



# BARD MANUFACTURING COMPANY, INC.

## I-TEC™ I30H-I60H Series Air-to-Air H/P

### Engineering Specification Guide

## 1.0 GENERAL

### 1.1 SUBMITTALS

Provide in accordance with Division 01 and Section 15

Submittals for Single Packaged Vertical Indoor Mount heat pump or air conditioner shall include: equipment performance, dimensions, and electrical requirements. Two stage equipment shall include the following performance data: CFM, EER, COP, IPLV, Total, Sensible, Latent capacities at standard AHRI conditions, for and all stages of operation.

Factory tested sound data per ANSI S12.60. Dba levels at all operating conditions and ERV speeds including exterior sound level.

Complete exterior Louver performance information. Louver shall be provided by SPVU manufacturer.

Factory Warranty documentation verifying 5 year compressor, and 5 year parts warranty.

Control submittal if controller is provided by equipment manufacturer.

### 1.2 QUALITY ASSURANCE

Design, construction, testing and installation shall comply with the following standards as applicable:

- UL or ETL classified in accordance ANSI/UL 1995/CSA 22.2 No. 235-05 fourth edition.
- Certificate of performance by AHRI or other independent third party testing agency. AHRI or third party testing will be in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units (SPVU). Self- test data provided "in accordance with AHRI 390-2003" will not be accepted or considered as alternate. Consideration for exceptions will require testing by a third party agency preapproved by the specifier and accompanying statement of indemnification from the Manufacturer.

### 1.3 OPERATING CHARACTERISTICS

Unit shall be capable of simultaneous heating duty and defrost cycle operation when using accessory electric strip heat. Unit electric nameplate shall display required electric circuit. Factory installed adjustable control allowing for optional low amp draw operation preventing simultaneous operation of compressor and strip heat shall not be allowed. Only dedicated

low ampacity units manufactured and shipped with correct electric nameplate data shall be accepted.

Motor shall automatically adjust to maintain constant cfm at rated airflow independent of external static pressure up to .5 external static pressure.

#### **1.4 WARRANTY**

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

#### **2.0 GENERAL EQUIPMENT REQUIREMENTS**

Capacities of Heat Pumps as indicated on drawing and schedules are net capacities actually required. Efficiencies shall be at AHRI conditions, submitted performance shall be at specified conditions.

Furnish and install a self-contained, vertical, floor standing, interior mount, thru-the-wall, heat pump, to be manufactured by Bard Manufacturing Company. Units shall be, self-contained vertical packaged (SPVU) heat pump. 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 submittal data. If AHRI documentation is not available, 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 prior to bid and include statement of performance indemnification from the Manufacturer.

Units shall be UL or ETL listed and labeled, classified in accordance ANSI/UL 1995/CSA 22.2 No. 235-05 fourth edition. Unit shall be constructed following ISO: 9001 quality control procedures and be factory assembled, fully charged internally wired, 100% run tested. Run test data shall be stored and available upon request.

#### **2.1 CONSTRUCTION**

Constructed of 20 gauge prepainted steel consisting of galvanized steel in accordance with ASTM A653, modified acrylic primer .25 MIL., top coat paint shall be .75 MIL. Exterior panels shall be double wall construction. No screws exposed on the exterior panels. Front panel is hinged and lockable for filter service and access to primary functional electrical controls. Front and side panels are easily removable for separation of top and bottom sections. Back of unit to be painted in neutral color to reduce visibility from outdoors. Colors options: Beige, Gray or white.

No fiberglass shall not be utilized in any part of the unit.

Exterior panels shall be easily removable, and cabinet shall consist of two modules with refrigeration system contained in top section. The two sections

can easily be separated by removing 4 bolts. Fork slots allow for the top module to be lifted and separated. Each module shall pass thru a standard door frame, and/or into standard sized elevator doors without tilting or laying equipment down.

Unit shall be suitable for right or left hand corner installation without modification. No clearance is required. All service access shall be thru the front of the unit. Side supply grilles on accessory ductless plenum box shall include adjustable opposed damper to balance airflow for each side discharge, and in corner installations.

## **2.2 FILTERS**

Unit shall be factory furnished with 2" pleated filters and have a Minimum Efficiency Reporting Value of MERV8 per ASHRAE standard 52.2.

Filters shall be accessible thru front of unit. Filter size shall be readily available commercial sizes.

## **2.3 COMPRESSORS**

Shall be 2-stage hermetically sealed scroll compressor with internal unloading providing 2 stages of heating and cooling operation.

The refrigeration circuit shall be equipped with factory installed high and low pressure control with resettable lockout circuit. An internal overload shall protect the compressor against excessive motor temperatures and currents. Refrigerant shall be R-410A.

Refrigeration circuit will include thermostatic expansion valve (TXV), liquid line filter dryer, refrigerant service ports and discharge muffler. Service gauge access ports shall be available without removing any panels.

The compressor shall be mounted on double floating isolation mounting system and fitted with a factory installed sound attenuation jacket.

## **2.4 CONDENSATE DRAIN SYSTEM**

Condensate shall be removed from the unit by connections located in the back of the unit. Both indoor and outdoor coil drain pans shall be constructed of non-corrosive materials and shall not allow standing water in the drain pan. A factory installed condensate overflow protection system shall monitor both drain pans and shut down system to prevent condensate overflow.

## **2.5 MODULATING CONDENSER MOTOR**

The condenser fan motor shall be electronically commutated motor-ECM. Motor shall provide variable speed operation, ball bearing, 6kV surge protection and matched to a sweep designed low noise composite condenser fan. Factory integrated modulating low ambient control shall be provided as standard.

## **2.6 INDOOR BLOWER MOTOR**

The indoor blower motor shall be electronically commutated variable speed (ECM), factory programmed to produce rated air flow from 0 to .5 inch WC of external static pressure.

The motor is to be self-adjusting to provide proper rated air flow at high static pressures without user adjustment or wiring changes by the user. The motor shall be pre-programmed for 20-second ramp up and 60-second down rate for quiet, smooth starting and stopping. PSC motor shall not be acceptable. Motor shall automatically adjust to proper blower speeds matching compressor operation: ultra-quiet ventilation only, stage 1 cooling, stage 2 cooling, stage 1 heating, and stage 2 heating, continuous circulation ventilation mode.

## **2.7 ELECTRICAL COMPONENTS AND CONTROLS**

Electrical components shall be easily accessible for routine inspection and maintenance through front service panels. Circuit breaker shall be standard on all 208/230 volt models and a disconnect standard on all 460 volt models. Circuit breaker/disconnect access is through lockable access panel. Lock and key are to be provided with each unit. Unit shall have single point entry for line voltage. Electrical component access point shall be located at standard eye level to allow easy serviceability.

The internal low voltage control circuit shall consist of a current limiting 24 VAC type 75 VA transformer with circuit breaker.

Defrost control 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 90-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 a ten-minute defrost override shall be all be standard on the electronic heat pump control.

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.

All units with 3-phase power shall include factory mounted phase rotation monitor. 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. If unit is wired correctly a green light will illuminate. 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.

**2.8 DEHUMIDIFICATION AND HOT GAS REHEAT**  
(Factory installed option- recommended if ventilation package is included with unit)

The dehumidification option shall incorporate an independent reheat coil in the supply air stream in addition to the standard evaporator coil, 2 way valve, solid state dehumidification circuit board, and independent dehumidification terminal on 24 volt control terminal strip. The coil shall be mounted after the evaporator coil, and sized to nominally match the sensible cooling capacity. The solid state dehumidification circuit will monitor the 24 volt terminal for a call for dehumidification. If the humidity rises above a set point the dehumidification terminal is energized the dehumidification control board shall:

- Monitor unit operation. If dry bulb temperature is satisfied and no call for cooling or heating is active, the unit will energize in cooling mode and also energize the 2 way valve so that reheat coil becomes active.
- If the unit is operating in cooling or heating at the time of the call for dehumidification, the unit shall remain in cooling or heating until comfort temperature set point is satisfied. If the high humidity call is still active, the unit will then operate in dehumidification mode.
- If a call for cooling or heating is received during dehumidification operation, the solid state board will deenergize the 2 way valve. The unit will operate in active cooling or heating mode until dry bulb set point is satisfied.
- If the humidity set point control is satisfied and no call for cooling or heating is active the unit will cycle off.

**2.9 VENTILATION – ENERGY RECOVERY VENTILATOR (OPTIONAL)**

Energy Recovery module shall consist of 2 rotary wheels in an insulated cassette frame complete with silica gel media, seals, drive motor, belt, intake and exhaust blowers. Dampers will be used to prevent infiltration during off periods.

The inherit design of the ERV shall be such as to promote self-cleaning in standard conditions.

Intake and exhaust blower motors shall be fractional horsepower ecm motors providing either 3 selectable cfm levels (450, 375, 300 ) or modulating cfm based on 0-10 v modulating signal from a control source. Intake and exhaust airflow shall be independently adjustable providing for positive pressurization of the space.

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.

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 date of installation.

### **3.0 REQUIRED ACCESSORIES**

#### **3.1 WALL SLEEVE**

SPVU manufacturer shall furnish a properly sized wall plenum for intake and exhaust condenser air, including intake and exhaust air path for ventilation air. Sleeve shall be telescoping for adjustable width, and adjustable 3" height from 31" to 34" AAF, or higher with factory supplied subbase. Wall sleeve shall be constructed of galvanized steel, coated with an epoxy primer and baked on polyester enamel paint. Wall sleeve casing shall be capable of withstanding 500-hour salt spray exposure per ASTM B117

#### **3.2 OUTDOOR LOUVER**

Exterior Louver shall be a product of the SPVU manufacturer that has been designed, tested and rated to meet the manufacturers rated performance standards as a system. Louver shall be available in 1", 2" or 4" depths. Louvers shall be constructed of mill finish aluminum and powder coated to color. Factory standards colors include: dark bronze, medium bronze, or aluminum. Color chart shall be provided for additional color options if required.

### **4.0 OPTIONAL ACCESSORIES**

#### **4.1 TOP DISCHARGE PLENUM BOX (OPTIONAL)**

Supply air discharge plenum box shall be provided by manufacturer. Exterior finish shall match unit, lined with sound deadening insulation. Insulation shall be covered with acoustically designed perforated galvanized metal. Plenum box shall include 1 or 2 front discharge diffusers, and may include one diffuser on each side of the plenum box.

#### **4.2 CABINET EXTENSION (OPTIONAL ON DUCTED INSTALLATION)**

Three sided assembly manufactured of prepainted steel matching unit color, to fill space from top of unit to ceiling. For use on ducted or plenum box installations.

#### **4.3 RISER PLATFORM (OPTIONAL)**

Riser platform manufactured of prepainted steel, matching unit color, is used to elevate unit wall sleeve penetration if required to match existing wall opening height, existing window sill height or other custom height requirement.

#### **4.4 SIDE TRIM KIT (OPTIONAL)**

Side trim pieces, 4" or 6" in depth manufactured of prepainted steel matching unit color shall be used to trim out space between rear sides of unit and exterior wall.