BARD MANUFACTURING COMPANY, INC.
W18HC-W60HB Series Heat Pump
Engineering Specification Guide

1.0 QUALIFICATIONS

Manufacturer: Company specializing in manufacture of products specified in this section, with a minimum of 5 years documented experience. Manufacturer shall have available complete catalog data with expanded ratings, installation and maintenance instructions.

2.0 GENERAL

Furnish and install self-contained, wall mounted heat pump, suitable for outdoor use. Unit to be manufactured by Bard Manufacturing Company, Inc. in accordance with plans. The unit shall be approved and listed by Intertek ETL Listed (ETL US/C). Unit shall be factory assembled, pre-charged, pre-wired, tested and ready to operate. The manufacturer of equipment shall be ISO 9001: 2015 Certified. Unit performance shall be certified by an independent third party testing agency, in accordance with the Air Conditioning, Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units. Unit cooling efficiency shall be specified by EER.

Manufacturers: Capacities shall be indicated on drawings and units shall be manufactured by Bard Manufacturing Company, Inc. or prior approved equal.

3.0 CONSTRUCTION FEATURES

3.1 CABINET

Construction shall be a single, enclosed, weatherproof casing constructed of 20-gauge galvanized steel, stainless steel, or aluminum (choose one). Unit base is constructed of 16-gauge galvanized steel for painted and aluminum cabinets, stainless steel for stainless cabinets. Each exterior casing panel to be bonderized and finished with baked-on exterior polyester enamel paint prior to assembly. The baked-on cured paint finish shall pass the industry rub test with a minimum of 72 rubs MEK (Methyl, Ethyl Ketone) or standard rub test of a minimum of 100 rubs using Toluene. Cooling section shall be fully insulated with a non-fiberglass material with heavy duty foil facing for durability and ease of cleaning. Fiberglass insulation is not acceptable. Openings shall be provided for power connections. Access openings appropriate for outside structure to all fan motors and compressor for making repairs and for removing

internal components without removing unit from its permanent installation. Fresh air intake and outdoor coil shall be protected from intrusions by a sturdy metal grating with less than 1/4 inch openings.

Colors (Select One)
Beige (standard)
White
Gray
Desert Brown
Dark Bronze
Aluminum
Stainless Steel

Painted cabinet construction shall be a minimum of 20 gauge Zinc coated steel, painted units shall have baked on paint, designed and tested to withstand 1000 hours of salt spray test per ASTM B117-03.

Stainless steel construction shall be 316 grade, with stainless steel screws and fasteners for all exposed areas. The condenser fan blade shall be treated with corrosion resistant material, and condenser fan motor mounts shall be stainless steel.

Aluminum exterior cabinet shall be ASTM B 2019 grade aluminum with stucco appearance.

3.2 DRAIN PAN

Drain pan shall be constructed with 20-gauge galvanized steel, bonderized and finished with baked-on exterior polyester enamel paint.

3.3 INSULATION

Insulation shall be non-fiberglass material with foil faced for ease of cleaning. Insulation materials used shall not contain fiberglass or formaldehyde.

3.3.1 Filters

Filters shall be Minimum Efficiency Reporting Value of MERV 8 per ASHRAE Standard 52.2. Filters shall be readily available commercial sizes.

3.4 MOUNTING BRACKETS

Full-length, side mounting brackets shall be an integral part of the cabinet. Bottom mounting bracket shall be provided.

3.5 REFRIGERATION SYSTEM

All models shall use a high efficiency hermetic scroll compressor. The compressor shall be covered by a 5-year parts warranty. The refrigeration circuit shall be equipped with factory installed high and

low pressure controls, suction and liquid access valves, compressor control module and liquid line filter dryer. A refrigerant metering device is included. Compressor shall be mounted on rubber grommets. Unit shall be provided with R-410A (HFC) non-ozone depleting refrigerant.

3.6 OUTDOOR SECTION

The condenser coil shall be constructed of aluminum plate fins mechanically bonded to seamless copper tubes. The condenser fan, motor and shroud shall be of slide out configuration for easy access. Condenser fan motor shall be enclosed casing with ball bearings. Open winding motors are not acceptable.

3.7 INDOOR SECTION

The evaporator coil shall be constructed of aluminum fins mechanically bonded to seamless copper tubes. Aluminum fins shall have hydrophilic coatings to aid in condensate drainage, inhibit mold growth and protect aluminum fins from oxidation. 5-speed indoor blower motor shall be twin wheels with forward curve blades. Motor shall be high efficiency ECM with overload protection.

3.8 ELECTRICAL COMPONENTS

Electrical components are easily accessible for routine inspection and maintenance through front service panels. Circuit breaker is standard on all 208/230 volt models and toggle disconnect standard on all 460 volt models. Circuit breaker/toggle disconnect access is through lockable access panel.

3.9 CONTROL CIRCUIT

The internal control circuit shall consist of a current limiting 24VAC type transformer with resettable circuit. The defrost circuit shall consist of a solid state electronic heat pump control. A 30-minute timer shall initiate a frost cycle if the outdoor coil temperature indicates the possibility of an iced condition. The thermistor sensor, speed-up terminal for service and a ten-minute defrost override shall be standard on the electronic heat pump control. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be factory installed to prevent nuisance tripping during low temperature start-up.

Phase rotation protection and phase failure protection shall be standard factory on all equipment with three-phase power. If unit is wired incorrectly, phase monitor will lock out compressor operation and red warning light shall energize. Once power wiring is corrected at field power wiring location, a green light will energize on phase monitor. If a phase of power is lost, the phase monitor will also lock out.

4.0 COOLING OPTIONS

4.1 STANDARD COOLING

The heat pump shall function with standard cooling sensible and latent capabilities.

4.2 BALANCED CLIMATE™

The heat pump shall function with enhanced latent capacity when BALANCED CLIMATE™ cooling mode is enabled. Unit shall include Y1 and Y2 low voltage terminal connections. A 2-stage thermostat shall be capable of operating BALANCED CLIMATE™. Stage 1 cooling will operate with a preprogrammed and fully tested reduced fan speed. The reduction in fan speed increases latent capacity and reduces sensible capacity for increased runtime and increased latent capacity. If the 2 stage thermostat calls for second stage cooling, the unit shall shift to high speed blower and standard operation. BALANCED CLIMATE™ is achieved with a single stage compressor. Expanded rating in BALANCED CLIMATE™ mode shall be provided at time of submittal, and full factory performance data shall be available upon request.

5.0 HEATING OPTIONS

5.1 HEAT PUMP

The heat pump shall function with standard heating capacities.

5.2 ELECTRIC HEAT

The heat pump shall have a factory or field installed electric resistance heater available, designed specifically for application in the WH Series heat pumps. Heater shall include automatic limit safety controls.

6.0 VENTILATION OPTIONS (Select One)

WH models are designed to provide optional ventilation packages to meet all of your ventilation and indoor air quality requirements. All ventilation packages are factory or field installed, and easily removable for service.

Units shall include an independent ventilation low voltage terminal connection, allowing for an independent 24v signal provided by controls to operate the ventilation package. No additional field installed relays shall be required to provide independent ventilation. Ventilation shall be deenergized during unoccupied hours unless otherwise specified. Only one ventilation package shall be provided and must be specified.

6.1 BAROMETRIC AIR DAMPER (X)

Damper provided with multiple pin positions, each pin position shall allow damper to open to that pin, whenever the supply blower is

energized. The damper will fall shut when supply fan is deenergized. Damper shall be shipped in closed position. No exhaust path is provided in the unit. If no ventilation package is specified, this option shall be provided.

6.2 BAROMETRIC FRESH AIR DAMPER WITH EXHAUST (A) OPTIONAL

Barometric damper provided with multiple pin positions, each pin position shall allow damper to open to that pin, whenever the supply blower is energized. The damper will fall shut when supply fan is deenergized. Damper shall be shipped in closed position. An exhaust air path is provided, allowing for up to 25% of outside air, on standard fan operation.

6.3 BLANK OFF PLATE (B) OPTIONAL

A blank off plate covers the air inlet openings that restrict any outside air from entering the unit. The blank off plate should be utilized in applications where outside air is not required to be mixed with the conditioned air.

6.4 COMMERCIAL ROOM VENTILATOR (M) OPTIONAL

ON/OFF

The built-in commercial room ventilator is internally mounted and allows outside ventilation air, up to 50% of the total air flow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper. The damper can easily be adjusted to control the amount of fresh air supplied into the building.

6.5 COMMERCIAL ROOM VENTILATOR (V) OPTIONAL

Modulating Damper Control

The built-in commercial room ventilator is internally mounted and allows outside ventilation air, up to 50% of the total air flow rating of the unit, to be introduced through the air inlet openings. It includes a built-in exhaust air damper. The damper shall accept a 24V on/off signal, 0-10V signal for modulation based on control input. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality.

6.6 ENERGY RECOVERY VENTILATOR (R) OPTIONAL

The Energy Recovery Ventilator (ERV) shall consist of 1 or 2 rotary wheels in an insulated cassette frame with seals, drive motor and belt. The ERV assembly shall also include intake and exhaust blowers. The entire assembly shall easily slide in or out of the ventilation section, allowing for maintenance or replacement. The total energy wheel shall be coated with silica gel desiccant, permanently bonded without the use of binders or adhesives. The coated segments shall be washable with detergent or alkaline coil cleaner and water. Desiccant shall not dissolve or deliquesce in the presence of water or high humidity. All diameter and perimeter seals shall be provided as part of the cassette assembly and shall be

factory set. Drive belts shall not require external tensioners or adjustment. Cassette wheels shall include rims to prevent belts from slipping off wheels. Intake and exhaust blowers shall have selections of high, medium or low speed and selected independently, to allow for positive pressurization if desired. The ERV cassette including parts and media shall include 5-year warranty subject to terms and conditions of Bard's warranty. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality.

6.7 ECONOMIZER OPTIONAL

The Economizer is internally mounted and allows outside air to be used for free-cooling when temperature and humidity conditions are favorable. The amount of exhaust air varies in response to the system controls and settings defined by the user. It includes a built in exhaust air damper. The economizer is designed to provide free cooling when outside conditions are cool and dry enough to satisfy cooling requirements without operating the compressor, providing lower operating costs while extended the life of the compressor.

Standard Features:

- **4cfm/ft² or less damper leakage rate at 1" w.c. pressurization**
- **Fully modulating**
- **Honeywell hi-torque 44 lb.-in actuator**
- **Simple single blade design**
- **Positive shut-off with non–stick gaskets**
- **Electronic DB and Enthalpy sensors**
- **Honeywell JADE electronic economizer module with precision settings and diagnostics**

7.0 FILTER OPTIONS – (Select One)

- **7.1 1" Fiberglass**
- **7.2 2" Pleated – MERV 8**
- **7.3 2" Pleated – MERV 11**
- **7.4 2" Pleated – MERV 13**
- **7.5 1" Washable**

8.0 UNIT CONTROL OPTIONS

- **8.1 Low ambient control**
- **8.2 Outdoor air thermostat (used as compressor cut-off)**
- **8.3 Compressor start kits (1-ph only)**
- **8.4 Filter pressure switch**

9.0 OPERATING CONTROLS (Field Installed)

- **9.1 None**
- **9.2 Electronic non–programmable manual/auto changeover**

9.3 Electronic programmable, auto changeover

10.0 INSTALLATION

10.1 Installation shall be done in strict adherence to Bard's Installation Instructions.

11.0 HOT GAS REHEAT DEHUMIDIFICATION (OPTIONAL –factory installed (not available on all models, consult specification sheets)

11.1 The dehumidification circuit incorporates an independent heat exchanger coil in the supply air stream in addition to the standard evaporator coil. This coil reheats the supply air after it passes over the cooling coil and is sized to nominally match the sensible cooling capacity of the evaporator coil. Extended run times in dehumidification mode can be achieved using waste heat from the refrigeration cycle to achieve the reheat process, while at the same time, large amounts of moisture can be extracted from the passing air stream. Models that also have electric heaters installed have the electric heat inhibited during dehumidification mode, although it remains available for additional reheat during certain conditions. The dehumidification cycle shall be energized by a rise in relative humidity above set point. The unit shall energize in the cooling mode and also a two position valve will energize, allowing hot refrigerant gas to pass through the reheat coil, reheating the cold air leaving the evaporator coil. An electronic expansion valve (EEV) will be utilized to help maintain a very low sensible capacity and consistent latent capacity. The dehumidification cycle shall have on/off capability. If the thermostat calls for cooling or heating during the dehumidification cycle, the unit shall drop out of dehumidification to satisfy the call from the thermostat.

12.0 WARRANTY

12.1 The Bard product specified shall be free from defects in materials and workmanship for a period of 5 years for compressor, and for a period of 5 years for all parts. Warranty period shall start from date of installation as stated on warranty card; or from date of shipment if no warranty card is returned to Bard Manufacturing. Equipment must be used under normal conditions and warranty is subject to Bard Manufacturing's standard limited warranty statement.