BARD MANUFACTURING COMPANY, INC.
I-TEC™ I30A1D-I60A1D Series
Air-to-Air AC with Dehumidification
Engineering Specification Guide

1.0 GENERAL

Furnish and install a self-contained, vertical, floor standing, interior mount, thru-the-wall, air conditioner 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 factory assembled, pre-charged, pre-wired, tested and ready to operate. Unit performance shall be certified in accordance with the Air Conditioning Heating and Refrigeration Institute (AHRI) Standard 390-2003 for Single Package Vertical Units (SPVU). Unit efficiency shall be specified in terms of EER and IPLV.

Warranty

Unit shall include 5-year parts warranty covering compressor, and 5-year warranty covering parts, heat exchange coils, ventilation packages, subject to terms and conditions of Bard Limited Warranty agreement. No labor is included in Bard warranty.
5 and 5 warranty shall be provided for all SPVU equipment.

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

2.0 CONSTRUCTION FEATURES

2.1 CABINET

Constructed of 20 gauge pre-painted steel exterior finish. Exterior panels shall be of double wall construction. No screws are exposed on the exterior panels.
Color options available (select one):

2.1.1 Beige – Painted Steel Finish
2.1.2 Gray – Painted Steel Finish
2.1.3 White – Painted Steel Finish

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.

2.2 MODULAR CONSTRUCTION

Exterior panels shall be easily removable, and cabinet shall consist of two modules, easily separated by removing 4 bolts, with fork slots allowing for modules to be separated. One module shall contain complete sealed refrigeration system and one module shall contain the ventilation system. Each module shall pass thru standard door frame, and into standard sized elevator doors without tilting or laying equipment down.

2.3 INSULATION

No fiberglass insulation shall be exposed to the airstream. Exterior cabinet components shall consist of double wall construction with insulation between panels.

2.4 INSTALLATION LOCATIONS

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 air grilles on air distribution box shall include adjustable opposed dampers to limit airflow in corner installations.

2.5 COMPRESSOR

All models shall use a high efficiency 2-stage scroll compressor for maximum efficiency and reliability. Equipment shall be designed to provide 2 stages of cooling. 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, liquid line filter dryer, and discharge muffler.

Modulating low ambient control to 20 degrees shall be factory installed.

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

The refrigeration control shall be a factory installed TXV. Refrigerant shall be R-410A.

2.6 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 condensate overflow protection system shall monitor both drain pans and shut down system to prevent condensate overflow.

Two condensate drain connections are manifolded together providing for either right or left access.

The I-tec does not require a trap. The lower rear portion of the cabinet provides room for P trap if required.

2.7 CONDENSER FAN MOTOR

The condenser fan motor shall be variable speed ECM, allowing for modulating low ambient control and low sound performance.

2.8 INDOOR BLOWER MOTOR

The indoor blower motor shall be a variable speed (ECM) type to produce the same rated air flow from 0 to .5 inch WC of external static pressure at low sound levels. 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 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 speed: Ventilation, stage 1 cooling or stage 2 cooling operation. Submittals shall include rated cfm for high speed, low speed, and ventilation speed.

2.9 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. Lock and key are 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

2.10 CONTROL CIRCUIT

The internal control circuit shall consist of a current limiting 24 VAC type 75 VA transformers with circuit breaker. To prevent rapid compressor short cycling, a five-minute time delay circuit shall be incorporated into the compressor control module. A low pressure bypass shall be incorporated into the compressor control module 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. 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 HEAT OPTIONS (Select One)

3.1 NONE

3.2 ELECTRIC HEAT

The I-Tec shall have a factory installed electric resistance heater available that is designed specifically for application in the I-TEC Series air conditioner. Heater shall include automatic limit safety controls.

3.3 HOT WATER COIL

The hot water coil shall be factory mounted in discharge air plenum, or for ducted application. Freezestat shall be included for field installation.

- **Duct-free plenum box with hot water coil painted to match the unit.**
- **Hot water coil with duct connection: Requires cabinet extension painted to match the unit.**

Note: Water control valves not included. Order separately for field installation.

4.0 VENTILATION OPTIONS (Select One)

I-TEC™ models are designed to provide independent control of ventilation air with a dedicated low voltage ventilation terminal connection. Operation of supply air fan is also required for ventilation operation.
Optional ventilation packages are available to meet all of your ventilation and indoor air quality requirements. All ventilation packages are factory installed.

4.1 BLANK OFF PLATE OPTIONAL

A blank off plate covers the air inlet openings which restrict any outside air from entering the unit. The blank off plate should be utilized in applications where outside air is not required thru SPVU unit.

4.2 COMMERCIAL ROOM VENTILATOR OPTIONAL

The commercial room ventilator shall be factory installed and provide intake and exhaust fans to allow outside ventilation air, up to 525 cfm to be introduced through the air inlet openings. Positive shutoff of intake and return air path is required to prevent infiltration of outside air during occupied and unoccupied periods. Condenser fan operation shall not be required for ventilation powered exhaust. The airflow rate shall be easily adjustable to 4 cfm rates. The CRV can be controlled by indoor blower operation or field controlled based on room occupancy or schedule, or demand control using CO2 controller with relay output.

4.3 ENERGY RECOVERY VENTILATOR OPTIONAL

The Energy Recovery Ventilator (ERV) shall consist of 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 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 airflow can be modulating mode (requires CO2 controller with 2-10vdc output) or can be demand control fixed mode On/Off using relay output from CO2 controller. In fixed mode the intake and exhaust rates are individually adjustable, and can be set to maintain positive pressure if desired. The ERV cassette including parts and media shall include 5-year 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.

5.0 FILTER OPTIONS - (Select One)

5.1 **2" pleated MERV 8**

5.2 **2" pleated MERV 11**

5.3 **2" pleated MERV 13**

6.0 DEHUMIDIFICATION CYCLE- (Utilizing waste heat from condenser gas) (STANDARD)

6.1 **The dehumidification circuit shall incorporate an independent DX coil in the supply air stream in addition to the standard evaporator coil. This coil shall be mounted in the reheat position, and 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, Models that also have electric heaters installed shall have the electric heat inhibited during dehumidification mode, unless a call for emergency heat is initiated.**

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 thru the reheat coil, reheating the cold air leaving the evaporator coil. The dehumidification cycle shall have on/off capability. If the thermostat calls for cooling or heating during the dehumidification cycle, the unit shall terminate dehumidification to satisfy the call from the thermostat. A solid state circuit board shall control the dehumidification function.

7.0 COIL OPTIONS – (Select Standard Hydrophilic Evaporator and Non-Coated Condenser or Coated: Evaporator or Condenser Coils, or Both)

Standard evaporator coil shall be constructed of hydrophilic fin stock (green) providing acrylic coating with no bead-up condensate, lower wet coil pressure drop and improved draining and reduced re-entrainment of moisture back into the air stream. Acrylic coating shall also provide antimicrobial properties providing resistance to microbial and fungicidal growth. Coil coating shall meet ASTM D2372- no growth.

Evaporator coil shall be either standard hydrophilic fin stock or hydrophilic fin stock with Phenolic coating.

Standard condenser coil shall be constructed of aluminum fin stock and copper tube.

7.1 PHENOLIC COATING (TechniCoat)

Phenolic coating is a proprietary epoxy-modified phenolic dip coating. It is the only anti-corrosive coating ever designed and custom engineered specifically for HVAC/R coils. After years of research and 25 years of experience gained in coating TechniCoat is state of the art in corrosion control. Total immersion ensures complete coverage with no significant loss of thermal efficiency. The 4-step coating system consists of (1) a multi-step cleaning process, (2) chemical etch primer, (3) epoxy-modified phenolic, and (4) phenolic sealer.

8.0 CONTROLS – (Select one of the following field mounted control options. CompleteStat can be ordered and shipped with the Air Conditioners for field installation and wiring at specified location within the space)

8.1 None

8.2 CompleteStat THO (Temp. Humidity, Occupancy)

8.3 CompleteStat THOC (Temp. Humidity, Occupancy) and CO2

8.4 CompleteStat THO (Temp. Humidity, Occupancy) and Ethernet

8.5 CompleteStat THOC (Temp. Humidity, Occupancy) CO2 and Ethernet

Note: All CompleteStats are BACnet capable using shielded twisted pair, and the Ethernet versions have Ethernet port to simplify networking.

9.0 ACCESSORIES

9.1 WALL SLEEVE (wall sleeve and louver required)

Wall sleeve shall be factory supplied and must be constructed of galvanized steel, coated with an epoxy primer and baked-on polyester enamel paint. It shall be designed to withstand a minimum of 1000 hours of salt spray protection when tested per ASTM B117-03 standard. One sleeve size fits all models (select 1 of 3 adjustable depth sleeves: 5.5" to 8.5", 8.0" to 13.5", 13.0" to 23.5"). Sleeve location shall be at least 31" above finished floor and shall be adjustable by +3". Floor base shall be provided to raise height over 34" above finished floor. Wall sleeve shall be

continuous from outside wall to rear of unit for weather tight installation. See 10.6 for optional Riser Platforms.

9.2 OUTDOOR LOUVER GRILLES

Furnish factory 1" louver designed for condenser air and outside air intake and exhaust. Louver shall be aluminum construction with removable core for service. Access to removable core is by tamper-proof screws. Louver shall have a powder coat finish. See our color chart for color selections.

9.3 AIR DISTRIBUTION

For duct-free installation, the I-TEC™ shall have a discharge air plenum box with double wall construction. Exterior finished to match the base I-Tec unit, and lined on the interior with sound deadening insulation covered with perforated galvanized metal. One front and two side diffusers are required. Diffusers shall be linear slot design with heavy gauge extruded aluminum blades on ¾" centers and fixed 30-degree up angle. Side diffusers shall be equipped with rear opposed blade balancing dampers.

9.4 CABINET EXTENSIONS

Painted 3-sided assembly to enclose ductwork, piping as required, or to fill space from duct-free plenum boxes to ceiling if desired.

9.5 RISER PLATFORMS

3" or 6" riser platforms painted to match the unit are available to elevate unit if needed for window sills above 34".

10.0 INSTALLATION

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