Sample Specification

Pinnacle™, Primary Ventilation System

Optional items are shown in RED text. Items in RED should be deleted unless the option is desired.

CASING - Wall and roof panels shall consist of 2" thick dual wall 18 gauge galvanized solid exterior skins and 22 gauge galvanized steel solid interior skins enclosing 2 inch thick 3 pcf mineral wool insulation. The housing shall be supported by a painted structural steel base. The base includes a solid welded floor with 6" thick mineral wool insulation. The bottom face of the insulation shall be protected with a 22 gauge galvanized steel cover. The base shall be self-flashing when set on a properly sized curb. Floor openings shall have perimeter lips turned up into unit and be covered by a protective grate. Lifting lugs shall be welded to the structural base.

ACCESS - Access shall be provided through large hinged, tightly sealed doors or removable access panels. Access doors shall be constructed of the same materials as the unit casing. Each door shall be provided with two cam type handles and two heavy duty hinges to achieve maximum sealing. Handles shall be internal and external for opening from the inside or outside of the unit. All doors shall open against the air pressure. Removable panels shall be provided for heating and cooling coils.

OUTDOOR INSTALLATION - Units shall have a factory-installed, 22-gauge galvanized steel standing seam sheet metal roof. All roof field joints shall have U-clips. The U-clips shall be shipped with the unit for field installation. Outdoor air intake and exhaust air discharge openings shall have galvanized steel sheet metal hoods with openings covered with bird screen. Hoods may ship loose for field installation depending on shipping width restrictions.

FANS - Fans shall be centrifugal plenum type. Fans shall incorporate a wheel, heavy gauge reinforced steel inlet plate with removable spun inlet cone, structural steel frame, and shaft and bearings in the AMCA Arrangement 3 configuration to form a heavy duty integral unit. All fan wheels shall be tapered spun wheel cones or shrouds providing stable flow and high rigidity. The wheels shall be non-overloading type. The blades shall be securely welded, die-formed backward curved (16" and smaller) or airfoil (18" and larger) type. Fan wheels shall be statically and dynamically balanced. Fan shafts shall be sized for first critical speed of at least 1.25 times the maximum speed for the class. Fan wheel bearings shall be heavy duty, grease lubricated, anti-friction ball or roller, self-aligning, pillow block type and selected for minimum average bearing life (AFBMA L-50) in excess of 200,000 hours at the maximum class RPM. Fan ratings shall be based on tests made in accordance with AMCA Standard 210 and shall bear the AMCA Seal.

MOTORS, DRIVES, and GUARDS - Fan motors shall be standard NEMA frame, high efficiency, with 1.15 service factor and open drip-proof enclosures. Belt drives shall be designed for a minimum 1.4 service factor. Drives shall be fixed pitch. Rotating fan and drive parts shall be enclosed by protective guards.

FAN VIBRATION ISOLATION - Fans assemblies shall have adjustable motor bases, motors and V-belt drives mounted with the assembly mounted on 1-inch deflection spring isolators with flexible connections between fan and fan wall.

ENTHALPY RECOVERY WHEEL - The rotor media shall be made of aluminum, which is coated to prohibit corrosion. All media surfaces shall be coated with a non-migrating solid adsorbent layer prior to being formed into the honeycomb media structure to insure that all surfaces are coated and that adequate latent capacity is provided. The media shall have a flame spread of less than 25 and a smoke developed of less than 50 when rated in accordance with ASTM E87. In addition to the desiccant coating that is applied to the surfaces of the aluminum substrate, the two faces of the total energy recovery wheel shall be covered and sealed with a two-part polymer heavy duty coating specifically chosen for chemical resistance.

The desiccant shall be inorganic and specifically developed for the selective adsorption of water vapor. The desiccant shall utilize a 3A molecular sieve certified by the manufacturer to have an internal pore diameter distribution which limits adsorption to materials not larger than the critical diameter of a water molecule (2.8 angstroms).

Submit certification by a qualified independent organization documenting equal sensible and latent recovery efficiencies conducted in accordance with ASHRAE Standard 84 and the results presented in accordance with ARI 1060 standards.

An independent wheel test from a credible test laboratory shall document that the desiccant material utilized does not transfer pollutants typically encountered in the indoor air environment. The cross-contamination and performance certification reports shall be provided upon written request for engineering review.

PASSIVE DEHUMIDIFICATION WHEEL - The rotor media shall be made of aluminum which, is coated to prohibit corrosion. All media surfaces shall be coated with a non-migrating solid adsorbent layer prior to being formed into the honeycomb media structure to insure that all surfaces are coated and that adequate latent capacity is provided. The media shall have a flame spread of less than 25 and a smoke developed of less than 50 when rated in accordance with ASTM E87. In addition to the desiccant coating that is applied to the surfaces of the aluminum substrate, the two faces of the total energy recovery wheel shall be covered and sealed with a two part polymer heavy duty coating specifically chosen for chemical resistance.

MEDIA CLEANING - The media shall be cleanable with low-pressure steam (less than 5 PSI), hot water or light detergent, without degrading the latent recovery. Dry particles up to 800 microns shall pass freely through the media.

PURGE SECTOR - The unit shall be provided with a factory set, field adjustable purge sector designed to limit cross contamination to less than .04 percent of that of the exhaust air stream concentration when operated under appropriate conditions.

ROTOR SEALS - The rotor shall be supplied with labyrinth seals only, which at no time shall make contact with any rotating surface of the exchanger rotor face. These multi-pass seals shall utilize four labyrinth stages for optimum performance.

ROTOR SUPPORT SYSTEM - The rotor media shall be provided in segmented fashion to allow for field erection or replacement of one section at a time without requiring side access. The media shall be rigidly held in place by a structural spoke system made of extruded aluminum.

ROTOR HOUSING - The rotor housing shall be a structural framework which, limits the deflection of the rotor due to air pressure loss to less than 1/32". The housing is made of galvanized steel to prevent corrosion. The rotor is supported by two pillow block bearings which can be maintained or replaced without the removal of the rotor from its casing or the media from its spoke system.

TEMPERATURE CONTROL PANEL - Variable speed control of the passive dehumidification wheel shall be accomplished by the use of an A/C inverter. The inverter shall include all digital programming with a manual speed adjustment on the front of the inverter.

CHILLED WATER, DX AND HOT WATER COILS - Primary surface shall be round seamless 5/8 inch O.D. by .020 inch thick copper tube on 1.5 inch centers, staggered in the direction of airflow. All joints shall be brazed.

Secondary surface shall consist of .006 inch rippled aluminum plate fins for higher capacity and structural strength. Fins shall have full drawn collars to provide a continuous surface cover over the entire tube for maximum heat transfer. Bare copper tube shall not be visible between fins and the fins shall have no openings punched in them to accumulate lint and dirt. Tubes shall be mechanically expanded into the fins to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates.

Casings shall be constructed of continuous galvanized steel. Coil side plates shall be of reinforced flange type.

Coils shall have equal pressure drop through all circuits. Coils shall be circuited for counter flow heat transfer to provide the maximum heat transfer rates.

Headers on coils shall be seamless copper tubing. The headers shall have intruded tube holes to provide a large brazing surface for maximum strength and inherent flexibility. Supply and return connections on water coils shall be steel with male pipe threads. DX coils shall have copper sweat connections.

The complete coil core shall be tested with 315 psig air pressure under warm water and be suitable for operation at 250 psig working pressures.

Individual tube tests and core tests before installation of headers shall not be considered satisfactory. Water cooling coils shall be circuited for drainability. Use of internal restrictive devices to obtain turbulent flow shall not be acceptable. Vents and drains shall be furnished on all water coils. Coils shall be rated in accordance with ARI.

Coils shall be mounted in galvanized holding racks. Water coil supply and return connections shall be extended to the unit exterior. Water coil drain and vent connections are accessible from the interior of the unit and are not extended. Cooling coils shall be mounted in an insulated pitched 304 stainless steel condensate pan.

ELECTRIC HEATING COIL - Where scheduled, electric coil shall be the open element electric resistance type. Heater shall include main disconnect switch, fusing as required, magnetic contactors, control circuit transformer, pressure type air flow interlock switch and manual and auto reset thermal cutout over current protection. The electric coil shall require a separate power feeder connection in addition to the power connection to the main unit electrical panel.

PRE-FILTERS (return & outside air) - Filters shall be Farr type 30/30 or approved equal. Air filters shall be 2" thick, pleated, disposable type. Each filter shall consist of a non-woven cotton and synthetic fabric media, media support grid and enclosing frame. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard. The filter shall be listed by Underwriters' Laboratories as Class 2. A bank of galvanized universal holding frames shall be arranged for upstream access. Provisions shall be made on the downstream side of the frames to prevent filter blowout from moisture or overloading.

SECONDARY FILTERS - Outside air high efficiency filters shall be Farr type Riga-Flo or approved equal, mounted in the same filter frames as the pre-filters shall be 12" deep, high performance filters, deep pleated, totally rigid and consisting of high density media, media support grip, contour stabilizers, diagonal support bracing and enclosing frame. The media shall have an average efficiency of 65, 85 or 95 percent. The filter shall be listed as UL class 2.

OUTDOOR AIR DAMPERS - Dampers shall have galvanized steel frames and blades, with blade and jamb seals for low leakage performance. Dampers shall have electric actuators.

EXHAUST AIR DAMPERS - Dampers shall be gravity operated back-draft type. Dampers shall have aluminum frames and blades, with blade seals for low leakage performance.

UNOCCUPIED DAMPER - Damper shall be integral to the interior wall of the unit to permit reduced flow of fresh air while maintaining circulation within the space. Damper shall have electric actuator.

ELECTRICAL - Unit shall require either a 480, 240 or 208 volt (as scheduled), 3 phase, 60 cycle power connection at the main electrical panel. The electrical panel shall be NEMA 12 rated and mounted on the unit exterior as shown on the General Arrangement drawings. The electric panel shall consist of a non-fused disconnect, fused IEC full voltage starters for each fan and constant speed wheel, control power transformer, and HOA switch for the unit. Electrical panels shall bear an ETL label.

All wiring 120 volt and higher and wire size #8 and smaller shall be run in MC cable. All wire size #6 and larger shall be run in EMT. Fan motors requiring wire run in EMT shall have a 2' length of seal-tight at the motor junction box. Low voltage wiring shall use plenum cable, installed external to the conduit. Starter coils shall be 24 volt AC for contactors rated 75 amps or less and 120 volt AC for contactors rated greater than 75 amps.

LIGHTS & GFI RECEPTACLE - Vapor tight lights shall be provided in access compartments as shown on the General Arrangement drawing. Lights shall be wired to a single switch on the unit exterior. A GFI receptacle shall be mounted next to

the light switch. A separate 120-volt power connection shall be required at the GFI receptacle to provide power for the lights and receptacle.

CONTROLS - The DDC control system shall consist of a controller, I/O board(s), backlit LCD display, and modem. Sensors include temperature and RH sensors mounted in the outdoor, supply, and return plenums, plus cooling coil entering and leaving air temperature sensors.

WARRANTY - The unit manufacturer shall warrant to the Buyer that for a period of eighteen months from the date of shipment the goods to be delivered to the Buyer shall in all material respects be free from defects in material and workmanship when used in a proper and normal manner. Should any failure to conform to the above appear within eighteen months after the date of shipment, the unit manufacturer shall upon prompt notification thereof during the Warranty Period and confirmation to the unit manufacturer's satisfaction that the goods have been stored, installed, operated and maintained properly and in accordance with standard industry practice, correct the non-conformity at the unit manufacturer's option either by repairing any defective part or parts or by making available at the unit manufacturer's plant a repaired or replacement part.