Bard SINCE 1914
Climate Control Solutions

BARD MANUFACTURING COMPANY, INC.
WG3S-WG5S 2-Stage Cooling with Gas Heat
Engineering Specification Guide

1.0 GENERAL

Furnish and install a self-contained, vertical, exterior wall mount, electric air conditioner with gas fired heat, to be manufactured by Bard Manufacturing Company, Inc. The unit shall be approved and listed by Intertek ETL Listed (ETL US/C). Unit shall be AHRI/GAMA certified for heating capacity and efficiency. Unit shall be factory assembled, pre-charged, pre-wired, tested and ready to operate. Cooling performance shall be certified in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units. Unit cooling efficiency shall be in EER and IPLV, and heating efficiency in AFUE.

Manufacturers: Capacities shall be as indicated on drawings. Units shall be manufactured by Bard Manufacturing Company, Inc. or prior approved equal. Equal products shall be in standard production for 3 years or longer.

2.0 CONSTRUCTION FEATURES

2.1 CABINET

Construction shall be a single, enclosed, weatherproof casing constructed of 20-gauge galvanized steel. Unit base is constructed of 16-gauge galvanized steel. 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 Tolulene. Cooling section shall be fully insulated with 1-inch fiberglass to prevent sweating and to muffle sounds. Openings shall be provided for electric power and gas 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 1/2 inch openings. Hinged Service door (lockable) shall be provided for access to filter, heat exchanger inspection and indoor blower motor service.

Sloped top shall be factory installed. If unit does not include sloped top, field supplied sloped rain hood painted to match unit shall be provided.

Color Options (select one)

Beige (standard)
Buckeye Gray
Dark Bronze

2.2 DRAIN PAN

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

2.3 INSULATION

Insulation in the heating and cooling coil section shall be foil-faced fiberglass, and the remainder shall be matte-faced fiberglass.

2.4 MOUNTING BRACKETS

Full-length side mounting brackets shall be an integral part of the cabinet.

2.5 REFRIGERATION SYSTEM

All models shall use a high efficiency scroll compressor with step capacity providing 2 stages of control. 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. The refrigeration control shall be a factory installed TXV. Crankcase heater shall be provided. Unit shall be provided with R-410A (HFC) non-ozone depleting refrigerant. Unit shall be provided with liquid line filter/drier.

2.6 CONDENSER FAN MOTOR

The condenser fan, motor and shroud shall be of slide out configuration for easy access. The condenser air direction is a blow-through design.

2.7 INDOOR BLOWER MOTOR

The indoor blower motor shall be a high efficiency, variable speed (ECM) type motor. Motor shall provide soft start, slowly ramping up to speed to provide quiet operation. The motor shall be self-adjusting to provide proper airflow at high static pressures without user adjustment or wiring changes by the user. The motor shall be programmed for 20-second ramp up and 60-second down rate for quiet, smooth starting and stopping.

2.8 ELECTRICAL COMPONENTS

Electrical components are easily accessible for routine inspection and maintenance through hinged access panel. Circuit breaker is standard on 208/230-volt models both single phase and three phase. 460/3/60 volt models shall have rotary disconnect. Circuit breaker or disconnect access is through lockable access panel.

2.9 CONTROL CIRCUIT

The internal control circuit shall consist of a current limiting 24VAC type 50VA transformer with 208/230 primary taps. Refrigerant circuit shall include factory installed compressor control module, and high-pressure and low pressure switches. A solid-state blower control shall provide one-minute delay before stopping blower, once the cooling cycle has been completed to maximize the unit operating efficiency. In the heating mode, there shall be a thirty second on-delay, and a two-minute off-delay. Unit shall include compressor control module with: built-in delay timer adjustable from 30 seconds to 5 minutes, 2 minute on-delay if power is interrupted, 102 second bypass for low-pressure control, and both soft and manual lockouts for high and low pressure control. Alarm output for alarm relay included. High and Low pressure switched shall be auto-reset, with built in lock out circuit that can be reset from thermostat.

Phase rotation monitors shall be installed on all 3-phase units to prevent reverse rotation. This device shall protect scroll compressor from reverse rotation and also protect unit from phase failure. 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 incorrect phase. Also if a power leg is lost, the phase monitor will lockout the unit due to phase imbalance. Once the condition is corrected, turning the power off at the circuit breaker or disconnect will reset the phase monitor.

3.0 HEATING SYSTEM

3.1 Heat Exchanger

Heat exchanger shall be constructed of 18-gauge stainless steel. Primary and secondary heat exchangers shall be mechanically joined tubular construction.

3.2 Ignition System

The gas heat section shall have a direct spark ignition system and remote ignition sensor. Diagnostics shall be included in integrated ignition control. Unit shall contain a Honeywell natural gas valve.

Valve shall be field convertible to LP with a certified conversion kit. In-shot burners shall contain factory installed high fire natural gas orifices. Low fire natural gas orifices shall be factory furnished for field installation for a 10% reduction in heating input. Optional field conversion kits for high altitude applications shall be available from the factory. The system shall include induced draft mechanical combustion system with pressure proving switch to verify adequate combustion air, before allowing the ignition system to begin. Combustion switch shall monitor combustion throughout the heating cycle sequence.

4.0 VENTILATION OPTIONS (Select One)

WGS 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. Ventilation packages shall direct access after removing one external panel. No other factory-installed sections shall block access to ventilation section.

4.2 BLANK OFF PLATE 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.

4.3 COMMERCIAL ROOM VENTILATOR OPTIONAL

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 be easily adjusted to control the amount of fresh air supplied into the building. Automatic control shall be provided to maintain desired ventilation rate during the different supply airflows of fan only, Stage 1 and Stage 2 modes of operation. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy using CO2 controller. Unit complies with ANSI/ASHRAE Standard 62.1 Ventilation for Acceptable Air Quality.

4.4 ENERGY RECOVERY VENTILATOR OPTIONAL

The Energy Recovery Ventilator (ERV) shall consist of 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 5year warranty subject to terms and conditions of Bard's warranty.

The ERV thermal performance shall be certified by the 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.

4.5 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 extending the life of the compressor.

Standard Features:

- **Fully modulating**
- **Honeywell hi-torque 44 lb-in. actuator**
- **Simple single blade design**
- **Positive shut-off with non-stick gaskets**
- **Electronic DB or Enthalpy sensors depending upon version specified**
- **Honeywell JADE electronic economizer module with precision settings and diagnostics**

5.0 RESERVED

6.0 FILTER OPTIONS - (Select One)

6.1 1" Washable

6.2 2" Fiberglass – Pleated – MERV 6 (standard)

7.0 UNIT CONTROL OPTIONS

7.1 Low ambient control

8.0 OPERATING CONTROLS (Field Installed)

8.1 None
8.2 Electronic non-programmable, manual changeover
8.3 Electronic programmable, auto changeover
8.4 CO2 Control for CRV or ERV ventilation option

9.0 INSTALLATION

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

10.0 WARRANTY

10.1 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.