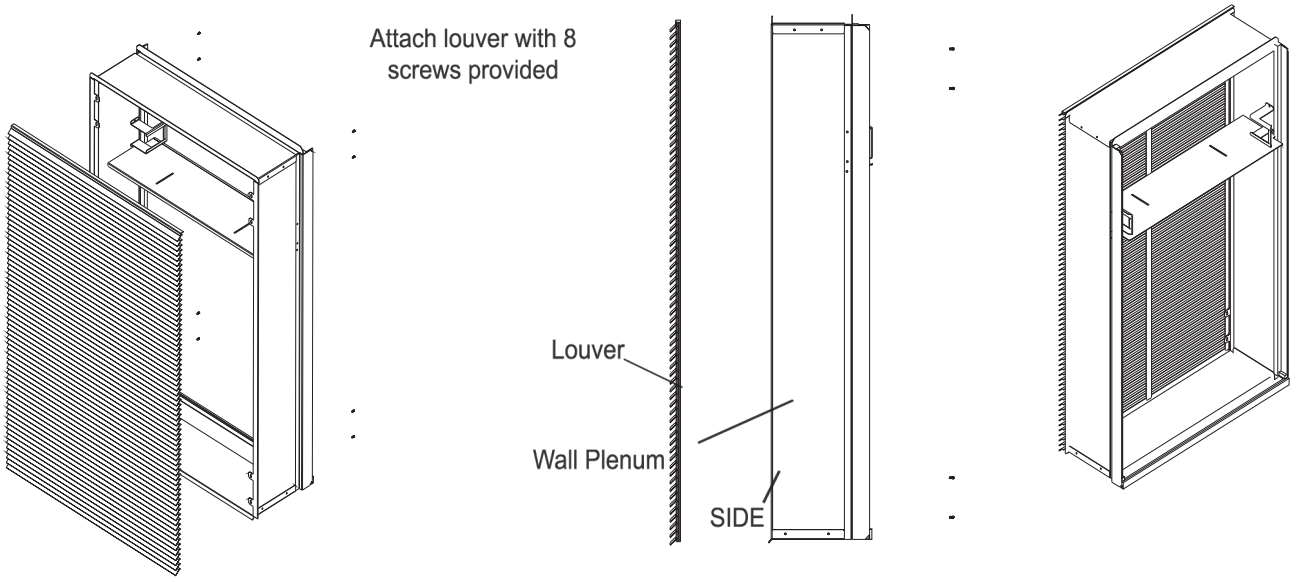



**Note: Do not place any screws, fasteners, or penetrating holes through the top or bottom of the plenum assembly.**

1) Drill pilot holes on the interior of the inside plenum half (Part B) as show in Detail A. 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.

# Louver Installation

**Installation of the louver PRIOR to Wall Plenum Installation**
Hold the louver up to the Outside Wall Plenum Part A and line up the louver top with the very top edge of the 3/4" flange. Line up the Wall Plenum holes with the threaded holes in the louver, install and tighten the 8 screws.



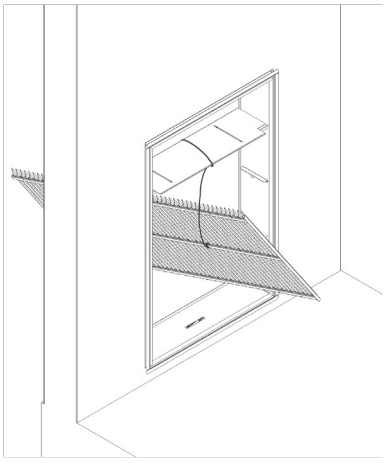

NOTE: Louvers & Drip Ledge orientation is down

**Optional Pre-assembled Outside Element (Grill and Plenum)**

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

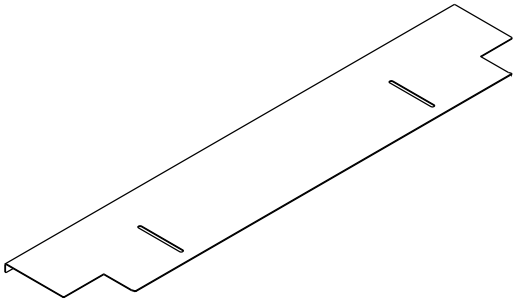
**From the interior of the utility closet:**

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.

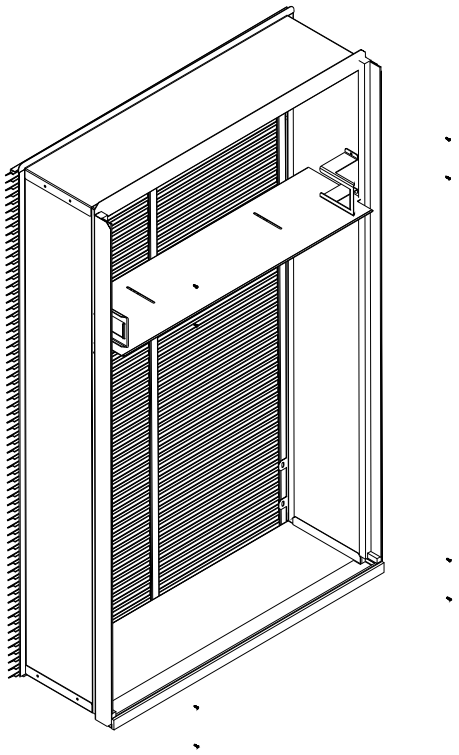


# Final Wall Plenum and Architectural Louver Installation

**Plenum Divider Extension Plate (Baffle)**



**Plenum Divider Extension Plate Installed into Full Plenum Assembly**



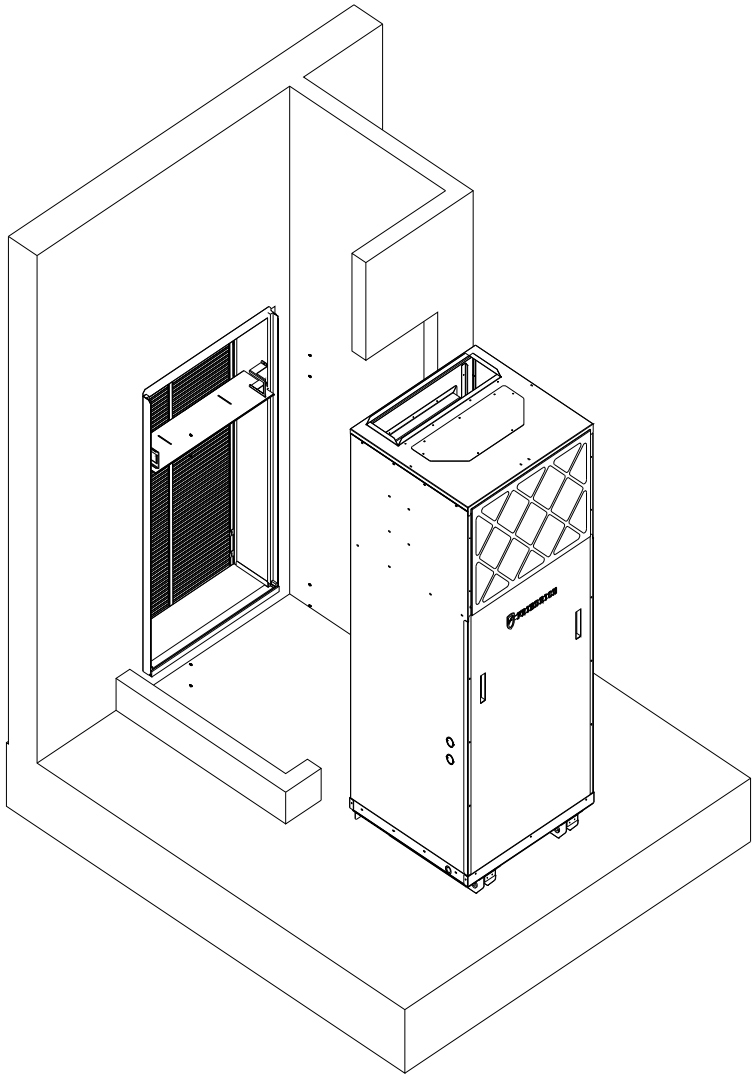
Ensure that the weather strip is undamaged and provides a continuous seal around the inner perimeter of the plenum.

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) Install the plenum adjuster plate. Ensure the exterior edge is seated against the inside of the architectural louver.
2) Secure the plenum divider extension plate to the architectural louver using the two provided screws.
3) Use tape and sealant to seal any gaps.

# Unit Installation

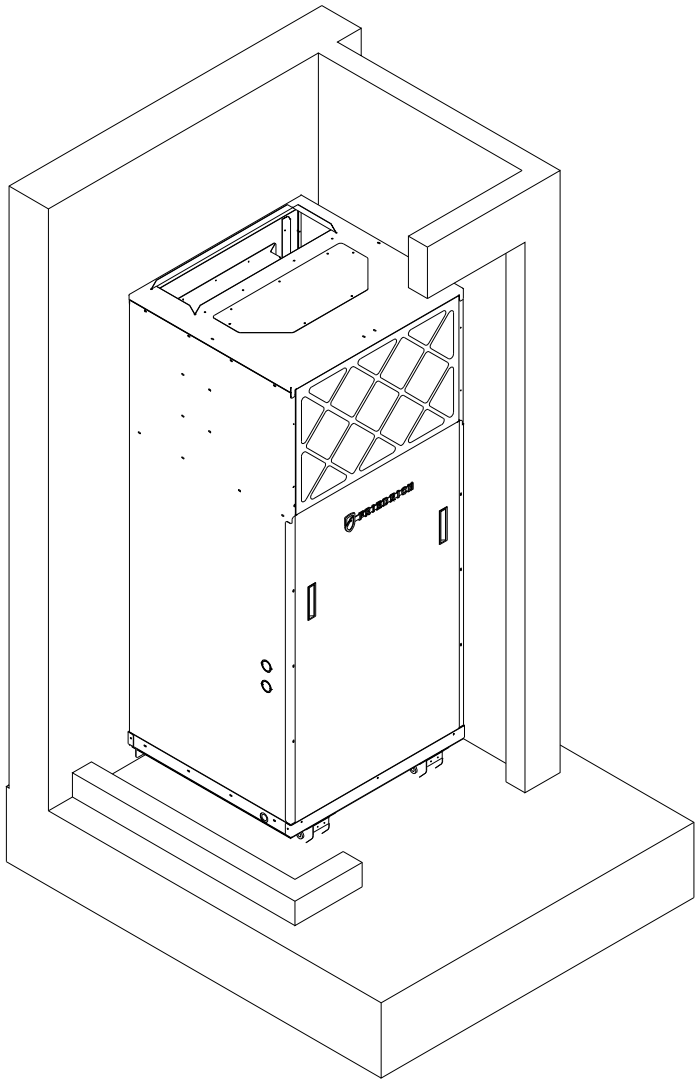
**Unit Placement Prior to Installation (Front-Install Configuration)**



All louver, plenum, rough plumbing, and rough wiring steps must be complete prior to final installation of the air conditioning chassis.

# Final Unit Installation Overview

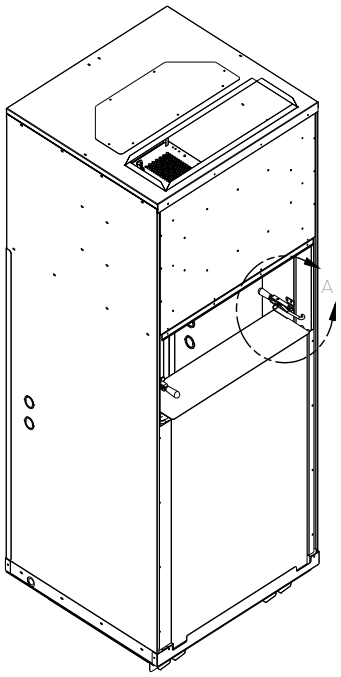
**Unit Final Placement - Front Install**

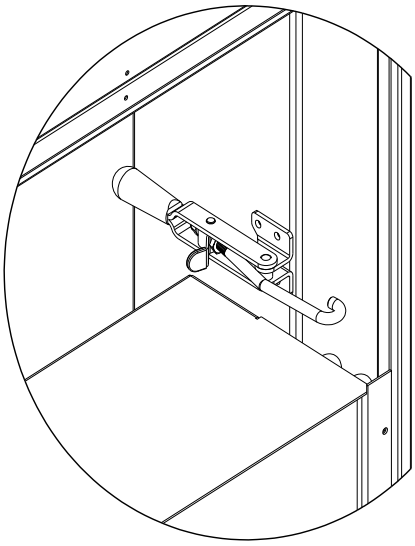


1) Ensure that power is off at the junction box feeding power to the air conditioner until all process steps are completed.
2) Move the unit from the shipping base and onto the installation site.
3) Insert the unit's rear extension into the wall plenum, it should butt up against the compression gasket.
4) Remove the front panel to access the chassis clamps. Attach the hooks into the plenum braces and close.
5) Reattach the front panel.
6) Identify the appropriate drain port to use and complete plumbing (See Page 25).
7) Attach the ductwork to the unit at the supply-air outlet and ensure the seal is air tight (See Page 26).
8) Wire and connect the wall controller (See Pages 27).
9) Connect the main power (See Page 28).

# Final Unit Installation Overview

**Unit Final Placement - Plenum Attachment**



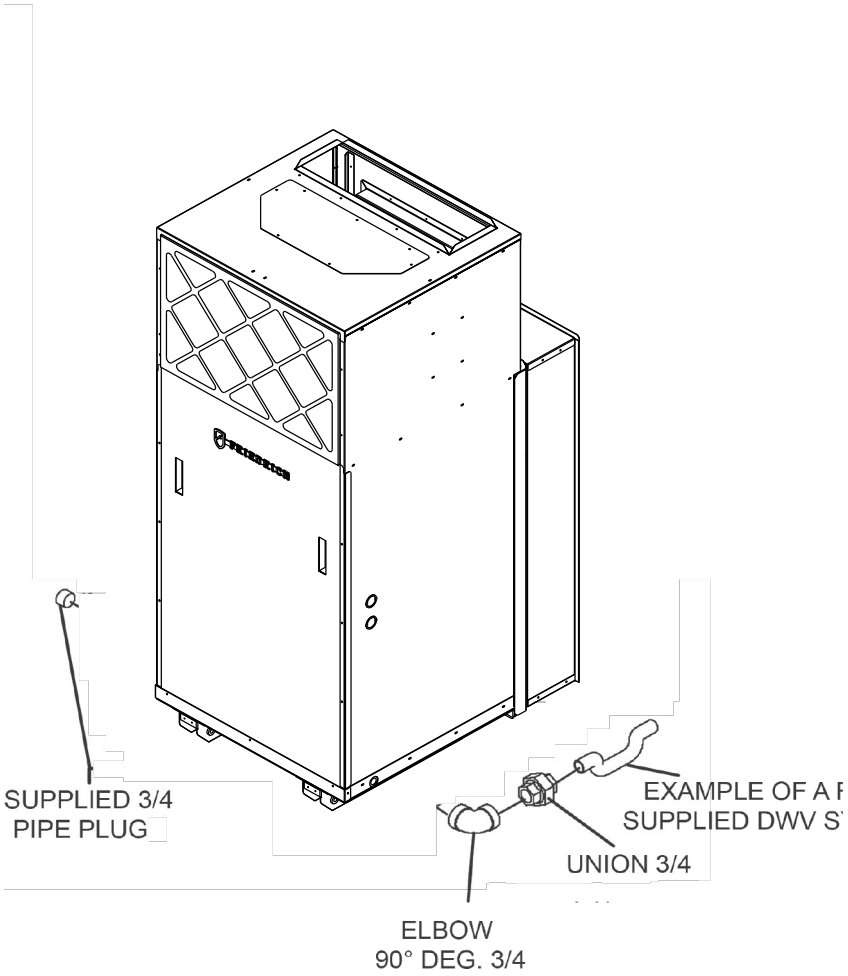
DETAIL A
SCALE 1 / 2

1) Ensure that power is off at the junction box feeding power to the air conditioner until all process steps are completed.
2) Ensure that the unit is pushed flush against the start of the wall plenum.
3) Remove the front panel from the unit.
4) Reach under and behind the electrical box and locate the panel mounted fasteners (Detail A). There is one on each of the left and right interior panel.
5) Align the hook of each fastener with the brackets mounted on the interior portion on the wall plenum.
6) Pull back on the fastener handles until locked.

**NOTE:** Once the unit is fastened there should be a gap of at least 1" between the unit and finished wall

# Final Drain Installation

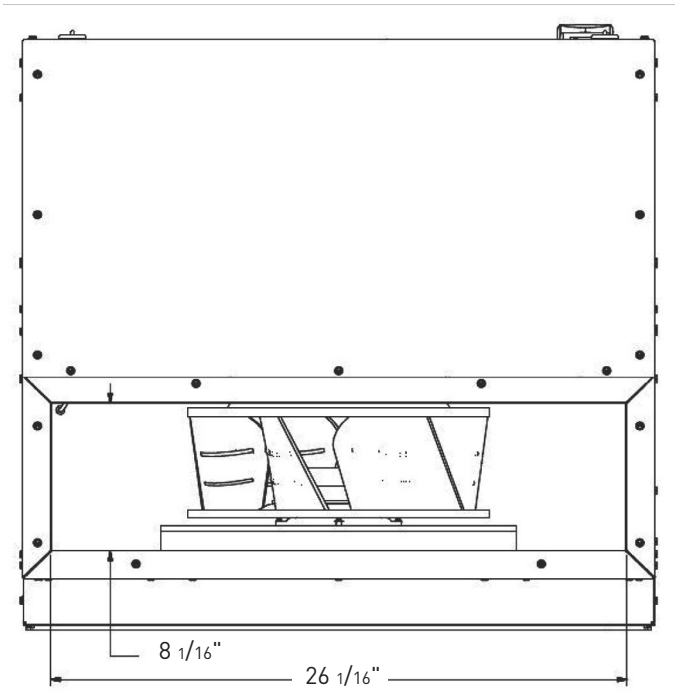
**Unit Drain Installation**




**NOTE:** Failure to follow the following procedures may result in serious property damage. A field supplied secondary condensate pan 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 two (left or right) 3/4" FPT connections on the unit base-pan.
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 required 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 unused connection port with the provided 3/4" pipe plug and field-supplied Teflon tape or pipe joint compound. High 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.

# Ductwork Installation & Base Pan Heat Option




Supply air duct connection is the responsibility of the installer and should be installed per industry best practices.

Supply discharge area is 8 1/16"D x 26 1/16"W.

Sheet metal or duct board may be used for the transition from the discharge to 10" or larger diameter flexible ducting.

Avoid sharp transitions in the ductwork to ensure optimal indoor blower performance.

Allow at least 18" from the discharge of the unit to the final reduced-size transition to support optimal efficiency of the blower system.

**Basepan Heat Thermostat**
VRP model numbers that end with the 'L' character will come equipped with a basepan heater. The basepan heat engages and disengages automatically based on outdoor ambient and base-pan temperatures.

# Wall Controller Installation

### Connecting Thermostat to VRP Unit

Connecting Thermostat to VRP Unit

1. Connect harness to Thermostat
2. Connect other end of harness into four VRP terminals. Follow color coded connections as shown below.

| Wire Color | Terminal Letter |
|---|---|
| ORANGE | V+ |
| BROWN | D+ |
| BLUE | D- |
| GREEN | V- |

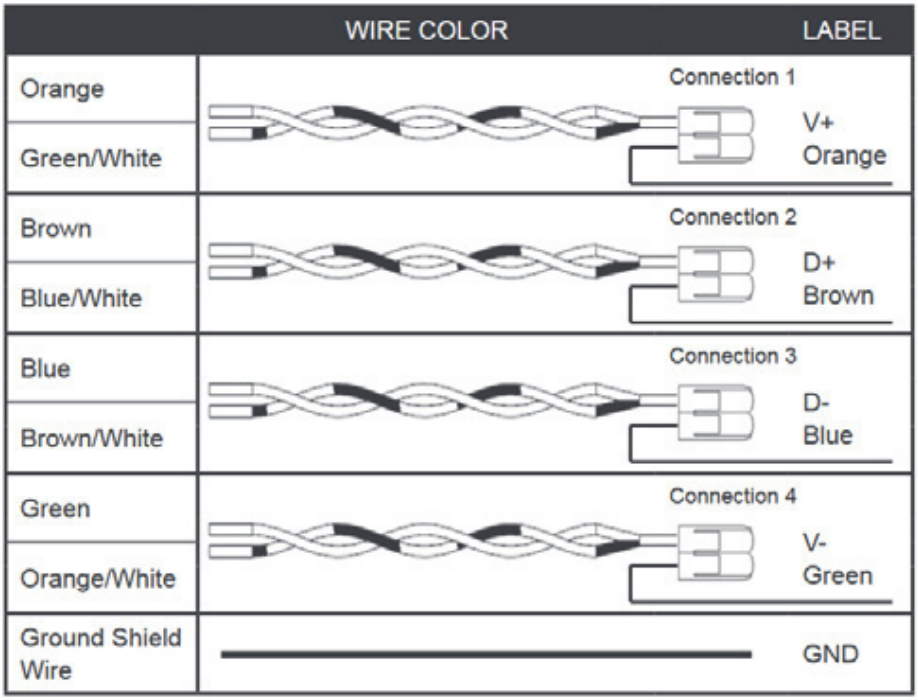
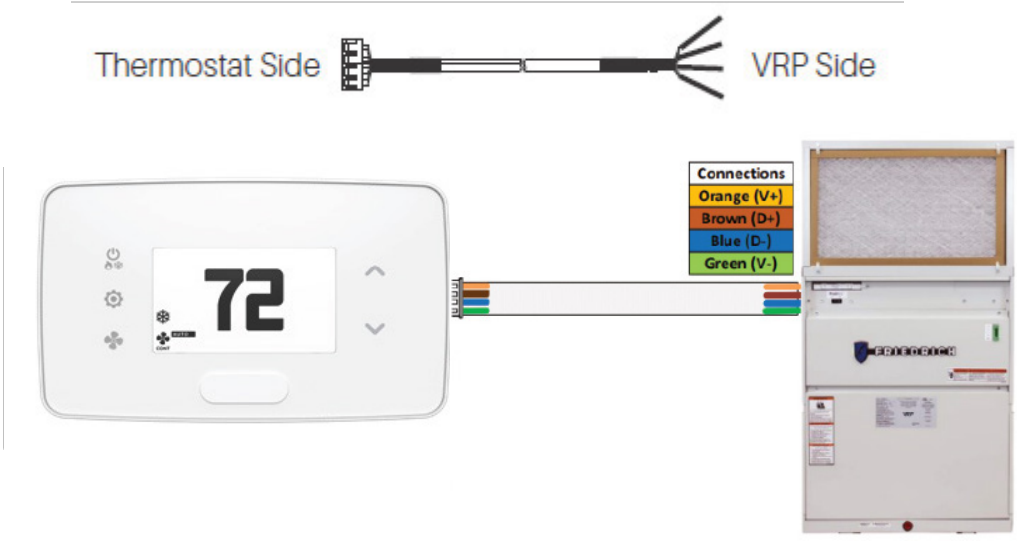
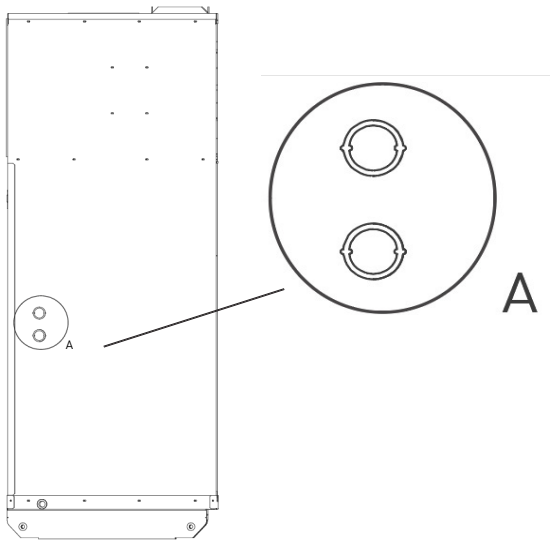



Table shows which wire pairs go with which screw terminal.

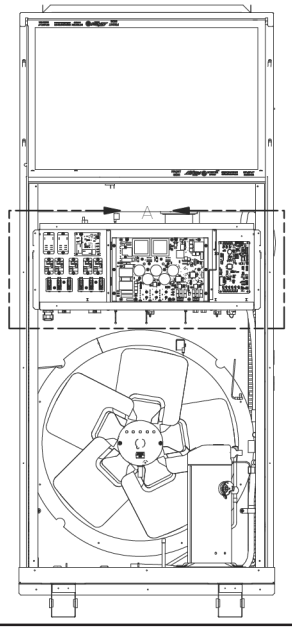


# Electrical Installation

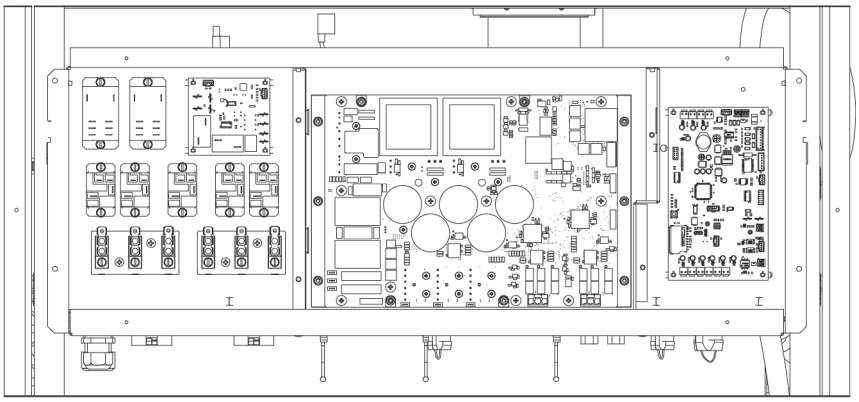



Remove and discard hole knock-out from the side of the unit (Detail A)

**NOTE:** Only one punch-out needs to be removed for 0.0 kW and 10.0 kW models.. Both punch-outs must be removed on the 15.0 kW models for dual service.



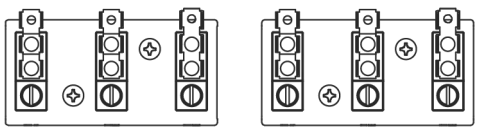

A



Remove the front access panel (Detail A) to expose the electrical box and incoming Power terminal block (see below)

**B** **A**

Ground L1 L2 Ground L1 L2



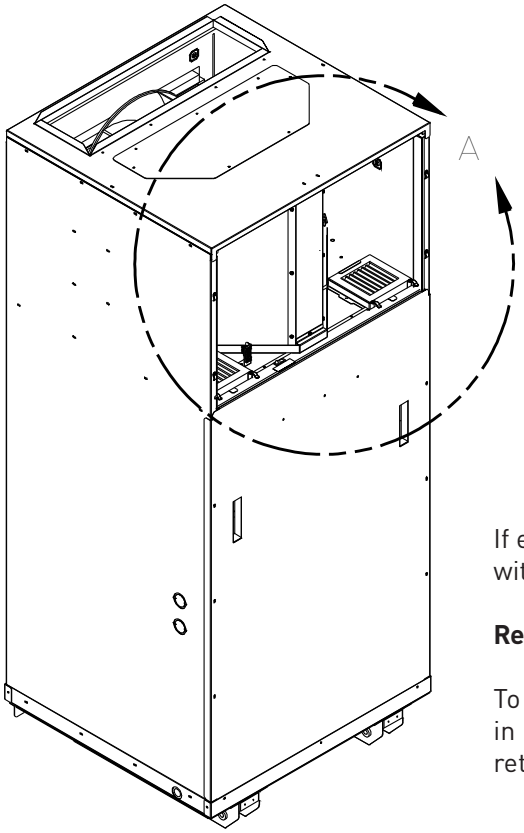
Insert all wires through the punched out hole(s) and fasten wires as shown.

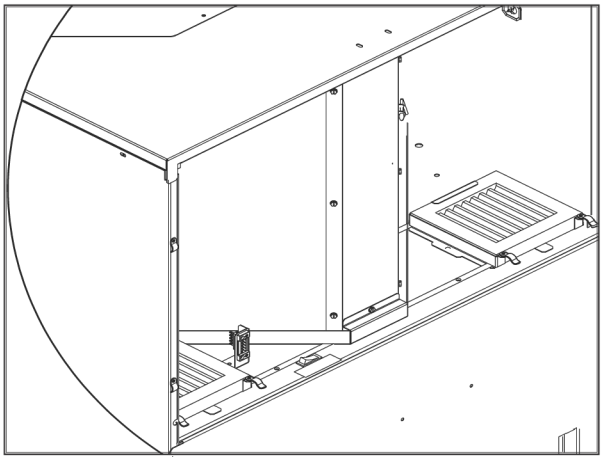
The 0kW and 10kW models will require the use of only one of the terminal blocks (Block 'A'). The 15kW models will connect the extra 5kW electric heat to the remaining terminal block (Block 'B') and separate 30A service.

# Return Air & Door Installation

1. A 36” door louvered door is recommended for all VRP36 installations.
2. The louvered portion of the door should have a minimum of 325 sq. in. of free area.
3. Alternatively, a solid door may be used in tandem with a transfer register on an adjacent wall to the closet. The transfer register should have a minimum free area of 325 sq. in.

# FreshAire™ System Set-Up and Operation



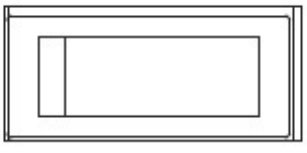



If equipped with the FreshAire™ System, the unit will come with a FreshAire filter and blank-off plate.

**Remove the blank-off plate prior to turning the unit on.**

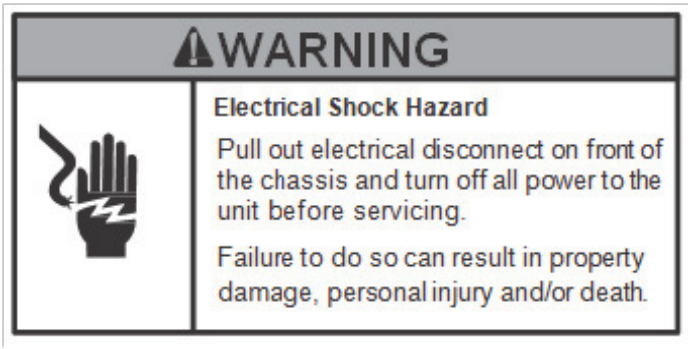
To remove the blank off plate, pull the attached tab shown in Detail A. The blank-off plate can be discarded or retained for future use.

To engage the FreshAire™ System, flip the switch into the ON position. The fresh air switch is located behind the return air filter.

**ON OFF OUTDOOR AIR FAN**

# 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.
- **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.

# Chassis Operation

## Cooling Operation

The set point must be at least 3°F below room temperature to ensure compressor operation. In the cooling mode, when demand is present, the indoor blower and outdoor fan will operate. The compressor will vary operating speed to maintain desired set point.

## Heat Pump Operation

The set point must be greater than 0.3°F but not greater than 6°F above room temperature to ensure compressor operation.
In the heating mode, when demand is present, the indoor blower and outdoor fan will operate. The compressor will vary operating speed to maintain desired set point.

## Electric Heat Operation

If the set-point is greater than 5°F - 15°F (depending on outdoor conditions) above room temperature, the heat pump operation will be terminated and the electric heater will be energized to satisfy the heating demand. If heat pump operation is not available due to defrost or error, the electric heater will be used to satisfy heating demand.

## FreshAire™

The FreshAire™ System (optional) delivers outside air to the indoor space. The system has a fan that draws outdoor air into the system. The outdoor air leaves the system through a filter and enters the indoor space in front of the indoor conditioning coil. The outdoor air mixes with the return air and is drawn through the indoor conditioning coil. This system can be configured with high air flow (D option) or low air flow (F option) from a single fan." Then let the second paragraph handle the filters entirely.

The FreshAire™ System uses two ( 2 ) 6 x 6 x 1 filters. The filters are accessed through the front of the unit just below the main unit filter. Slide the filter straight out to remove and straight in to replace.

# Service & Warranty

### Servicing / Chassis Quick Change Outs

The chassis is designed for quick disconnect and change out. For minor electrical service, the Electrical Access Panel is easily removable once the screws are removed. For major electrical,refrigeration and fan service the chassis may be removed from 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 VRP unit and allows lint and dirt to accumulate on the indoor-air coil. Lint and dirt on the indoor- air 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 size is 20" x 30" x 1"

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

### To Remove the Chassis from the Closet:

A. Switch the wall controller off.
B. Disconnect the power coming into the unit from the main breaker panel or the closet mounted disconnect.
C. Disconnect the electrical connection.
D. Disconnect the duct work.
E. Slide the chassis out of the wall plenum.
F. Roll the chassis out of the utility closet.

### 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.

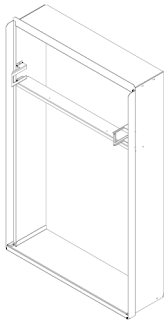
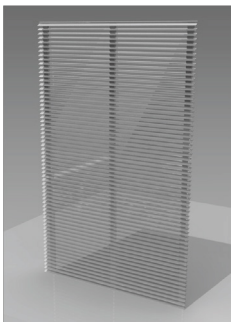
# Electronic Control Error Code Diagnostics and Test Mode

### Error Code Diagnostics

The VRP electronic control continuously monitors the unit operation and will store error codes if certain conditions are witnessed. In some cases the unit may take action and shut the unit off until conditions are corrected. To enter the error code menu, do a long press (3 seconds) of the Fan Mode and Fan Speed keys. When the menu opens an E will be displayed on the screen. Navigate through the diagnostics with the Up and Down keys. The displayed number denotes the number of the active diagnostic test.

To exit, press the Enter key.

# Accessories

| ITEM | DESCRIPTION | CHECK LIST |
|---|---|---|
| VRPXWPC-8 | Wall Plenum for VRP36 with VRPXALC for 4” to 8” thick wall | Require One of these Wall Plenums per unit |
| VRPXWPC-14 | Wall Plenum for VRP36 with VRPXALC for 8” to 14” thick wall | |
| |  | |
| VRPXALC | Architectural louver (VRP36 only) (30° Blade angle) | Require One of these Louvers per unit |
| VRPXSCC | Architectural louver (VRP36 only) Custom Color - Special Order (30° Blade angle) | |
| |  | |
| VRPXAP1 | Return Air Access Panel | Require One per unit |

# Accessories

| TYPE | ITEM | DESCRIPTION | CHECK LIST |
|---|---|---|---|
| WALL CONTROLLER | VRPXWCTA4 | Wall Controller   VRPXWCTA4 | Required one per unit |
| | VRPXEMRT(A/B)4 | VRP Energy Management Wired Wall Controller with Occupancy Sensor | Require One of the Controllers per unit |
| | VRPXEMWRT(A/B)4 | VRP Energy Management Wireless Wall Controller with Occupancy Sensor | |
| | EMOCT4 | Online Connection Kit – Optional with VRPXEMR(W)T(A/B)4 | Optional |
| | EMRAF4 | Remote Access Fee – Optional with VRPXEMR(W)T(A/B)4 | Optional |
| | |   VRPXEM(W)RT(A/B)4 | |

# Diagnostic Error Codes

| Code | Description |
|---|---|
| 3 | Return Air Sensor (T6) is open or shorted. |
| 4 | Indoor Coil Cool Inlet sensor (T2) is open or shorted |
| 5 | Outdoor Coil Heat Inlet sensor (T1) is open or shorted |
| 6 | Discharge Air sensor (T5) is open or shorted |
| 7 | Outdoor Ambient Air sensor (T7) is open or shorted |
| 9 | Compressor Discharge sensor (T4) is open or shorted |
| 10 | Compressor Suction sensor (T3) is open or shorted |
| 13 | Wall Controller isn't communicating current humidity levels |
| 14 | Low Pressure Limit Switch Open |
| 15 | High Pressure Limit Switch Open |
| 16 | Compressor Model Code Error |
| 17 | Compressor Output Phase Loss |
| 19 | Outdoor Coil > 190°F |
| 20 | Indoor Coil at sensor T2's location reaches a temperature < 30°F and remains there for 5 consecutive minutes |
| 23 | Room Freeze Protection |
| 24 | The Discharge Air sensor is reading above 185°F |
| 27 | Minimum Configuration not Met |
| 28 | Inverter Board Critical Failure |
| 32 | Inverter board Compressor Port Over Current Protection |
| 34 | Unit Not Provisioned |
| 35 | Inverter board DC Bus Over Voltage |
| 34 | Unit not provisioned |
| 35 | Inverter board DC Bus Over Voltage |
| 36 | Inverter board DC Bus Under Voltage |
| 37 | Inverter board PCB Over Temperature |
| 39 | PSC Fan Low RPM |
| 40 | Wall controller disconnected |
| 42 | Compressor Speed Sync Error |
| 43 | Inverter board Communication Issue |
| 44 | Compressor Start Failure |
| 45 | Compressor Current Limiter |
| 46 | Indoor Coil > 175°F for 5 consecutive minutes |
| 47 | Inverter Generic Error |
| 48 | Outdoor Fan Malfunction Error |
| 51 | Inverter board DC Bus Over Current |
| 53 | Inverter board AC Line Under Voltage |
| 54 | Inverter board AC Line Over Voltage |

**Friedrich Air Conditioning Co.**
10001 Reunion Place, San Antonio, TX 78216
800.541.6645
www.friedrich.com

VRP Variable Refrigerant Packaged Heat Pump

# LIMITED WARRANTY

**1. A) ONE YEAR PARTS WARRANTY - FRIEDRICH AIR CONDITIONING CO. (FRIEDRICH)** warrants to the original end-user of this product that should it prove defective due to improper workmanship and/or material under normal use for a period of one year commencing from the date of installation or 120 days after original end-user purchase, whichever comes first, FRIEDRICH will repair or replace, at its option, any defective part without charge for the part. Replacement parts are warranted for the remainder of the original warranty period.

**B) THIS WARRANTY DOES NOT INCLUDE LABOR** or other cost incurred for servicing, repairing, removing, installing, shipping, or handling of either defective or replacement parts, or complete unit. Such cost may be covered by a separate warranty provided by the installing contractor.

**C) SECOND THROUGH FIFTH YEAR (Sixty (60) months commencing from 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. LABOR IS NOT INCLUDED FOR INSTALLING REPLACEMENT PARTS. **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, 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.**

**D) NOTICE**: To obtain service and/or warranty parts replacement, you must notify an authorized FRIEDRICH Air Conditioning Co. distributor, dealer, or contractor of any defect within the applicable warranty period.

**2. Any defective part to be replaced must be made available to FRIEDRICH in exchange for the replacement part.** You must present proof of the original date of installation of the product in order to establish the effective date of the warranty. Otherwise, the effective date will be deemed to be the date of purchase plus thirty days. The return of the owner registration card is not a condition of warranty coverage. However, please detach and return it so that we can contact you should a question of safety arise which could affect you.

**3. TO OBTAIN WARRANTY SERVICE,** please contact your authorized FRIEDRICH distributor, dealer, or the contractor who installed the equipment. If your dealer or contractor needs assistance, the authorized FRIEDRICH distributor is available for consultation, and FRIEDRICH supports the efforts of the distributor.

**4. This limited warranty applies** only to units remaining at the site of the original installation (except for mobile home installations) and only to units installed within the continental United States, Alaska, Hawaii, and Canada. This limited warranty applies only if the unit is installed and operated in accordance with FRIEDRICH instructions and in compliance with applicable local installation and building codes and good trade practices.

**5. THIS WARRANTY DOES NOT COVER** damages caused by: (a) accident, abuse, negligence, or misuse; (b) operating the product in a corrosive atmosphere containing chlorine, fluorine or any other damaging chemicals; (c) modification, alteration, poor service practices; (d) improper matching or application of the product or components; (e) failure to provide proper maintenance and service to the product according to manufacturer's instructions; (f) installation or operating of the product in a manner contrary to the instructions of the manufacturer; (g) lightning, fluctuations in electrical power or other Acts of God; (h) operation of the unit during construction. This LIMITED WARRANTY also excludes all cost of installation, disconnection or dismantling the product, parts used in connection with normal maintenance such as air filters or belts and owner-required maintenance. Consult the instructions enclosed with the product for information regarding recommended maintenance.

**6. No one is authorized to change this LIMITED WARRANTY** in any respect, or to create any other obligation or liability in connection with this product.

**7. YOUR ONLY REMEDIES ARE PROVIDED IN THIS LIMITED WARRANTY. ANY EXPRESS WARRANTY NOT PROVIDED HEREIN, AND ANY REMEDY WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION OR OPERATION OF LAW, IS HEREBY EXCLUDED AND DISCLAIMED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY LIMITED TO A TERM OF ONE YEAR FROM THE DATE OF ORIGINAL INSTALLATION. UNDER NO CIRCUMSTANCES SHALL FRIEDRICH BE LIABLE TO THE OWNER OR ANY OTHER PERSON FOR ANY INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THIS PRODUCT, WHETHER ARISING OUT OF BREACH OF WARRANTY, BREACH OF CONTRACT OR OTHERWISE.**

8. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental, special or consequential damages, so the above limitations or exclusions may not apply to you.

**9. This warranty gives you specific legal rights,** and you may have other rights which vary from state to state and province to province.

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**10. This warranty is valid in the U.S.A. and Canada** and is not transferable.

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VRP®

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*Innovative | Intelligent | Inverter*

FRIEDRICH

Friedrich Air Conditioning Co. | 10001 Reunion Place, Suite 500 | San Antonio, TX 78216 | 877.599.5665 | www.friedrich.com