



**General Information: Single Packaged Vertical Wall-Mount Air Source Heat Pump**

**1. Submittals**

- a. Provide submittals in accordance with Division 01 and Section 15.
- b. Submittals for Single Packaged Wall Mount heat pump shall include equipment performance, dimensions, required clearances, and electrical requirements and connections. Two-stage equipment shall include the following performance data: CFM, EER, COP, IPLV, Total, Sensible, and Latent capacities at standard AHRI conditions and for all stages of operation. Submittals shall also include performance at design conditions per the schedule.
- c. Factory tested sound data per ANSI S12.60. Data shall include Dba levels at all operating conditions and ERV speeds, including exterior sound level.
- d. Factory Warranty documentation verifying 5-year compressor and 5-year parts warranty.
- e. Control submittal if the controller is provided by the equipment manufacturer.
- f. Equipment shall be provided by Bard Manufacturing or approved equal.

**2. Quality Assurance**

- a. Design, construction, testing and installation shall comply with the following standards as applicable:
  - 1) UL or ETL classified in accordance with ANSI/UL 1995/CSA 22.2 No. 236-05 fifth edition or ANSI/UL STD 60335-1 & ANSI/ UL STD 60335-2-40/CSA STD C22.2 No. 60335-1 & CSA STD C22.2 No. 60335-2-40 Fourth Edition.
  - 2) Certificate of performance by AHRI or another independent third-party testing agency. AHRI or third-party testing will be in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2021 for Single Package Vertical Units (SPVU). Self-test data provided “in accordance with AHRI 390-2021” will not be accepted or considered as an alternate. Consideration of exceptions will require testing by a third-party agency preapproved by the specifier and an accompanying statement of indemnification from the Manufacturer.
- b. An ISO 9001:2015 Certified Manufacturer shall manufacture unit and successfully manufacture SPVU equipment continuously for a minimum of 5 years.

**3. Operating Characteristics**

- a. Unit shall have staged operation for sensible load matching and provide longer run time capability for humidity reduction.
- b. Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric strip heat. The unit's electric nameplate shall display the required electric circuit. Factory-installed adjustable controls allowing for optional low amp draw operation preventing simultaneous operation of the compressor and strip heat during heating or defrost operation shall not be permitted unless accurate electrical values are provided on the unit nameplate. Standard heat pumps with concurrent electric heat operation or dedicated low ampacity units manufactured and shipped with correct nameplate data shall be accepted.

- c. Supply airflow shall automatically adjust to maintain constant cfm at rated airflow independent of external static pressure up to .5" WC.

#### **4. Warranty**

- a. The unit shall include a full 5-year parts warranty covering the compressor, sealed refrigeration system, heat exchange coils, and ventilation packages, as defined by the terms and conditions of the Bard Limited Warranty agreement. Labor is excluded from the Bard standard warranty. Any non-equivalent 5-year compressor and 1-year parts warranty shall not be accepted. All parts warranty documentation shall be included in the submittal data. Any exceptions to a manufacturer's standard warranty must be acknowledged in writing by the Manufacturer's senior manager.

#### **5. Training, Commissioning, and Technical Support**

- a. Optional on-site, remote, and video training available. See [www.bardhvac.com](http://www.bardhvac.com) for additional information.
- b. Optional on-site commissioning available. See [www.bardhvac.com](http://www.bardhvac.com) for additional information.
- c. Standard technical services from Bard using trained, experienced technical staff. Both phone and video support services are available. See [www.bardhvac.com](http://www.bardhvac.com) for additional information.
- d. Installation manuals, service manuals, application guides, replacement parts manuals, and wiring diagrams ship with the product and are available at [www.bardhvac.com](http://www.bardhvac.com).
- e. Installation shall be in full accordance with the manufacturer's instructions, generally accepted practices, and all applicable codes.

### **General Equipment Requirements**

#### **6. Capacity and efficiency**

- a. Capacities of Heat Pumps as indicated on drawing and schedules are net capacities required.
- b. Efficiencies shall be at AHRI conditions, and submitted performance shall be at specified conditions per the schedule.
- c. Furnish and install a self-contained, vertical wall-mount heat pump to be manufactured by Bard Manufacturing Company.
- d. Units shall be self-contained vertical packaged (SPVU) heat pumps. Cooling performance shall be tested and certified by AHRI per Standard 390-2003 and listed in the AHRI database. AHRI certificate shall be included in the submittal data. If AHRI documentation is unavailable, third-party performance certification by an agency preapproved by the specifier may be considered. Third-party submittals of capacity and efficiency in heating and cooling shall be provided 10 days before the bid and include a statement of performance indemnification from the Manufacturer.

#### **7. Cabinet and Component Construction**

- a. Constructed of 20-gauge pre-painted steel consisting of galvanized steel in accordance with ASTM A653, modified acrylic primer .25 MIL., topcoat paint shall be .75 MIL. The cabinet shall be tested to withstand a 1000-hour salt spray test per ASTM B117-03.
- b. Exterior panels shall include a filter service door for easy access for filter changes.
- c. Fresh air intake shall use slotted or louvered panels for opening protection.
- d. Insulation: The cooling section shall be fully insulated with non-fiberglass insulation. A foil facing shall be provided on cabinet panels for easy cleaning if necessary and

protection against insulation damage. Insulation must meet flame/smoke rating requirements of 25/50 per UL723. Exterior cabinet panel insulation shall be a minimum of ¾" thick with an R2.9 value or greater. Insulation shall be adhered to cabinet panels using a hot melt gluing process or equivalent.

- e. Color options: Beige, White, Gray, desert Brown, Dark Bronze, Stainless Steel, or Aluminum.
- f. Low voltage electrical entrance into cabinet shall be Ø.875 for easy conduit connection. High voltage electrical entrances shall be triple knockouts with Ø1.75, Ø1.375, Ø1.063 connection sizes.
- g. Built-in side flanges shall be used to mount the unit to the exterior wall surface during installation. Side mounting holes for unit installation shall be Ø.375" for wall fasteners. Florida wind code information regarding installation and code compliance shall be supplied upon request.
- h. Unit shall include a sloped top for water drainage. Pitch of sloped top is 4° angle.
- i. The top fill piece used to seal the top of the unit to the wall shall be factory-supplied. The top fill shall be caulked so as not to allow water between the unit and the wall. A drip edge must be field-supplied and installed if a top fill piece is not factory-supplied or used. Side mounting flanges shall be built into the unit cabinet. Optional bottom support shall be supplied with every unit to aid with unit attachment to the wall.
- j. The evaporator coil drain pan shall be made from primed and painted steel for corrosion resistance. The primary drain shall be a non-corrosive material, and the drain line shall be a flexible Vinyl or PVC tubing material of .750 I.D. and 1" O.D. A secondary emergency drain location is provided in case of an obstructed drain line, and water needs to exit the pan. This drain is located away from the electrical parts in the unit. Caulk or other sealants used must be 100% silicone rubber with a design temperature from -76°F to 350°F (-60°C to 177°C) for durability and seal the pan for the life of the product.
- k. A 2" supply air and return air duct flange shall be provided for ducted connections and short stub ducts through wall cavities. A foam seal shall be provided around the supply and return openings for reduced air infiltration into the room or area being conditioned.
- l. **OPTIONAL:** A bottom installation support bracket shall be supplied for optional use. If used during installation, the bottom support bracket provides unit support while fasteners are inserted into the side flange mounting holes.
- m. **OPTIONAL:** Stainless steel cabinet construction with 316-grade exterior panels shall be available. This includes the upper unit front, service panels, condenser grilles, sides, fan shroud, base, exterior brackets, and unit back. Fasteners and the outdoor fan motor mount shall be constructed of stainless steel. Serviceable panel fasteners shall have clips, threaded riv-nuts, or extruded holes to resist thread stripping during panel removal.
- n. **OPTIONAL:** Cabinet coating shall be available for harsh environments where additional cabinet protection is required. Complete disassembly is required to apply the coating to all unit areas. Piping and component casings are also coated. Labels are masked for easy reference after the coating process. Surfaces are cleaned with solvent or a stem cleaner. The interior bare surfaces are etched with GalvaPrep or equal, then rinsed. Painted surfaces are scuffed and then cleaned to be free of dust, dirt, and debris. An epoxy primer is then applied at 50 to 75 microns thickness. An epoxy shell is then applied at 100 to 200 microns thickness. After a 12-hour dry time, a high gloss urethane coating is applied at 50 to 75 microns thickness.
- o. **OPTIONAL:** Units above the 3-ton capacity range shall have a notched or recessed top option to allow the unit to be installed in overhanging rooflines during legacy equipment replacement.

## **Mechanical Cooling, Heating, and Electric Heat**

## 8. Refrigeration System and Coil Construction

- a. The evaporator coil shall have a standard hydrophilic protective fin coating (green fin). Exposed aluminum fins are not acceptable. Equivalent approved sprayed or dipped protective coatings are acceptable. The fin coating is green and applied to the fin surface before constructing the coil. The fin coating shall resist the following corrosive agents: Ammonia, Sodium Hydroxide, Sodium Chloride, Acidic solutions, and solvents. Salt spray corrosion testing per ASTM B177 shall have no effect after 500 hours. Acidic Brine Immersion testing per HTM0039 shall have no effect after 120 hours.
- b. The refrigeration system shall be pressure tested to a minimum of 450psi after all braze joints are completed. After pressure testing, a trace gas shall be used to leak-test the refrigerant system. The refrigeration system shall then be put under a vacuum of 50 microns or less before adding refrigerant. Once the refrigerant is added, another leak test shall be performed on the final sealed system. The refrigerant used shall be R-410A.
- c. **OPTIONAL:** The condenser coil and/or evaporator shall have a Technicoat AA option for advanced corrosion protection or equivalent. Technicoat AA has the following properties:
  - 1) Pass 10,000 hours of salt spray testing per ASTM B 117.
  - 2) Pass 3,000 hours of acetic salt spray testing per ASTM G85.
  - 3) Pass 40 cycles DIN 50018 Kesternich Sulphuric testing.
  - 4) 25 micron or 1 mil coating thickness.
  - 5) Dipped application process to coat fin pack core, header, and hairpin tubes.
  - 6) Contains 18 grams or less of VOC per liter of coating material.

## 9. Compressors

- a. Shall be a 2-stage hermetically sealed scroll compressor with internal unloading providing 2 stages of heating and cooling operation.
- b. The refrigeration circuit shall have factory-installed high- and low-pressure controls with a resettable lockout circuit. An internal overload shall protect the compressor against excessive motor temperatures and currents.
- c. Short cycle protection shall be standard.
- d. Refrigeration circuit will include a thermostatic expansion device, liquid line filter dryer, refrigerant service ports, service port caps, and discharge muffler.
- e. The compressor shall be mounted on a double floating isolation mounting system and fitted with a factory-installed sound attenuation jacket.

## 10. Optional Electric Heat

- a. Unit models shall have optional factory or field-installed auxiliary electric heat. Electric heat.
- b. Electric heat shall be of a resistance type with primary and secondary limits/thermal cutoffs.

## *Unit Indoor and Outdoor Airflow*

### 11. Variable Speed Indoor Blower Motor

- a. The indoor blower motor shall be electronically commutated variable speed (ECM), factory programmed to produce rated airflow from 0" to .5" WC of external static pressure.
- b. The motor is to be self-adjusting to provide proper rated airflow at high static pressures without user adjustment or wiring changes by the user.
- c. The motor shall be pre-programmed for a 20-second ramp-up and a 60-second ramp-down for quiet, smooth starting and stopping.
- d. NOX Rust coating shall be applied to the motor shaft for ease of serviceability.

- e. EC motor control module shall be remotely mounted with a plug-in connection to the motor for easy maintenance and troubleshooting.
- f. PSC motor shall not be acceptable.

## **12. Enclosed Outdoor Condenser Motor**

- a. The motor shall have an enclosed (no exposed windings) casing and use a long-life ball-bearing design.
- b. Factory-integrated low ambient control to control outdoor fan speed shall be available.
- c. NOX Rust coating shall be applied to the motor shaft for ease of serviceability.
- d. Electronically commutated or split capacitor motors shall be acceptable.

## **13. Outdoor Condenser Airflow**

- a. The standard blow-thru airflow design allows condenser air to be brought into the sides of the unit, pass through the condenser coil, and discharge through the front unit grille.
- b. An optional draw-thru airflow design for units above 3-ton capacity shall allow condenser air to be brought into the front of the unit, pass through the condenser coil, and discharge through the left and right-side unit grilles.
- c. Access for condenser coil cleaning shall be provided for routine maintenance.

## ***Filtration and Indoor Air Quality***

### **14. Filters**

- a. The unit shall be factory furnished with 1" or 2" pleated primary filters and have a Minimum Efficiency Reporting Value per ASHRAE standard 52.2. Filters available in the following ratings:
  - 1) MERV 2, 1" disposable or washable.
  - 2) MERV 8, 2" pleated.
  - 3) MERV 11, 2" pleated.
  - 4) MERV 13, 2" pleated.
- b. All filters shall be accessible through the filter access door. Filter sizes shall be readily available in commercial sizes.
- c. An optional pressure-regulated dirty filter switch indicator with adjustable sensitivity shall be available as a control option.

### **15. UVC-LED (Optional with MERV 13 Filter)**

- a. Provides ultraviolet germicidal irradiation (UVGI) that disinfects the air through short wavelength ultraviolet light.
- b. UVC light system is rated for 7 to 10 years without required bulb maintenance.
- c. UVC light will be factory or field installed.

### **16. Bipolar Ionization Device (Optional with MERV 13 Filter)**

- a. Needle Point Bipolar Ionization devices will be factory or field installed.

## ***Electrical Components and Unit Controls***

### **17. General Electrical Components**

- a. Electrical components shall be easily accessible for routine inspection and maintenance through front or side service panels.
- b. Circuit breakers shall be standard on all 208/230-volt models and a disconnect standard on all 460-volt models.

- c. Circuit breaker/disconnect access is through a lockable access panel. Lock and key are to be provided with each unit.
- d. Unit shall have an entry for line voltage through the right and/or left side or back panel with optional single or dual circuit options depending on voltage and amperage requirements.
- e. The internal low voltage control circuit shall consist of a current-limiting 24 VAC type 75 VA transformer with a resettable circuit breaker.

### **18. Defrost Control**

- a. Controls for defrost shall be by temperature and time. After 30, 60, or 90 minutes (selectable), the heat pump control shall place the system in defrost mode. The defrost circuit shall consist of a solid-state electronic heat pump control. A 60-minute timer (factory setting) shall initiate a defrost cycle if the outdoor coil temperature indicates the possibility of an iced condition. The thermistor sensor, speed-up terminal for service, and an eight-minute defrost override shall all be standard on the electronic heat pump control. Both time and temperature are used for heat pump defrost logic.
- b. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be incorporated into the heat pump control board. A low-pressure bypass shall be incorporated into the heat pump control board to prevent nuisance tripping during low-temperature start-up.

### **19. Phase Monitor (3-Phase Units Only)**

- a. All units with 3-phase power shall include a factory-installed phase rotation monitor. This device shall protect the scroll compressor from reverse rotation and also protect the unit from phase failure.
- b. If 3-phase power is incorrectly connected at the field power connections, the phase monitor shall lock out the unit, and a red light will illuminate, indicating an incorrect phase. If the unit is wired correctly, a green light will illuminate during a compressor call.
- c. If a power leg is lost, the phase monitor will lock out the unit due to phase imbalance. Once the condition is corrected, turning the power off at the circuit breaker or disconnecting it will reset the phase monitor.

## ***Ventilation and Outdoor Air Intake (Select One)***

### **20. Standard Barometric Intake Damper without Exhaust Damper**

- a. An intake damper opens when the indoor fan is operational.
- b. The damper can provide outdoor air intake of up to 25% rated airflow (the actual amount depends on room pressurization).
- c. Pins shall allow for airflow amount adjustment.
- d. A cleanable vinyl screen shall provide pre-filtration of entering air.

### **21. Standard Barometric Intake Damper with Exhaust Damper**

- a. An intake damper opens when the indoor fan is operational. The exhaust damper opens based on room pressurization.
- b. The damper can provide outdoor air intake of up to 25% rated airflow (the actual amount depends on room pressurization).
- c. Pins shall allow for airflow amount adjustment of the intake and exhaust air damper.
- d. A cleanable vinyl screen shall provide pre-filtration of entering air.

### **22. Commercial Room Ventilator (On/Off)**



- a. The vent shall provide an outdoor air intake and room air exhaust path.
- b. The damper can provide outdoor air intake of up to 50% rated airflow (the actual amount depends on room pressurization).
- c. The damper shall have an adjustable blade stop and open to a predetermined position when 24VAC is applied to the damper motor.
- d. The damper blade and motor shall be spring closed during power loss. The blade shall be closed within 30 seconds when power is removed from the damper.
- e. Seals shall be provided to reduce air leakage through damper assembly.
- f. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air. Exhaust air shall have a cleanable media to avoid infiltration of debris during operation.

### **23. Commercial Room Ventilator (Modulating)**

- a. The vent shall provide an outdoor air intake and room air exhaust path to reduce room pressurization.
- b. The damper can provide outdoor air intake of up to 50% rated airflow (the actual amount depends on room pressurization).
- c. The damper shall have an adjustable blade stop and open to a predetermined position when 24VAC is applied to the damper motor or can modulate based on a 0-10VDC signal from a CO2 sensor or other device.
- d. The vent shall have a user-adjustable pre-purge option with 0/30/60/90 min. timer settings.
- e. The damper blade and motor shall spring closed during power loss. The blade shall be closed within 30 seconds when power is removed from the damper.
- f. Ultra-low leakage seals shall be provided to reduce air leakage through damper assembly. The damper meets 4cfm/ft<sup>2</sup> blade leakage requirements per AMCA 500-D-2012 testing procedures.
- g. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air. Exhaust air shall have a cleanable media to avoid infiltration of debris during operation.

### **24. Economizer with Enthalpy (temperature and humidity) Monitoring**

- a. The vent shall provide an outdoor air intake and room air exhaust path to reduce room pressurization.
- b. The damper can provide outdoor air intake of up to 100% rated airflow (the actual amount depends on room pressurization).
- c. The vent shall have a JADE economizer control or equivalent with the following features:
  - 1) Monitor both outdoor temperature and humidity for economizing acceptability. Acceptable conditions are based on user-adjustable enthalpy curves (temperature and humidity).
  - 2) Capable of a 0-10VDC input for a CO2 sensor or other device.
  - 3) Capable of a minimum blade position energized by a 24VAC input.
  - 4) Compressor lockout feature based on outdoor temperature.
  - 5) Auxiliary output for a damper fail alarm or secondary exhaust fan.
  - 6) Supply/mixed air sensor and optional field installed return air sensor.
  - 7) Economizer logic based on requirements of CEC Title 24 for California use.
- d. The damper blade and motor shall spring closed during power loss. The blade shall be closed within 30 seconds when power is removed from the damper.
- e. Ultra-low leakage seals shall be provided to reduce air leakage through damper assembly. The damper meets 4cfm/ft<sup>2</sup> blade leakage requirements per AMCA 500-D-2012 testing procedures.

- f. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air. Exhaust air shall have a cleanable media to avoid infiltration of debris during operation.

## **25. Economizer with Dry Bulb (temperature) Monitoring**

- a. The vent shall provide an outdoor air intake and room air exhaust path to reduce room pressurization.
- b. The damper can provide outdoor air intake of up to 100% rated airflow (the actual amount depends on room pressurization).
- c. The vent shall have a JADE economizer control or equivalent with the following features:
  - 1) Monitor the outdoor temperature for economizing acceptability. Acceptable conditions are based on user-adjustable outdoor dry bulb setpoint.
  - 2) Provide a 0-10VDC input for a CO2 sensor or other device.
  - 3) Provide a minimum blade position energized by a 24VAC input.
  - 4) Compressor lockout feature based on outdoor temperature.
  - 5) Auxiliary output for damper fail alarm or secondary exhaust fan.
  - 6) Supply/mixed air sensor and optional field installed return air sensor.
  - 7) Economizer logic based on requirements of CEC Title 24 for California use.
- d. The damper blade and motor shall spring closed during power loss. The blade shall be closed within 30 seconds when power is removed from the damper.
- e. Ultra-low leakage seals shall be provided to reduce air leakage through damper assembly. The damper meets 4cfm/ft2 blade leakage requirements per AMCA 500-D-2012 testing procedures.
- f. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air. Exhaust air shall have a cleanable media to avoid infiltration of debris during operation.

## **26. Economizer without factory controls.**

- a. The vent shall provide an outdoor air intake and room air exhaust path to reduce room pressurization.
- b. The damper can provide outdoor air intake of up to 100% rated airflow (the actual amount depends on room pressurization).
- c. The vent shall have a 0-10VDC damper motor and a 10k outdoor sensor that a field-supplied controller or building management system can control.
- d. The damper blade and motor shall spring closed during power loss. The blade shall be closed within 30 seconds when power is removed from the damper.
- e. Ultra-low leakage seals shall be provided to reduce air leakage through damper assembly. The damper meets 4cfm/ft2 blade leakage requirements per AMCA 500-D-2012 testing procedures.
- f. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air. Exhaust air shall have a cleanable media to avoid infiltration of debris during operation.

## **27. Energy Recovery Ventilator (ERV)**

- a. The Energy Recovery module shall consist of 2 rotary wheels in an insulated cassette frame complete with silica gel desiccant permanently bonded, seals, drive motor, belt, intake, and exhaust blowers.
- b. The inherited design of the ERV shall be such as to promote self-cleaning in standard conditions.
- c. Intake and exhaust blower motors shall be fractional horsepower PSC motors providing 3 selectable cfm levels. Intake and exhaust airflow shall be independently adjustable, providing for positive pressurization of the space.



- d. The ERV thermal performance shall be certified by BOTH the ERV media manufacturer and the HVAC equipment manufacturer in accordance with ASHRAE Standard 84, Method of Testing Air-to Air Heat Exchangers and ARI Standard 1060, Rating for Air-to-Air Energy Recovery Ventilation Equipment Cassettes, and shall be listed in the ARI Certified Products. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality.
- e. The energy transfer media shall include enthalpy transfer utilizing silica gel desiccant of other media with high latent transfer capability. All components of the ERV assembly shall be warranted (parts only) 5 years from the installation date. ERV performance at design conditions shall be furnished upon request.
- f. A cleanable vinyl screen or coarse filter shall provide pre-filtration of entering air.

### **Optional Standard Accessories**

#### **28. Ductless Direct Supply Indoor Grille**

- a. Supply air grille sized to match unit supply discharge flange. The grille is designed to fit the supply duct in the wall cavity between the unit and the inner wall surface.
- b. Silver finish.
- c. 4-way deflectors provided for even air distribution in the room.
- d. Grill shall have a standard 2" flange to provide coverage of the supply wall cavity and allow fasteners to attach the grille to the wall. A 1" flange supply grille option is available.
- e. Grille shall be an anodized aluminum or silver finish.

#### **29. Ductless Direct Return Indoor Grille**

- a. The return air grille is sized to match the unit return intake flange. The grille is designed to fit the return duct in the wall cavity between the unit and the inner wall surface.
- b. Silver finish.
- c. 45° angled deflectors provided for even air distribution in the room.
- d. Grill shall have a standard 2" flange to provide coverage of the return wall cavity and allow fasteners to attach the grille to the wall. A 1" flange supply grille option is available.
- e. Grille shall be an anodized aluminum or silver finish.

#### **30. Optional Condenser Drain Pan Kit**

- a. Drain pan shall provide a means of draining defrost water from the condenser coil to avoid re-freezing on sidewalks and around the unit base.
- b. A barbed plastic connector shall be provided in the pan for drain line connection. The field-supplied pan drain line shall be sized to match the factory-supplied evaporator condensate drain line.

#### **31. Optional Outdoor Thermostat Kit**

- a. An optional outdoor thermostat kit shall be available to limit heat pump operation and energize electric heat as the primary heat source.
- b. The outdoor thermostat shall be field adjustable.

#### **32. Optional Crank Case Heater Kit**

- a. Crankcase heater kits shall be available for field installation. When the unit is not being used, the crankcase heater provides heat to the compressor to help avoid refrigerant migration during cold outdoor conditions. Recommended for year-round equipment cooling applications in areas with cold winter weather.

### **33. Optional Shipping Crate**

- a. Shipping crates shall be provided for additional unit protection during transport. Unit shall ship on the standard wood skid, cardboard inner packaging, and an external wood crate.
- b. Crate shall use OSB board construction with steel corners and supporting members.

## **Optional Curb and Sound Accessories**

### **34. Optional Exterior Equipment Cooling Upgrade Wall Curbs**

- a. SPVU manufacturer shall furnish an appropriately sized wall curb manufactured of painted steel matching unit color. Spray paint of galvanized steel shall not be accepted.
- b. Constructed of 20-gauge pre-painted steel exterior consisting of galvanized material in accordance with ASTM A653, modified acrylic primer .25 MIL., topcoat paint shall be .75 MIL. The curb shall be tested to withstand a 1000-hour salt spray test per ASTM B117-03. Multiple colors and finishes are available to match unit finish.
- c. The wall curb is insulated with an anti-microbial flame/ smoke resistant non-fiberglass cotton material. Middle partitions are used in all curb designs that seal and separate the return and supply air paths.
- d. Fasteners required to attach the Bard Wall Mount unit to the curb are supplied from the factory. These include carriage bolts, washers, and Keps nuts that will be used to install the unit to the curb. A foam seal between the unit flanges and the curb front surface is provided. Fasteners required to attach the curb to the wall are field-supplied and are specific to wall construction. Installation and seismic requirements must follow all national, state, and local codes.

### **35. Optional Exterior Sound Reduction and Vibration Isolation Wall Curbs**

- a. SPVU manufacturer shall furnish an appropriately sized wall curb manufactured of painted steel matching unit color. Spray paint of galvanized steel shall not be accepted.
- b. Constructed of 16 and 20-gauge painted steel exterior consisting of galvanized material in accordance with ASTM A653, modified acrylic primer .25 MIL., topcoat paint shall be .75 MIL. The curb shall be tested to withstand a 1000-hour salt spray test per ASTM B117-03. Multiple colors and finishes are available to match unit finish.
- c. The wall curb is insulated with an anti-microbial flame/ smoke resistant non-fiberglass cotton material. Middle partitions are used in all curb designs that seal and separate the return and supply air paths.
- d. Curb construction shall be comprised of an inner frame that attaches to the wall mount unit, and an outer frame that attaches to the wall surface. Industrial-grade rubber isolators separate the inner and outer frame, minimizing sound and vibration transferal. Pre-assembly is completed at the factory for ease of installation.
- e. Back return opening panels are relocatable to allow for adjustment based on room construction.
- f. Top or front (direct) supply air discharge versions available.
- g. Fasteners required to attach the Bard Wall Mount unit to the curb are factory supplied. These include rev-bolts, washers, and nuts that will be used to install the unit to the curb. A foam seal is provided between the unit flanges and curb front surface. Fasteners required to attach the curb to the wall are field-supplied and are specific to wall construction. Installation and seismic requirements must follow all national, state, and local codes.

### **36. Optional Sound Isolation Interior Return Plenum**

- a. SPVU manufacturer shall furnish an appropriately sized indoor wall plenum of painted steel. White, Gray, and Beige colors are available. Spray paint of galvanized steel shall not be accepted.
- b. Constructed of 16 and 20-gauge painted steel consisting of galvanized material in accordance with ASTM A653, modified acrylic primer .25 MIL., topcoat paint shall be .75 MIL. The Plenum shall be tested to withstand a 1000-hour salt spray test per ASTM B117-03.
- c. The plenum is insulated with an anti-microbial flame/ smoke resistant non-fiberglass cotton material.
- d. Plenum construction shall be comprised of perforated steel insulated sound baffles to absorb and reduce unit return air sound. Inner baffles shall have the ability to be arranged so the plenum can be installed vertically or horizontally on the indoor room wall.

### **37. Optional Sound Isolation Interior Supply Plenum**

- a. SPVU manufacturer shall furnish an appropriately sized indoor wall plenum of painted steel. White, Gray, and Beige colors are available. Spray paint of galvanized steel shall not be accepted.
- b. Constructed of 16 and 20-gauge painted steel consisting of galvanized material in accordance with ASTM A653, modified acrylic primer .25 MIL., topcoat paint shall be .75 MIL. The Plenum shall be tested to withstand a 1000-hour salt spray test per ASTM B117-03.
- c. The plenum is insulated with an anti-microbial flame/ smoke resistant non-fiberglass cotton material.
- d. Plenum construction shall be comprised of perforated steel insulated sound baffles to absorb and reduce unit supply air sound. A 4-way deflection supply grille is supplied pre-installed in the plenum front.

### ***Environmental Controls Accessories (Select One)***

### **38. Advanced Environmental Unit Controls – BrightStat**

- a. 3H/2C with 2 Stage Compressor Operation. 1 stage electric heat (Additional Em. Heat stage w/LUA)
- b. No battery-72-hour clock retention, non-volatile memory for all other settings
- c. Automatic or manual changeover. Smart fan output for fan on during occupied times
- d. Occupancy per schedule, on/off ventilation or modulating 0-10V output w/optional CO2 card.
- e. Programmable (7-day, individual days) or non-programmable.
- f. Selectable Maximum Heat and Minimum Cool Settings.
- g. Built-in De-Humidistat, Range 30 to 95% RH, Span 5-10%.
- h. Color Touchscreen display with multiple screen color and icon configurations.
- i. Unit service alarm input, Configurable I/O with custom LUA programming options.
- j. Modulating 0-10V heat option for indoor units with hot water plenum option.
- k. User selectable 2nd stage emergency heat mode (LUA Script file required).
- l. Configurable password 4 pin lock of configuration menu.
- m. Adaptive learning predicts how long it takes to reach setpoint.
- n. BACnet or Modbus capable using 2-wire shielded twisted pair.
- o. Optional 10k type 2 Outdoor remote sensor.
- p. Optional 10k type 2 Indoor remote sensor.
- q. Optional ZigBee wireless card for wireless sensor options.

- r. Optional CO2 card for 0-10V ventilation control.
- s. Optional built-in motion sensor. Wide range occupancy sensor: up to 20 ft, 120° horiz, 30° vertical.

### **39. Advanced Thermostat Controller – 8403-060**

- a. 3H/2C with 2-stage compressor operation. 1 stage electric heat with additional Em. Heat stage.
- b. Digital 7-day programmable, 5+2 day, or non-programmable.
- c. No battery, 24-hour clock retention, non-volatile memory for all other settings.
- d. Automatic or manual changeover; Events per day: Residential 2 or 4, Business 2.
- e. Occupancy per schedule and a dedicated ventilation terminal.
- f. Vacation Hold, Permanent Hold Fan Operation----Auto-On-Programmed.
- g. Selectable Maximum Heat and Minimum Cool Settings.
- h. Built-in De-Humidistat (configured for non-economizer), Range 45 to 90% RH.
- i. Dehumidification Control-----Occupied Only or Full Time Dehumidify.
- j. Simple 5-Button User Interface Screen Displays with RH-Temp-Mode-Fan-Menu.
- k. Unit service alarm input.
- l. User selectable emergency heat mode.
- m. Menu Driven Security Lockout, Test Mode, Service Information.
- n. Smart recovery; Intermittent Fan Option.
- o. Selectable Backlight Periods: 30-60-90-120 Seconds, Continuous.
- p. Optional 10k type 2 Outdoor remote sensor.
- q. Optional 10k type 2 Indoor remote sensor.

### **40. User Supplied Thermostat, Controller, or Direct DDC Control.**

- a. Control of unit operation supplied using 24VAC signals from a field supplied device.
- b. Unit has a low voltage terminal connection area with easy to access connection points.