

# RETROAIRE™

*The Right Fit for Comfort*

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An ISO 9001-2000 Certified Company



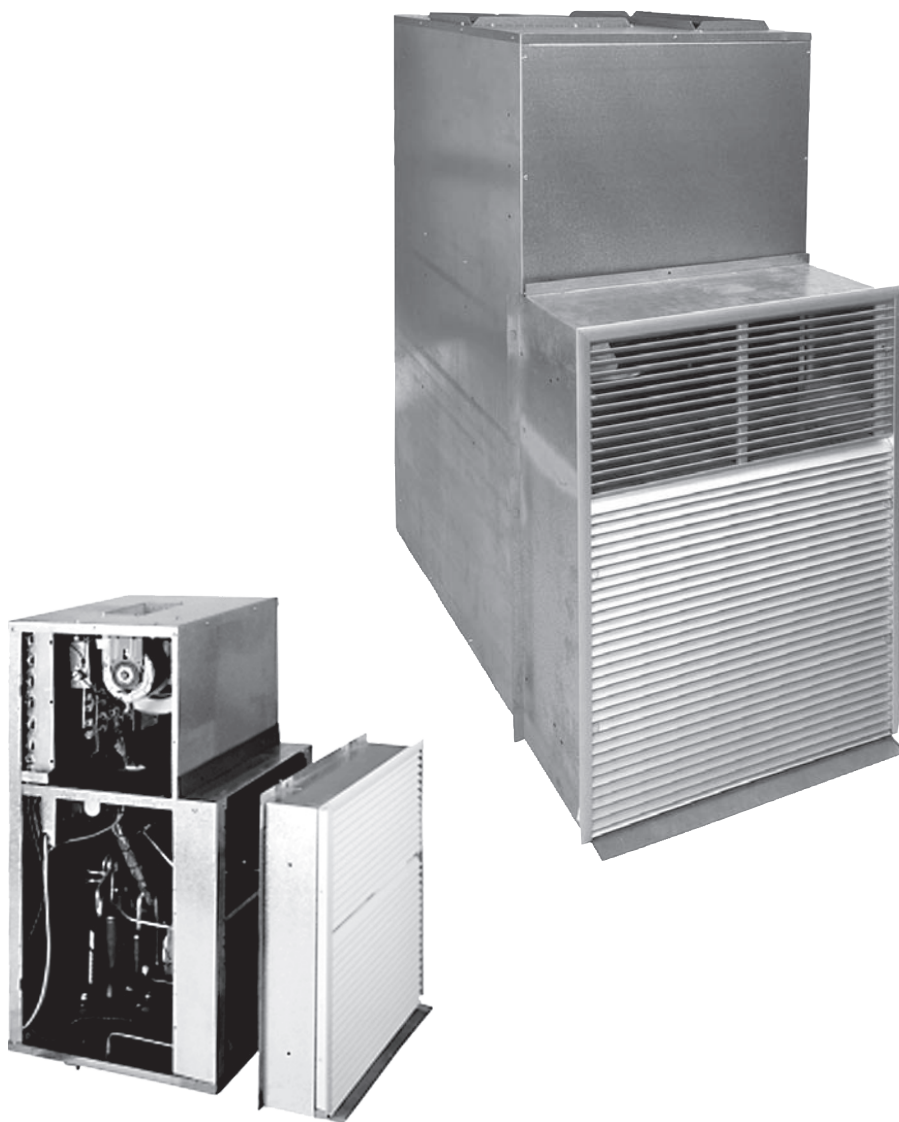
# VPRC / VPRH

Single Package Vertical Air Conditioner/Heat Pump

Straight cool/Limited Range Heat pump nominal capacities

9,000	12,000	18,000	19,000	24,000	30,000	36,000	Btuh
2.6	3.5	5.3	5.6	7.0	8.8	10.5	kW

## Installation, Operation and Maintenance Manual



P/N 240006980, Rev. I [01/15/2010]

## Contents

### Table of contents

Read This First .....	3
General Product Information .....	4-5
Verify Unit Before Installing — Model Number .....	6
Verify Unit Before Installing — Operational Performance Data .....	7
Verify Unit Before Installing — Dimensional/Physical Data .....	8-9
Verify Unit Before Installing — Responsibilities & Application Limitations .....	10
Control Box Location .....	11
Prepare the Enclosure .....	12-13
Install the Wall Sleeve .....	14
Chassis and Wall Sleeve, Typical .....	15
Insert Chassis into Wall Sleeve — FRONT-MOUNTED CONTROL PANEL UNITS ONLY .....	16
Insert Chassis into Wall Sleeve — SIDE-MOUNTED CONTROL PANEL UNITS ONLY .....	17
Condensate Drain .....	18
Optional return air access panel .....	19
Hydronic Coil Option — Performance Data .....	20-21
Hydronic Coil Option — Assembly and dimensions .....	22-23
Features .....	24
Electrical Connections .....	25
Sequence of Operation .....	26
Final Inspection and Start-up .....	27-28
Maintenance and Troubleshooting .....	29-31
Electrical Specifications .....	32-35
Carrier 50QT/ET Replacement Option — Installation .....	36-37
Start-Up Report .....	38
Notes .....	39

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

**Examine the exterior.**

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

### Inspection

Carefully check the shipment against the bill of lading.

Verify your equipment by using the model nomenclature listed in Figure 1, Page 6. Make sure chassis, wall sleeve, and louver (as well as any options) have been received.

#### 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? — can be factory-installed on front, left or right side for models 09–18; field modifiable to left or right on model 24 only; front side only for models 30–36.
- Voltage correct?
- Wall sleeve correct for unit, and the 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?
- Other options?



#### CAUTION

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

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

The purchaser must notify ECR International's Customer Service department of all damage and is responsible for filing any necessary claims with the carrier.

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

### Read This First



**Recognize this symbol as an indication of important safety information.**

#### NOTICE

The VPRC/VPRH is backed by EMI and ECR International and is tested and rated in accordance with AHRI Standard 390 and UL-484 and UL-1995. Due to ongoing product development, product designs and specifications may change without notice. Please contact the factory for more information.

#### To the installer

Retain this manual and warranty for future reference.

Before leaving the premises, review this manual to be sure the unit has been installed correctly and run the unit for one complete cycle to make sure it functions properly.

To obtain technical service or warranty assistance during or after the installation of this unit, contact your local representative. Visit our web site [www.retroaire.com](http://www.retroaire.com) for a local representative listing. For further assistance call 1-800-325-5479.

When calling for assistance, please have the following information ready:

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

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

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

#### WARNING



**Completely read all instructions prior to assembling, installing, operating, or repairing this product.**

Inspect all parts for damage prior to installation and start-up. The VPRC/VPRH PTAC must be installed **ONLY** by qualified installation personnel.

#### DANGER

The RetroAire™ VPRC/VPRH must:

- Be connected to a properly grounded electrical supply with the proper voltage as stated on the rating plate.
- Have proper overcurrent protection (i.e. time- delay fuse/HACR Breaker) as listed on the Rating Plate.



**Tampering with the VPRC/VPRH is dangerous and may result in serious injury or death.** Tampering voids all warranties. Do not attempt to modify or change this unit in any way.

Failure to follow these instructions can result in a fire, explosion, or electrical shock causing property damage, personal injury, or death.

#### WARNING

#### Safety instructions

This manual is intended as an aid to qualified service personnel for proper installation, operation, and maintenance of the VPRC/VPRH Packaged Terminal Air Conditioner (PTAC). Read these instructions thoroughly and carefully before attempting installation or operation. Failure to follow these instructions may result in improper installation, operation, service, or maintenance, possibly resulting in fire, electrical shock, property damage, personal injury, or death.



Read all instructions before using this unit. Install or locate this unit only in accordance with these instructions. Use this unit only for its intended use as described in this manual.

Check the rating plate on the unit before installation to make certain the voltage shown is the same as the electric supply to the unit. The rating plate is located on the front panel only.

This unit must be connected only to a properly grounded electrical supply. Do not fail to properly ground this unit.

Turn off the electrical supply before servicing the unit.

Do not use the unit if it has damaged wiring, is not working properly, or has been damaged or dropped.

[Save these instructions]

## General Product Information

### Product description

The VPRC/VPRH 09–36 single package vertical air conditioner (SPVAC) and heat pump (SPVHP) creates new options in layout and space utilization. The VPRC/VPRH 09–36 offers low cost operation and quiet, comfortable air distribution, especially when used in multi-room suites, apartments, health care facilities, and homes.

Each system utilizes environmentally-friendly R-410A refrigerant, and is supplied with a custom wall sleeve and outdoor louver. The cabinet is constructed with 20 gauge galvanized steel with a G-90U corrosion-resistant rating. The insulated top-discharge indoor compartment provides quiet, ducted, conditioned air delivery to other room location(s).

Framed into a concealed closet enclosure for low operating sound levels, the VPRC/VPRH vertical discharge allows ducting to the top of the room(s) for superior air circulation and distribution.

All VPRC/VPRH models can be applied in non-ducted return air applications. The VPRC/VPRH 30-36 can also be applied in ducted return air applications.

The VPRC/VPRH offers an economic benefit when used in a multi-room suite by supplying conditioned air to more than one room without the need to install additional units. This is also a design advantage since other rooms will not need an exterior wall to accommodate additional units.

VPRH models are limited-range heat pumps — heat pump operation will cease at approximately 40°F (4.4°C) outdoor temperature. Utilizing the electric resistant heat option or the hydronic heat option is recommended if the heating load of the application will require the unit to operate in outdoor ambient temperatures below 40°F (4.4°C).

### Standard controls and components:

- Cooling or heat pump chassis with high efficiency rotary, scroll or reciprocating type compressors
- Custom wall sleeve
- Anodized aluminum outdoor louver for indoor field installation (optional colors available)
- R-410A refrigerant
- 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
- Filter — disposable return air filter for models 09–24 only, and a 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**
  - Motors are thermally protected PSC type. Air stream surfaces are insulated with 1/4 inch (6.3 mm) fiberglass or 1/8 inch (3.2 mm) Volara™.
  - The indoor fan is a forward-curved type directly mounted to the motor shaft.
  - Models VPRC/VPRH 09, 12, 19 & 24 blow air across the outdoor coil, while models VPRC/VPRH 18, 30 & 36 draw air through the outdoor coil.

### • Condensate removal

- VPRC/VPRH 09, 12, 19 & 24 — The outdoor blower incorporates a condensate slinger ring. Base pans are designed to accommodate a field-installed drain stub kit if necessary. See field installed accessories.
- VPRC/VPRH 18, 30 & 36 require an internal drain system. Models VPRC/VPRH 18 are supplied standard with an over-flow drain stub kit for field installation.
- VPRC/VPRH 30-36 outdoor coil side drain stub is integral to the base pan, and allows easy connection of the drain line.

### • Microprocessor control board

- Universal control board is used in straight cool electric resistance heat, hydronic heat (models 09–24 only), or cooling/heat pump applications
- 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 the 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 26)

### Factory-installed options:

- Supplemental electric heat — see heat options in Figure 1
- 265/277V (contact factory for availability)
- Corrosion-resistant coil options (sea coast and harsh environment usage):
  - Coated aluminum fin/copper tube condenser coil
- Models 09–18 only — 10-inch diameter (254 mm) factory-installed duct collar
- Models 09–12 only — Carrier Model 50QT/ET replacement configuration
- Models 09–24 only — Right or left control box mounting
- Models 09–24 only — Hydronic heat option
- Models 09–24 only — Power disconnect switch — ONLY to a maximum of 5kW electric heat, or hydronic heat

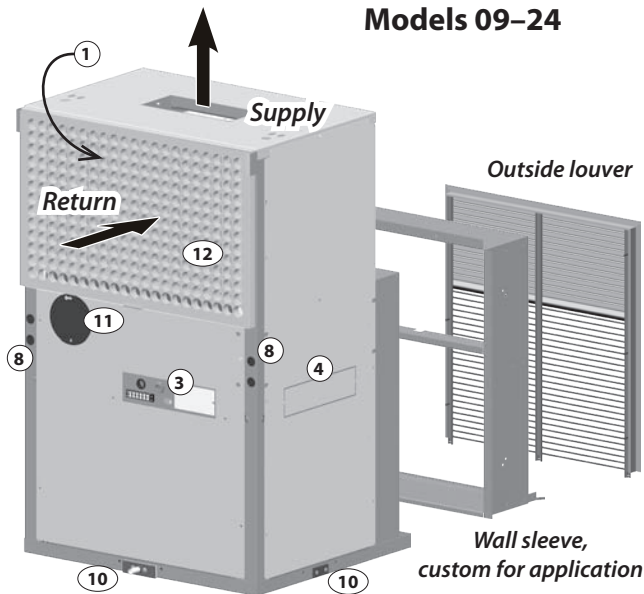
### Field-installed accessories:

- Hydronic heat plenum (coil included on models 09–24 only)
- Remote wall thermostat (digital 1-stage or 2-stage available)
- Painted condenser louver — (baked enamel/Kynar)
- Return air access panel (standard white, consult factory for custom colors — w/disposable return air filters) — 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 Pg. 15)



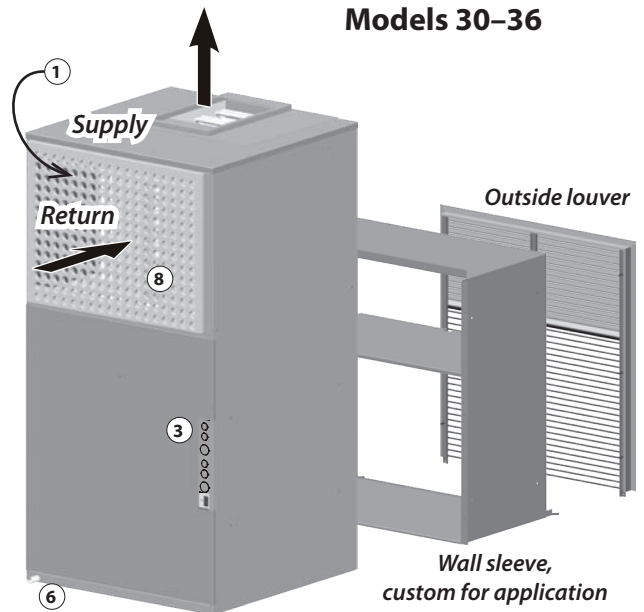
### General Product Information *(continued)*

#### Models 09–24



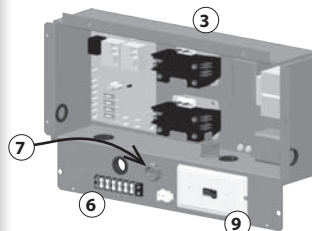
Front — 09, 12, 18, 19, 24

#### Models 30–36



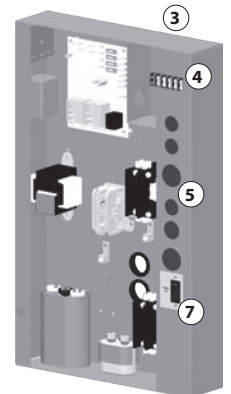
Front — 30, 36

- 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 2, Page 9 for dimensions)

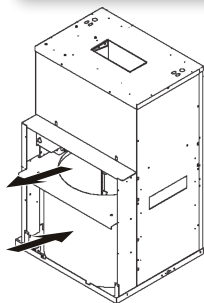


Control panel, typical  
09–24

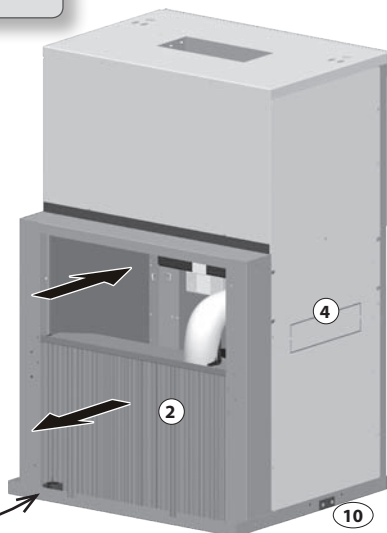
- 1 Indoor coil (behind filter)
- 2 Outdoor coil
- 3 Control/power box
- 4 24-volt connection strip
- 5 Line voltage power entrances
- 6 Drain stub location — ¾" I.D. connection
- 7 Motorized fresh air damper switch
- 8 Return air filter (see Table 2, Page 9 for dimensions)



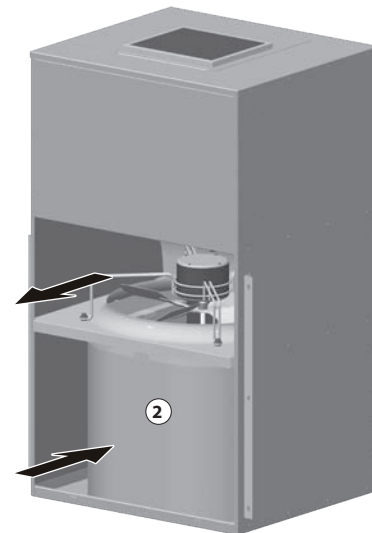
Control panel, typical  
30, 36



Rear — 18



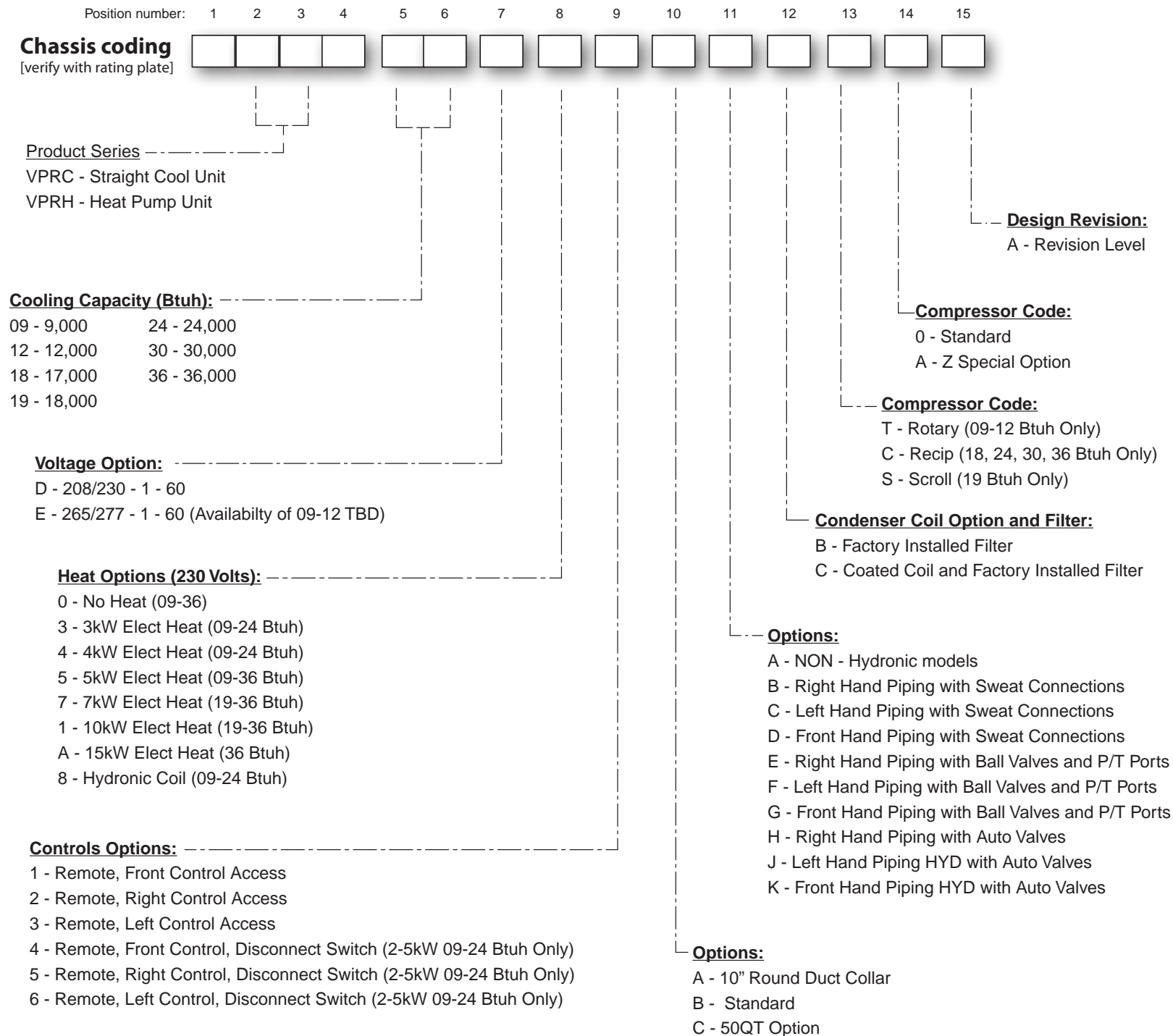
Rear — 09, 12, 19, 24



Rear — 30, 36

### Verify Unit Before Installing — Model Number

**Figure 1** Model nomenclature



### Verify Unit Before Installing — Operational Performance Data

Tested/Rated  
in Accordance with  
ARI Standard 390



#### IMPORTANT

Performance data is subject to change without notice. For the most current unit/system performance data, please refer to the Enviromaster International listing of certified products in the ARI certified directory, at [www.ahridirectory.org](http://www.ahridirectory.org).

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

**Table 1** VPRC/VPRH 09–36 performance data

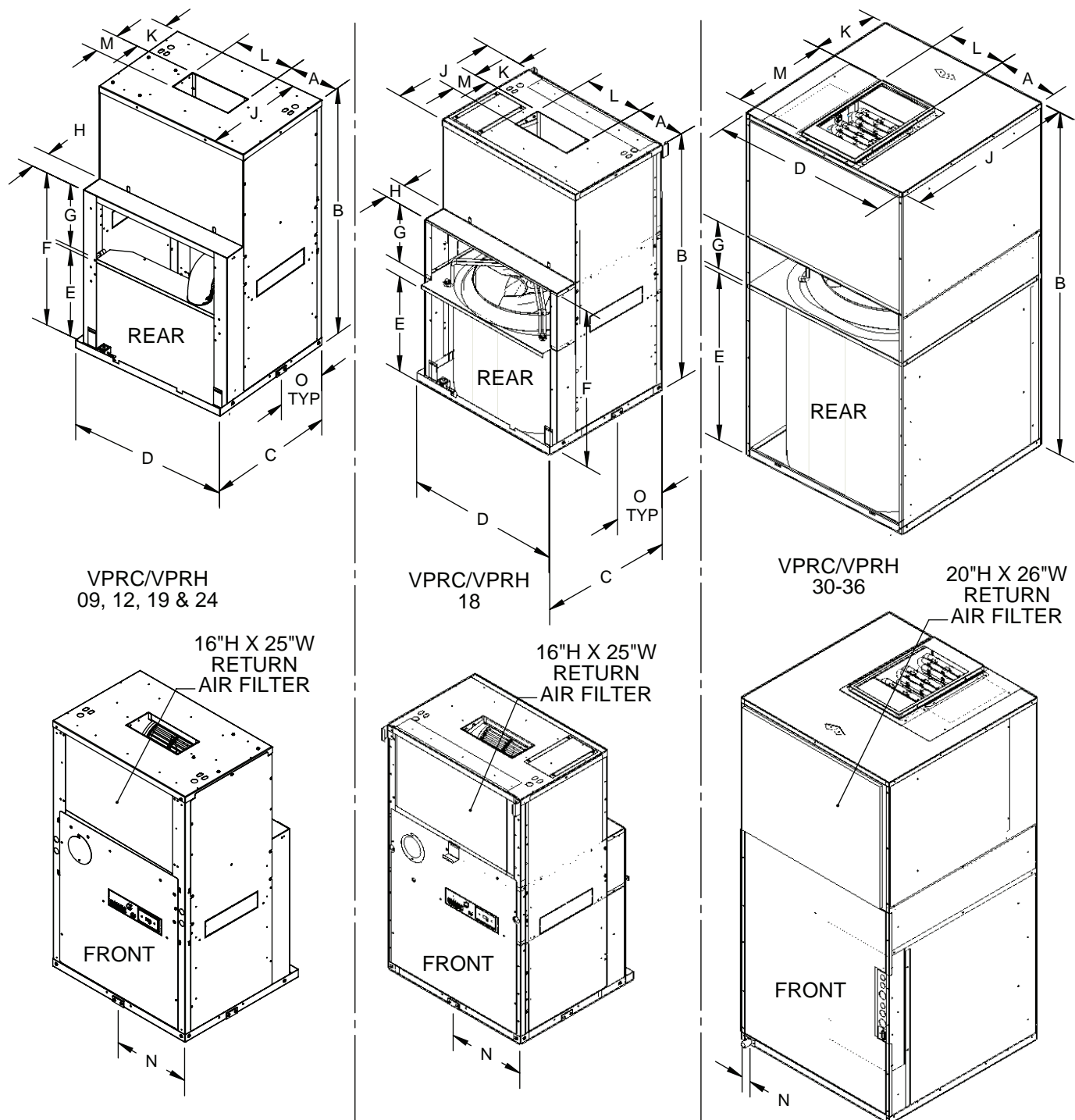
Model	Cooling Btuh (kW)	Sensible Heat Ratio	EER	Heat Pump Btuh (kW)	COP	Air Flow vs External Static Pressure			Fresh Air Inlet Flow	Outdoor Sound Level
						Static Pressure				
						0.10 <i>in. w.c.</i> (2.5 mm w.c.)	0.20 <i>in. w.c.</i> (5.1 mm w.c.)	0.30 <i>in. w.c.</i> (7.6 mm w.c.)		
						CFM (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)		

### Verify Unit Before Installing — Dimensional/Physical Data

#### IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

**Figure 2** VPRC/VPRH dimensions — inches (mm)





## Verify Unit Before Installing — Dimensional/Physical Data *(continued)*

### IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

**Table 2** Dimensions, shipping weights and return air filter sizes

Dimension	Model				
	09–12 in. (mm)	18 in. (mm)	19–24 in. (mm)	30 in. (mm)	36 in. (mm)
<b>A</b>	7 5/8 (194)	7 3/4 (197)	6 1/2 (165)	8 3/4 (222)	8 3/4 (222)
<b>B</b>	40 (1016)	40 (1016)	50 (1270)	56 (1422)	56 (1422)
<b>C</b>	21 7/16 (545)	21 7/16 (545)	26 7/16 (672)		
<b>D</b>	25 (635)	25 (635)	25 (635)	28 (711)	28 (711)
<b>E</b>	14 5/8 (372)	14 13/16 (376)	20 5/8 (524)	21 3/4 (553)	21 3/4 (553)
<b>F</b>	25 (635)	24 5/8 (625)	32 (813)		
<b>G</b>	10 5/16 (261)	9 13/16 (249)	11 3/8 (289)	6 1/4 (159)	6 1/4 (159)
<b>H</b>	3 1/2 (89)	3 1/2 (89)	3 1/2 (89)		
<b>J</b>	16 1/2 (419)	16 1/2 (419)	21 9/16 (548)	28 (711)	28 (711)
<b>K</b>	6 1/8 (156)	6 1/8 (156)	8 3/16 (208)	11 1/4 (286)	11 1/4 (286)
<b>L</b>	9 5/8 (245)	9 1/2 (241)	12 (305)	10 1/4 (260)	10 1/4 (260)
<b>M</b>	4 1/4 (108)	4 1/4 (108)	10 3/8 (264)	16 (406)	16 (406)
<b>N</b>	12 1/2 (317)	12 1/2 (317)	12 1/2 (317)	1 5/8 (41)	1 5/8 (41)
<b>O</b>	8 3/4 (222)	8 3/4 (222)	13 3/4 (348)		

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>18</b>	260 (118)	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)
<b>30</b>	430 (195)	20 x 26 (508 x 660)	20 x 30 (508 x 762)
<b>36</b>	430 (195)	20 x 26 (508 x 660)	20 x 30 (508 x 762)

## Verify Unit Before Installing — Responsibilities & Application Limitations

### Installer responsibilities

This manual has been prepared to acquaint you with the installation, operation and maintenance of the VPRC/VPRH SPVU and to provide important safety information in these areas.

Read all instructions thoroughly before attempting the installation or operation of this unit. This manual should be kept for future reference.

The manufacturer of this unit will not be liable for any damages caused by failure to comply with the installation and operating instructions outlined in this manual.

The installer is solely responsible for ensuring that VPRC/VPRH units are installed in accordance with all applicable national and local codes.

A rating plate identifying this unit can be found on the front panel of the unit. When referring to your unit, always have the information listed on the rating plate readily available.

### Hydronic coil option, when used

#### IMPORTANT

**Hydronic coil option, when used** — Install the hydronic coil option to the unit **BEFORE** placing chassis in the wall sleeve.

See information on the hydronic coil option beginning on page 20.

For a VPRC/VPRH with optional hydronic heat attached to the supply air panel, it is still necessary to maintain minimum spacing between the enclosure and the unit for proper air flow, but additional space is recommended for the hydronic option.

Refer to Figure 19, Page 23 of these instructions to determine spacing for serviceability and access to piping connections.

### Application limitations



#### CAUTION

Installer — Verify that the ambient temperature conditions will be within the limits shown in Figure 1.

Contact ECR International's Sales Department if units will be operated in temperatures outside the ranges listed below.

**Table 3** 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

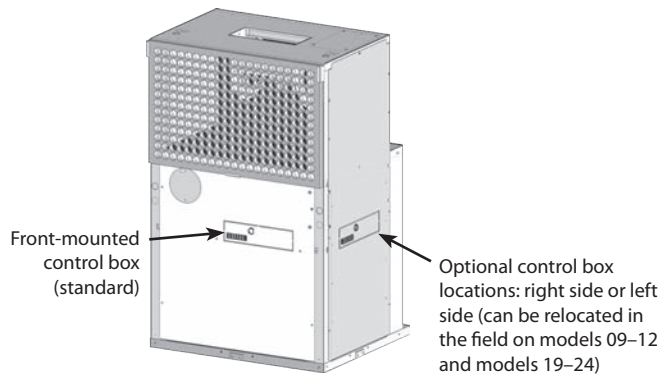
#### Control box location

Unless otherwise specified, the VPRC/VPRH control box is factory mounted in the front position.

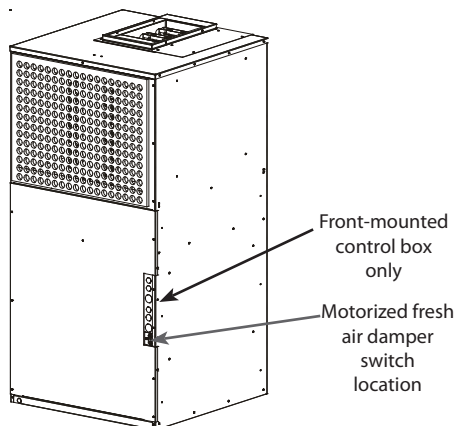
The control box can be factory mounted for front, left or right side applications on models 09–24. The control box is available only on the front for models 30 and 36.

Please specify the preferred control box mounting location when ordering equipment.

**Figure 3** Control box mounting — Models 09–24 — control box can be factory mounted on front (standard) or, when specified, on the right or left side



**Figure 4** Control box mounting — Models 30 & 36 — front-mounted control box only



#### Relocating the control box



#### DANGER

**Electrical shock hazard** — Power to the VPRC/VPRH **MUST** be disconnected before servicing or accessing the control compartment. Failure to do so could result in severe personal injury or death.

The control box can be factory mounted on the front, left, or right side on Models 09-24. The control box is only available on the front for Models 30-36.

Unless otherwise specified, the VPRC / VPRH control box is factory mounted on the front of the unit. Please specify the preferred control box mounting location when ordering equipment.

It is possible to relocate the control box on models 09, 12, 19, & 24 in the field. This must be done prior to installing the unit. To relocate the control box:

1. Determine the desired location of the control box on the unit.
2. Remove the sheet metal panels from the current control box location, and the desired control box location.
3. Remove the control knock-out from the panel where the desired control box location will be.
4. Remove the insulation directly behind the knock-out.
5. Use metal tape to seal the opening in the panel where the control box was originally located.
6. Cut the wire ties that secure the wire harness. This will allow freedom of movement while relocating the control box.
7. Remove the mounting screws holding the control box in place.
8. Relocate the control box, and install the mounting screws.
9. Use wire ties to bundle and secure the wire harness.



#### WARNING

Ensure wires do not contact any sharp sheet metal edges, refrigeration tubing, the outdoor fan motor, or any moving parts.

10. Replace sheet metal panels.

### Prepare the Enclosure

#### Provide proper clearances

**NOTE:** ECR International recommends installing the unit before any carpentry work is started for the enclosure.

It is very important for proper air flow and sound levels that a minimum clearance of 4 inches, 102 mm (models 09–18) or 6 inches, 152 mm (models 24–36) between the enclosure and the chassis be maintained (see Figure 5).

For designed performance, sound levels, and service, maintain a minimum of 6 inches (152 mm) on both sides and front for non-ducted return air applications only.

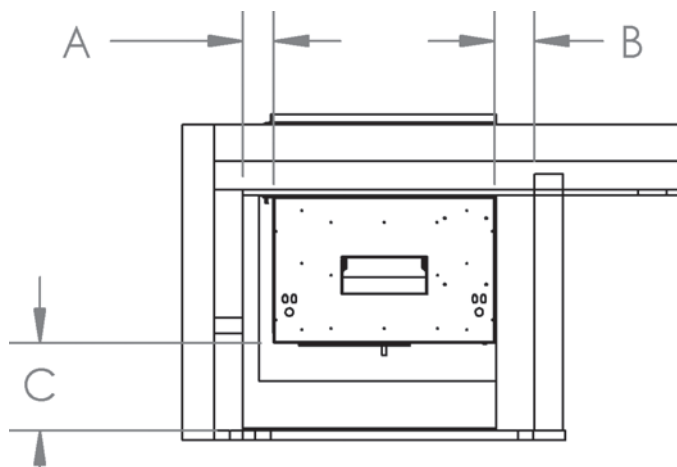
Ducted return air applications only require minimal spacing for service requirements.

Consult ECR International's Sales Department if these minimums can not be met. Depending on the application and return air introduction, some re-configuration can probably be accommodated.

Minimum and maximum operation conditions must be observed to ensure maximum system performance with minimum service required.

**Figure 5** Minimum clearances around unit

Minimum clearances [inches (mm)]			
Model	A	B	C
09, 12, 18	4 (102)	4 (102)	4 (102)
19, 24, 30, 36	6 (152)	6 (152)	6 (152)
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			



#### IMPORTANT

**Optional return air access panel assembly** — The rough opening to the enclosure, and enclosure dimensions must be sized to accept the access panel door frame, when used. See page 19 for details.

#### Rough openings

**Access opening** — The access opening must allow for the unit to be inserted for installation. Provide at least the minimum opening dimensions below. (See Figure 16, Page 19, for dimensions of the opening when using the option return access panel assembly.)

**Table 4** Minimum access opening dimensions (item 1, 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** — It is very important that the rough opening in the wall for the wall sleeve and louver be the correct dimension and in the exact position necessary for installation.

**Table 5** 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 6, Page 13 and Figure 9, Page 15 for details of the platform and wall sleeve installation. The platform height must make the bottom of the VPRC or VPRH chassis flush with the bottom inside edge of the wall sleeve. This means that the platform surface must be 1/2 inch (13 mm) **ABOVE** the bottom of the wall sleeve rough opening.

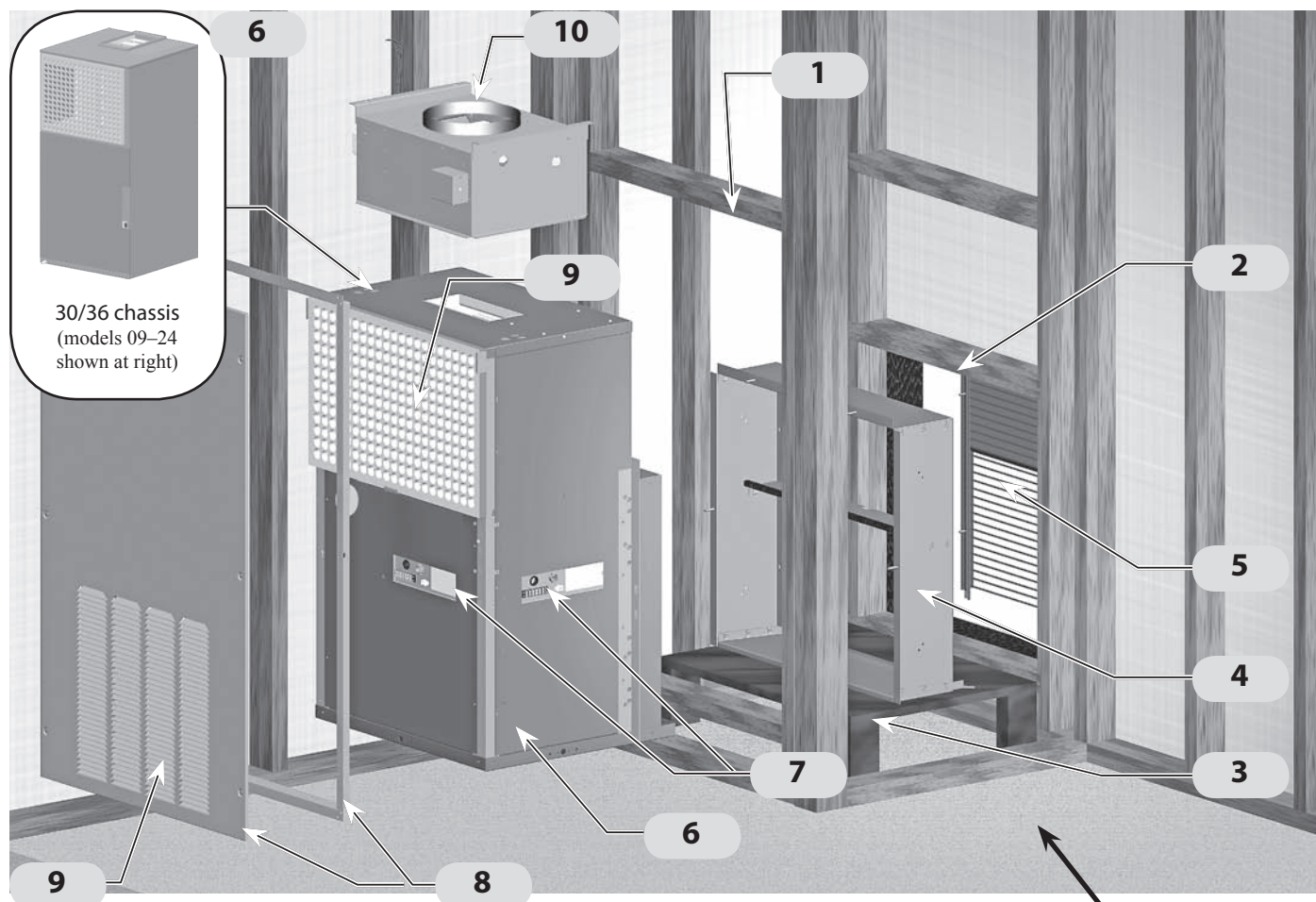
The platform dimensions above will allow the chassis base pan to align with the bottom of the wall sleeve.

#### Air filter

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

### Prepare the Enclosure (continued)

**Figure 6** Exploded view of typical installation (chassis shown is typical of models 09–24)



- 1** Access opening (for unit insertion/removal) — See unit dimensions in Figure 2, Page 9. See Table 4, page 12 for minimum recommended opening dimensions. Make sure to account for the extra height of the hydronic coil module, if used.  
  
NOTE: The access opening will be in the left or right side of the enclosure for left or right-side-mounted control panel units (available option on models 09–24 only).  
  
See Figure 5, Page 12 for minimum clearances around unit to determine minimum enclosure dimensions.
- 2** Wall sleeve opening to outside — See required dimensions in Table 5, Page 12.
- 3** Platform (see page 12) — See Figure 9, Page 15 for the required platform height. The platform **MUST** be level.
- 4** Wall sleeve (see page 14) — The wall sleeve must be ordered to accommodate the total wall thickness (from inside surface of wall sleeve opening to the surface of the outside wall).
- 5** Outside louver — The outside louver attaches to the wall sleeve with nuts placed on the louver studs.
- 6** VPRC/VPRH chassis.
- 7** Control panel (front standard; available on left side or right side for models 09–24 only). Access opening must be on the same side of the unit as the control panel. Thermostat connection terminal block located here.
- 8** Optional return access panel assembly. See Figure 16, Page 19 for details and dimensions.
- 9** Return air opening — **EVERY** VPRC/VPRH requires an air filter on the return air. The filter is located on the chassis opening unless the optional return air access panel is used (for these applications, the air filter is removed from the chassis — a filter is installed on the access panel).
- 10** Hydronic coil option — See page 20 to page 22.





## Install the Wall Sleeve

### Verify wall sleeve depth

The wall sleeve depth must be suitable for the overall wall thickness. It is critical that wall thickness be determined before ordering the wall sleeve (Figure 7).

Consult factory for available wall sleeves.

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

### Verify openings and enclosure

Verify the access opening size, wall sleeve opening size and enclosure size per page 12.

#### CAUTION



Verify the wall sleeve opening is square by measuring corner to corner. Also verify that the platform (if used) is at the correct height and is level with the wall sleeve opening. Adjust the platform and framing as necessary. If the opening and platform are not square, the unit will not fit properly to the wall sleeve.

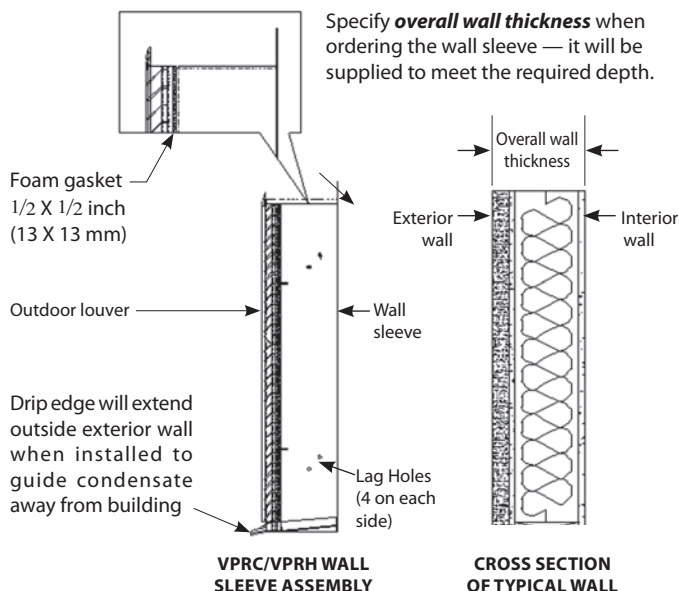
### Assemble the wall sleeve (09–24 only)

Models 09–24 are supplied with a tabbed-assembly wall sleeve. Follow the instructions supplied with the wall sleeve to assemble. The wall sleeve should look like that shown in Figure 8. (Note that the wall sleeves for models 30–36 are factory assembled.)

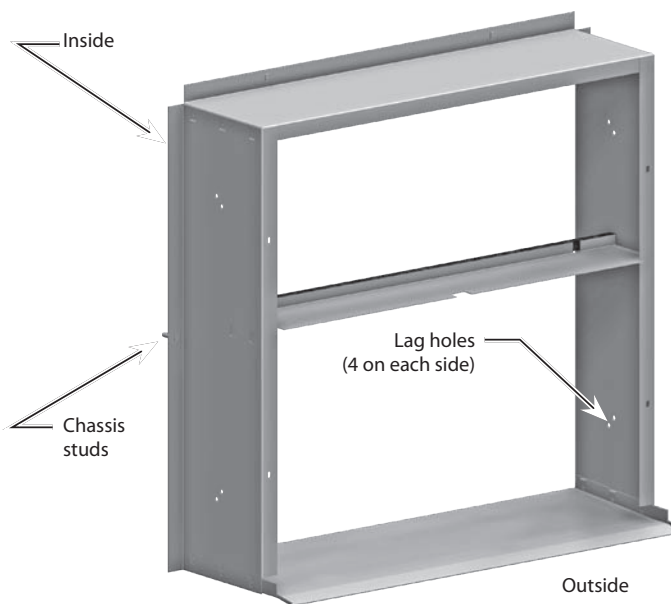
### Secure the wall sleeve

1. Slide the wall sleeve into the rough opening.
2. Slide the wall sleeve to one side of the opening, preferably to the side that is most plumb.
3. Secure the wall sleeve to this side of the opening using screws through the lag holes (see Figure 8), making sure the wall sleeve is level. Fill any gaps between the wall sleeve and the opening with shims to prevent distortion when the screws are tightened.
4. Secure the wall sleeve to the other side in the same manner. Be sure the wall sleeve is both square and level before tightening the screws.

**Figure 7** Determining wall sleeve depth

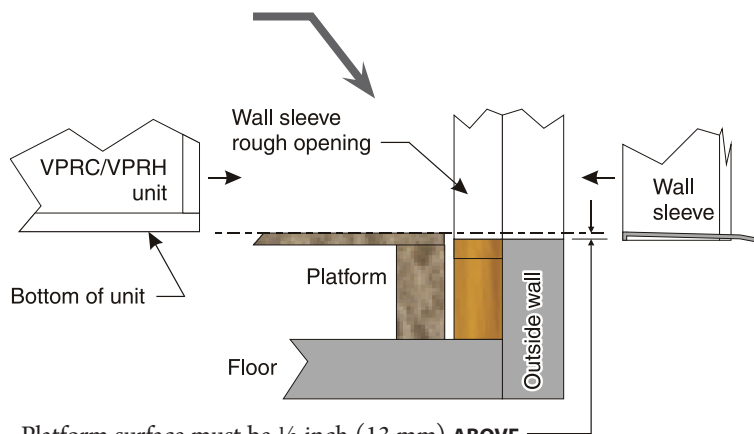
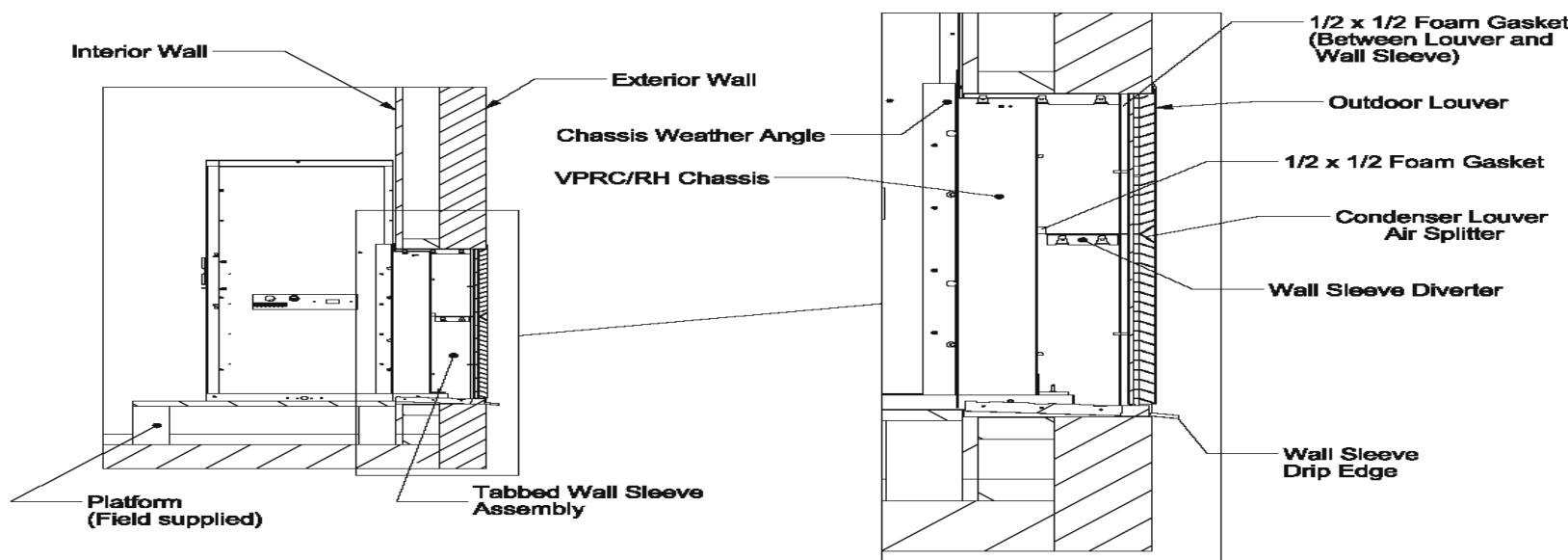


**Figure 8** Typical tabbed-assembly wall sleeve (09–24)



### Chassis and Wall Sleeve, Typical

**Figure 9** Typical VPRC/VPRH installation, with platform

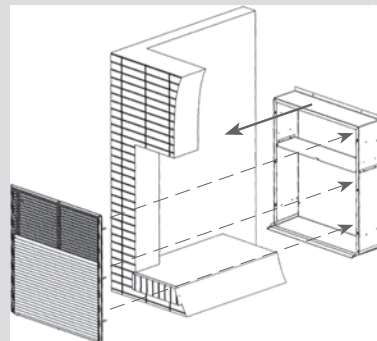


Platform surface must be  $\frac{1}{2}$  inch (13 mm) **ABOVE** the bottom of the wall sleeve rough opening.

\* Platform surface must be raised an additional  $\frac{3}{8}$  in (10 mm) if installing a wall sleeve transition kit. (See Pg 4)

### To install the outside louver

1. Install the studs on the inside of the louver. They will pass through the clearance holes in the wall sleeve flange.
2. Place the outside louver in position.
3. Secure the louver by installing the nuts (supplied) on the studs.



## Insert Chassis into Wall Sleeve — FRONT-MOUNTED CONTROL PANEL UNITS ONLY

### Inspect foam insulation

Verify that the foam insulation strips around the condenser opening are intact (see Figure 10 and Figure 11). Replace if necessary.

The foam insulation must be in place and in good condition to prevent air or water leakage or air recirculation.

### Attach weather angles

1. See Figure 10 and Figure 11 for the locations of the weather angles.
2. Using the screws provided, attach a weather angle to each side of the chassis as shown in the illustrations.

### Insert the chassis into the wall sleeve

1. Slide the chassis into the wall sleeve, making sure the studs on the wall sleeve slide through the holes in the back panel and weather angles.
2. Apply 1/4-20 nuts to the studs that pass through the weather angles, each side of the chassis.
3. **DO NOT** apply nuts to the studs that pass through the back panel of the chassis. This would make removal very difficult.



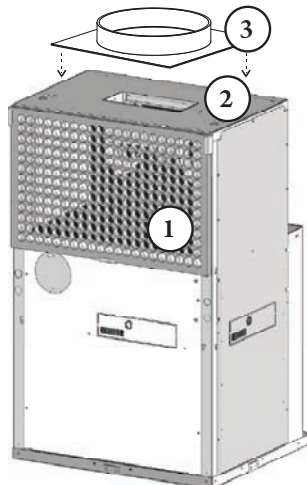
### CAUTION

The chassis must be firmly attached to the wall sleeve to prevent leakage or recirculation.

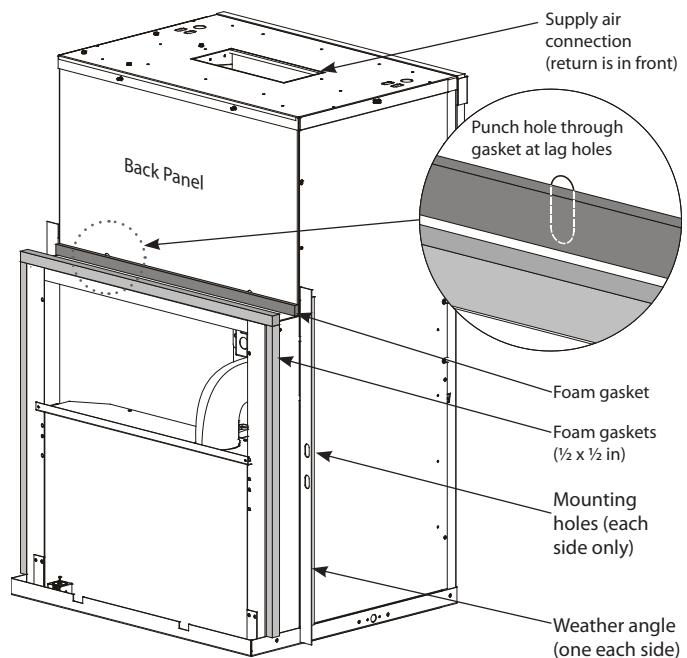
4. See Figure 9, Page 15, for a side view of a typical completed installation.

### 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, an accessory 10-inch round duct collar is available. Contact ECR International's Sales Department to order. See figure at right:
  - Item 1: return air inlet with filter installed
  - Item 2: supply air outlet
  - Item 3: optional supply air duct collar, 10-inch (254 mm) round

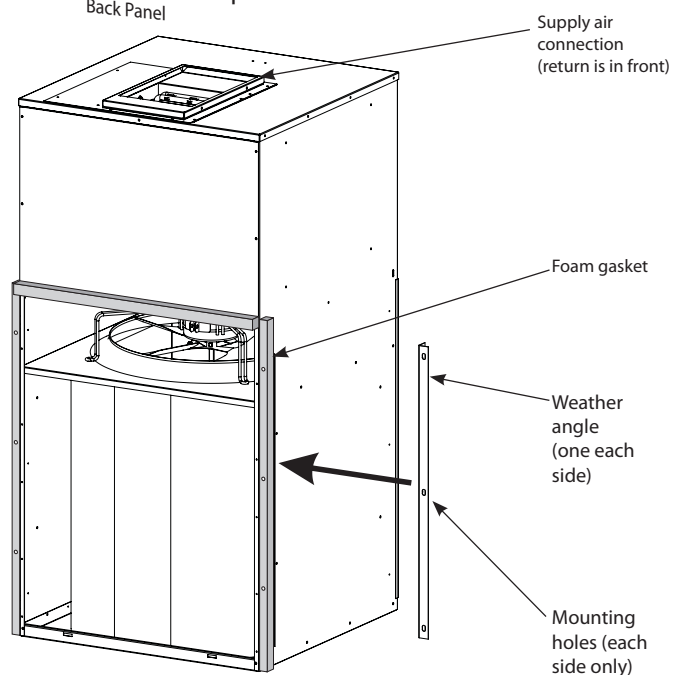


**Figure 10** Foam gasket & weather angles — 09-24 — front control panel installations



Punch holes in the foam gaskets at the locations of the mounting holes in the back panel and weather angles (see callouts in Figure 12 and Figure 13). This will make it easier for the wall sleeve studs to pass through the holes when the chassis is slid into place.

**Figure 11** Foam gasket & weather angles — 30-36 — front control panel installations



### Insert Chassis into Wall Sleeve — SIDE-MOUNTED CONTROL PANEL UNITS ONLY

#### Inspect foam insulation

Verify that the foam insulation strips around the condenser opening are intact (see Figure 12 and Figure 13). Replace if necessary.

The foam insulation must be in place and in good condition to prevent leakage or recirculation.

#### Insert the chassis into the wall sleeve

1. **Right-side-mounted** control panel — remove the right side panel.
1. **Left-side-mounted** control panel — remove the left side panel.
2. Slide the chassis into the wall sleeve, making sure the studs on the wall sleeve slide through the holes in the back panel.
3. Apply 1/4-20 nuts to the studs that pass through the back panel.



#### CAUTION

The chassis must be firmly attached to the wall sleeve to prevent air or water leakage or air recirculation.

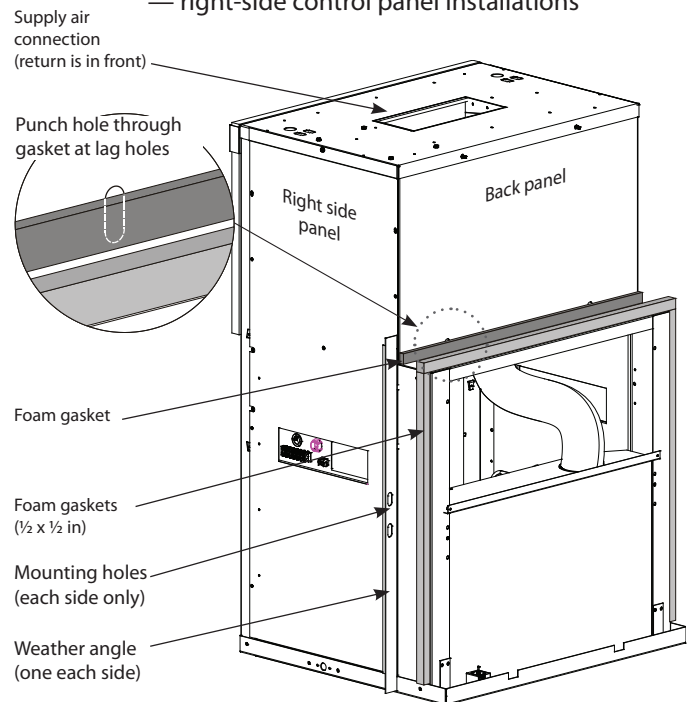
#### Attach weather angle

1. **Right-side-mounted** control panel
  - a. Replace the right side panel.
  - b. See Figure 12 for the location of the right-side weather angle.
  - c. Using the screws provided, attach the weather angle to the chassis as shown in Figure 12.
  - d. DO NOT install the left-side weather angle.
  - e. Apply 1/4-20 nuts to the studs that pass through the weather angle.
2. **Left-side-mounted** control panel
  - a. Replace the left side panel.
  - b. See Figure 13 for the location of the right-side weather angle.
  - c. Using the screws provided, attach the weather angle to the chassis as shown in Figure 13.
  - d. DO NOT install the right-side weather angle.
  - e. Apply 1/4-20 nuts to the studs that pass through the weather angle.
3. See Figure 9, Page 15, for a side view of a typical completed installation.

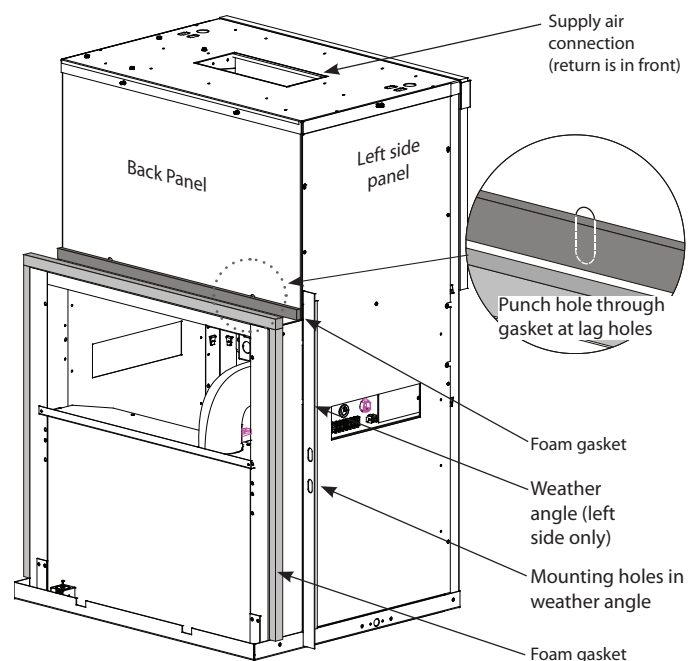
#### Plenum and duct work

1. Install plenum and duct work.

**Figure 12** Foam gasket & weather angles — 09-24  
— right-side control panel installations



**Figure 13** Foam gasket & weather angles — 09-24  
— left-side control panel installations



Punch holes in the foam gaskets at the locations of the mounting holes in the back panel and weather angles (see callouts in Figure 12 and Figure 13). This will make it easier for the wall sleeve studs to pass through the holes when the chassis is slid into place.

### Condensate Drain

#### Condensate drain

1. Models VPRC / VPRH 09,12,19, and 24 are designed so that condensate generated during the cooling operation is delivered to the base pan, and picked up by the outdoor fan's slinger ring. The condensate is slung onto the outdoor coil where it evaporates. Any excess condensate, or wind driven rain that enters the base pan will overflow through notches located in the rear of the unit and run out the wall sleeve, onto the drip edge, and out of the building. Models VPRH 09,12,19, and 24 are also equipped with a thermostatic drain valve located on the bottom of the base pan. This valve opens when outdoor temperatures reach 500F (100C), and allows any residual condensate or wind driven rain in the base pan to run out the wall sleeve as stated above. This feature protects the outdoor fan from damage during heat pump operation.
2. An accessory drain stub kit is available for models VPRC / VPRH 09,12,19, and 24. This field installed kit is designed for use with the building's internal drain system, and must be installed prior to

operation. See figure 14 for locations on the base pan, and connection size. If the unit is equipped with aadfqwefqwef drain stub in the basepan, connect the drain stub to the building's internal condensate removal system.

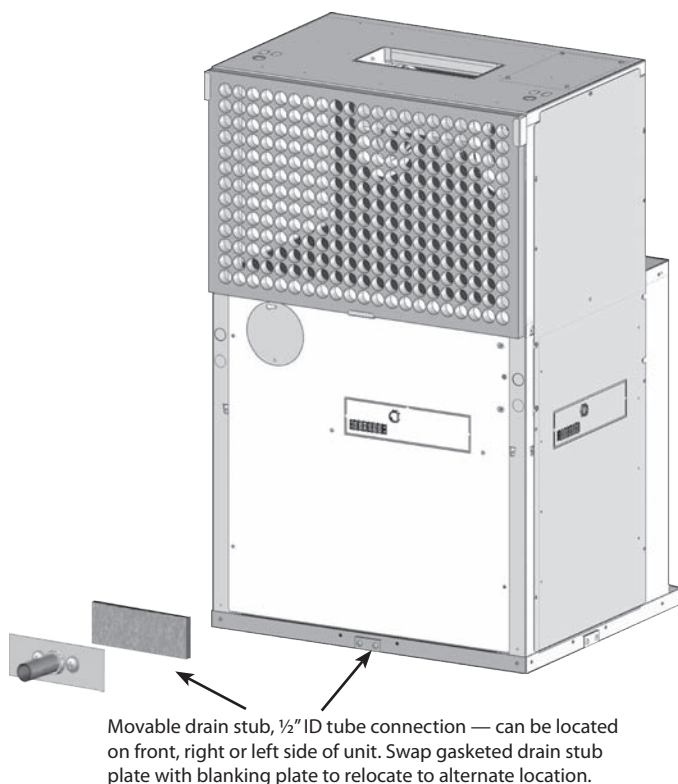
3. Models VPRC / VPRH 18 are supplied with a drain stub that must be installed on the unit, and connected to the building's internal drain system prior to operation. See figure 14 for locations on the base pan, and connection size.
4. Models VPRC / VPRH 30 and 36 are supplied with a drain stub that must be installed on the unit, and connected to the building's internal drain system prior to operation. See figure 15 for location on the base pan, and connection size.



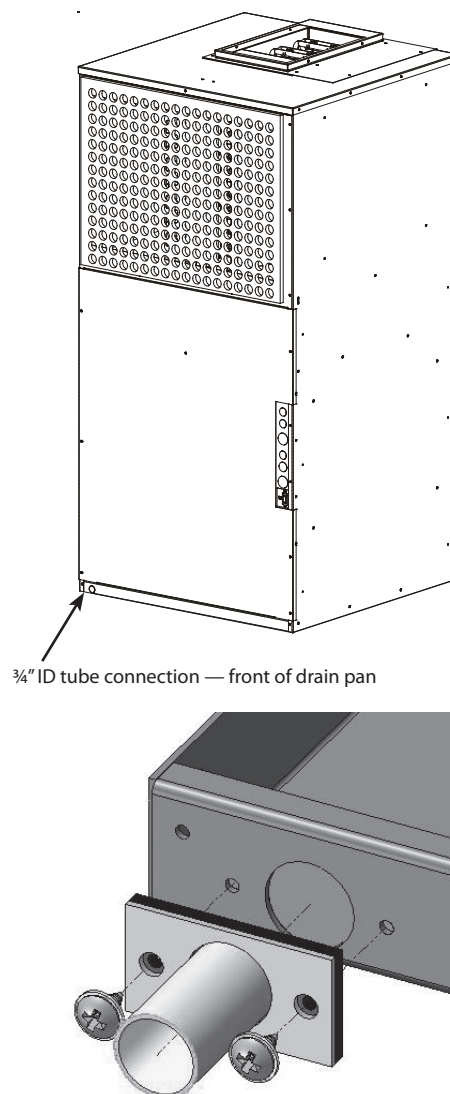
#### CAUTION

Drain stub must be connected to an internal condensate removal system.

**Figure 14** Drain stub location — models 09–24 (optional on models 09, 12, 19 and 24; included and required on model 18)



**Figure 15** Drain stub location — models 30–36





## Optional return air access panel

### Optional return air access panel (with filter)

#### NOTE

All models must have an air filter installed prior to operation.

Return air access panels vary by model. When ordering, be sure to match access panels to units.

Make sure the installation will provide adequate clearance and access to the control panel.

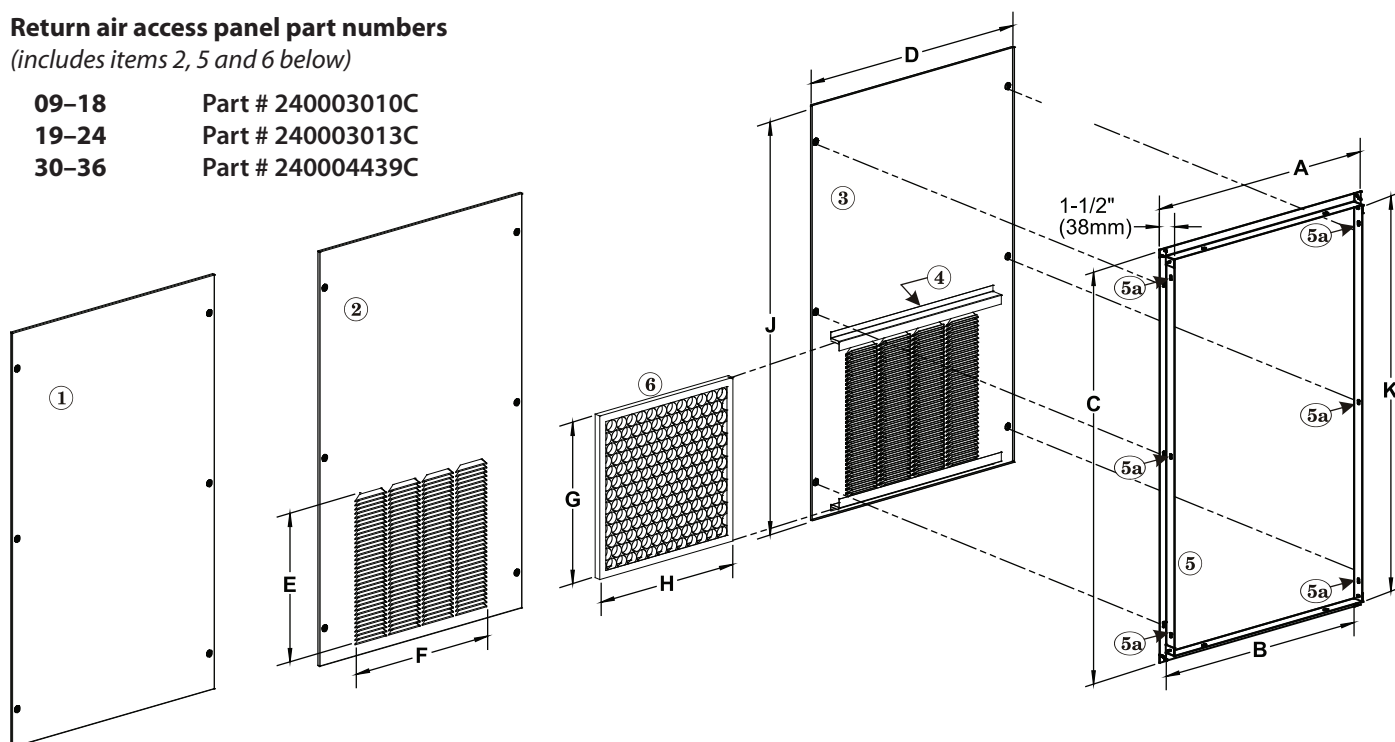
It is necessary to work closely with the other trades to locate the opening for the return air access panel. The return air access panel must be installed with enough room available to remove the unit if necessary. The frame is installed with screws through the lag holes into the frame studs and should be level and plumb (Figure 16). The return air access panel is set onto the frame and held in place with 6 screws.

**Figure 16** Return air access panel (available with solid doors if ducted return air is used; available in standard white or consult factory for custom colors)

#### Return air access panel part numbers

(includes items 2, 5 and 6 below)

09–18	Part # 240003010C
19–24	Part # 240003013C
30–36	Part # 240004439C

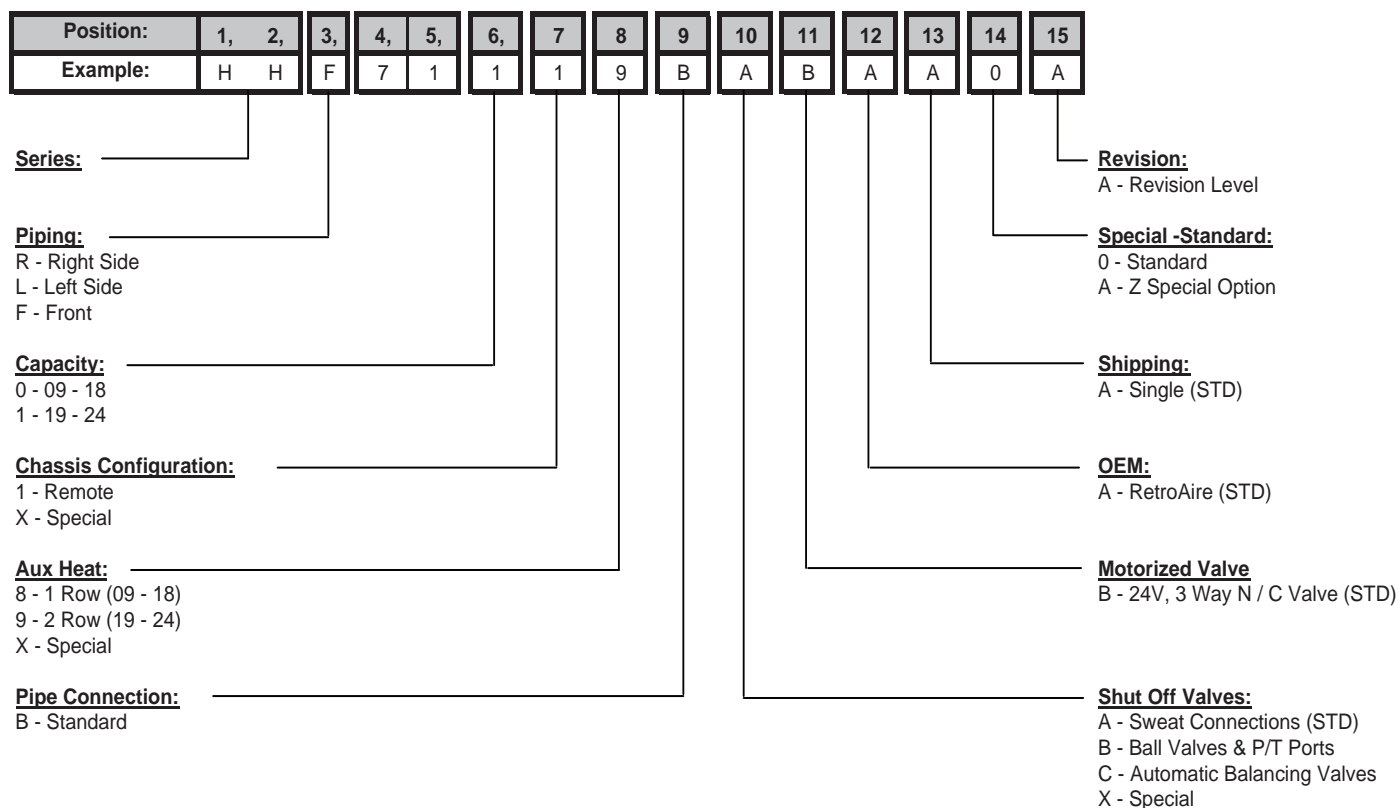


**Table 6** Return air access panel dimensions — inches (mm)

Model	A	B	C	D	E	F	G	H	J	K	Item	Description
09–18 Std.	29 3/4 (756)	27 3/4 (705)	47 3/4 (1213)	30 (762)	17 3/4 (451)	20 1/4 (514)	20 (508)	20 (508)	50 (1270)	45 3/4 (1162)	1	Solid door panel (for ducted return air installations)
19–24 Std.	29 3/4 (756)	27 3/4 (705)	59 3/4 (1518)	30 (762)	28 (711)	20 1/4 (514)	30 (762)	20 (508)	62 (1518)	57 3/4 (1467)	2	Door assembly, front view
											3	Door assembly, rear view
											4	Filter bracket (on back)
30–36 Std.	35 7/8 (911)	33 15/16 (862)	60 (1524)	36 1/8 (918)	17 5/8 (448)	33 9/16 (852)	30 (762)	20 (508)	62 (1518)	58 (1473)	5	Frame assembly (items 5a are lag holes, 3 per side)
											6	Filter

### Hydronic Coil Option — Performance Data

**Figure 17** Hydronic coil option nomenclature (order as described below to obtain required coil and accessories)



### HH Series Hydronic Coil Option

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

#### IMPORTANT

Install the hydronic coil option to the unit BEFORE placing chassis in the wall sleeve.

The coil package comes with a sheet metal enclosure. An 2- or 3-way motorized 24v water valve is available (models 09-24 only). Verify that the hydronic coil package is either left, right or front aligned, matching the control section alignment of the unit on which it is to be installed.

1. The coil package must be centered on top of the VPRC/VPRH chassis. Make sure it is centered over the fan discharge and that the piping package is in the correct position.
2. Find the two "Z" mounting brackets used to clamp the hydronic enclosure to the chassis top. Mount these brackets to the chassis top using the holes provided. This will allow the chassis to be pulled out for service/maintenance without disturbing the hydronic package.
3. Complete the piping of the hydronic package, including field supplied shut off valves and other field supplied items.

4. Install threaded rods through the slots in the brackets (Figure 18), place a washer and nut on the threaded rod, and tighten the nut to secure it in place. The upper end of the threaded rod should be secured to angle iron or 2 x 4 inch (51 x 102 mm) wood. Make sure that the rods do not interfere with the chassis plenum or duct work. These rods will hold the hydronic package in place when the chassis is removed for maintenance.

#### IMPORTANT

System duct work is connected to the discharge opening on the duct collar or plenum. A flex collar is advised.

### Standard Features

- 20 Ga. Galvanized G90U sheet metal enclosure.
- Front, Left or Right side piping connections.
- ½" sweat connections
- 24V, 3 way, normally closed motorized valve.
- 10" diameter supply air duct connection.

### Optional Features

- Ball valves & P/T ports
- Automatic balancing valves with P/T ports and shut-off
- Refer to Figure 17, page 20 for HH series nomenclature to order the hydronic coil that meets your needs.

### Hydronic Coil Option — Performance Data *(continued)*

#### IMPORTANT

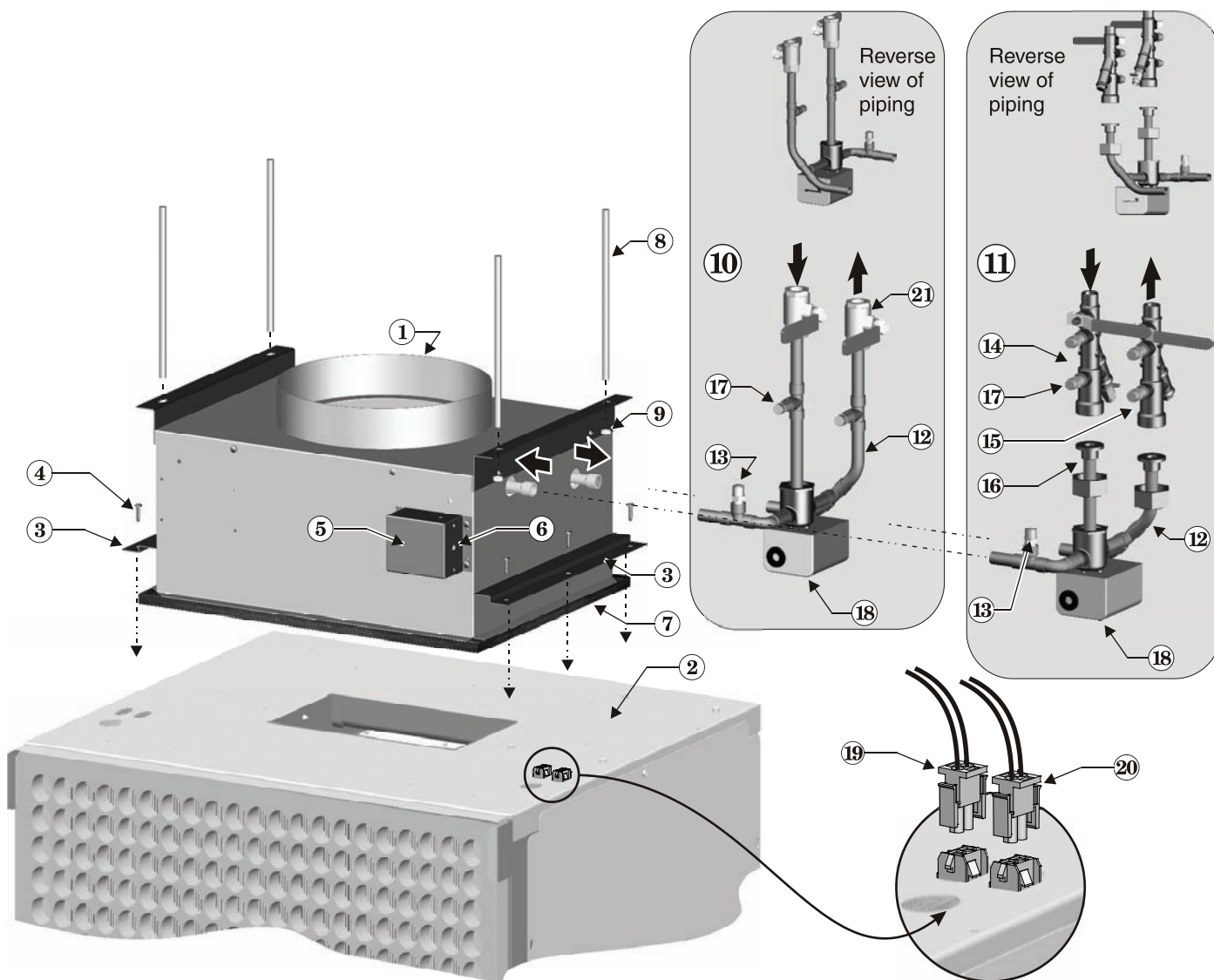
Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

**Table 7** 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.					

## Hydronic Coil Option — Assembly and dimensions

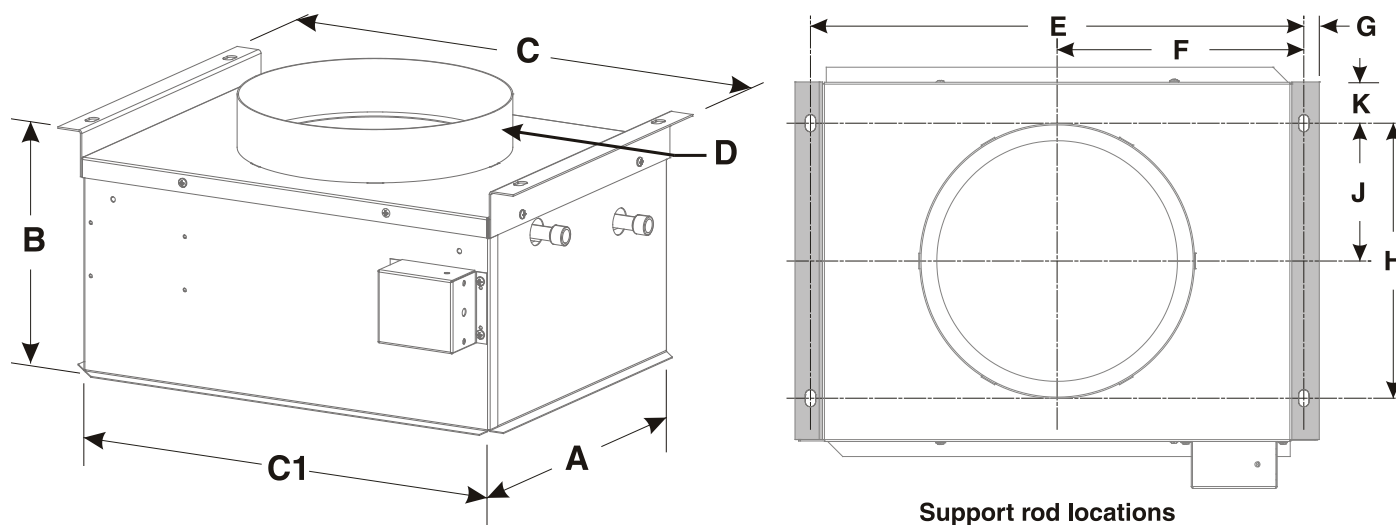
**Figure 18** Hydronic coil option (front/right application shown) — see Figure 17, page 20 for ordering information



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

### Hydronic Coil Option — Assembly and dimensions *(continued)*

**Figure 19** Hydronic coil dimensions



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



## Features

### Hydronic heat operation *(optional)*

An optional factory-supplied, field-installed hydronic heat package is available. With the thermostat system switch set to heat and the setpoint temperature above room temperature, the hydronic valve will open allowing water to flow through the coil. The indoor fan will also switch on and warm air will flow from the unit. Heating will continue as long as the setpoint remains above room temperature. Place the setpoint temperature below room temperature. The hydronic valve will close and indoor fan will switch off after the sixty-second purge time has elapsed. The hydronic valve is a 24vac normally open valve. Should power be lost to the unit, the valve will default to the open position.

The hydronic package is equipped with a thermostat (freeze-stat) that is designed to prevent the hydronic coil from freezing. At 35°F (1.7°C) the thermostat will switch open the hot water valve to prevent the coil from freezing. At 50°F (10°C) the thermostat will reset. If the room thermostat is not calling for heat, the valve will close. The freeze stat is factory preset.

### Coil freeze protection *(standard)*

This feature prevents the coil from freeze up in the cooling mode. Coil freeze up can occur due to a dirty air filter, low refrigerant charge or low room or outdoor temperatures. This in turn can cause compressor damage. Should a freeze condition be detected, the compressor and condenser fan will be switched off for a minimum of three minutes and until the freeze condition is satisfied. During this time the indoor fan will continue to run to aid in the defrost process.

### Thermostatic drain valve

*(standard — VPRH 09, 12, 19 & 24 only)*

Heat pump units are equipped with a thermostatic drain valve that will open when outdoor temperatures fall below 50°F (10°C). This keeps the base pan free of condensate water where it may otherwise freeze during colder outdoor temperatures.

### Emergency heat *(optional)*

#### NOTE

#### VPRH units

ECR International recommends using a factory-supplied, field-installed **two-stage thermostat with heat pump units (VPRH)** equipped with electric resistance heat option. In the event of heat pump system failure, the two-stage thermostat will automatically switch the unit's control from heat pump mode to electric heat mode.

**If a single-stage thermostat is used** and the heat pump system fails, it is possible to manually force the control board into electric heat mode.

#### VPRC units

Use a single-stage heat/cool thermostat, available as a factory option.

### Anti-short-cycle timer *(standard)*

This feature prevents compressor short cycling. It also prevents multiple units from starting simultaneously after a power outage. This delay-on-break feature ensures that the compressor remains off between cycles until the three-minute time delay period has elapsed, allowing system pressures to equalize before restarting.

### Random start timer *(standard)*

The random start feature, initiated after a power failure, will add a random time delay (from 5 to 120 seconds) to the three-minute anti short cycle time following a power outage. This will stagger the starting of multiple units in a single facility allowing a building to slowly go back on line when power is restored.

### Carrier 50QT/ET replacement *(optional)*

See installation information on page 36. The VPRC/VPRH 09–18 can be used to replace the Carrier 50QT/ET series PTAC and older vertical PTAC's from other manufacturers. Refer to Figure 1 on page 4 "Options" when ordering a Carrier 50QT/ET replacement. Model 18 can be field-modified with a simple extension of the outdoor air baffle. Consult your ECR International sales representative for more information.

### Electrical Connections

#### Electrical connections



#### CAUTION

**Electrical shock hazard** — Disconnect all power before removing chassis or performing any cleaning, servicing, or maintenance.

Refer to the wiring diagram attached to the unit for wiring details. All field wiring must be done in accordance with the National Electrical Code, ANSI/NFPA 70—latest edition, and local codes (in Canada — CSA C22.1 Canadian Electrical Code Part 1 and local codes).

Check the VPRC/VPRH ratings. The installer is responsible for ensuring that VPRC/VPRH units are installed in accordance with all applicable national and local codes. Check the rating plate for circuit ampacity. Size the breaker(s) or fuse size(s) accordingly.

- Use only HACR type breakers or time delay fuses.
- Select the proper wire for the breaker or fuse size used.
- Some units require more than one power supply.
- If a plug and receptacle are used, check for proper fit.
- Check the nameplate and wiring diagram for further instructions and wire connections.
- Each unit is equipped for a 24v wall thermostat connection.

#### NOTICE

VPRC/VPRH units are wired for 230v primary voltage from the factory. The transformer must be rewired by the installer if the jobsite voltage is 208v.

#### Power cord with integral safety protection

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

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

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

#### Disconnect switch (optional)

The disconnect switch ensures that all power to the control box is disconnected for servicing, resetting if main power is interrupted.

#### WARNING



Each power cord must be tested before use. Follow the test instructions in the order listed on the plug of the power supply cord.

**Do not use the product if the power supply cord fails the test.**

**DO NOT** attempt to repair a damaged power supply cord. Replace with a new cord from the manufacturer only.

#### Choosing a thermostat

ECR International offers your choice of a single-stage or two-stage mercury-free thermostat that is compatible with all models of the VPRC/VPRH. (Use a two-stage thermostat for VPRH units equipped with the electric heat option.)

- RetroAire™ thermostats have digital readout with a temperature control range from 45°F (7°C) to 90°F (32°C).
- When using a thermostat other than one offered by ECR International, use ONLY a 24v heat/cool thermostat.

#### Cooling-only with electric or hydronic heat

(VPRC only)

- Select a thermostat that is compatible with a cooling/electric heat system.
- The thermostat should have “R”, “Y”, “W” and “G” terminals.

#### Heat pump with electric heat

(VPRH only)

##### Single-stage thermostat

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

- The thermostat should have “R”, “Y”, “O” and “G” terminals. RetroAire™ units are single stage heating only.
- The electric heat and heat pump will not operate simultaneously.

##### Two-stage thermostat

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

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

## Sequence of Operation

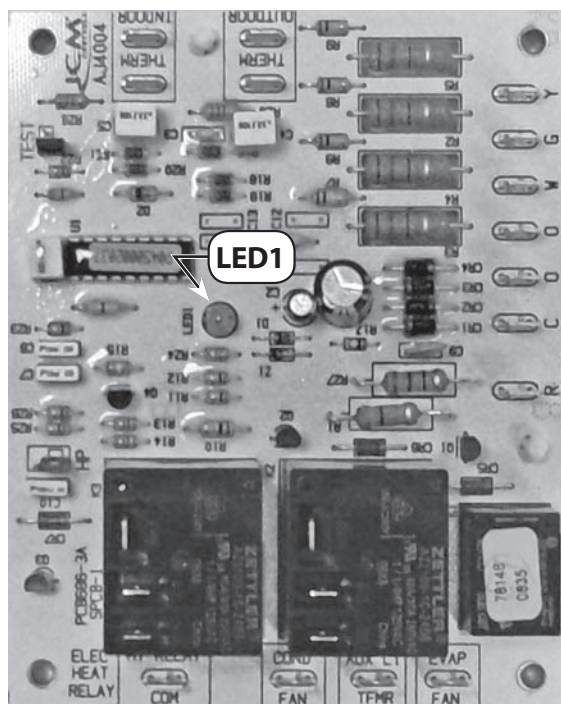
### Initial power-up or power restoration

When power is applied to the unit, either for the first time or after a power failure, the board will initialize itself. During the initialization, LED1 will be lit continuously for approximately 5 seconds.

Following initialization, a random-start timer is initiated. This timer adds a randomly selected 5-120 seconds to the start-up sequence, reducing the possibility of multiple units starting at the same time.

Once the random start timer has expired, a 180-second anti-short-cycle timer is initiated. LED1 blinks a two-flash code. (The anti-short-cycle timer prevents the 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 an auto/on fan switch.

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

### Cooling operation

If the room temperature is above the thermostat setting, the reversing valve (VPRH only) will be energized. The compressor and outdoor fan will start provided the Anti-Short Cycle Timer has timed out from the initial power-up, power restoration or a previous compressor on cycle. Operation will continue until the room temperature satisfies the thermostat. Once the room temperature falls below the set point by 3 °F (2 °C), the compressor, outdoor fan motor and reversing valve (VPRH only) will de-energize.

As soon as the compressor is de-energized, the anti-short-cycle timer will be initialized and will prevent the compressor from starting again for another 180 seconds. While the anti-short-cycle timer is active, the LED1 is set to blink a two-flash code. After the anti-short-cycle timer expires, the LED1 is set to blink a one-blink code, indicating normal operation.

### Mechanical heating (VPRH only)

If the outdoor coil temperature remains above 25 °F (-4 °C), the compressor and outdoor fan will start provided the anti-short-cycle timer has timed out from the initial power-up, power restoration or a previous compressor on cycle. Operation will continue until the room temperature satisfies the thermostat.

Once the room temperature rises above the set point by 3 °F (2 °C), the compressor and outdoor fan motor will de-energize.

As soon as the compressor is de-energized, the anti-short-cycle timer will be initialized and will prevent the compressor from starting again for another 180 seconds. While the anti-short-cycle timer is active, LED1 blinks a two-flash code. After the anti-short-cycle timer expires, LED1 flashes a one-blink code, indicating normal operation.

### Auxiliary heating

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

### Hydronic heating

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

### Final Inspection and Start-up



#### WARNING

Moving parts can cause injury. Exercise caution when testing the unit.

1. 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.

#### NOTE

Some units may require two power supplies (check nameplate and wiring diagram for further instructions.)

2. Connect the low voltage wires from thermostat to unit. Follow the wire diagram for details.
3. Turn power on and check for proper operation.

#### Heating

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

#### Cooling

1. Set the wall thermostat to cool mode. Set the thermostat below the room temperature setting.
2. After a few minutes of operation, cool air should discharge from the grilles.
3. The thermostat can be set at the most desired setting with the selector switch in the heat or cool position.
4. Ensure the unit is level. Check condensate removal by pouring water into the base pan, putting the unit in cooling mode and, with the condenser fan running, seeing if water is picked up by the slinger ring and thrown onto the outdoor coil. (Models VPRC/VPRH 09–24 only)
5. If the condensate is routed to an internal drain, verify that the drain is functioning properly.
6. Make sure that there is nothing to interfere with the room discharge air or the return air.



#### WARNING

Do not operate unit without filter in place or use as a temporary heating/cooling source during construction.

#### Manual fresh air shutter

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

#### Motorized fresh air damper

#### NOTE

A motorized damper is used on models 30–36. The switch to operate the damper is located on the control box. (See Figure 4, Page 11.)

#### Start-up checklist — Before operating this unit:

- ☐ Be sure to read and understand the contents of this manual.
- ☐ Be sure to install the unit per the instructions outlined in this manual.
- ☐ Ensure the electrical supply matches the electrical requirements of the unit, and that the unit is properly grounded.
- ☐ Examine control box. Ensure all wire connections are secure, and that control board jumpers are in the proper positions. See Page 28.
- ☐ Ensure indoor blower wheels and outdoor fan blades are secured to their motor shafts.
- ☐ Ensure all sheet metal panels are in place and secure.
- ☐ If a drain stub is used, ensure it is secure to the base pan, and the condensate drain is functioning properly.
- ☐ Ensure the chassis is properly fitted to the wall sleeve, and securely mounted to the surrounding framing.



### Final Inspection & Start-up (continued)

#### NOTICE

All wiring should be in accordance with both the National Electric Code (NEC) and the local building codes.

**UNITS RATED 208/230V** — the RetroAire unit is wired for 230v primary voltage from the factory. The transformer must be rewired by the installer if the jobsite voltage is 208v. Change the transformer tap from orange to red. See the wiring diagram for details.

### Setting the control board jumpers

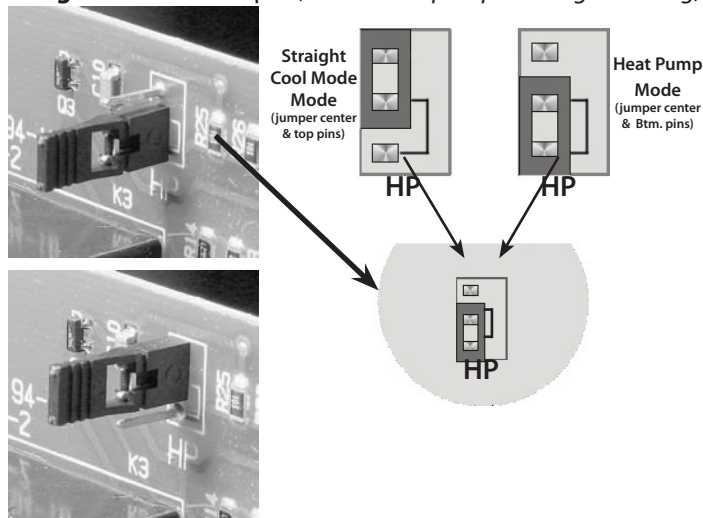
The control board has two sets of factory installed jumper pins on the control board, **HP** jumper and **TEST** jumper. These pins have

#### HP jumper — to select heat pump or straight cooling

These pins determine whether the unit operates as straight cooling or as heat pump (see Figure 21 and Figure 23).

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

**Figure 21** HP Jumper (selects heat pump or straight cooling)



#### TEST jumper — to select normal or test mode

This jumper is for use in testing only (see Figure 22 and Figure 23).

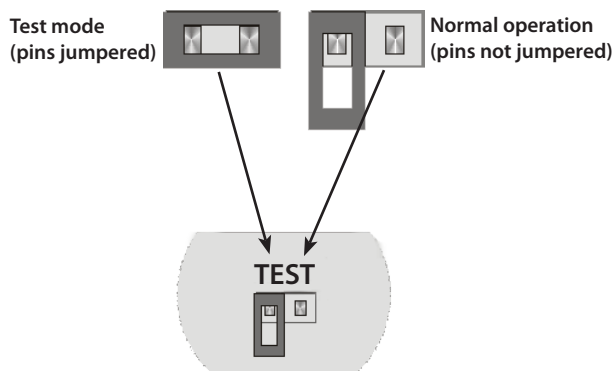
When the **JUMPER** pins are jumpered together, all timers are eliminated (example — anti-short cycle, purge, etc.). This is mainly used for production line testing. But it may be used for field testing as well. The units are factory set with the jumper on only one pin (normal operation position).



#### WARNING

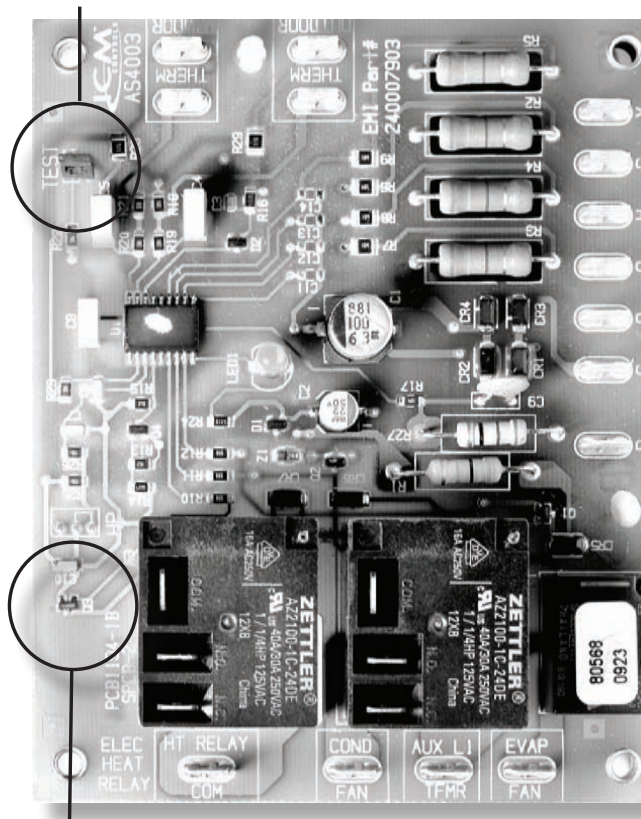
Do not leave the unit operating with the TEST jumper in the TEST position.

**Figure 22** TEST jumper (selects normal or test mode)



**Figure 23** Circuit board

#### TEST JUMPER




#### HEAT PUMP JUMPER



### Maintenance and Troubleshooting

#### Maintenance schedule



**DANGER**

**Electrical shock hazard** — Power to the VPRC/VPRH **MUST** be disconnected before servicing or accessing the control compartment. Failure to do so could result in severe personal injury or death.

For optimum performance and reliability of your VPRC / VPRH, ECR International recommends performing the following inspections and maintenance on a monthly basis. Units that are 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 the indoor air filter.
- ☐ Inspect the chassis interior for rodent or insect infestation. Clean if necessary.
- ☐ Clean & flush condensate drain pan and chassis base pan.
- ☐ If applicable, ensure the 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. Ensure dirt or debris have not collected on the fins. Clean if necessary. Be careful not to damage coil fins when cleaning. Use a fin comb to straighten any bent fins.
- ☐ Examine control box. Ensure all wire connections are secure.
- ☐ Ensure indoor blower wheels and outdoor fan blades are secured to their motor shafts.
- ☐ Ensure dirt or debris have not collected on the indoor blower wheels and outdoor fan blades. Use a vacuum and soft brush to clean if necessary.
- ☐ Ensure any ductwork connected to the unit is secure and free of air leaks.
- ☐ If the unit has a hydronic option installed, inspect piping, especially braze joints, for signs of water leaks. Repair if necessary.

#### Seasonal start-up and maintenance

At the beginning of the cooling and heating seasons, a complete mechanical check should be performed and maintenance/inspections performed as described below.

Disconnect power to unit and remove necessary access panels . . .

1. Remove the access panel and do a visual check of the equipment. Look for obvious changes in the unit such as damaged coils or evidence of extended wear on any moving parts. Check for unusual odors or leaks (examples: burnt motor windings, water, or refrigerant) and make sure the base pan is clean.

#### WARNING



Clean or replace the return air filter as needed. Allowing dust to collect on the filter will cause the unit to lose efficiency and eventually malfunction. Check the filter at least once a month. Some environments may require more frequent replacement, depending on particulate in the air stream.

2. Inspect all electrical connections for frayed wires and poor connections.
3. Check fan motors and blower assemblies. Ensure setscrews and motor mounting hardware are tight.
4. Centrifugal fan blades and blower cage assemblies must be clean to operate efficiently. Brush and/or vacuum as necessary.
5. Inspect both indoor and outdoor coils. Use a fin comb to straighten out any damaged fins. These coils must be clean for proper operation.

#### IMPORTANT

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

6. Look for oil leaks or stains on or around all braze joints and refrigerant lines. The presence of oil here indicates a potentially serious problem (such as a refrigerant leak).
7. Inspect and clean the drain pan and drain line(s). The use of an anti-fungicide tablet to keep the condensate system free from bacterial contaminants is recommended.
8. Ensure the unit is level. Over time, the building and equipment may settle, causing a shift in the direction the condensate flows. Ideally, the unit should be level for proper operation. (Note that the bottom of the wall sleeve is pitched downward to shed water to the outside. Make sure that any shifting that may have occurred over time does not interfere with proper drainage.)
9. Check weep holes along rear flange of the base pan to ensure they are free of debris.
10. Check the seal around the unit to ensure it is not broken or damaged.

#### IMPORTANT

Air leaks may make the conditioned area uncomfortably drafty or produce noises. Visually inspect the foam gasket between the wall and the unit, especially taking note of the separation between the air inlet for the condenser and the 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 the condenser coil.

11. Replace the access panels and reconnect the electrical power.

## Maintenance and Troubleshooting (continued)

### Troubleshooting



#### WARNING

The troubleshooting procedures below should only be conducted by a qualified technician.

Symptom	Suggestion
No heat or cooling	<ul style="list-style-type: none"> <li>Check to see if the unit has power and if the thermostat is satisfied. If the thermostat is not satisfied, call your installing contractor or service contractor.</li> </ul>
The thermostat calls for cooling, but cool air is not coming out of the unit.	<ul style="list-style-type: none"> <li>Check for continuity between the thermostat and the unit. Also make sure 24Vac is present across terminals C and R.</li> <li>Check to make sure the high pressure switch located in the outdoor section has not been tripped. If it has been tripped, press the switch button to restart the compressor.</li> <li>Some units are equipped with an LCDI (Leakage current detection interrupt) line cord. Make sure this line cord is reset by pressing the reset button at the line cord plug.</li> <li>Note: If the evaporator fan is operational and all of the above suggested procedures have been followed, and there is still no cooling being supplied by the unit, then contact a trained heating and cooling professional.</li> </ul>
A light on the circuit board is blinking.	<ul style="list-style-type: none"> <li>The circuit board uses this light for diagnostic purposes. The 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>
The circuit board light is blinking 3 or 4 times, but there is no freeze condition.	<ul style="list-style-type: none"> <li>Make sure the sensors have not been damaged. Remove sensor wires from the control board and make resistance measurements, then compare them to the following sensor resistances. Indoor and outdoor coil sensor wires are labelled, as is the 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>
The thermostat is satisfied, but the fan is still running.	<ul style="list-style-type: none"> <li>If the thermostat is set to auto mode, once the thermostat is satisfied, the fan will stay energized for an extra 60 seconds to purge the unit of excess cool or warm air in the plenum.</li> <li>If the thermostat fan switch is set to ON, the fan will stay energized regardless of whether the thermostat is satisfied or not. The only way to turn the fan off would be to turn the unit off or to turn the thermostat fan switch to AUTO.</li> </ul>
The thermostat calls for heat, but no heat comes out of the unit.	<ul style="list-style-type: none"> <li>Units equipped with electric heaters have a temperature limit switch to prevent the electric heater from reaching unsafe temperatures. If after calling for heating the heater is not energized, check for continuity across the limit. If the limit is open, replace it with an equivalent limit switch.</li> </ul>
The thermostat calls for heat while in heat pump mode, but heated air is not coming out of the unit.	<ul style="list-style-type: none"> <li>Check to see if the unit has power or if the thermostat has been satisfied. If the unit has power and the thermostat is satisfied, turn the thermostat a few degrees above room temperature.</li> <li>Make sure the LCDI line cord has not tripped. (See page 25 for information.)</li> <li>While in heat pump mode, make sure the thermostat is not energizing the O terminal. Retroaire units are designed to work in heat pump mode when 24vac is present across Y and C. Also, make sure the heat pump jumper on the control board is jumping the two pins labeled "HP" (see control board jumper locations, Figure 22, Page 28 and discussion).</li> <li>Make sure there are no freeze conditions. Refer to blinking codes question above for more information.</li> </ul>

### Maintenance and Troubleshooting *(continued)*

#### Indoor motor speed tap selection



#### WARNING

Before accessing the control compartment, disconnect power to the unit. Failure to do so could result in serious injury or electrical shock.

For information on indoor motor speed tap selection, please refer to the “Indoor Motor Speed Tap Selection Chart” label attached to the chassis of the VPRC/VPRH (Table 8).

Models’ VPRC/VPRH 09–36 motors are factory-wired for the corresponding units as described in the 230V column. 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 factory settings and ECR International will not be liable for any system problems that could arise if motor speed is not changed to match application.

**Table 8** 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	Blu
	0.3 (8)			
12	0.1 (3)	Blu	Blu	Blu
	0.2 (5)		Blk	Blk
	0.3 (8)			
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

#### NOTICE

All field wiring must be done in accordance with the National Electrical Code, ANSI/NFPA 70–latest edition, and local codes (in Canada — CSA C22.1 Canadian Electrical Code Part 1 and local codes).

















**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

### Electrical Specifications *(continued)*

**Table 10** NEMA Specifications Non-Locking/Receptacles

VOLTAGE	125V		250V			265V		
	15(A)	20(A)	15(A)	20(A)	30(A)	15(A)	20(A)	30(A)
PLUG	 5-15 P	 5-20 P	 6-15 P	 6-20 P	 6-30 P	 7-15 P	 7-20 P	 7-30 P
RECEPTACLE	 5-15 R	 5-20 R	 6-15 R	 6-20 R	 6-30 R	 7-15 R	 7-20 R	 7-30 R

### IMPORTANT

Due to ongoing product development, designs, specifications, and performance are subject to change without notice. Please consult the factory for further information.

**Table 11** VPRC/VPRH 09 electrical specifications

Power Supply Volt — 1-60			Indoor Fan Motor		Outdoor Fan Motor		Electric Heat				Unit Electrical Ratings				
Volt	Min	LRA	FLA	Hp	FLA	Hp	Htr #	Volt	W	HA	TCA	THA	MCA	MOCP	Plug
208/ 230V	197	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
								230	N/A	N/A		12.6	15.7	20	6-20P
							3	208	2454	11.8		13.8	17.3		
								230	3000	13.0		16.5	20.7	25	6-30P
							4	280	3271	15.7		18.2	22.7		
								230	4000	17.4		20.5	25.6	30	6-30P
							5	208	4089	19.7		22.5	28.2		
								230	5000	21.7					

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

**Table 12** 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		12.6	15.7	20	6-20P
								3	208	2454	11.8		13.8	17.3		
									230	3000	13.0		16.5	20.7	25	6-30P
								4	280	3271	15.7		18.2	22.7		
									230	4000	17.4		20.5	25.6	30	6-30P
								5	208	4089	19.7		22.5	28.2		
									230	5000	21.7					

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

### Electrical Specifications *(continued)*

**Table 13 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		
								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	
265V	240	5.8	46	0.56	0.07	0.5	0.17	3	277	4100	14.8		15.4	19.2	20	
									265	4576	17.3		17.8	22.3	25	
								4	265	4576	17.3		17.8	22.3	25	
									277	5000	18.1		18.6	23.3	25	

\* T H A value applies to hydronic heat only, Htr # 8 .

**Table 14 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 *(continued)*

**Table 15 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
									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	23.2	25	
								4	277	5000	18.1		19.4	24.2	25	
									265	6635	25.0		26.3	34.3	35	
								7	277	7250	26.2		27.5	34.0	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.

**Table 16 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	H-WIRE
								4	265	4576	17.3		19.6	24.5	25	
									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.

### Electrical Specifications *(continued)*

**Table 17 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.

#### NOTICE

All field wiring must be done in accordance with the National Electrical Code, ANSI/NFPA 70—latest edition, and local codes (in Canada — CSA C22.1 Canadian Electrical Code Part 1 and local codes).

Tested/Rated  
in Accordance with  
ARI Standard 390



### Carrier 50QT/ET Replacement Option — Installation

The VPRC/VPRH can be used to replace the Carrier 50QT/ET series PTAC and older vertical PTAC's from other manufacturers if certain field modifications are made. See information below. Consult your ECR International sales representative for more information.

#### Condenser louver replacement

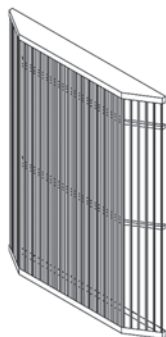
The existing Carrier wall sleeve can be retained in all applications, provided the VPRC/VPRH unit is installed as required for the 50QT/ET option.

The condenser louver must be modified or replaced unless it is the aluminum vertical-bar type with no plastic or metal block-off as shown in Figure 23. Two other louver types are used on Carrier units. See the following.

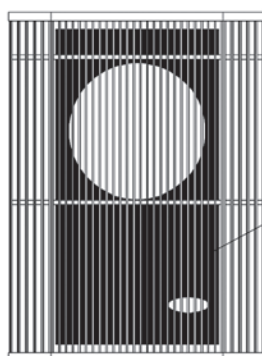
If you have the aluminum vertical bar type louver with a metal or plastic block-off (Figure 24), you must remove the block-off for the louver to function with the VPRC/VPRH or use the louver shipped with the VPRC/VPRH.

If the louver is stamped sheet metal (Figure 25), it must be removed and replaced with standard VPRC/VPRH louver shipped with the unit or the warranty will be voided. Modify the louver application as needed for proper fit and function of the VPRC/VPRH.

**Figure 24** Aluminum vertical bar louver **WITHOUT** block-off — can be used with the VPRC/VPRH as is

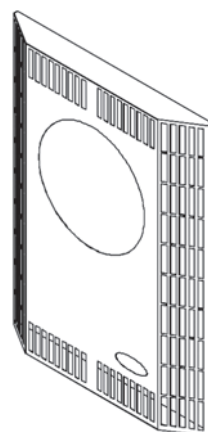


**Figure 25** Aluminum vertical bar louver **WITH** block-off — block-off must be removed to use with VPRC/VPRH



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

**Figure 26** Stamped metal louver **CANNOT be used with the VPRC/VPRH** — use the standard louver shipped with the VPRC/VPRH, adapting the installation as needed for fit and function



#### Installing the VPRC/VPHC into an existing wall sleeve/enclosure

Replacing another manufacturer's unit with the VPRC/VPRH chassis requires certain modifications because the unit is being installed into an existing wall sleeve and enclosure.

The installer is responsible for using proper installation practices when installing the VPRC/VPRH in an existing wall sleeve/enclosure. ECR International will not be responsible for the installation when accessories not normally included in our installation package are used.

#### DANGER



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

#### WARNING

For proper installation into an existing wall sleeve/enclosure, the following steps **MUST** be completed correctly.

1. Remove the existing Carrier 50QT/ET unit from the wall sleeve.
2. Inspect the wall sleeve. Ensure it is free of dirt or debris and is in good condition. If the condition of the existing wall sleeve is beyond repair, it must be replaced. Please contact your ECR International sales representative to obtain a replacement.

### Carrier 50QT/ET Replacement Option — Installation *(continued)*

#### WARNING

Carrier series applications utilize an internal drain system due to the design of the unit and matching wall sleeve. Make certain that the existing drain system is in working condition and able to move condensate freely.

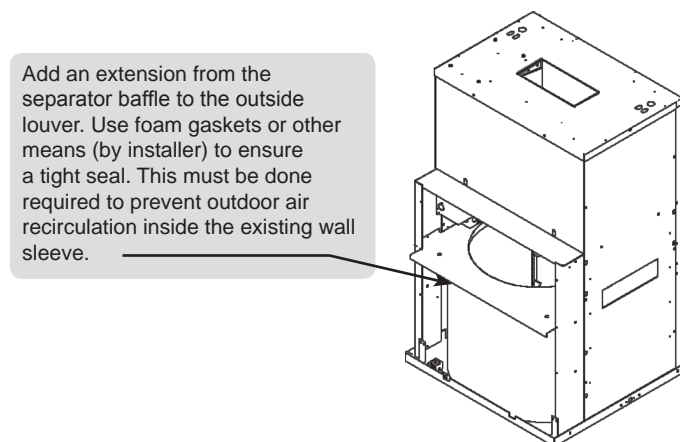
#### VPRC/VPRH Models 09–12 only

1. Attach the three baffles included in the chassis kit to the back of the condenser coil as shown in Figure 27.

#### VPRC/VPRH Model 18

1. The installer must fabricate and install an air diverter to separate inlet and discharge outdoor air. This diverter must extend to the condenser louvers. If this is not done, air recirculation between the condenser discharge and intake can result in premature compressor failure due to continued operation at high pressures, as well as dramatically decreasing the unit's capacity and efficiency from rated values.

**Figure 27** Model 18 — add a diverter extension



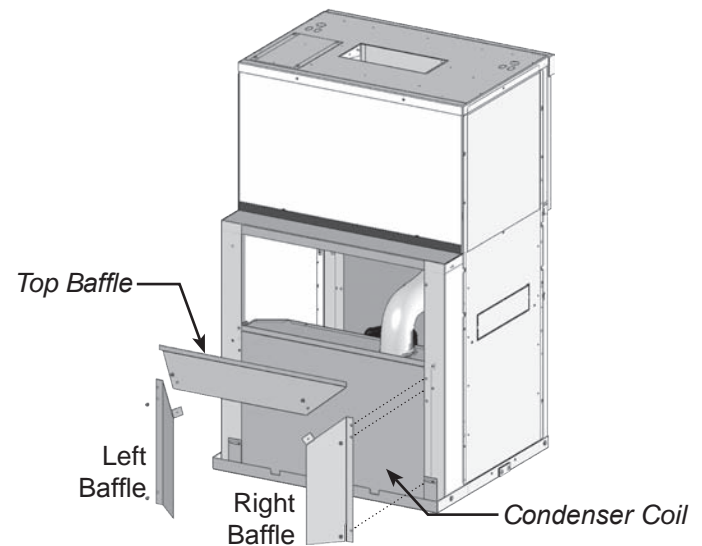
#### Models 09–18

1. The VPRC/VPRH includes an accessory drain stub that must be installed on the unit's base on the front side. See Figure 14, Page 18. The drain stub cannot be mounted on the side, because the unit inserts too deeply into the Carrier wall sleeve. (If this location is not acceptable, contact your ECR International sales representative for alternatives.) Connect the drain stub to a suitable drain.
2. Insert the VPRC/VPRH chassis 13 inches (330 mm) into the wall sleeve. Ensure it is level. When the unit is in position, fasten in place permanently by mechanical means. Shimming the chassis into position (i.e., by using a wooden platform) is acceptable. If the unit is completely removed, it will need to be re-leveled to ensure proper condensate drainage.

#### WARNING

It is extremely important that the chassis is level so condensate or wind-driven rain will flow from the base pan. The installer must test and confirm that condensate flows into an adequate drain. ECR International recommends pouring water into the base pan prior to operating the unit to ensure the drain system is operating properly.

**Figure 28** Install baffles on back of condenser coil



3. There must be an airtight seal between the chassis and the existing wall sleeve all the way around the condenser section. Since applications vary, ECR International recommends using expandable foam or closed cell foam to create the seal. This prevents air bypass around the chassis that will adversely affect the efficiency, operation, and reliability of the unit. This seal is also important to prevent inclement weather from entering the wall sleeve/interior of the building.
4. Install high and low voltage wiring to the VPRC/VPRH unit. Refer to the wiring diagram on the unit for wire connections.
5. Connect supply air ductwork to the VPRC/VPRH unit.
6. Turn on power to the unit.
7. Confirm operation by cycling the unit several times, observing that it behaves as described in the Sequence of Operation on page 26.
8. Replace all trim and components that were removed for the installation.

## Start-Up Report

### NOTICE

The Start-Up Report is provided for use by a qualified service professional in the event that there is a problem with the unit. In order for our Technical Service Department to better serve you, please complete.

Make sure to include the Model Number, Serial Number, and Date of installation. Have this information ready when calling.

Call our 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

This image shows a full page of blank graph paper. The grid consists of thin, light gray horizontal and vertical lines that intersect to form small squares across the entire surface. There are no margins, text, or other markings on the paper.

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