

INDOOR PREMANUFACTURED AIR HANDLING UNITS

1. GENERAL

1.1 Scope

- .1 Supply and install indoor air handling units as described here in and indicated on Drawings.
- .2 This Specification is applicable to AHU units H640, S780 and T610.
- .3 Refer to Section 15999 Air Handling Unit Schedule for performance specifications.

1.2 References

- .1 AFBMA 9, Load Ratings and Fatigue Life for Ball Bearings
- .2 AMCA 99, Standards Handbook
- .3 AMCA 210, Laboratory Methods of Testing Fans for Rating Purposes
- .4 AMCA 300, Test Code for Sound Rating Air Moving Devices
- .5 AMCA 500, Test Methods for Louvers, Dampers and Shutters
- .6 ARI 410, Forced-Circulation Air-Cooling and Air-Heating Coils
- .7 NEC
- .8 NEMA MG1, Motors and Generators
- .9 NFPA 70, National Fire Protection Code
- .10 SMACNA, HVAC Duct Construction Standards – Metal and Flexible
- .11 ULC 900, Test Performance of Air Filter Units
- .12 ASHRAE 62-2001, Ventilation for Acceptable Indoor Air Quality

1.3 Quality Assurance

- .1 It is the intent of this Specification that the manufacturer provides air handling units designed and manufactured specifically to the requirements of this project. Overall dimensions and configuration are to be as shown on the plans and as described in the specifications. Take responsibility for the engineering and operational integrity of the air handling units.
- .2 Unit construction shall be per the construction details included at the end of this Section, and as described herein.

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- .3 Provide unit produced by a recognized manufacturer who maintains a local service agency and parts stock.
- .4 Air flow rates, external static pressures, water flow rates, coil face velocities, filter face velocities, water and air side pressure drops shall be the same or better than specified for alternate selections.
- .5 Fans shall be to AMCA standards, and bear AMCA “certified” seal.
- .6 Coils shall be ARI certified, and bear ARI seal.
- .7 Provide all motors with thermal overload protection. Provide thermostats in motor windings. All motors shall be high efficiency type and shall be inverter duty for use with variable frequency drives.
- .8 Start-up of unit shall be executed by manufacturer's personnel.
- .9 All components, paints and lining shall have a flame spread rating of not over 25 without evidence of continued progressive combustion and a smoke developed rating no higher than 50.

1.4 Factory Inspection by Engineer

- .1 All air handling units shall be inspected at the manufacturer's plant by the Contract Administrator, prior to shipment to the Site. The manufacturer shall include all costs of these plant visits including the cost of the Contract Administrator's time and travel expenses. A minimum of five working days notice will be required prior to each plant visit.

1.5 Operation and Maintenance Data

- .1 Include instructions for lubrication, filter replacement, motor and drive adjustment and replacement, spare parts lists and wiring diagrams.

1.6 Delivery, Storage and Handling

- .1 Accept products on-site in factory applied protective wrapping, and factory installed lifting lugs. Inspect for damage. Store in clean dry place and protect from weather and construction traffic. Handle carefully to avoid damage to components, enclosures and finish.

1.7 Environmental Requirements

- .1 Do not operate units for any purpose, temporary or permanent, until vendor installation certification has been completed, ductwork is clean, filters are in place, bearings lubricated and fan has been test run under observation.

1.8 Submittals

- .1 Submit Shop Drawings and product data in accordance with Section 01300 – Submittals and Section 15010 – Mechanical General Requirements.

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- .2 Shop Drawings shall be clear and legible, facsimiles will not be accepted. Provide a cover page for each air handling unit, showing the project name, consulting engineer, mechanical Contractor, tagging information, revision if applicable and submission date, leaving adequate space for approval stamps.
- .3 Provide all technical information relevant to the product being provided, including but not limited to all the information shown in the schedules of the Specification. It is the responsibility of the vendor to highlight any variances the equipment has with the requirements of this Specification.
- .4 Product data shall include dimensions, weights, capacities, component performances, electronic characteristics, construction details, required clearances, field connection details (indicating size and location), proposed test descriptions and sample reports, pressure drops, vibration isolation, gauges and finishes of materials.
- .5 Provide fan performance curves depicting the operating point described on the schedule for each individual fan.
- .6 Provide coil selection data sheets, clearly showing input data with proper consideration for altitude, air density, glycol correction, as well as clearly indicating the selected coils' output data.
- .7 Provide filter information, including initial APD, final APD, dust spot efficiency, filter dust holding capacity, filter media description, filter frame details, filter replacement details and filter gauge details if applicable.
- .8 Submit air handling unit inlet, discharge and radiated sound power levels at nominal capacity.
- .9 Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring; clearly indicating factory installed and field installed wiring and accessories.
- .10 Submit manufacturer's recommended installation instructions.
- .11 Omission of any of the above information will cause submittal package to be immediately returned without review.

2. PRODUCTS

2.1 General

- .1 The air handling unit shall be a self-contained air purification system.
- .2 It shall be designed to remove hydrogen sulfide contaminants from the air stream and operate as either a pressurization or recirculation unit.

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2.2 Components

- .1 Air handling units shall consist of, but not be limited to, the following components:
 - .1 Supply fan
 - .2 Preheat element
 - .3 Cooling coil (external of unit)
 - .4 Prefilter
 - .5 Two-stage media filter
 - .6 Access sections
 - .7 24 VDC cooling only thermostat

2.3 Construction

- .1 Exterior Panels: minimum 18 gauge steel with 38-mm deep double wall panels filled with 2.0 lb./cu. Ft. dense insulation.
- .2 Interior Seams: all sealed to prevent leakage.
- .3 Filters racks shall be supported by formed metal tracks that prevent air bypass.
- .4 Access Doors:
 - .1 Shall be 38-mm deep double wall panels filled with 2.0 lb./cu. Ft. dense insulation.
 - .2 Shall have positive locking latches to secure and compress PVC closed gasket to prevent leakage.
- .5 Insulation:
 - .1 All exterior panels and access doors shall be filled with 2.0 lb./cu. Ft. dense insulation.
 - .2 The fan section, intake and discharge plenums shall be lined with non-allergenic and inert flexible polyester urethane foam acoustic insulation, meeting UL 94 MF-1 flammability classification.
- .6 Filters:
 - .1 Pre-filter: 50 mm pleated filter, average efficiency 25 to 30 percent on ASHRAE Test Standard 52-76. Non-woven cotton and synthetic fabric media. FARR 30/30.

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- .2 Media filter: media type filter capable of removing hydrogen sulfide from the air stream with minimum 0.12 second (per stage) residence time. Standard of acceptance: Circul-aire MM-1000 MULTI-MIX® media.
- .3 Provide one (1) magnehelic filter gauge for each bank of filters, including for each position of prefilter. Flush mount gauge on the exterior of the unit.
- .7 Finish: all metal surfaces shall be coated with lift resistant alkyd primer and a two component polyurethane coating.

2.4 Blower Section

- .1 The fan blower shall be a backward inclined, airfoil impeller molded from glass reinforced polyamide.
- .2 Blower shall be factory balanced.
- .3 Complete with:
 - .1 Bearings
 - .2 Adjustable v-belt drives
 - .3 Belts rated at 150 percent of design fan power
- .4 Blower assembly shall be isolated from housing by a neoprene closed cell gasket.

2.5 Coil Section

- .1 Cooling coils shall be located externally of air handling unit complete with drain pans.
- .2 Coils shall be fully enclosed within the section and shall have double wall stainless steel floor construction consistent with stainless steel coil casing construction.
- .3 Piping connections shall extend to the outside through rubber grommets.
- .4 Coils shall include stainless steel blank out sheets to hold coils rigid and prevent air from bypassing the coils.
- .5 Removable two inch thick access panels shall be provided on both sides to remove coils through casing wall. Coils shall be mounted on independent racks and shall be individually removable.
- .6 Drains for drain pans shall be fully recessed in the drain pans to ensure complete drainage.
- .7 Coils shall be tested in accordance with ARI standard 410.

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- .8 The complete coil core shall be tested with 2170 kPag (315 psig) of air pressure under warm water and be suitable for operation at 1725 kPag (250 psig) working pressure. Water coils shall be circuited for drainability without removing individual plugs from each tube.
- .9 Limit cooling coil face velocity to 2.5 m/s (500 fpm).

2.6 Drain Pans

- .1 Provide a 316 SS drain pan to drain the fresh air intake duct section, and cooling coil. Pipe all drains to nearest floor drain.

2.7 Condensing Unit

- .1 Refer to Equipment Schedules.

3. EXECUTION

3.1 Assembly

- .1 Units are to be one-piece construction.
- .2 Pipe units to permit coil removal.
- .3 Any piping or conduit passing through the unit casings must be sealed with rubber grommets and retaining plates to prevent air or water leakage.
- .4 Insulate all piping as per Section 15200.

3.2 Air Handling Unit Schedule

- .1 Refer to Equipment Schedules.

END OF SECTION