

# RETROAIRE™

*The Right Fit for Comfort*

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An ISO 9001-2008 Certified Company

# VPRC / VPRH

Single Package Vertical Air Conditioner/Heat Pump

## Installation, Operation & Maintenance Manual



P/N 240006980, Rev. P [10/2012]

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**Information and specifications outlined in this manual in effect at the time of printing of this manual. ECR International reserves the right to discontinue, change specifications or system design at any time without notice and without incurring any obligation, whatsoever.**

## RECEIVING INFORMATION

**Shipping damage MUST be reported to the carrier IMMEDIATELY.  
Examine exterior.**

**Remove cover and examine compressor and piping for signs of damage.**

### Inspection

Check shipment against bill of lading.

Verify equipment received as ordered.

Verify unit:

- Unit size and type correct per submittal sheet and job requirements?
- Louver color correct, if special color specified?
- Control box located on correct side?
  - factory-installed on front, left or right side models 09–18;
  - field modifiable to left or right model 24 only;
  - front side only models 30–36.
- Voltage correct?
- Wall sleeve correct for unit, and correct depth?  
[Available in depths for walls of 6½ inches (165 mm) or deeper, in increments of ½ inch (12.7 mm)]
- Electric heat correct capacity, if used?
- Hydronic coil included, if required? Piping located as required?

Inspect each component for damage. Concealed damage **must** be reported to carrier within 15 days of receipt of shipment.

Carrier must make proper notation on delivery receipt of all damage identified and complete carrier inspection report.

Purchaser must notify Manufacturer's Service department of all damage and is responsible for filing any necessary claims with carrier.

### General Information

Installation shall be completed by qualified agency. Retain this manual and warranty for future reference.

Installer review this manual to verify unit has been installed correctly. Run unit for one complete cycle to verify proper function.

To obtain technical service or warranty assistance during or after installation, contact your local representative.

Visit our web site [www.retroaire.com](http://www.retroaire.com) for local representative listing.

For further assistance call 1-800-325-5479.

When calling for assistance, please have following information ready:

Model Number\_\_\_\_\_

Serial Number\_\_\_\_\_

Date of installation\_\_\_\_\_

**Customer Service : (800) 228-9364**

## IMPORTANT SAFETY INFORMATION

All field wiring shall conform to requirements of authority having jurisdiction or in absence of such requirements:

- United States - National Electrical Code, ANSI/NFPA 70
- Canada - CSA C22.1 Canadian Electrical Code Part 1.

### **WARNING**

Fire, and electrical shock hazard. Improper installation could result in death or serious injury. Read this manual and understand all requirements before beginning installation.



**Become Familiar With Symbols  
Identifying Potential Hazards.**

### **DANGER**

Indicates a hazardous situation which, if not avoided, WILL result in death or serious injury.

### **WARNING**

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

### **CAUTION**

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

### **NOTICE**

Indicates information which should be followed to ensure proper installation and operation.

### **WARNING**

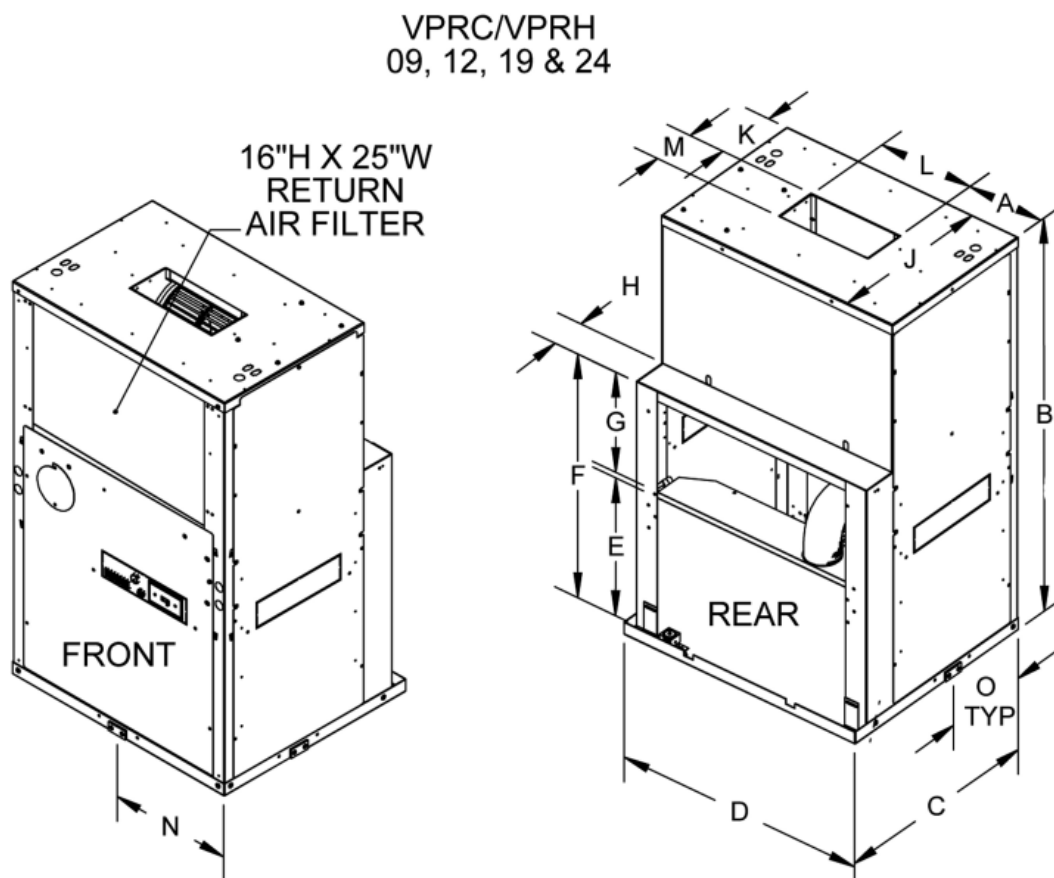
Tampering with VPRC/VPRH is dangerous and could result in serious injury or death. Do not modify or change this unit.

### **Safety Information**

- Installation by qualified personnel.
- Turn off electrical supply before servicing unit.
- Inspect all parts for damage prior to installation and start-up.
- Do not use unit if it has damaged wiring, is **not working** properly, or has been damaged or dropped.
- Connect to properly grounded electrical supply with proper voltage as stated on rating plate.
- Have proper overcurrent protection (i.e. time- delay fuse/HACR Breaker) as listed on Rating Plate.
- Connect unit to properly grounded electrical supply. Do not fail to properly ground this unit.
- Tampering voids all warranties.

## DIMENSIONAL/PHYSICAL DATA

**Figure 1 VPRC/ VPRH Dimensions — Inches (mm) - Models 09, 12, 19 & 24**



**Table 1 Nominal Capacities, Dimensions, Shipping Weights And Return Air Filter Sizes**

Dimension	Model	
	09–12 in. (mm)	19–24 in. (mm)
<b>A</b>	7-5/8 (194)	6-1/2 (165)
<b>B</b>	40 (1016)	50 (1270)
<b>C</b>	21-7/16 (545)	26-7/16 (672)
<b>D</b>	25 (635)	25 (635)
<b>E</b>	14-5/8 (372)	20-5/8 (524)
<b>F</b>	25 (635)	32 (813)
<b>G</b>	10-5/16 (261)	11-3/8 (289)
<b>H</b>	3-1/2 (89)	3 1/2 (89)
<b>J</b>	16-1/2 (419)	21-9/16 (548)
<b>K</b>	6-1/8 (156)	8-3/16 (208)
<b>L</b>	9-5/8 (245)	12 (305)
<b>M</b>	4-1/4 (108)	10-3/8 (264)
<b>N</b>	12-1/2 (317)	12-1/2 (317)
<b>O</b>	8 3/4 (222)	13 3/4 (348)

Straight cool/Limited Range Heat pump nominal  
capacities

9,000	12,000	19,000	24,000	Btuh
2.6	3.5	5.6	7.0	kW

Model	Shipping weight pounds (kg) (shipping weight = unit weight + 60 lbs (27 kg))	Return Air Filter Dimensions inches (mm) All models must have an air filter installed prior to operation.	
		Chassis Mounted	Return Air Access Panel Mounted
<b>09</b>	190 (86)	16 x 25 (406 x 635)	20 x 20 (508 x 508)
<b>12</b>	190 (86)	16 x 25 (406 x 635)	20 x 20 (508 x 508)
<b>19</b>	300 (136)	16 x 25 (406 x 635)	20 x 30 (508 x 762)
<b>24</b>	300 (136)	16 x 25 (406 x 635)	20 x 30 (508 x 762)

Figure 2 VPRC/ VPRH Dimensions - Model 18

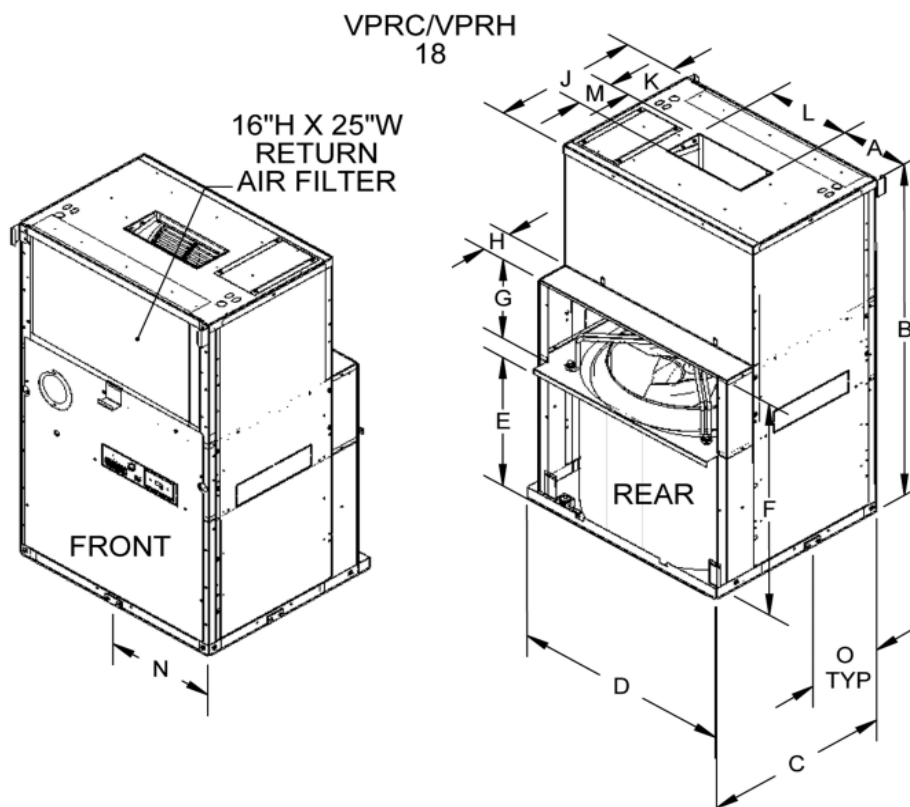


Table 2 Dimensions, Shipping Weights And Return Air Filter Sizes

Dimension	Model
	18 in. (mm)
A	7-3/4 (197)
B	40 (1016)
C	21-7/16 (545)
D	25 (635)
E	14-13/16 (376)
F	24-5/8 (625)
G	9-13/16 (249)
H	3-1/2 (89)
J	16-1/2 (419)
K	6-1/8 (156)
L	9-1/2 (241)
M	4-1/4 (108)
N	12-1/2 (317)
O	8-3/4 (222)

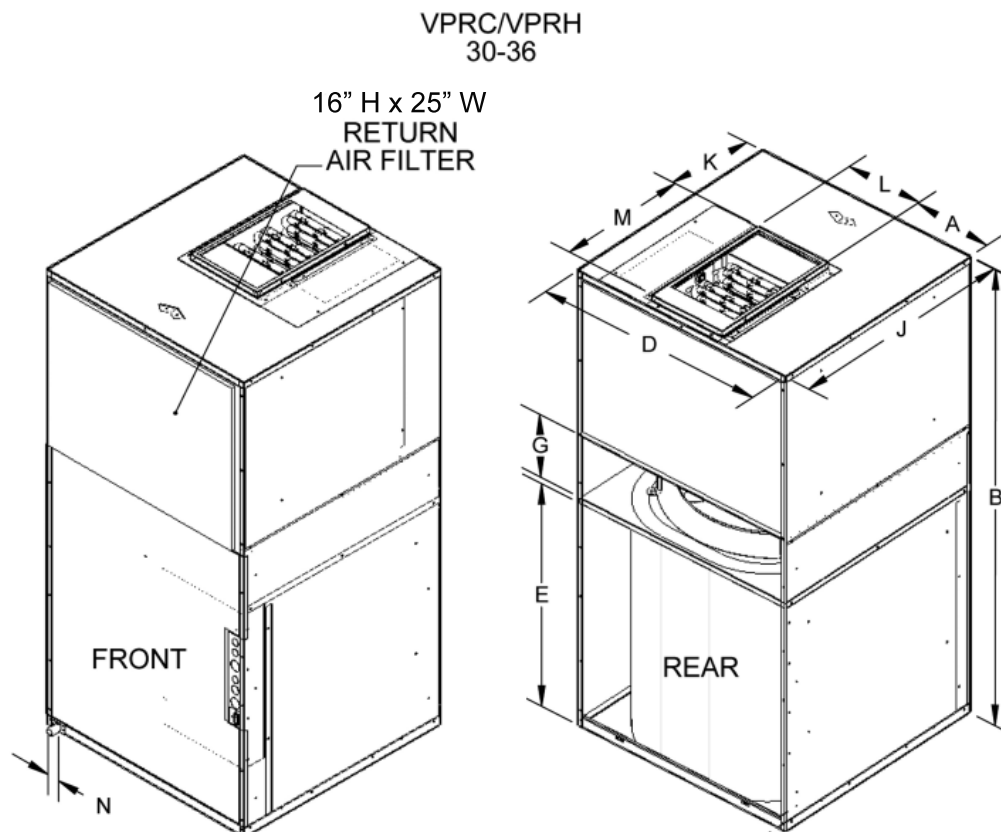
Straight cool/Limited Range Heat pump nominal capacities

18,000	Btuh
5.3	kW

Model	Shipping weight pounds (kg) (shipping weight = unit weight + 60 lbs (27 kg))	Return Air Filter Dimensions inches (mm) All models must have an air filter installed prior to operation.	
		Chassis mounted	Return air access panel mounted
18	260 (118)	16 x 25 (406 x 635)	20 x 20 (508 x 508)

## DIMENSIONAL/PHYSICAL DATA

**Figure 3 VPRC/ VPRH Dimensions - Models 30 & 36**



**Table 3 Dimensions, Shipping Weights And Return Air Filter Sizes - Models 30 & 36**

Dimension	Model	
	30 in. (mm)	36 in. (mm)
A	8 3/4 (222)	8 3/4 (222)
B	56 (1422)	56 (1422)
D	28 (711)	28 (711)
E	21 3/4 (553)	21 3/4 (553)
G	6 1/4 (159)	6 1/4 (159)
J	28 (711)	28 (711)
K	11 1/4 (286)	11 1/4 (286)
L	10 1/4 (260)	10 1/4 (260)
M	16 (406)	16 (406)
N	1 5/8 (41)	1 5/8 (41)

**Straight Cool/Limited Range Heat Pump Nominal Capacities**

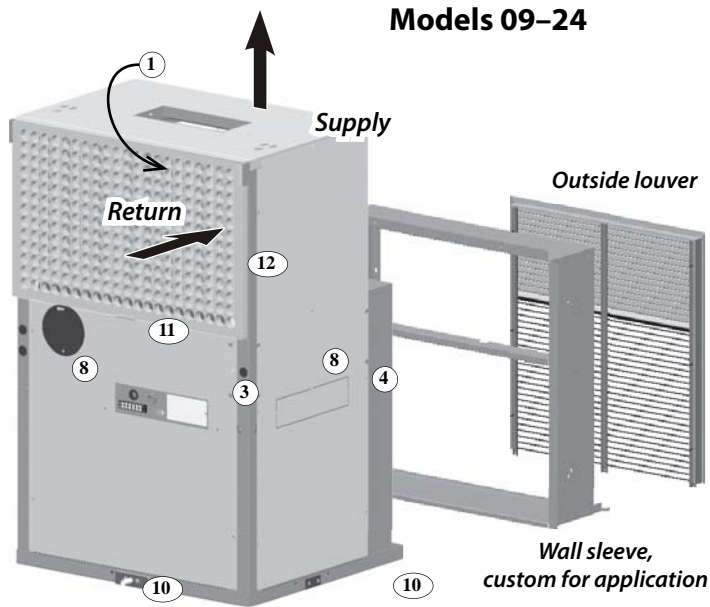
30,000	36,000	Btuh
8.8	10.5	kW

Model	Shipping weight pounds (kg) (shipping weight = unit weight + 60 lbs (27 kg))	Return air filter dimensions inches (mm) All models must have an air filter installed prior to operation.	
		Chassis mounted	Return air access panel mounted
30	430 (195)	16 x 25 (406 x 635)	20 x 30 (508 x 762)
36	430 (195)	16 x 25 (406 x 635)	20 x 30 (508 x 762)



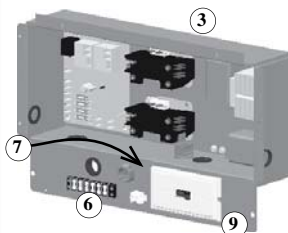
# COMPONENTS

## Models 09–24

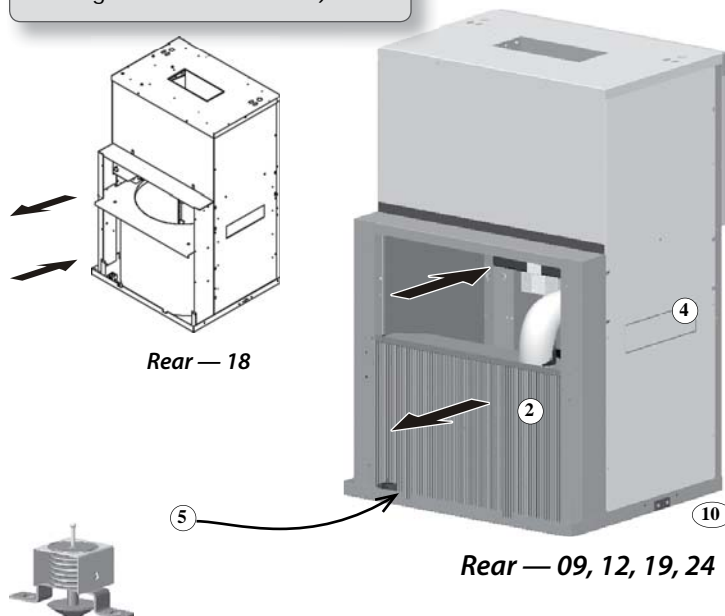


Front — 09, 12, 18, 19, 24

- 1 Indoor coil (behind filter)
- 2 Outdoor coil
- 3 Control/power box
- 4 Alternate control box location (right or left side)
- 5 Thermostatic drain valve (09, 12, 19 and 24 only)
- 6 24-volt connection strip
- 7 Power cord strain relief (for units with power cords)
- 8 Line voltage power entrances (for hard-wired units)
- 9 Optional disconnect switch
- 10 Drain stub location options (front, right or left side) — ½" I.D. connection
- 11 Fresh air shutter
- 12 Return air filter (see Table 19, Page 40 for dimensions)

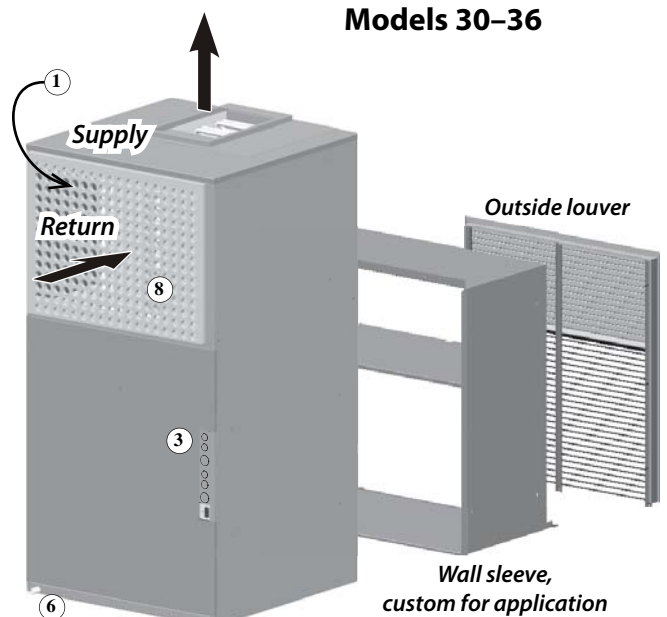


Control panel, typical 09–24



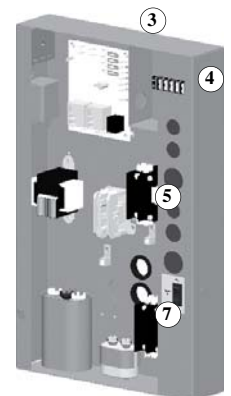
Rear — 09, 12, 19, 24

## Models 30–36

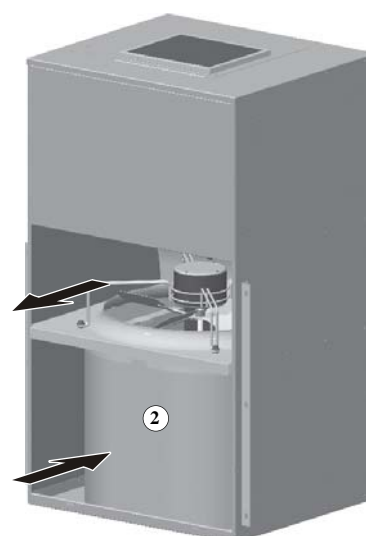


Front — 30, 36

- 1 Indoor coil (behind filter)
- 2 Outdoor coil
- 3 Control/power box
- 4 24-volt connection strip
- 5 Line voltage power entrances
- 6 Drain stub location — ¾" I.D. connection
- 7 Motorized fresh air damper switch
- 8 Return air filter (see Table 19, Page 40 for dimensions)



Control panel, typical 30, 36



Rear — 30, 36



Transition Kit # 55002100



## Product Description

- VPRC/VPRH 09–36 single package vertical air conditioner (SPVAC) and heat pump (SPVHP).
- R-410A refrigerant.
- Custom wall sleeve and outdoor louver.
- Insulated top-discharge indoor compartment.
- VPRC/VPRH vertical discharge allows ducting to top of room(s).
- VPRC/VPRH models can be applied in non-ducted return air applications. VPRC/VPRH 30-36 can also be applied in ducted return air applications.
- VPRH models are limited-range heat pumps. Heat pump operation will cease at approximately 40°F (4.4°C) outdoor temperature.

## Standard Controls And Components:

- Ability to utilize single or 2-stage thermostat for VPRH emergency heat.
- Front-mounted control box standard for 09–36 (right or left-side mounting available for 09–24 only).
- Manual fresh air damper for models 09–24, motorized fresh air damper for models 30–36.
- Disposable return air filter for models 09–24. Washable, reusable return air filter for models 30–36 only.
- Thermostatic drain pan valve for heat pump operation condensate removal (VPRH 09, 12, 19–24 only).
- **Air Systems**
  - Models VPRC/VPRH 09, 12, 19 & 24 blow air across outdoor coil, models VPRC/VPRH 18, 30 & 36 draw air through outdoor coil.
- **Condensate Removal**
  - VPRC/VPRH 09, 12, 19 & 24 — Outdoor blower incorporates condensate slinger ring. Base pans are designed to accommodate field-installed drain stub kit if necessary.
  - VPRC/VPRH 18, 30 & 36 requires internal drain system. Models VPRC/VPRH 18 are supplied standard with overflow drain stub kit for field installation.
  - VPRC/VPRH 30-36 outdoor coil side drain stub is integral to base pan, allows easy connection of drain line.

## • Microprocessor Control Board

- Random start timer prevents multiple units from simultaneous start-ups.
- Fan purge — fan remains on for 60 seconds after heat/cool call is satisfied
- Anti-short-cycle compressor protection prevents compressor from rapid cycling
- Freeze protection — prevents evaporator coil freeze up, improving compressor reliability
- Low ambient lockout prevents compressor operation in outdoor temperatures less than 40°F (4.4°C)
- Test operation — all timers are temporarily suppressed to allow ease of testing or troubleshooting
- Control board LED provides self-diagnostic troubleshooting codes (see Sequence of Operation, page 24)

## • Field-Installed Accessories:

- Hydronic heat plenum (coil included on models 09–24 only).
- Remote wall thermostat (digital 1-stage or 2-stage available).
- Return air access panel - optional solid panel available for application with separate air intake.
- Models 09, 12, 19–24 only — Drain stub kit, can be installed on front, right side or left side.
- Wall sleeve transition kit Model 30 only- Needed when installing a VPRC/VPRH 30 in place of a VPAC/VPHP 30. See page 8. [Transition Kit 550002100]

## APPLICATION LIMITATIONS

- Contact manufacturer if units will be operated in temperatures outside ranges listed below.

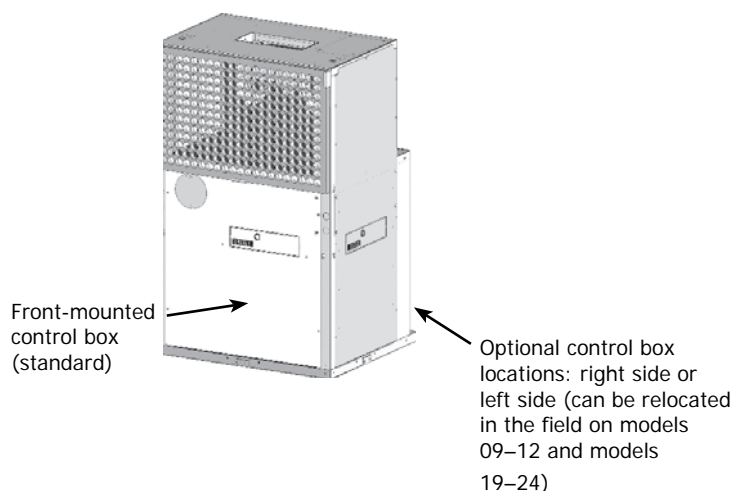
Table 4 Ambient Air Limitations					
OUTDOOR [Ambient air temperature °F (°C)]					
COOLING				HEATING	
Minimum		Maximum		Maximum	
Dry bulb		Dry bulb		Dry bulb	
67 (19)		115 (46)		75 (24)	
INDOOR [Ambient air temperature °F (°C)]					
COOLING				HEATING	
Minimum		Maximum		Min.	Max.
Dry bulb	Wet bulb	Dry bulb	Wet bulb	Dry bulb	
67 (19)	57 (14)	90 (32)	72 (22)	50 (10)	80 (27)

## CONTROL BOX LOCATION

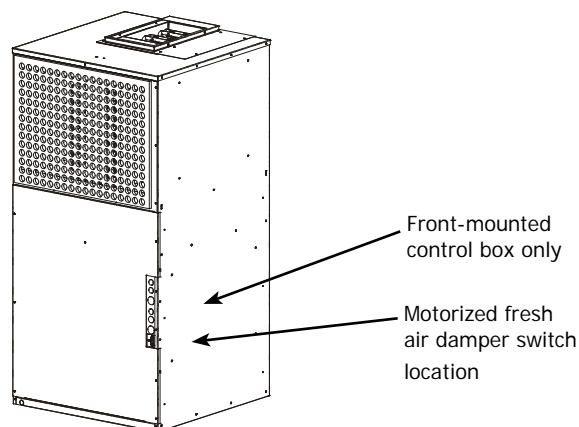
### Control Box Location

- VPRC/VPRH control box is factory mounted in front position, unless otherwise specified.
- Control box can be factory mounted for front, left or right side applications on models 09–24.
- Control box is available only on front for models 30 and 36.

**Figure 4 Optional Control Box Locations**



**Figure 5 Front-Mounted Control Box Only (Models 30 & 36)**



### Relocating Control Box

#### **⚠ DANGER**

Electrical shock hazard. Disconnect power to unit before servicing or accessing control compartment. Failure to do so will result in severe personal injury or death.

(Models 09, 12, 19, & 24) Field relocation of Control Box must be done prior to installing unit.

1. Determine desired location.
2. Remove sheet metal panels from current control box location, and desired control box location.
3. Remove control knock-out from panel.
4. Remove insulation directly behind knock-out.
5. Use metal tape to seal opening in panel where control box was originally located.
6. Cut wire ties securing wire harness.
7. Remove mounting screws holding control box in place.
8. Relocate control box, and install mounting screws.
9. Use wire ties to bundle and secure wire harness.

#### **⚠ DANGER**

Electrical shock hazard. Verify wires do not contact any sharp sheet metal edges, refrigeration tubing, outdoor fan motor, or any moving parts. Failure to do so will result in severe personal injury or death.

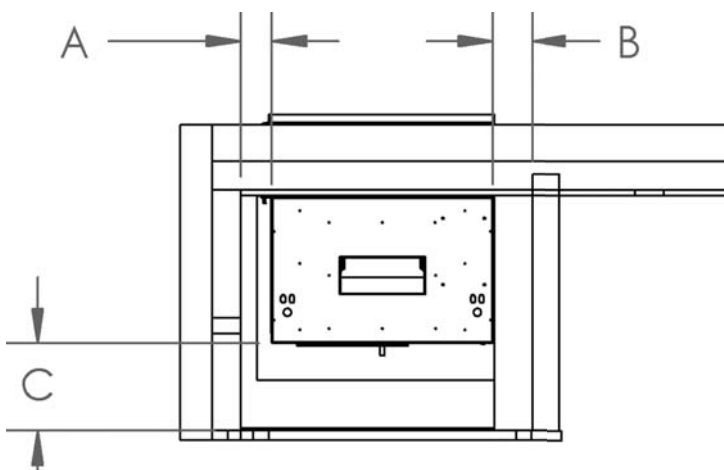
10. Replace sheet metal panels.

## Proper Clearances

- For proper air flow and sound levels minimum clearance of 4 inches (102 mm) [models 09–18] or 6 inches, (152 mm) [models 24–36] between enclosure and chassis be maintained (see Figure 6).
- For service, maintain minimum of 6 inches (152 mm) on both sides and front for non-ducted return air applications only.
- Ducted return air applications only require minimal spacing for service requirements.

**Figure 6 Minimum Clearances**

Minimum clearances [inches (mm)]			
Model	A	B	C
09, 12, 18	4 (102mm)	4 (102mm)	4 (102mm)
19, 24, 30, 36	6 (152mm)	6 (152mm)	6 (152mm)
A = distance from left side of unit to interior wall B = distance from right side of unit to interior wall C = distance from front of unit to interior wall			



## NOTICE

Optional return air access panel assembly: Rough opening to enclosure, and enclosure dimensions must be sized to accept access panel door frame, when used. See page 34 for details.

## Rough Openings

**Access opening** — allows unit insertion. Provide minimum opening dimensions. (See Figure 21, Page 33, for dimensions of opening when using optional return access panel assembly.)

**Table 5 Minimum Access Opening Dimensions (Figure 6)**

Model	Width [inches (mm)]		Height [inches (mm)]	
	Front access (front control panel)	Side access (side control panel)	Without hydronic option	With hydronic option
09–12	26 1/8 (664)	26 1/8 (664)	45 3/4 (1162)	55 3/4 (1416)
18	26 1/8 (664)	26 5/8 (676)	45 3/4 (1162)	55 3/4 (664)
19–24	26 1/8 (664)	33 5/8 (854)	57 3/4 (1467)	69 3/4 (664)
30	28 9/16 (726)	36 1/4 (921)	58 3/4 (1492)	N/A
36	28 9/16 (726)	36 1/4 (921)	58 3/4 (1492)	N/A

**Wall sleeve rough opening** — rough opening in wall for wall sleeve and louver, must be correct dimension and exact position necessary for installation.

**Table 6 VPRC/VPRH rough wall sleeve opening**

Model	Width [inches (mm)]	Height [inches (mm)]
09–12	26 1/8 (664)	26 1/8 (664)
18	26 1/8 (664)	26 5/8 (676)
19–24	26 1/8 (664)	33 5/8 (854)
30	28 9/16 (726)	36 1/4 (921)
36	28 9/16 (726)	36 1/4 (921)

## Platform

See Figure 7, Page 12 and Figure 10, Page 15 for details of platform and wall sleeve installation.

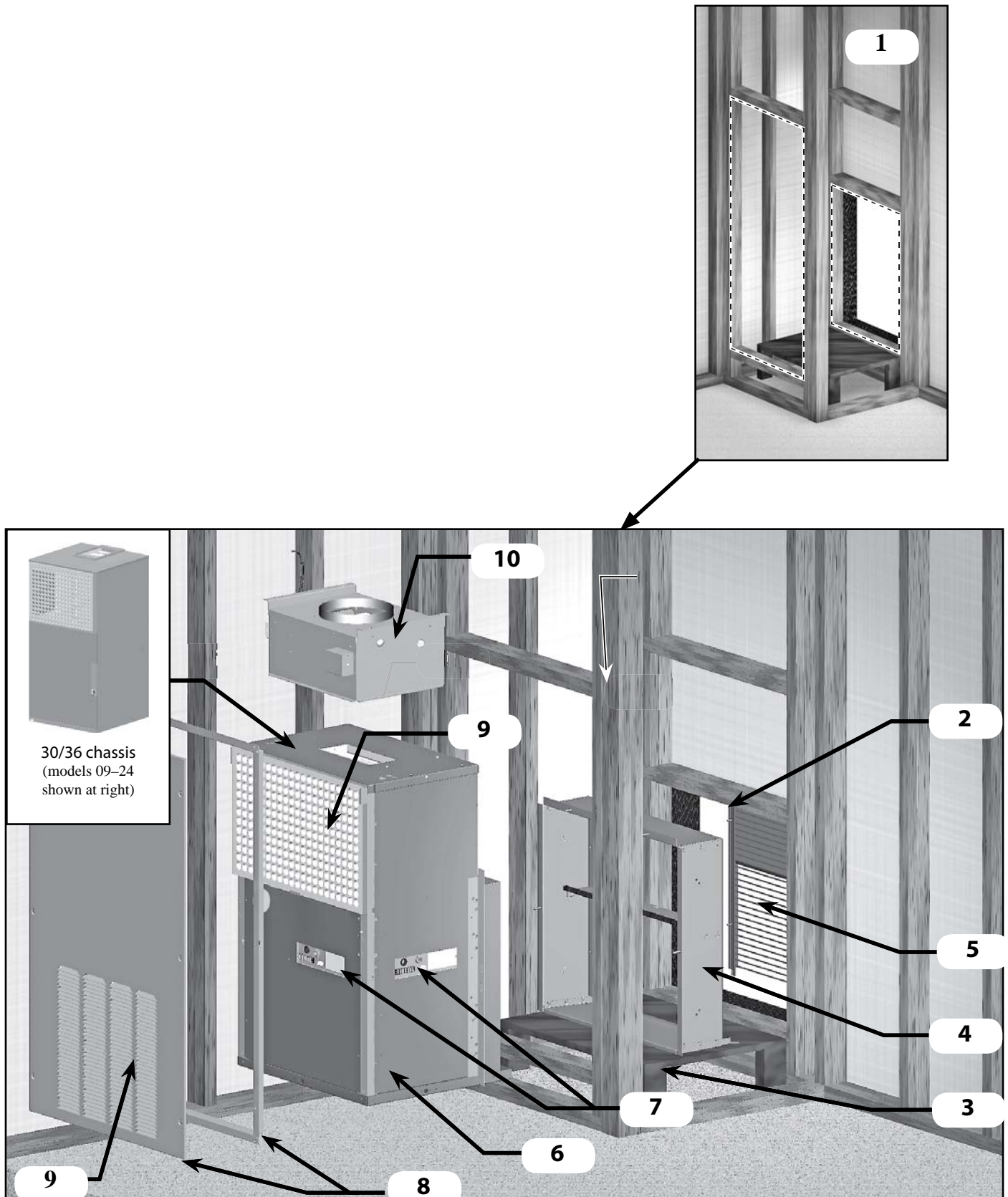
Platform height must make bottom of VPRC or VPRH chassis flush with bottom inside edge of wall sleeve. Platform surface must be 1/2 inch (13 mm) **ABOVE** bottom of wall sleeve rough opening.

Platform dimensions above will allow chassis base pan to align with bottom of wall sleeve.

## Air filter

All models must have air filter installed prior to operation. Use chassis-mounted air filter provided, unless using. For optional return air access panel, remove and discard filter from unit and install access panel with supplied filter in place.

Figure 7 Exploded View Of Typical Installation (Chassis shown is typical of models 09–24)



<b>Exploded View Of Typical Installation (Chassis shown is typical of models 09–24)</b>	
<b>1</b>	<p>Access opening (for unit insertion/removal) — See unit dimensions in Figures 2, 3, 4, Pages 5-7. See Table 6, page 11 for minimum recommended opening dimensions. Allow for extra height of hydronic coil module, if used.</p> <p><b>NOTE:</b> Access opening will be in left or right side of enclosure for left or right-side-mounted control panel units (available option on models 09–24 only).</p> <p>See Figure 6, Page 11 for minimum clearances around unit to determine minimum enclosure dimensions.</p>
<b>2</b>	Wall sleeve opening to outside — See required dimensions in Table 7, Page 11.
<b>3</b>	Platform (see page 11) — See Figure 10, Page 15 for required platform height. Platform must be level.
<b>4</b>	Wall sleeve (see page 14) — Wall sleeve must accommodate total wall thickness (from inside surface of wall sleeve opening to surface of outside wall).
<b>5</b>	Outside louver- — Outside louver attaches to wall sleeve with nuts placed on louver studs.
<b>6</b>	VPRC/VPRH chassis.
<b>7</b>	Control panel. Access opening must be on same side of unit as control panel. Thermostat connection terminal block located here
<b>8</b>	Optional return access panel assembly. See Figure 21, Page 33 for details and dimensions.
<b>9</b>	Return air opening — VPRC/VPRH requires air filter on return air. Filter is located on chassis opening unless optional return air access panel is used (for these applications, air filter is removed from chassis — filter is installed on access panel).
<b>10</b>	Hydronic coil option — See pages 35 to 37.

## Verify Wall Sleeve Depth

Wall sleeve depth must be suitable for overall wall thickness. (Figure 8).

Consult manufacturer for available wall sleeves.

- Minimum wall sleeve depth is 6½ inch (165 mm) overall wall thickness, and available in ½-inch (13-mm) increments for thicker walls.
- Wall thickness less than 6½ inches, wall sleeve will penetrate into room, and will require interior framing adaptations for proper fit.

## Verify Openings And Enclosure

- Verify access opening size, wall sleeve opening size and enclosure size. See page 11.
- Verify wall sleeve opening is square by measuring corner to corner. Also
- Verify platform (if used) is at correct height and is level with wall sleeve opening. Adjust platform and framing as necessary. If opening and platform are not square, unit will not fit properly to wall sleeve.

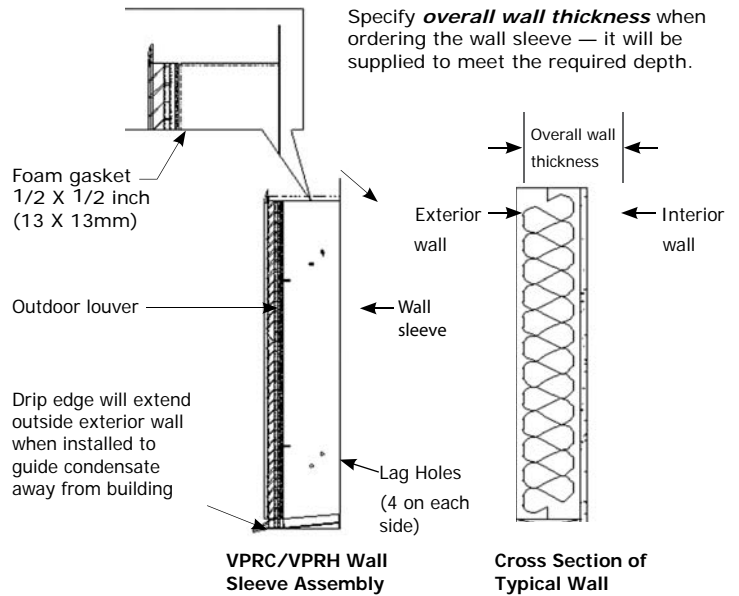
## Assemble wall sleeve (09–24 only)

- Models 09–24 are supplied with tabbed-assembly wall sleeve.
- Follow instructions supplied with wall sleeve to assemble. Wall sleeve should look like that shown in Figure 9.
- Wall sleeves for models 30–36 are factory assembled.

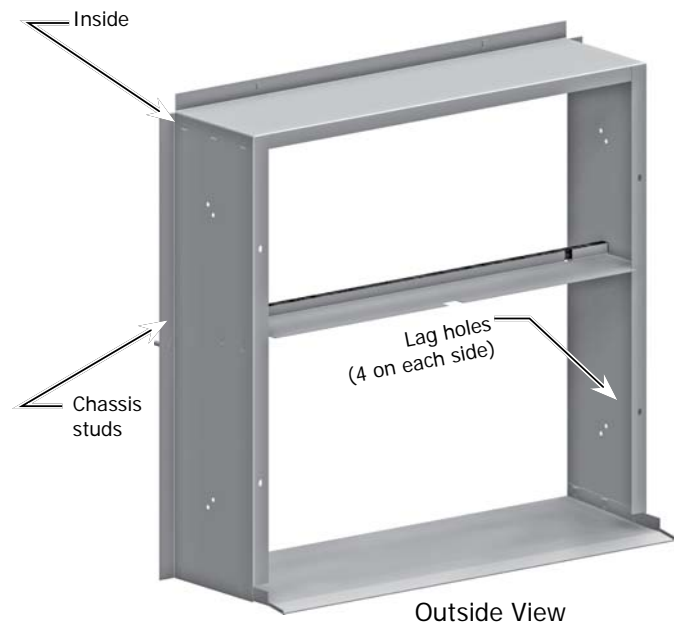
## Secure the wall sleeve

- Slide wall sleeve into rough opening.
- Slide wall sleeve to one side of opening, preferably to side that is most plumb.
- Secure wall sleeve to this side of opening using screws through lag holes (see Figure 9), verify wall sleeve is level. Fill any gaps between wall sleeve and opening with shims to prevent distortion when screws are tightened.
- Secure wall sleeve to other side in same manner. Verify wall sleeve is both square and level before tightening screws.

**Figure 8 Determining wall sleeve depth**



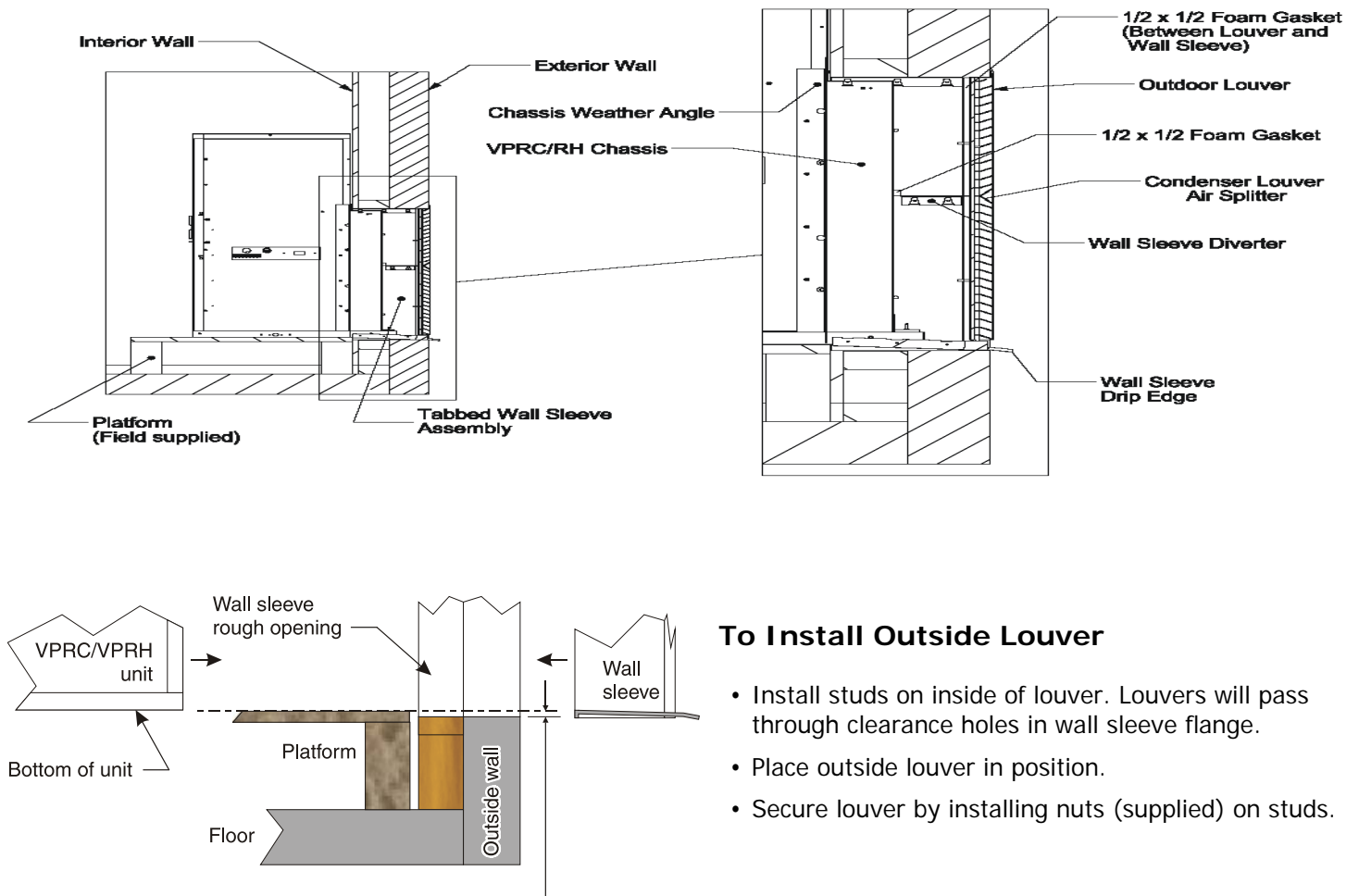
**Figure 9 Typical tabbed-assembly wall sleeve (09–24)**





## TYPICAL CHASSIS AND WALL SLEEVE, INSTALLATION

Figure 10 Typical VPRC/VPRH Installation, With Platform

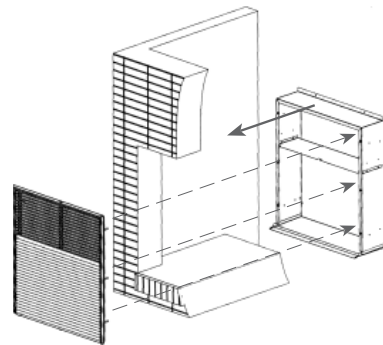


### To Install Outside Louver

- Install studs on inside of louver. Louvers will pass through clearance holes in wall sleeve flange.
- Place outside louver in position.
- Secure louver by installing nuts (supplied) on studs.

Platform surface must be 1/2 inch (13 mm) **ABOVE** bottom of wall sleeve rough opening.

\*NOTE: If replacing model VPAC/VPHP 30 with VPRC/VPRH 30 raise platform surface additional 3/8 in. (10mm) to accommodate new wall sleeve.



## FRONT-MOUNTED CONTROL PANEL - CHASSIS AND WALL SLEEVE, INSTALLATION

### Hydronic Coil (Optional)

Install hydronic coil option BEFORE placing chassis in wall sleeve. See pages 35-37.

### Inspect Foam Insulation

Verify foam insulation strips around condenser opening are intact. Replace if necessary. Foam insulation must be in place and in good condition to prevent air or water leakage or air recirculation. See Figure 11 and Figure 12.

### Attach Weather Angles

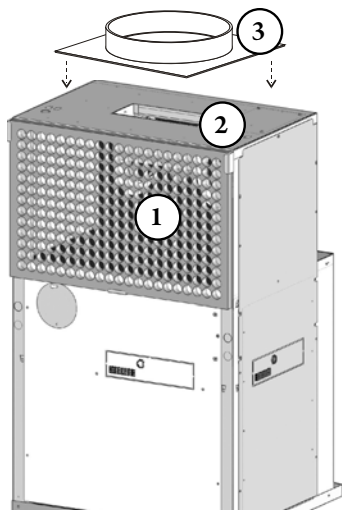
Using screws provided, attach weather angle to each side of chassis as shown in Figures 11 and 12.

### Insert Chassis Into Wall Sleeve

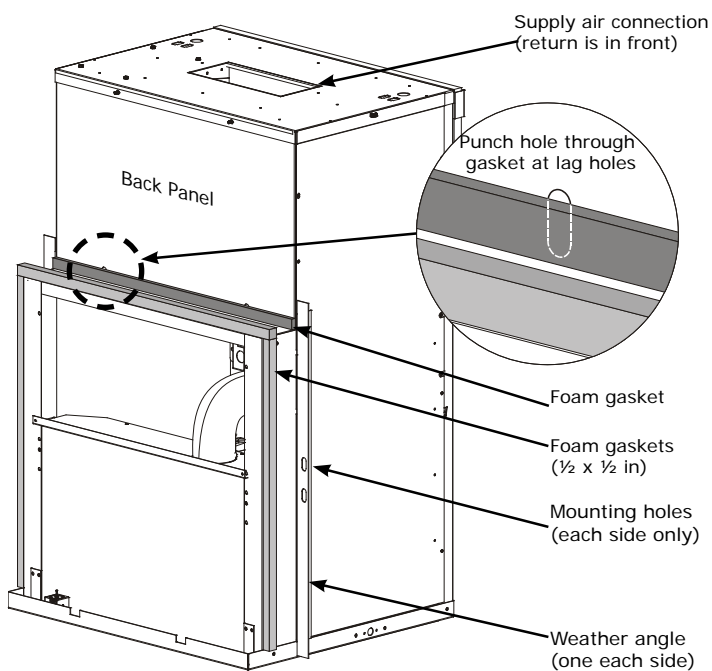
- Slide chassis into wall sleeve, verify studs on wall sleeve slide through holes in back panel and weather angles.
- Attach ¼-20 nuts to studs that pass through weather angles, each side of chassis.
- **DO NOT** attach nuts to studs that pass through back panel of chassis. This would make removal difficult.
- Chassis must be firmly attached to wall sleeve to prevent leakage or recirculation.
- See Figure 10, Page 15, for side view of typical completed installation.

### Plenum and Duct Work

1. Install plenum and duct work to supply air connection, all models.
2. Install return air duct work, if applicable (VPRH/VPRC 30–36 only).
3. For models 09–18, accessory 10-inch round duct collar is available.
  - 1: return air inlet with filter installed
  - 2: supply air outlet
  - 3: optional supply air duct collar, 10-inch (254mm) round



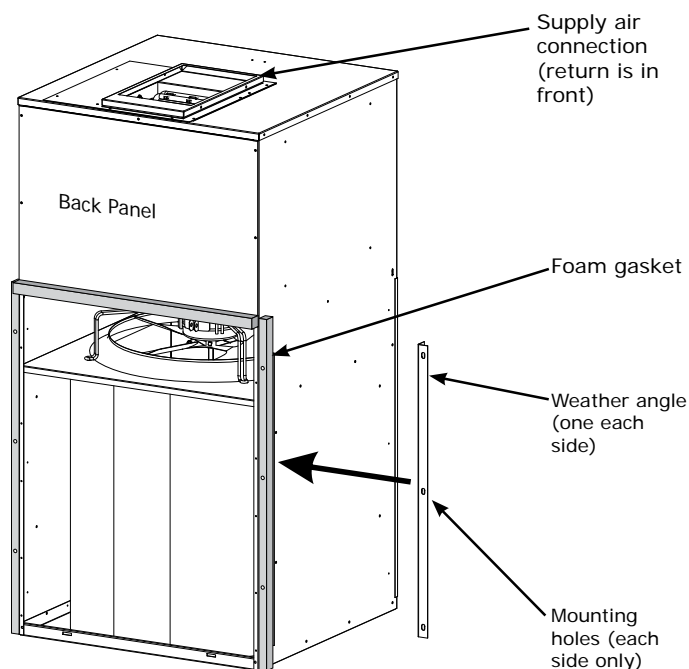
**Figure 11 Foam Gasket & Weather Angles (09–24) Front Control Panel Installations**



Punch holes in foam gaskets at locations of mounting holes in back panel and weather angles (see callouts in Figure 13 and Figure 14).

Making it easier for wall sleeve studs to pass through holes when chassis is slid into place.

**Figure 12 Foam Gasket & Weather Angles (30–36) Front Control Panel Installations**



## SIDE-MOUNTED CONTROL PANEL - CHASSIS AND WALL SLEEVE, INSTALLATION

### Inspect Foam Insulation

- Verify foam insulation strips around condenser opening are intact (see Figure 13 and 14). Replace if necessary.
- Foam insulation must be in place and in good condition to prevent leakage or recirculation.

### Insert Chassis Into Wall Sleeve

- **Right-side-mounted** control panel — remove right side panel.
- **Left-side-mounted** control panel — remove left side panel.
- Slide chassis into wall sleeve, verify studs on wall sleeve slide through holes in back panel.
- Attach ¼-20 nuts to studs that pass through back panel.
- Chassis must be firmly attached to wall sleeve to prevent air or water leakage or air recirculation.

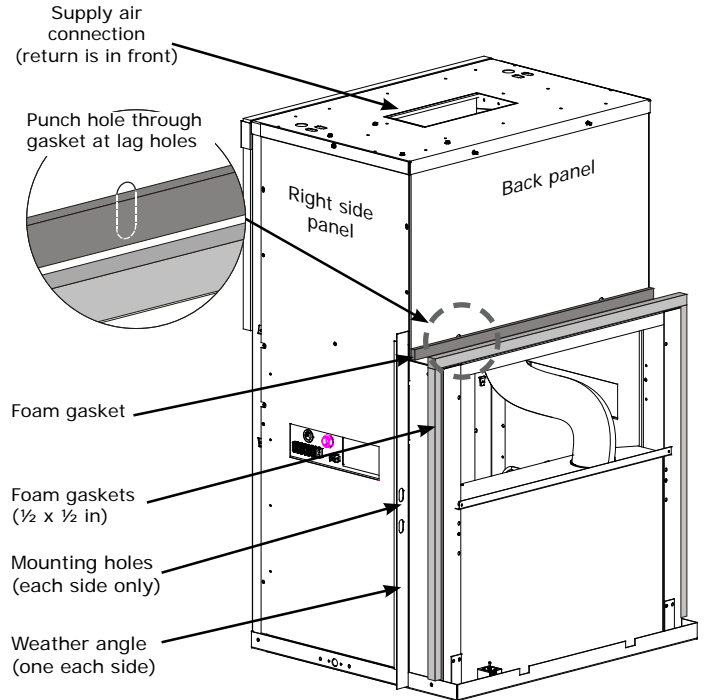
### Attach Weather Angle

- **Right-side-mounted** control panel
  - A. Replace right side panel.
  - B. See Figure 13 for location of right-side weather angle.
  - C. Using screws provided, attach weather angle to chassis. See Figure 14.
  - D. DO NOT install left-side weather angle.
  - E. Attach ¼-20 nuts to studs that pass through weather angle.
- **Left-side-mounted** control panel
  - A. Replace left side panel.
  - B. See Figure 14 for location of right-side weather angle.
  - C. Using screws provided, attach weather angle to chassis. See Figure 14.
  - D. DO NOT install right-side weather angle.
  - E. Attach ¼-20 nuts to studs that pass through weather angle.
- See Figure 9, Page 15, for side view of typical completed installation.

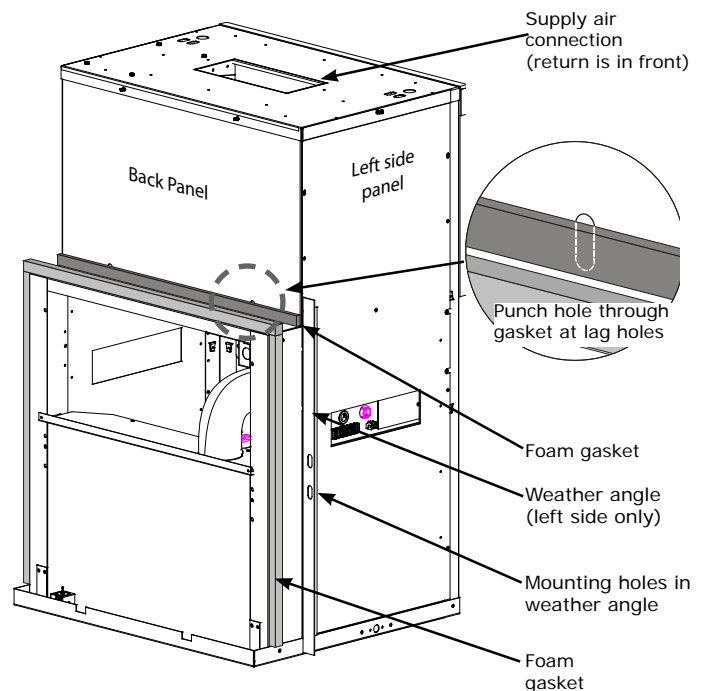
### Plenum And Duct Work

- Install plenum and duct work.

**Figure 13 Foam Gasket & Weather Angles (09–24) Right-Side Control Panel Installations**



**Figure 14 Foam Gasket & Weather Angles (09–24) Left-Side Control Panel Installations**



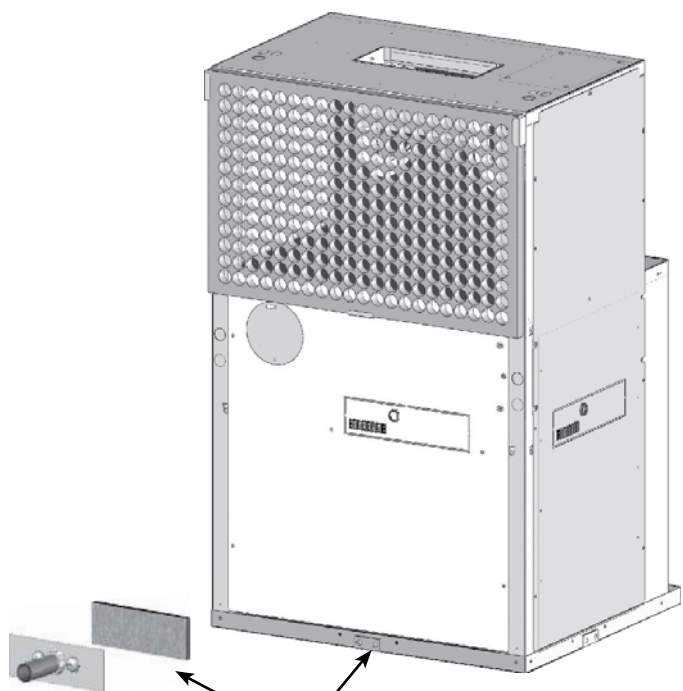
Punch holes in foam gaskets at locations of mounting holes in back panel and weather angles (see callouts in Figure 13 and 14).

Making it easier for wall sleeve studs to pass through holes when chassis is slid into place

## Condensate drain

1. Models VPRC/VPRH 09,12,19, and 24 are designed so condensate generated during cooling operation is delivered to base pan, and picked up by outdoor fan's slinger ring.
2. Condensate is slung onto outdoor coil where it evaporates. Any excess condensate, or wind driven rain that enters base pan will overflow through notches located in rear of unit and run out wall sleeve, onto drip edge, and out of building.
3. Models VPRH 09,12,19, and 24 are also equipped with thermostatic drain valve located on bottom of base pan. Valve opens when outdoor temperatures reach 50°F (10°C), and allows any residual condensate or wind driven rain in base pan to run out wall sleeve as stated above. Protects outdoor fan from damage during heat pump operation.

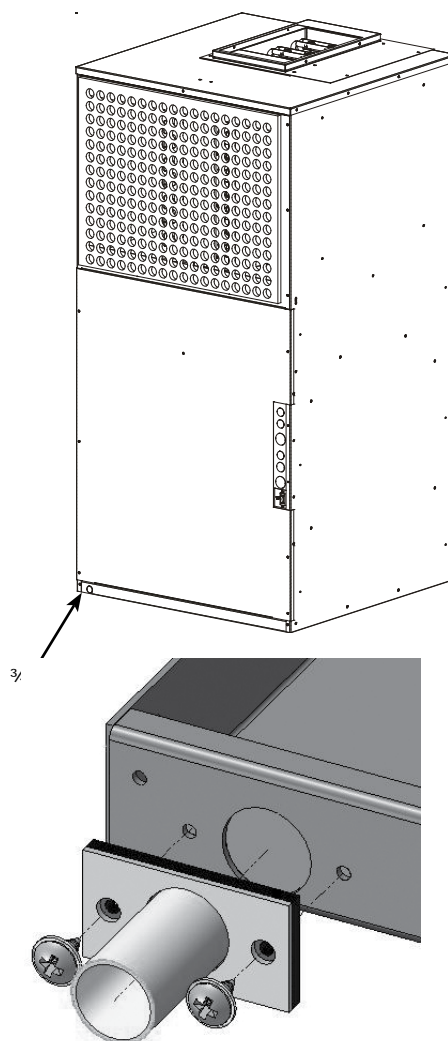
**Figure 15 Drain Stub Location - Models 09–24 (Optional On Models 09, 12, 19 And 24; Included And Required On Model 18)**



Movable drain stub, ½" ID tube connection may be located on front, right or left side of unit. Swap gasketed drain stub plate with blanking plate to relocate to alternate location.

4. Accessory drain stub kit is available for models VPRC/VPRH 09,12,19, and 24. Optional field installed kit is designed for use with building's internal drain system, and must be installed prior to operation. See Figure 15 for available stub locations on base pan, and connection size. If unit is equipped with additional drain stub in basepan, connect drain stub to building's internal condensate removal system.
5. Model VPRC/VPRH 18 is supplied with drain stub that must be field installed on unit, and connected to building's internal drain system prior to operation. See Figure 15 for locations on base pan, and connection size.
6. Models VPRC/VPRH 30 and 36 are supplied with drain stub that must be field installed, and connected to building's internal drain system prior to operation. See Figure 16 for location on base pan, and connection size.
7. Drain stub must be connected to internal condensate removal system.
8. Use of internal condensate drain stub requires connection to be lower than base pan weep holes, located near bottom of condensor coil.

**Figure 16 Drain Stub Location (Models 30–36)**



### Electrical Connections

#### **WARNING**

Electrical shock hazard. Disconnect all power before removing chassis, performing any cleaning, servicing, or maintenance. Failure to do so could result in death or serious injury.

Refer to wiring diagram attached to unit for wiring details. All field wiring shall conform to requirements of authority having jurisdiction or in absence of such requirements:

- United States
  - National Electrical Code, ANSI/NFPA 70
- Canada
  - CSA C22.1 Canadian Electrical Code Part 1.
- Check VPRC/VPRH ratings.
- Installer is responsible for ensuring VPRC/VPRH units are installed in accordance with all applicable national and local codes.
- Check rating plate for circuit ampacity.
- Size breaker(s) or fuse size(s) accordingly.
  - A. Use only HACR type breakers or time delay fuses.
  - B. Select proper wire for breaker or fuse size used.
  - C. Some units require more than one power supply.
  - D. If plug and receptacle are used, check for proper fit.
  - E. Check nameplate and wiring diagram for further instructions and wire connections.
  - F. Each unit is equipped for 24v wall thermostat connection.

#### **NOTICE**

VPRC/VPRH units are wired for 230v primary voltage from manufacturer. Transformer must be rewired by installer if jobsite voltage is 208v.

### Power Cord With Integral Safety Protection

All VPRC/VPRH units that are cord connected to power supply are equipped with power cord with integral sensor:

- Provides personal shock protection.
- Provides arcing and fire prevention.
- Senses any damage in line cord and disconnects power before fire can occur.

Tested in accordance with Underwriters Laboratories, cord set also offers unique "passive" operation, unit does not require resetting if main power is interrupted.

### Disconnect Switch (Optional)

Disconnect switch ensures all power to control box is disconnected for servicing, resetting if main power is interrupted.

- Each power cord must be tested before use. Follow test instructions in order listed on plug of power supply cord.
- **DO NOT** use product if power supply cord fails test.
- **DO NOT** attempt to repair damaged power supply cord. Replace with new cord from manufacturer only.

### Choosing Thermostat

Manufacturer offers choice of single-stage or two-stage mercury-free thermostat compatible with all models of VPRC/VPRH. (Use two-stage thermostat for VPRH units equipped with electric heat option.)

- RetroAire™ thermostats have digital readout with temperature control range from 45°F (7°C) to 90°F (32°C).
- When using field sourced thermostat use ONLY 24v heat/cool thermostat.

### Cooling-Only With Electric Or Hydronic Heat (VPRC only)

- Select thermostat compatible with cooling/electric heat system.
- Thermostat should have "R", "Y", "W" and "G" terminals.

## Heat Pump With Electric Heat (*VPRH only*)

### Single-Stage Thermostat

Select thermostat compatible with cooling/single stage heat/heat pump system.

- Thermostat should have "R", "Y", "O" and "G" terminals. RetroAire™ units are single stage heating only.
- Electric heat and heat pump will not operate simultaneously.

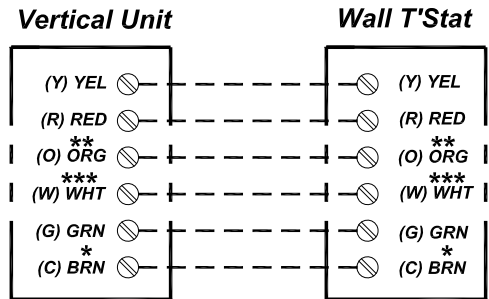
### Two-Stage Thermostat

Two-stage heat pump thermostat can be used with VPRH units.

- See wiring diagram for connections.
- VPRH units are designed to operate as single stage heat pumps — will alternate between heat pump and electric heat to meet heat demand.

## Thermostat Wiring

### Vetrical Stack Low Voltage Thermostat Connection



\* - Some thermostats do not use a "C" terminal

\*\* - (O) Used in Heat Pump Only

\*\*\* - (W) May be W1 on two stage thermostats



## ⚠ CAUTION

Moving parts can cause injury. Use caution when testing unit. Failure to do so could result in minor or moderate injury.

1. Do not operate unit without filter in place or use as temporary heating/cooling source during construction.
2. Plug in line cord, if supplied, or hard wire line voltage power to the unit. Refer to unit rating plate for proper voltage and amperage/fuse size.
3. Unit may require two power supplies (check nameplate and wiring diagram for further instructions.)
4. Connect low voltage wires from thermostat to unit. Follow wire diagram for details.
5. Turn power on and check for proper operation.

### Before Operating This Unit:

- ☐ Read and understand this manual.
- ☐ Verify electrical supply matches electrical requirements of unit, and unit is properly grounded.
- ☐ Examine control box. Verify all wire connections are secure, and control board jumpers are in proper positions. See Page 28.
- ☐ Verify indoor blower wheels and outdoor fan blades are secured to their motor shafts.
- ☐ Ensure all sheet metal panels are in place and secure.
- ☐ Verify drain stub, if used, is secure to base pan, and condensate drain is functioning properly.
- ☐ Verify chassis is properly fitted to wall sleeve, and securely mounted to surrounding framing.

### Heating

1. Set wall thermostat to heat mode.
2. Set thermostat above room setting.
3. After few minutes of operation, warm air should discharge from grilles.
4. Do not operate unit when panels are removed.

### Cooling

5. Set wall thermostat to cool mode. Set thermostat below room temperature setting.
6. After few minutes of operation, cool air should discharge from grilles.
7. Thermostat can be set at desired setting with selector switch in heat or cool position.
8. Verify unit is level.
9. Check condensate removal by pouring water into base pan, put unit in cooling mode, with condenser fan running, see if water is picked up by slinger ring and thrown onto outdoor coil. (Models VPRC/VPRH 09–24 only)
10. If condensate is routed to internal drain, verify drain is functioning properly.
11. Verify there is nothing interfering with room discharge air or return air.

### Manual Fresh Air Shutter

Manual fresh air shutter allows user to move fresh air into space to be conditioned. Damper handle is located below indoor coil on service panel (models 09–24 Only).

### Motorized Fresh Air Damper

Motorized damper is used on models 30–36. Damper operating switch is located on control box. See Figure 5, Page 10.

## General

Installation and wiring shall be in accordance with requirements of authority having jurisdiction. In absence of such requirements refer to:

- USA- National Electrical Code, ANSI/NFPA 70.
- Canada - Canadian Electrical Code, Part I, CSA C22.1: Safety Standard for Electrical Installations.

## Units Rated 208/230V:

- RetroAire unit is wired for 230v primary voltage from manufacturer.
- Transformer must be rewired by installer if jobsite voltage is 208v.
- Change transformer tap from orange to red. See wiring diagram for details.

## Setting Control Board Jumpers

Control board has two sets of factory installed jumper pins on control board, **HP** jumper and **TEST** jumper.

**HP Jumper** — selects heat pump or straight cooling.

Pins determine whether unit operates as straight cooling or as heat pump. See Figures 17 and 19.

- Jumper right pin to center pin for heat pump operation.
- Jumper left pin to center pin for straight cooling operation.

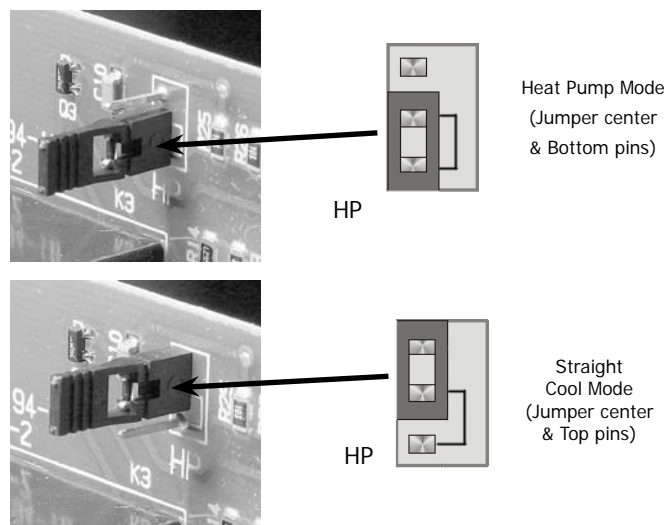
**TEST Jumper** — selects normal or test mode

### NOTICE

Do not leave unit operating with TEST jumper in TEST position.

- Jumper is for testing only. See Figure 18 and 19.
- When jumper pins are jumpered together, all timers are eliminated (*example — anti-short cycle, purge, etc.*).
- May be used for field testing. Units are factory set with jumper on only one pin (*normal operation position*).

**Figure 17 HP Jumper** (*selects heat pump or straight cooling*)



**Figure 18 TEST jumper** (*selects normal or test mode*)

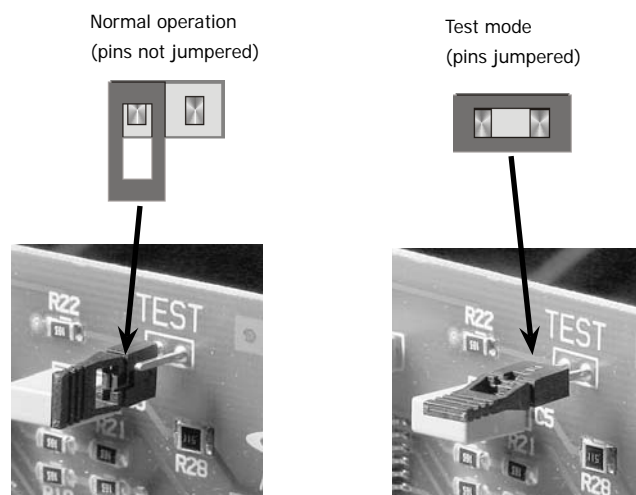
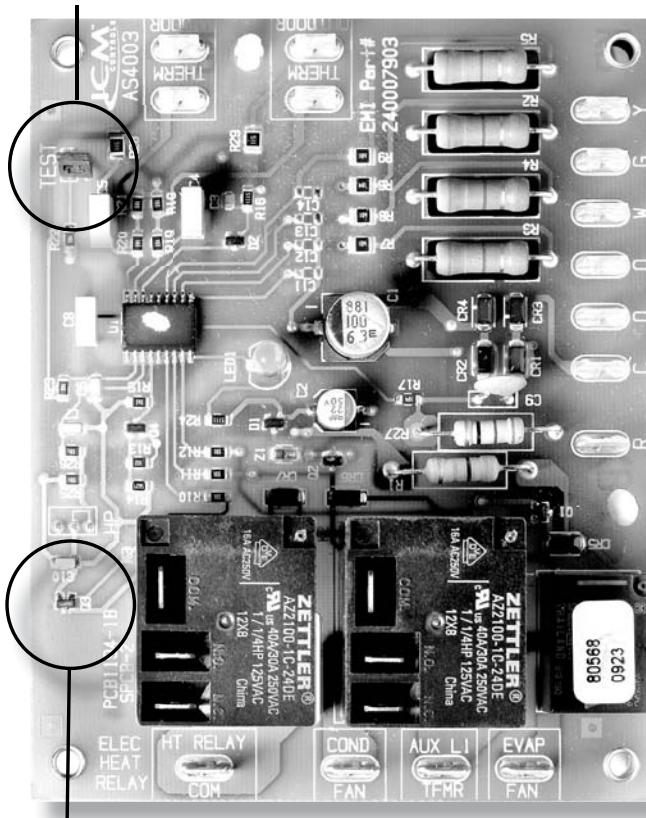


Figure 19 Circuit Board

TEST JUMPER



HEAT PUMP  
JUMPER

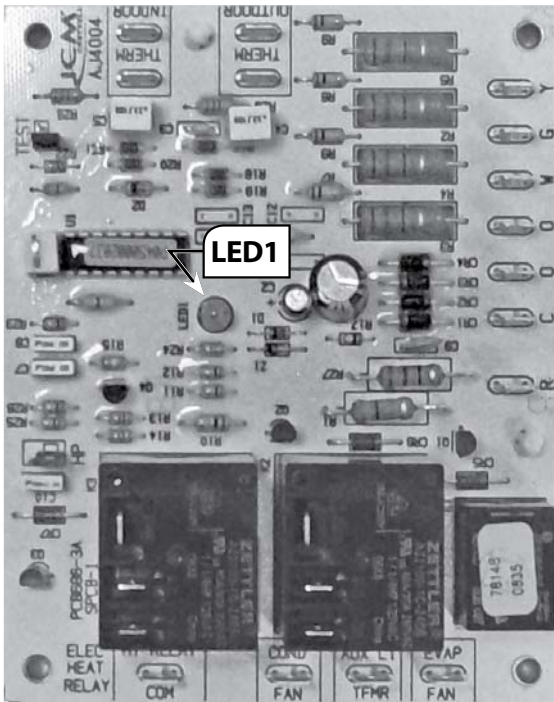
## SEQUENCE OF OPERATION

### Initial Power-Up Or Power Restoration

When power is applied, either for first time or after power failure, board will initialize.

- During initialization, LED1 will be lit continuously for approximately 5 seconds.
- Following initialization, random-start timer is initiated. This timer adds randomly selected 5-120 seconds to start-up sequence, reducing possibility of multiple units starting at same time.
- Once random start timer has expired, 180-second anti-short-cycle timer is initiated. LED1 blinks two-flash code. (Anti-short-cycle timer prevents compressor from rapid cycling.)
- After the anti-short-cycle timer expires, LED1 blinks a one-blink code, indicating normal operation.

**Figure 20 Indicator LED1**



### Fan Operation

Some thermostats are equipped with auto/on fan switch.

- When switch is placed in on position indoor fan will run continuous.
- When switch is in auto position indoor fan will cycle with call for heating or cooling.
- **Fan purge** (auto mode only) — after room thermostat has been satisfied, purge feature allows indoor fan to remain on for additional 60 seconds. Increases efficiency by pulling remaining energy from unit.

### Cooling Operation

- If room temperature is above thermostat setting, reversing valve (VPRH only) will be energized.
- Compressor and outdoor fan will start provided Anti-Short Cycle Timer has timed out from initial power-up, power restoration or previous compressor on cycle.
- Operation will continue until room temperature satisfies thermostat. Once room temperature falls below set point by 3 °F (2 °C), compressor, outdoor fan motor and reversing valve (VPRH only) will de-energize.
- As soon as compressor is de-energized, anti-short-cycle timer will be initialized and prevent compressor from starting again for another 180 seconds.
- While anti-short-cycle timer is active, LED1 is set to blink two-flash code.
- After anti-short-cycle timer expires, LED1 is set to blink one-blink code, indicating normal operation.

### Mechanical Heating (VPRH only)

- If outdoor coil temperature remains above 25°F (-4°C), compressor and outdoor fan will start provided anti-short-cycle timer has timed out from initial power-up, power restoration or previous compressor on cycle. Operation will continue until room temperature satisfies thermostat.
- Once room temperature rises above set point by 3 °F (2°C), compressor and outdoor fan motor will de-energize.
- As soon as compressor is de-energized, anti-short-cycle timer will be initialized and will prevent compressor from starting again for another 180 seconds. While anti-short-cycle timer is active, LED1 blinks two-flash code. After anti-short-cycle timer expires, LED1 flashes one-blink code, indicating normal operation.

### Auxiliary Heating

- If outdoor coil temperature falls to 25°F (-4°C) or below for 180 seconds during heating call, compressor and outdoor fan motor will be de-energized and auxiliary heat will be energized.
- Anti-short-cycle timer will be initiated, prohibiting compressor operation for 180 seconds.
- LED1 will flash three-blink code, indicating auxiliary heat operation. Heating operation with auxiliary heat will continue until outdoor coil sensor reaches 50°F (10°C).

### Hydronic Heating

- With call for heat, signal from processor board will activate water or steam valve and indoor fan.
- Signal to water or steam valve will continue until room temperature rises above set point by 3°F (2°C).

## ⚠ WARNING

Electrical shock hazard. Disconnect power to VPRC/VPRH before servicing or accessing control compartment. Failure to do so could result in severe personal injury or death.

## NOTICE

Perform regular service and maintenance by qualified service agency at least once every 12 months to assure safe, trouble free operation and maximum efficiency.

## NOTICE

Verify proper operation after servicing.

### Maintenance Schedule

Manufacturer recommends performing following inspections and maintenance on monthly basis. Units installed in harsh or dirty environments will require more frequent inspections and maintenance.

Disconnect power to unit and remove necessary access panels:

- ☐ Clean or replace indoor air filter.
- ☐ Inspect chassis interior for rodent or insect infestation. Clean if necessary.
- ☐ Clean & flush condensate drain pan and chassis base pan.
- ☐ If applicable, verify condensate drain is functioning properly.
- ☐ Inspect refrigeration tubing, especially braze joints, for signs of refrigerant leaks (oil residue). Repair if necessary.
- ☐ Inspect indoor and outdoor coils. Verify dirt or debris have not collected on fins. Clean if necessary. Take care not to damage coil fins when cleaning. Use fin comb to straighten any bent fins.
- ☐ Examine control box. Verify all wire connections are secure.
- ☐ Verify indoor blower wheels and outdoor fan blades are secured to their motor shafts.
- ☐ Verify dirt or debris have not collected on indoor blower wheels and outdoor fan blades. Use vacuum and soft brush to clean if necessary.
- ☐ Verify any ductwork connected to unit is secure and free of air leaks.
- ☐ If unit has hydronic option installed, inspect piping, especially braze joints, for signs of water leaks.

Repair if necessary.

### Seasonal Start-Up And Maintenance

Beginning of cooling and heating seasons, complete mechanical check should be performed and maintenance/inspections performed as described below.

Disconnect power to unit and remove necessary access panels:

1. Remove access panel. Visually inspect equipment. Look for obvious changes in unit such as damaged coils or evidence of extended wear on any moving parts.
2. Check for unusual odors or leaks (examples: burnt motor windings, water, or refrigerant). Verify base pan is clean.
3. Clean or replace return air filter as needed. Allowing dust to collect on filter. Check filter at least once month. Some environments may require more frequent replacement, depending on particulate in air stream.
4. Inspect all electrical connections for frayed wires and poor connections.
5. Check fan motors and blower assemblies. Verify screws and motor mounting hardware are tight.
6. Centrifugal fan blades and blower cage brush and/or vacuum as necessary.
7. Inspect both indoor and outdoor coils. Use fin comb to straighten out any damaged fins.

## NOTICE

Do not use solvent based cleaner to clean coils, some solvents will produce noxious odor when unit is in operation.

8. Look for oil leaks or stains on or around all braze joints and refrigerant lines. Presence of oil here indicates potentially serious problem (such as refrigerant leak).
9. Inspect and clean drain pan and drain line(s). Use of anti-fungicide tablet to keep condensate system free from bacterial contaminants is recommended.
10. Verify unit is level for proper operation. Building and equipment may settle, causing shift in direction of condensate flow. (Note that bottom of wall sleeve is pitched downward to shed water to outside. Verify any shifting does not interfere with proper drainage.)
11. Verify weep holes along rear flange of base pan are free of debris.
12. Verify seal around unit is not broken or damaged.
13. Air leaks may make the conditioned area uncomfortably drafty or produce noises. Visually inspect foam gasket between wall and unit, taking note of separation between air inlet for condenser and condenser coil discharge. These two areas must be sealed off from each other. If you experience poor cooling operation or erratic operation, check for air recirculation at condenser coil.
14. Replace access panels and reconnect electrical power.



## TROUBLESHOOTING

### **WARNING**

Electrical shock hazard. Disconnect power to unit before servicing or accessing control compartment. Failure to do so could result in severe personal injury or death.

### **NOTICE**

Have qualified technician conduct troubleshooting procedures.

Symptom	Suggestion
No heat or cooling	<ul style="list-style-type: none"> <li>Check to see if unit has power and if thermostat is satisfied. If thermostat is not satisfied, call your installing contractor or service contractor.</li> </ul>
Thermostat calls for cooling, but cool air is not coming out of unit.	<ul style="list-style-type: none"> <li>Check for continuity between thermostat and unit. Verify 24Vac is present across terminals C and R.</li> <li>Verify high pressure switch located in outdoor section has not been tripped. If tripped, press switch button to restart compressor.</li> <li>Some units are equipped with LCDI (Leakage current detection interrupt) line cord. Verify this line cord is reset by pressing reset button at line cord plug.</li> <li>Note: If evaporator fan is operational and all of above suggested procedures have been followed, and there is still no cooling being supplied by unit, contact trained heating and cooling professional.</li> </ul>
Light on circuit board is blinking.	<ul style="list-style-type: none"> <li>Circuit board uses light for diagnostic purposes. Blinking codes are as follows: <ul style="list-style-type: none"> <li>1 blink = normal operation</li> <li>2 blinks = compressor lockout (ASCT — Anti-short cycle timer)</li> <li>3 blinks = outdoor freeze condition</li> <li>4 blinks = indoor freeze condition</li> <li>5 blinks = simultaneous Y and W call (Straight cool units only)</li> </ul> </li> </ul>
Circuit board light is blinking 3 or 4 times, but there is no freeze condition.	<ul style="list-style-type: none"> <li>Verify sensors have not been damaged. Remove sensor wires from control board and make resistance measurements, compare to following sensor resistances. Indoor and outdoor coil sensor wires are labelled, as is control board. <ul style="list-style-type: none"> <li>77 °F = 10KOhms</li> <li>50F = 19.9KOhms</li> <li>35F = 30KOhms</li> <li>30F = 34.4KOhms</li> </ul> </li> </ul>
Thermostat is satisfied, but fan is still running.	<ul style="list-style-type: none"> <li>If thermostat is set to auto mode, once thermostat is satisfied, fan will stay energized for extra 60 seconds to purge unit of excess cool or warm air in plenum.</li> <li>If thermostat fan switch is set to ON, fan will stay energized regardless of whether thermostat is satisfied or not. Only way to turn fan off is to turn unit off or turn thermostat fan switch to AUTO.</li> </ul>
Thermostat calls for heat, but no heat comes out of unit.	<ul style="list-style-type: none"> <li>Units equipped with electric heaters have temperature limit switch to prevent electric heater from reaching unsafe temperatures. If after calling for heating, heater is not energized, check for continuity across limit. If limit is open, replace if with equivalent limit switch.</li> </ul>
Thermostat calls for heat while in heat pump mode, but heated air is not coming out of unit.	<ul style="list-style-type: none"> <li>Verify unit has power or thermostat has been satisfied. If unit has power and thermostat is satisfied, turn thermostat few degrees above room temperature.</li> <li>Verify LCDI line cord has not tripped. (See Ppage 19.)</li> <li>While in heat pump mode, verify thermostat is not energizing O terminal. Retroaire units are designed to work in heat pump mode when 24vac is present across Y and C. Verify heat pump jumper on control board is jumping two pins labeled "HP" (see control board jumper locations, Figure 17, Page 22).</li> <li>Verify there are no freeze conditions. Refer to blinking codes question above for more information.</li> </ul>



**Indoor Motor Speed Tap Selection**

- For information on indoor motor speed tap selection, please refer to "Indoor Motor Speed Tap Selection Chart" label attached to chassis of VPRC/VPRH (Table 8).
- Models' VPRC/VPRH 09–36 motors are factory-wired for corresponding units as described in 230V column Table 8.
- Make speed tap changes as required by job site voltage and/or external static pressure (ESP).
- Speed tap changes may need to be changed from manufacturer settings. Manufacturer will not be liable for any system problems that could arise if motor speed is not changed to match application.

**Table 7 VPRC/VPRH Indoor motor speed tap selection chart**

Model	ESP In. w.c. (mm w.c.)	230V	208V	197V
09	0.1 (3)	Red	Red	Red
	0.2 (5)			Blu
	0.3 (8)		Blu	
12	0.1 (3)	Blu	Blu	Blu
	0.2 (5)			Blk
	0.3 (8)		Blk	
18, 19, 24	0.1 (3)	Blk	Blk	Blk
	0.2 (5)			
	0.3 (8)			
30	0.1 (3)	Blu	Blu	Blu
	0.2 (5)			Blk
	0.3 (8)			
36	0.1 (3)	Blk	Blk	Blk
	0.2 (5)			
	0.3 (8)			
Tap Key — Red (Low) — Blu (Med) — Blk (High)				












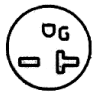




## ELECTRICAL SPECIFICATIONS

**Table 9 Legend For Electrical Specifications**

<b>FLA</b>	Full Load Amps
<b>H-WIRE</b>	Hard Wired
<b>HA</b>	Heater Amps
<b>Hp</b>	Horse Power
<b>Htr #</b>	Heater Option Number (see Figure 1)
<b>IFM</b>	Indoor Fan Motor
<b>LRA</b>	Locked Rotor Amps
<b>Max</b>	Maximum
<b>MCA</b>	Maximum Circuit Ampacity

<b>Min</b>	Minimum
<b>MOCP</b>	Maximum Overcurrent Protection Device Amps (HACR-type breakers or time-delay fuses)
<b>OFM</b>	Outdoor Fan Motor
<b>RLA</b>	Rated Load Amps
<b>TCA</b>	Total Cooling Amps
<b>THA</b>	Total Heating Amps
<b>Volt</b>	Voltage
<b>W</b>	Watts

**Table 8 NEMA Specifications Non-Locking/Receptacles**

	125V		250V			265V		
	15(A)	20(A)	15(A)	20(A)	30(A)	15(A)	20(A)	30(A)
<b>PLUG</b>	 5-15 P	 5-20 P	 6-15 P	 6-20 P	 6-30 P	 7-15 P	 7-20 P	 7-30 P
<b>RECEPTACLE</b>	 5-15 R	 5-20 R	 6-15 R	 6-20 R	 6-30 R	 7-15 R	 7-20 R	 7-30 R

# ELECTRICAL SPECIFICATIONS

**Table 10 VPRC/VPRH 09 Electrical Specification**

Power Supply Volt — 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V	197	3.9	20	0.80	0.07	0.72	0.125	0 or 8	208	N/A	N/A	5.42	0.8*	6.4	15	6–15P
								3	208	2454	11.8		12.6	15.7	20	6–20P
									230	3000	13.0		13.8	17.3		
								4	280	3271	15.7		16.5	20.7	25	6–30P
									230	4000	17.4		18.2	22.7		
								5	208	4089	19.7		20.5	25.6	30	6–30P
									230	5000	21.7		22.5	28.2		
								265V	240	3.32	18.8		0.56	0.07	1.2	0.125
2	265	2655	10.0	10.58	13.2	20										
	277	2901	10.5	11.03	13.8											
3	265	3752	14.2	14.72	18.4	25										
	277	4100	14.8	15.36	19.2											
4	265	4576	17.3	17.83	22.3	25										
	277	5000	18.1	18.61	23.3											

\* THA value applies to hydronic heat only, Htr #8.

**Table 11 VPRC/VPRH 12 Electrical Specifications**

Power Supply Volt — 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V	197	5.2	27	0.80	0.07	0.7	0.09	0 or 8	208	N/A	N/A	6.7	0.8*	8.1	15	6–15P
									230	N/A	N/A					
								3	208	2454	11.8		12.6	15.7	20	6–20P
									230	3000	13.0		13.8	17.3		
								4	280	3271	15.7		16.5	20.7	25	6–30P
									230	4000	17.4		18.2	22.7		
								5	208	4089	19.7		20.5	25.6	30	6–30P
									230	5000	21.7		22.5	28.2		
**208/ 230V	197	5.1	24	0.80	0.07	0.7	0.09	0 or 8	208	N/A	N/A	6.6	0.8*	7.9	15	6–15P
									230	N/A	N/A					
								3	208	2454	11.8		12.6	15.7	20	6–20P
									230	3000	13.0		13.8	17.3		
								4	280	3271	15.7		16.5	20.7	25	6–30P
									230	4000	17.4		18.2	22.7		
								5	208	4089	19.7		20.5	25.6	30	6–30P
									230	5000	21.7		22.5	28.2		
265V	240	4.6	20	0.56	0.07	1.2	0.125	0 or 8	265	N/A	N/A	6.36	0.56	7.6	15	H-WIRE
									277	N/A	N/A					
								2	265	2655	10.0		10.58	13.2	20	
									277	2901	10.5		11.03	13.8		
								3	265	3752	14.2		14.72	18.4	20	
									277	4100	14.8		15.36	19.2		
								4	265	4576	17.3		17.83	22.3	25	
									277	5000	18.1		18.61	23.3		

\*\* Compressor subject to availability (REV. "B")

# ELECTRICAL SPECIFICATIONS

**Table 12 VPRC/VPRH 18 Electrical Specifications**

Power Supply Volt 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V	197	6.5	43	1.0	0.15	0.8	0.125	0 or 8	208	N/A	N/A	8.3	1.0*	10.0	15	6–15P
									230	N/A	N/A					
								3	208	2454	11.8		12.8	16.0	20	6–20P
									230	3000	13.0		14.0	17.6		
								4	280	3271	15.7		16.7	20.9	25	6–30P
									230	4000	17.4		18.4	23.0		
								5	208	4089	19.7		20.7	25.8	30	6–30P
									230	5000	21.7		22.7	28.4		
265V	240	5.8	46	0.56	0.07	0.5	0.17	0 or 8	265	N/A	N/A	6.86	6.86	8.4	15	H-Wire
									265	3752	14.2		14.7	18.4	20	
								3	277	4100	14.8		15.4	19.2	20	
									265	4576	17.3		17.8	22.3	25	
								4	277	5000	18.1		18.6	23.3	25	

\* THA value applies to hydronic heat only, Htr #8.

**Table 13 VPRC/VPRH 19 Electrical Specifications**

Power Supply Volt — 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings					
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug	
208/ 230V	197	7.3	48	1.5	0.25	1.30	0.25	0 or 8	208	N/A	N/A	10.1	1.5*	14.6	15	6–15P	
									230	N/A	N/A						
								3	208	2454	11.8		13.3	16.6	20	6–20P	
									230	3000	13.0		14.5	18.2			
								4	280	3271	15.7		17.2	21.5	25	6–30P	
									230	4000	17.4		18.9	23.6			
								5	208	4089	19.7		21.2	26.4	30	6–30P	
									230	5000	21.7		23.2	29.0			
								7	208	5725	27.5		29.0	36.3	40	H-Wire	
									230	7000	30.4		31.9	39.9			
								1	208	8178	39.3		40.8	51.0	60		
									230	10,000	43.5		45.0	56.2			
265V	240	7.1	43	1.3	0.25	1.3	0.25	0 or 8	265	N/A	N/A	6.86	9.7	11.5	15		
									265	3752	14.2		15.5	19.3	20		
								3	277	4100	14.8		16.1	20.1	25		
									265	4576	17.3		18.6	22.3	25		
								4	277	5000	18.1		19.4	24.2	25		
									265	6635	25.0		26.3	32.9	35		
								7	277	7250	26.2		27.5	34.3	35		
									265	9152	34.5		35.8	44.8	50		
								1	277	10,000	36.1		37.4	46.8	50		

\* THA value applies to hydronic heat only, Htr #8.

# ELECTRICAL SPECIFICATIONS

**Table 14 VPRC/VPRH 24 Electrical Specifications**

Power Supply Volt — 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings					
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug	
208/230V	197	9.4	54.0	1.5	0.25	1.30	0.25	0 or 8	208	N/A	N/A	12.2	1.5 *	14.6	20	6–20P	
									230	N/A	N/A						
								3	208	2454	11.8			13.3	16.6	20	6–20P
									230	3000	13.0			14.5	18.2		
								4	280	3271	15.7			17.2	21.5	25	6–30P
									230	4000	17.4			18.9	23.6		
								5	208	4089	19.7			21.2	26.4	30	6–30P
									230	5000	21.7			23.2	29.0		
								7	208	5725	27.5			29.0	36.3	40	H-Wire
									230	7000	30.4			31.9	39.9		
								1	208	8178	39.3			40.8	51.0	60	
									230	10,000	43.5			45.0	56.2		
265V	240	8.0	46	1.3	0.25	1.3	0.25	0 or 8	265	N/A	N/A	6.86	9.7	11.4	15	H-Wire	
								3	265	3752	14.2			15.5	19.3		20
									277	4100	14.8			16.1	20.1		25
								4	265	4576	17.3			18.6	23.2		25
									277	5000	18.1			19.4	24.2		25
								7	265	6635	25.0			26.3	34.3		35
									277	7250	26.2			27.5	34.0		35
								1	265	9152	34.5			35.8	44.8		50
									277	10,000	36.1			37.4	46.8		50

\* THA value applies to hydronic heat only, Htr #8.

# ELECTRICAL SPECIFICATIONS

**Table 15 VPRC/VPRH 30 Electrical Specifications**

Power Supply Volt — 1–60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings													
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug									
208/ 230V	197	13.0	74	3.0	0.5	1.3	0.25	0	208	N/A	N/A	17.3	N/A	20.6	30	H-WIRE									
									230	N/A	N/A														
								5	208	4089	19.7		22.7	28.4	30										
									230	5000	21.7		24.7	31.0	35										
								7	280	6134	29.5		32.5	40.7	45										
									230	7500	32.6		35.6	44.5											
								1	208	8178	39.3		42.3	52.9	60										
									230	10,000	43.5		46.5	58.1	60										
								265V	240	10.5	67		2.3	0.5	1.4		0.25	0	265	N/A	N/A	6.86	14.2	16.8	25
																			265	4576	17.3				
4	277	5000	18.1	20.4	25.5	30																			
	7	265	6864	25.9	28.2	35.3	40																		
277		7500	27.1	29.4	36.8	40																			
1	265	9152	34.5	36.8	46.1	50																			
	277	10,000	36.1	38.4	48.1	50																			

\* THA value applies to hydronic heat only, Htr #8.

**Table 16 VPRC/VPRH 36 Electrical Specifications**

Power Supply Voltage — 1/60		Compressor		Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	RLA	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA*	TCA	THA*	MCA*	MOCP*	Plug
208/230V	197	13.6	88	3.0	0.5	1.3	0.25	0	208	N/A	N/A	17.9	N/A	21.3	30	H-WIRE
									230	N/A	N/A		N/A			
								5	208	4089	19.7		22.7	28.4	30	
									230	5000	21.7		24.7	31.0	35	
								7	280	6134	29.5		32.5	40.7	45	
									230	7500	32.6		35.6	44.5		
								1	208	8178	39.3		42.3	52.9	60	
									230	10,000	43.5		46.5	58.1	60	
								A	208	12,268	19.7 / 39.3		22.7 / 39.3	28.4 / 49.2	30 / 50	
									230	15,000	21.7 / 43.5		24.7 / 43.5	31.0 / 54.4	35 / 60	
265V	240	12	67	2.3	1.4	0.25	0	265	N/A	N/A	15.7	14.2	16.8	25		
								265	4576	17.3		19.6	24.5	30		
							4	277	5000	18.1		20.4	25.5	30		
								265	6864	25.9		28.2	35.3	40		
							7	277	7500	27.1		29.4	36.8	40		
								265	9152	34.5		36.8	46.1	50		
							1	277	10,000	36.1		38.4	48.1	50		
								265	13,729	17.3/34.5		19.6/34.5	24.5/43.2	30/45		
							A	277	15,000	18.1/36.1		20.4/36.1	25.5/45.2	30/50		

\* — Where two values are shown, data is displayed as Circuit 1 / Circuit 2

\* — Where two values are shown, data is displayed as Circuit 1 / Circuit 2

\* THA value applies to hydronic heat only, Htr #8.



## OPTIONAL - RETURN AIR ACCESS PANEL

### Optional Return Air Access Panel (With Filter)

#### NOTICE

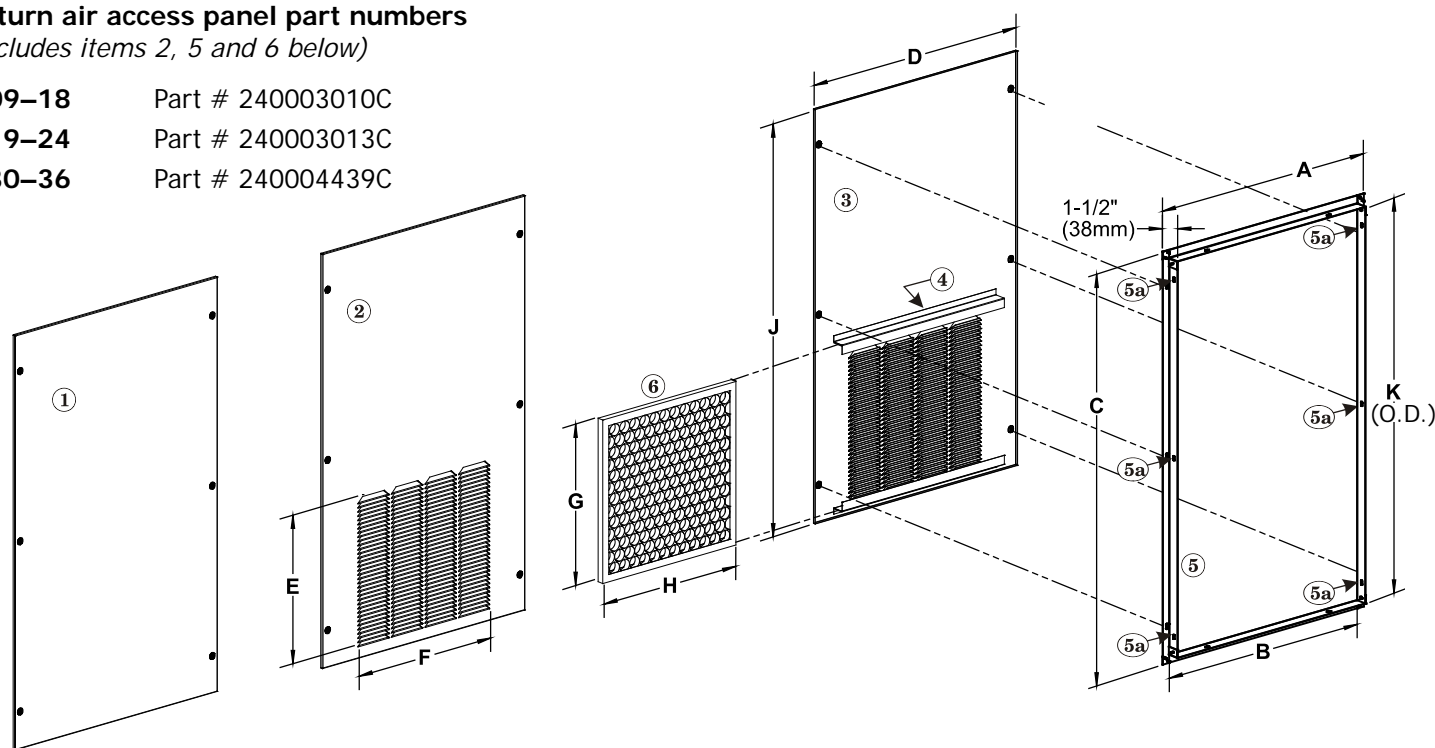
Install air filter installed prior to operation.

- Verify installation will provide adequate clearance and access to control panel.
- Work closely with other trades to locate opening for return air access panel.
- Return air access panel must be installed with enough room available to remove unit if necessary.
- Install frame with screws through lag holes into frame studs, level and plumb (Figure 21).
- Return air access panel is set onto frame, and held in place with 6 screws.

**Figure 21 Return Air Access Panel (Available with solid doors if ducted return air is used; available in standard white or consult manufacturer for custom colors)**

### Return air access panel part numbers (includes items 2, 5 and 6 below)

<b>09–18</b>	Part # 240003010C
<b>19–24</b>	Part # 240003013C
<b>30–36</b>	Part # 240004439C



**Table 17 Return Air Access Panel Dimensions — Inches (mm)**

Model	A	B	C	D	E	F	G	H	J	K	Item	Description
<b>09–18 Std.</b>	29 3/4 (756)	28 (711)	49 3/4 (1264)	30 (762)	17 3/4 (451)	20 1/4 (514)	20 (508)	20 (508)	50 (1270)	477/8 (1220)	1	Solid door panel (for ducted return air installations)
											2	Door assembly, front view
<b>19–24 Std.</b>	29 3/4 (756)	28 (711)	61 3/4 (1569)	30 (762)	28 (711)	20 1/4 (514)	30 (762)	20 (508)	62 (1518)	597/8 (1518)	3	Door assembly, rear view
											4	Filter bracket (on back)
<b>30–36 Std.</b>	35 7/8 (911)	34 1/8 (864)	62 (1575)	36 7/8 (918)	17 5/8 (448)	33 9/16 (852)	30 (762)	20 (508)	62 (1518)	60 (1524)	5	Frame assembly (items 5a are lag holes, 3 per side)
											6	Filter

## OPTIONAL - HYDRONIC COIL

### HH Series Hydronic Coil Option

(Available for VPRC / VPRH models 09-24 only)

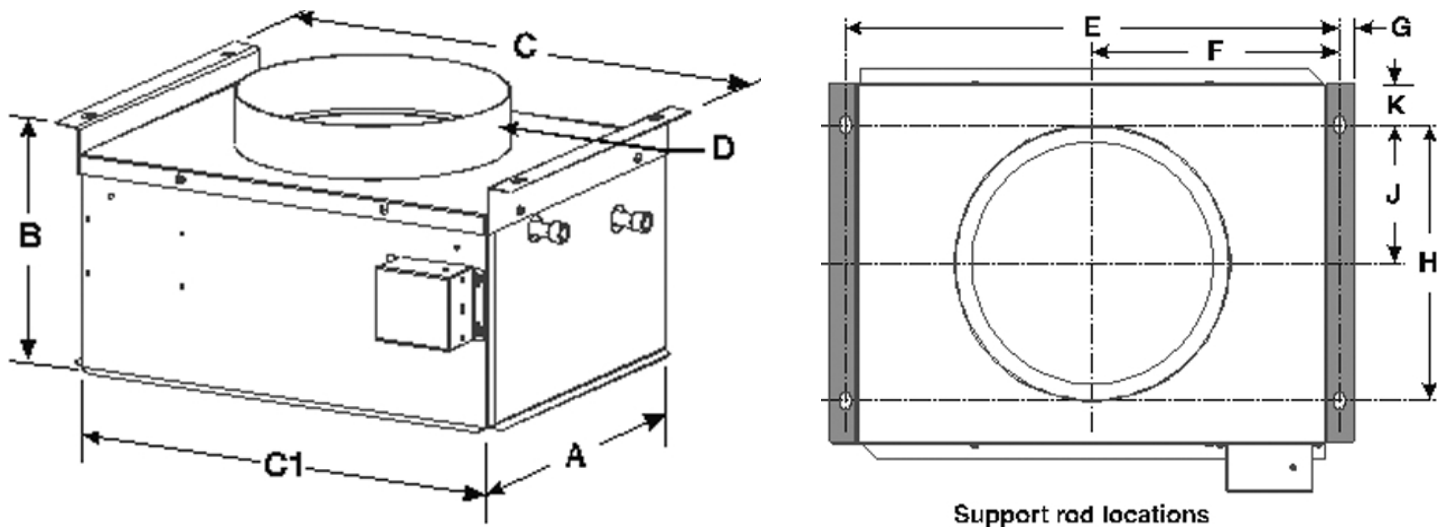
Install Hydronic Coil option to unit BEFORE placing chassis in wall sleeve.

1. Coil package includes sheet metal enclosure.
2. 2- or 3-way motorized 24v water valve is available (models 09–24 only).
3. Verify hydronic coil package is left, right or front aligned, matching control section alignment of unit on which it is to be installed.
4. Coil package must be centered on top of VPRC/VPRH chassis. Verify it is centered over fan discharge and piping package is in correct position.
5. Two "Z" mounting brackets are used to clamp hydronic enclosure to chassis top. Mount brackets to chassis top using holes provided. Allows chassis to be removed for service/maintenance without disturbing hydronic package.
6. Complete piping of hydronic package, including field supplied shut off valves and other field supplied items.

7. Install threaded rods through slots in brackets (Figure 23), place washer and nut on threaded rod, tighten nut. Secure upper end of threaded rod to angle iron or 2 x 4 inch (51 x 102 mm) wood.
8. Verify rods do not interfere with chassis plenum or duct work. Rods hold the hydronic package in place when chassis is removed for maintenance.

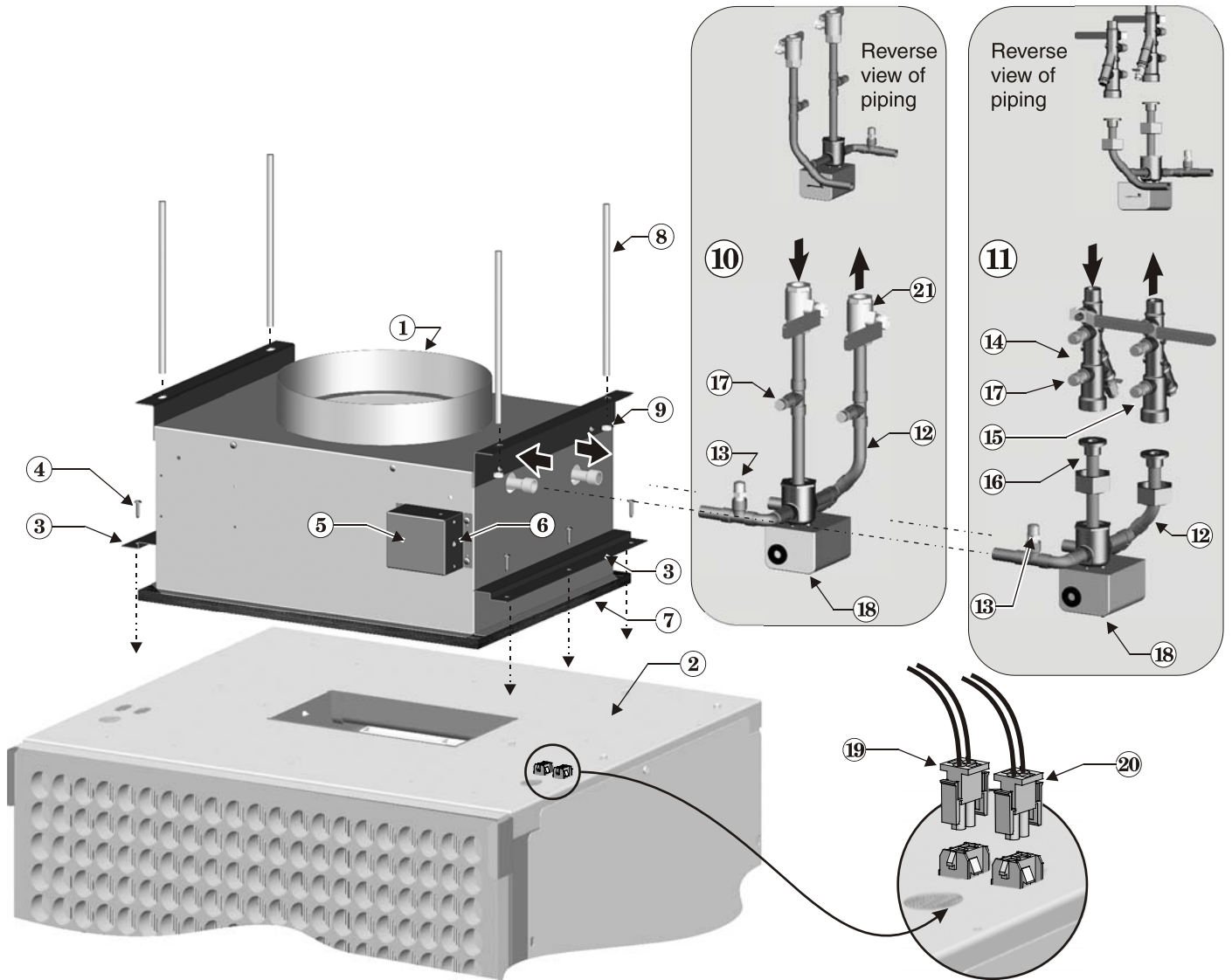
System duct work is connected to discharge opening on duct collar or plenum. Flex collar is advised.

**Figure 22 Hydronic Coil Dimensions**



Dimensions — Inches (mm)											
Models	A	B	C	C1	D	E	F	G	H	J	K
9–18	13 (330)	8 (203)	19 (483)	17 (432)	10 (254) Diameter	18 (457)	9 (229)	½ (13)	10 (254)	5 (127)	1½ (38)
19–24	17 (432)	12 (305)	23 (533)	21 (533)	10 (254) Diameter	22 (559)	11 (279)	½ (13)	13 (330)	6½ (165)	1½ (38)

**Figure 23** Hydronic Coil Option (*front/right application shown*)



1. 10-inch round (254 mm) duct collar
2. Chassis top panel
3. Z brackets (factory-supplied)
4. Z-bracket mounting screws (included)
5. Freezestat
6. Freezestat setpoint adjustment screw
7. ½ x ½ inch foam gasket
8. Mounting rods (field-supplied & installed), 5/16-18 all-thread
9. 5/16-inch nuts (field-supplied & installed)
10. Optional ball valves and P/T ports — includes (2) ball valves and (2) P/T ports
11. Optional automatic balancing valves (with dual P/T ports)
12. ½-inch copper piping (factory-assembled when valve option is specified)
13. Bleed valve
14. Return line automatic balancing valve, with drain cock in wye
15. Supply line automatic balancing valve
16. Flanges and nuts — flange is factory-installed with this option; automatic balancing valves are shipped with the HH, and are field installed
17. P/T ports
18. Optional 3-way motorized diverting valve (normally closed), factory piped as shown when ordered
19. Plug with wires to motorized valve (factory-wired to valve when valve is ordered)
20. Plug with wires to freezestat (factory-wired to freeze stat)
21. Optional ball valves

## OPTIONAL - HYDRONIC COIL

**Figure 24 VPRC/VPRH Hydrocoil Specifications (Entering Air Temperature on 70°F, dry bulb/58°F, wet bulb)**

Unit Size	CFM (L/s)	GPM (L/s)	Entering H2O Temp F C	Btu/h	(kW)	Head Loss, Ft/H <sub>2</sub> O (see note 1)
09	300 (142)	1 (0.163)	140 (60)	7300	2.14	1.1
		2 (0.126)		8400	2.46	4.0
		3 (0.189)		8900	2.61	8.7
		1 (0.163)	160 (71.1)	9500	2.78	1.1
		2 (0.126)		10900	3.19	3.9
		3 (0.189)		11500	3.37	8.6
		1 (0.163)	180 (82.2)	11800	3.46	1.0
		2 (0.126)		13500	3.95	3.9
		3 (0.189)		14200	4.16	8.4
12	400 (189)	1 (0.163)	140 (60)	8300	2.43	1.1
		2 (0.126)		9800	2.87	4.0
		3 (0.189)		10400	3.05	8.7
		1 (0.163)	160 (71.1)	10800	3.16	1.1
		2 (0.126)		12700	3.72	3.9
		3 (0.189)		13500	3.95	8.6
		1 (0.163)	180 (82.2)	13400	3.92	1.0
		2 (0.126)		15700	4.60	3.9
		3 (0.189)		16600	4.86	8.4
18	500 (236)	2 (0.126)	140 (60)	10900	3.19	4.0
		4 (0.252)		12200	3.57	15.2
		6 (0.379)		12700	3.72	33.2
		2 (0.126)	160 (71.1)	14200	4.16	3.9
		4 (0.252)		15800	4.63	14.9
		6 (0.379)		16400	4.80	32.6
		2 (0.126)	180 (82.2)	17500	5.12	3.9
		4 (0.252)		19400	5.68	14.7
		6 (0.379)		20100	5.89	32.0
19	700 (330)	2 (0.126)	140 (60)	23800	6.97	2.2
		4 (0.252)		28400	8.32	8.4
		6 (0.379)		30300	8.87	18.5
		2 (0.126)	160 (71.1)	30900	9.05	2.2
		4 (0.252)		36700	10.75	8.3
		6 (0.379)		39200	11.48	18.2
		2 (0.126)	180 (82.2)	38000	11.13	2.2
		4 (0.252)		45100	13.21	8.2
		6 (0.379)		48100	14.08	17.9
24	700 (330)	2 (0.126)	140 (60)	23800	6.97	2.2
		4 (0.252)		28400	8.32	8.4
		6 (0.379)		30300	8.87	18.5
		2 (0.126)	160 (71.1)	30900	9.05	2.2
		4 (0.252)		36700	10.75	8.3
		6 (0.379)		39200	11.48	18.2
		2 (0.126)	180 (82.2)	38000	11.13	2.2
		4 (0.252)		45100	13.21	8.2
		6 (0.379)		48100	14.08	17.9
Note 1	Head loss data above is for hydronic coil only. The optional motorized 3-way valve has a Cv of 4.0; the optional AutoFlow valves have a Cv of 7.0 at full open.					

## Condenser Louver Replacement

- Existing Carrier wall sleeve can be retained in all applications, provided VPRC/VPRH unit is installed as required for 50QT/ET option.
- Condenser louver must be modified or replaced unless it is aluminum vertical-bar type with no plastic or metal block-off as shown in Figure 25. Two other louver types are used on Carrier units.
- If you have aluminum vertical bar type louver with metal or plastic block-off (Figure 26), remove block-off for louver to function with VPRC/VPRH or use louver provided with VPRC/VPRH.
- If louver is stamped sheet metal (Figure 27), it must be removed and replaced with standard VPRC/VPRH louver provided with unit or warranty will be voided. Modify the louver application as needed for proper fit and function of VPRC/VPRH.

## Installing VPRC/VPHC Into An Existing Wall Sleeve/Enclosure

- Replacing another manufacturer's unit with VPRC/VPRH chassis requires certain modifications due to unit installation into existing wall sleeve and enclosure.
- Installer is responsible for proper installation practices when installing VPRC/VPRH in existing wall sleeve/enclosure.
- Manufacturer will not be responsible for installation when accessories not included in supplied installation package are used.

### DANGER

Electrical shock hazard — Verify power to existing unit (Carrier 50QT/ET) is disconnected before removing. Failure to do so will result in severe personal injury or death.

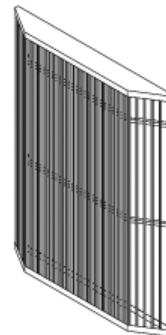
For proper installation into existing wall sleeve/enclosure, complete following steps as listed.

1. Remove existing Carrier 50QT/ET unit from wall sleeve.
2. Inspect wall sleeve. Verify it is free of dirt or debris and is in good condition. If condition is beyond repair, it must be replaced.

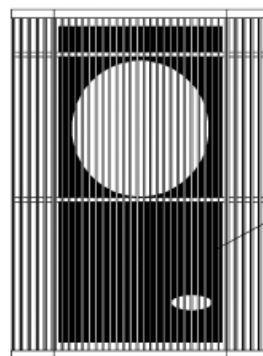
### NOTICE

Carrier series use internal drain system. Verify existing drain system is in working condition and able to move condensate freely.

**Figure 25** Aluminum Vertical Bar Louver Without Block-Off, Can Be Used With The VPRC/VPRH as is

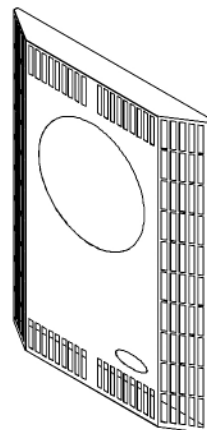


**Figure 26** Aluminum Vertical Bar Louver With Block-Off, Block-Off Must Be Removed To Use With VPRC/VPRH



Removing the metal or plastic block-off usually only requires drilling out a few pop rivets and is generally an easy task.

**Figure 27** Stamped Metal Louver Cannot Be Used With The VPRC/VPRH — Use Standard Louver Shipped With VPRC/VPRH, Adapting Installation As Needed For Fit And Function



## VPRC/VPRH Models 09–12 only

1. Attach three baffles included in chassis kit to back of condenser coil. See Figure 29.

## VPRC/VPRH Model 18

1. Installer must fabricate and install air diverter to separate inlet and discharge outdoor air.
2. Diverter must extend to condenser louvers. Failure to do so will create air recirculation between condenser discharge and intake creating compressor failure due to continued operation at high pressures, as well as decreasing unit's capacity and efficiency from rated values.

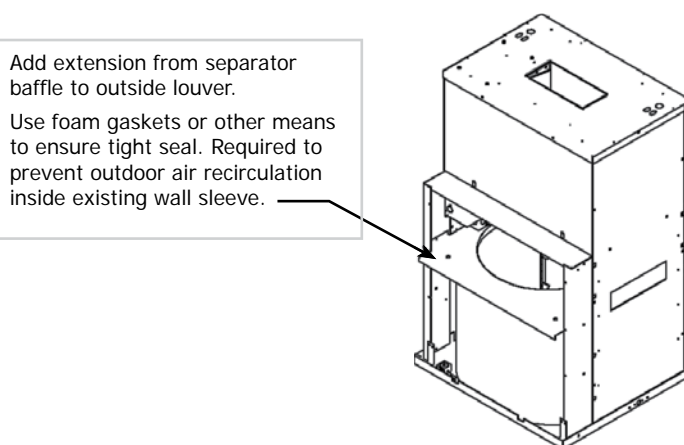
## Models 09–18

3. Install provided drain stub on unit's base at front. See Figure 14, Page 18. Do not mount drain stub on side, unit inserts too deeply into Carrier wall sleeve. (If this location is not acceptable, contact manufacturer for alternatives.) Connect drain stub to suitable drain.
4. Insert VPRC/VPRH chassis 13 inches (330 mm) into wall sleeve. Verify it is level. When unit is in position, fasten in place permanently by mechanical means. Shimming chassis into position (i.e., by using wooden platform). If unit is completely removed, re-level to ensure proper condensate drainage.
5. Verify seal is air tight between chassis and existing wall sleeve around condenser section. Manufacturer recommends using expandable foam or closed cell foam to create seal, preventing air bypass around chassis adversely affecting efficiency, operation, and reliability of unit. Seal also prevents inclement weather from entering wall sleeve/interior of building.
6. Install high and low voltage wiring to VPRC/VPRH unit. Refer to wiring diagram on the for wire connections.
7. Connect supply air ductwork to VPRC/VPRH unit.
8. Turn power on to unit.
9. Confirm operation by cycling unit several times, verify operation.
10. Replace all trim and components.

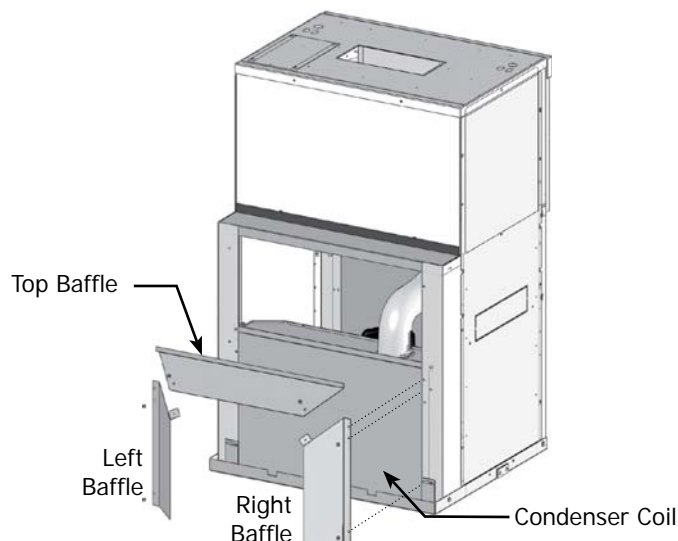
## NOTICE

Level chassis so condensate or wind-driven rain will flow from base pan. Installer, test and confirm condensate flow into drain. Manufacturer recommends pouring water into base pan prior to operating unit to verify drain is operating properly.

**Figure 28 Model 18 Add Diverter Extension**



**Figure 29 Baffles On Back Of Condenser Coil**





# OPERATIONAL PERFORMANCE DATA

Table 18 VPRC/VPRH 09–36 Performance Data

Model	Cooling Btuh (kW)	Sensible Heat Ratio	EER	Heat Pump Btuh (kW)	COP	Air Flow vs External Static Pres- sure			Fresh Air Inlet Flow	Outdoor Sound Level
						Static Pressure				
						0.10 in. w.c. (2.5 mm w.c.)	0.20 in. w.c. (5.1 mm w.c.)	0.30 in. w.c. (7.6 mm w.c.)		
						CFM (L/s)	CFM (L/s)	CFM (L/s)	CFM (L/s)	dBa
VPRC09	9,000 (2.64)	0.75	9.0	N/A	N/A	330 (156)	300 (142)	250 (118)	30	65
VPRH09	9,000 (2.64)	0.75	9.0	9,000 (2.64)	3.0	330 (156)	300 (142)	250 (118)		
VPRC12	12,000 (3.51)	0.70	9.0	N/A	N/A	440 (208)	385 (182)	350 (165)	35	75
VPRH12	12,000 (3.51)	0.70	9.0	11,400 (3.34)	3.0	440 (208)	385 (182)	350 (165)		
VPRC18	17,200 (5.04)	0.71	9.0	N/A	N/A	600 (283)	550 (260)	500 (236)	40	71
VPRH18	17,200 (5.04)	0.71	9.0	16,200 (4.75)	3.0	600 (283)	550 (260)	500 (236)		
VPRC19	18,400 (5.39)	0.73	9.0	N/A	N/A	710 (335)	650 (307)	600 (283)	50	69
VPRH19	18,400 (5.39)	0.73	9.0	16,400 (4.81)	3.0	710 (335)	650 (307)	600 (283)		
VPRC24	23,200 (6.80)	0.73	9.0	N/A	N/A	710 (335)	650 (307)	600 (283)	60	70
VPRH24	23,200 (6.80)	0.73	9.0	21,600 (6.33)	3.0	710 (335)	650 (307)	600 (283)		
VPRC30	31,600 (9.26)	0.69	9.0	N/A	N/A	1,190 (562)	1,170 (552)	1,130 (533)	95	69
VPRH30	31,600 (9.26)	0.69	9.0	32,000 (9.38)	3.0	1,190 (562)	1,170 (552)	1,130 (533)		
VPRC36	35,600 (10.43)	0.73	9.0	N/A	N/A	1,350 (637)	1,290 (609)	1,210 (571)	95	69
VPRH36	35,600 (10.43)	0.73	9.0	36,000 (10.55)	3.0	1,350 (637)	1,290 (609)	1,210 (571)		

## START-UP REPORT

In order for Technical Service to better serve you, please complete the following information.

Include Model Number, Serial Number, and Date of installation. Have this information ready when calling.  
Technical Support Department: (800) 228-9364

Model Number		Date:	
		Technician:	
Serial Number		Mode:	Cooling
Indoor Section		Notes	
Evaporator Entering Air – DB			
Evaporator Entering Air – WB			
Evaporator Leaving Air – DB			
Evaporator Leaving Air – WB			
Outdoor Section			
Entering Air			
Leaving Air			
Temperature Split			
Operating Pressures			
Compressor Suction – PSIG			
Compressor Discharge – PSIG			
Power Input			
Compressor – Volts			
Compressor – Amps			
OD Fan Motor – Volts			
OD Fan Motor – Amps			
ID Fan Motor – Volts			
ID Fan Motor – Amps			
Total Volts			
Total Amps			
Temperatures – Degrees F°			
Compressor Suction			
Compressor Discharge			
Liquid Out Cond.			
Liquid before Expansion			
Suction out Evaporator			
Capacity Calculations			
DB – Temp Split at evap.			
Test Summary			
Compressor Superheat			
Sub Cooling			

NOTES

## NOTES

NOTES

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