

## **Indoor Single Package Vertical, Air-Cooled Heat Pump Unit**

RetroAire Model Number: VPRH  
Capacity Range: 9,000, 12,000 & 19,000 Btuh (2.4 to 10kW)

### Part 1 – General

#### 1.01 UNIT DESCRIPTION

- A. Indoor, single package vertical, through the wall, limited range heat pump, air conditioning unit. Unit shall be shipped completely assembled and charged with refrigerant and oil, compressor, indoor and outdoor coils, expansion device, fans, fan motors, and controls. Additional installation components, wall sleeve and outdoor air louver shall be included. Unit shall be produced in the United States of America.
- B. Unit shall meet or exceed ASHRAE 90.1-Latest Edition minimum efficiency requirements for Single Packaged Vertical Units of 9.0 EER and 3.0 COP.

#### 1.02 QUALITY ASSURANCE

- A. Unit shall be Performance Certified by Air Conditioning Heating and Refrigeration Institute (AHRI). Unit rating shall be in accordance with ARI-390, latest revision, Performance Rating of Single Package Vertical Heat Pumps.
- B. Unit construction shall comply with ANSI/ASHRAE 15, latest revision.
- C. Unit construction shall comply with NFPA 70, (National Electrical Code, USA Only)
- D. Unit construction shall comply with UL484/CSA C22.2 No. 117-1970 (VPRH 09,12,19). Unit shall bear the ETL and ETLc label.
- E. Unit shall be operationally tested at the factory for proper operation.
- F. Unit to be produced in an ISO 9000 Certified Factory.

#### 1.03 DELIVERY, STORAGE, AND HANDLING

- A. Units shall be stored and handled per manufacturer's recommendations.

#### 1.04 WARRANTY

- A. Unit shall have a one-year limited parts warranty and a five-year limited compressor warranty.

Manufacturer reserves the right to change these specifications at any time without incurring obligation.

## Part 2 – Product

### 2.01 EQUIPMENT

#### A. Unit Cabinet

1. Unit cabinet shall be constructed of G-90U galvanized steel with a minimum thickness of 20 ga.
2. Unit base pan shall be constructed of G-60U galvanealed steel with a minimum thickness of 16 ga. The base pan shall be powder coat painted to prevent oxidation.
3. Base pan shall be provided with overflow notches to carry excess condensate, or in the event the condensate drain line becomes restricted, the overflow notches shall carry excess condensate into the wall sleeve to exit the building rather than spilling into the space.
4. Unit shall be equipped with a temperature actuated drain valve to remove condensate from the base pan in condensate re-evaporation systems. (VPRH 09, 12, 19)

#### B. Refrigerant System

1. A complete system refrigerant charge of R-410A shall be installed with the unit.
2. Compressor
  - a. Units shall utilize a hermetically-sealed Rotary (VPRH 09-12), Scroll (VPRH19) Compressor.
  - b. Compressor shall have internal and external isolation.
  - c. Compressor motor shall be a Permanently Split Capacitor (PSC) motor with overload protection.
3. Coils
  - a. Heat Exchanger Coils shall be enhanced aluminum fins mechanically bonded to internally enhanced copper tubes.
  - b. Heat Exchanger Coils shall be pressure tested at 500 psig (3447 kPa).
  - c. Coil tubesheets shall be constructed of galvanized steel.
4. Refrigerant expansion shall be capillary tube controlled (VPRH 09-12), piston controlled (VPRH 19) for the cooling side. Heating Refrigerant expansion shall be capillary tube expansion VPRH 09, 12,19).
5. Factory braze connections shall be leak tested at 500 psig (3447 kPa).
6. Units shall be equipped with a manual reset High Pressure Switch to disable the unit in the event of a high pressure situation.

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- C. Drain Pans:
1. Drain Pans shall be constructed of G-60U galvanealed steel with a minimum thickness of 20 ga. and insulated with a closed cell sheet insulation to prevent the formation of condensation. The drain pan shall be powder coat painted to prevent oxidation.
  2. Drain Pans will be connected to a factory supplied drain hose leading to the base pan for positive condensate re-evaporation (VPRH09,12,19).
- D. Indoor Fan System:
1. Indoor Fan Motor shall be a Permanently Split Capacitor (PSC) type motor with permanently lubricated bearings, Class B insulation, and inherent overload protection.
  2. Indoor Fan Motor shall have a minimum of 2 speeds to meet required external static pressure.
  3. Indoor Fan Motor shaft shall have inherent corrosion resistance.
  4. Indoor Fan Blower shall be a direct drive, forward curved, centrifugal blower and shall draw through the heat exchanger coils.
  5. Indoor Fan Blower shall be statically and dynamically balanced.
- E. Insulation:
1. Conditioned air stream and cabinet shall be factory insulated. Insulation and adhesive shall comply with NFPA-90A requirements for flame spread and smoke generation.
  2. Expanded liquid refrigerant and suction piping shall be factory insulated with closed cell insulation. Insulation and adhesive shall comply with NFPA-90A requirements for flame spread and smoke generation.
- F. Outdoor Air System
1. Outdoor Fan Motor shall be a Permanently Split Capacitor (PSC) type motor with permanently lubricated bearings, Class B insulation, and inherent overload protection.
  2. Outdoor Fan Motor shaft shall have inherent corrosion resistance.
  3. Outdoor Fan Blade shall be a direct drive, slinger-type propeller fan and shall blow through the heat exchanger coils (VPRH 09,12, 19).
  4. Indoor Fan Blower shall be statically and dynamically balanced.
- G. Controls:
1. Controls shall be 24-volt and shall be operable with a 24 volt wall mounted thermostat.
  2. Control shall include a minimum on-time for heating and cooling to eliminate system short cycling.

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3. Control shall include an Anti-Short Cycle Compressor Protection to eliminate system short cycling.
  4. Evaporator Freeze Protection – Prevents evaporator freeze up.
  5. When power is restored the equipment will resume operation after a three-minute compressor time delay.
  6. Fault conditions shall be displayed by an LED code located on the control board.
  7. Control Box shall be capable of being mounted in the front of the machine and have the ability to be mounted on the left or right side of the machine (VPRH 09,12,19).
- H. Electrical Connections
1. Factory supplied line voltage connections shall be either a ground fault interrupter circuit line cord or pigtail leads.
  2. Factory supplied field control connections shall be to a terminal block.
  3. All power connections shall be capable receiving a strain relief.
- I. Return Air System:
1. Unit shall be supplied with factory-installed disposable return air filters (VPRH 09,12,19).
  2. Unit shall be equipped with a means to introduce fresh air into the indoor air stream.
- J. Wall Sleeve/Louver Assembly.
1. Provide a custom wall sleeve for the specified wall depth noted on the Equipment Schedule.
    - a. Wall Sleeve sides, top and diverter panel shall be a minimum of 20 ga galvanized steel.
    - b. Wall Sleeve base shall be a minimum of 16 ga. galvanized steel and shall be sloped to allow for rain water to drain away from the unit. Base shall incorporate a drip lip to channel water away from the side of the building.
  2. Provide an anodized aluminum louver for condenser air.
- K. Special Features:
1. Voltage:
    - a. Unit voltage shall match voltage specified on the Equipment Schedule and shall be 208/230-1-60 or 265-1-60.
  2. Electric Heater:
    - a. Unit shall include Open Coil Element Electric Heater as noted on the Equipment Schedule, as a heat source. Electric Heater shall be factory installed and tested.

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Electric heater shall have a limit switch (VPRH 09,12,19) and fuse link (VPRH 09,12,19) approved for the application.

3. Hydronic Heat (VPRH 09,12,19)
    - a. A hot water heating coil shall be supplied as a field installed module that allows for removal of the chassis without disconnecting water piping.
    - b. Heat Exchanger Coil shall be enhanced aluminum fins mechanically bonded to copper tubes.
    - c. Heat Exchanger Coil shall be pressure tested at 320 psig (2206 kPa).
    - d. Coil tubesheets shall be constructed of galvanized steel.
    - e. Hydronic Module shall be supplied with a 10" Round Duct Collar for ease of installation.
    - f. Factory control wiring to the separate module shall be made by a Molex-Type connector.
    - g. A factory-supplied, field installed 24 vac, 3-way valve shall be supplied.
    - h. Freeze Protection for the hydronic coil shall be factory supplied.
    - i. Field water connections shall be located on the front, left or right side of the unit as noted on the equipment schedule.
    - j. Field water connections shall be [sweat-type connections. Ball Valves with Pressure/Temperature ports shall be supplied. Automatic Balancing Valve connections shall be supplied, and shall include Pressure/Temperature Ports].
  4. Control Box Location (VPRH 09,12,19)
    - a. The standard unit is configured with the control box in the front. The control box location can be installed on the left or the right side of the equipment.
  5. Disconnect Switch (VPRH 09,12,19)
    - a. A power disconnect switch shall be provided for units with electric heat no greater than 5 kW.
  6. Custom Painted Outdoor Air Louver
- L. Accessories:
1. Return Air Access Panel (Optional)
    - a. A Return Air Access Panel shall be supplied with a standard size, fiberglass, disposable return air filter. The access panel shall be constructed of 18 ga. sheet metal and powder coat painted.
  2. Digital Thermostat (Optional)
    - a. A two stage, Mercury-free, digital thermostat shall be supplied for heating/cooling control. The thermostat shall have a large LCD Display, which easily converts from

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Fahrenheit to Celsius Operation, with independent heating and cooling set points. Thermostat shall allow for an automatic heating system shutdown if indoor temperature exceeds 90 °F (32 °C). Thermostat allows for emergency heat, if mechanical heating is off-line. Thermostat shall have a Low Battery Indicator.

- b. A single stage, Mercury-free, digital thermostat shall be supplied for heating/cooling control. The thermostat shall have a large LCD Display, which easily converts from Fahrenheit to Celsius Operation, with independent heating and cooling set points. Thermostat shall allow for an automatic heating system shutdown if indoor temperature exceeds 90 °F (32 °C). Thermostat shall have a Low Battery Indicator.
3. Condensate Drain Stub (VPRH 09,12,19)
  - a. A field-installed Condensate Drain Stub shall be supplied to allow for condensate to be removed from the unit base to a central drain system. The drain shall be field configurable for front, left or right side drain.
4. 10" Round Duct Collar (VPRH 09,12)
  - a. Provide a 10" Round Duct Collar for connection of the supply air ductwork.

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