

SECTION 23 70 00 –AIR HANDLING UNITS

PART 1 - GENERAL

1.1. SUMMARY

A. Related Sections:

1. Section 23 00 10 – HVAC Design Criteria.
2. Section 23 09 00 – Building Automation Systems Design Criteria
3. Section 26 05 90 - Motors
4. Section 26 29 23 - Variable Speed Drives

1.2. SUBMITTALS:

A. As-built drawings shall show total unit configuration in direction of airflow, unit dimensions, and field duct connection details.

B. Product Data:

1. Manufacturer, model, type, finishes of materials, dimensions & weights;
2. Unit air flow and arrangement data;
3. Filter data;
4. Airflow capacity, external static pressure, total static pressure;
5. Motor HP & electrical characteristics;
6. Heating coil data;
7. Cooling coil data;
8. Water flow data; filter media, filter sizes, and filter quantities.

1.3. AIR HANDLERS – GENERAL REQUIREMENTS:

- A. All air handlers, including energy recovery units, pool units, etc. shall have Building Automation System (BAS) control devices which match the campus BAS vendor – JCI (Metasys) and have the capability for full BACnet MSTP (preferred) or BACnet IP (allowed) communication to the BAS.
- B. Show Manufacturer's recommended service clearances and pull clearances as shaded areas on mechanical plans.
- C. Provide safety platform if air-handling unit is installed greater than or equal to 3 feet from the finished roof or floor level per OSHA requirements.
- D. Provide concrete housekeeping pad or structural steel bases for base-mounted air handlers.

1.4. AIR HANDLERS – DETAILED REQUIREMENTS:

A. CASING:

1. Combined height of pad and casing floor shall permit required drain trap depth.
2. Access Doors: Access doors shall be provided between each air handler component to ensure access and ability to clean air handler. Each door shall have a minimum of two securing latches, which also operate from inside the unit.

Doors in positively-pressurized sections shall swing inward; in negatively-pressurized sections outward.

3. Casings shall be double-wall construction, with manufacturer's standard insulation between interior and exterior walls.
4. Provide drain pans, pitched toward the side of the unit for all steam humidification coils and cooling coils to allow for proper trapping of lines.

B. FANS:

1. Direct-drive fans are preferred. ECM motors are acceptable.
2. Systems designed with fan wall configuration, shall also call out and specify appropriate individual isolation/backdraft dampers for proper operation.
3. Fan motor: Totally-enclosed, premium efficiency, inverter-duty rated. See Section 26 05 90 – Motors for additional requirements.
4. Fans shall be statically and dynamically tested as an assembly at the required RPM to meet design specifications.
5. Provide self-aligning, grease lubricated heavy duty sealed or pillow-block bearings. For pillow-block type bearings extend grease lubrication fittings to drive side of unit.

C. ECONOMIZER:

1. Provide return, outside air, and exhaust dampers and controls for a fully functional 100% outside air economizer cycle when design conditions permit.

D. COILS:

1. Freeze Protection: Cooling coils shall have non-trapping circuits to facilitate seasonal drainage.
2. In research buildings, provisions to eliminate the need for drainage shall be made, such as the installation of freeze pumps.
3. Pre-heat coils shall not be steam or gas-reheat.

E. FILTERS:

1. Prefilter: 2-inch 30% eff. Pleated (MERV 7/8)
 - a. Manufacturer: Camfil-Farr 30/30, or equal
2. Final Filter: 12-inch 85% eff. (MERV 13)
 - a. Manufacturer: Camfil-Farr "Durafill", or equal
3. Final Filter: (High Moisture Applications) 85% eff. (MERV 13)
 - a. Manufacturer: Camfil-Farr "Hi-Flo ES", or equal
4. Provide Magnehelic Differential Pressure gage across each filter bank, scale 0-5" water column or as required; for units rated over 4,000 CFM, also provide a differential pressure transducer connected to the BAS.

F. DAMPERS:

1. Multi-zone dampers shall be type as required, mounted on stainless steel shafts and stainless steel bearings.

2. Outside air, return air and exhaust dampers, and Face and Bypass dampers shall be internally-mounted, low leakage type. Provide as opposable blade type, mounted on stainless steel shafts and stainless steel bearings.
3. Damper blades shall be horizontal-mounted, not vertical mounted.

G. ACCESSORIES:

1. Provide Marine-style lights for all fan sections, access sections and mixing box sections. Control lights with an exterior-mounted light switch with pilot light.
2. Provide access door double-pane view ports.
3. Provide air blender to provide mixing of air to prevent stratification (if mixing box is not configured to prevent OA/RA stratification).
4. Air Flow Measurement Station: When required, provide electronic type air measurement station. Air flow measurement stations shall only be used for monitoring and not a means of control for the unit operation.
5. Variable Frequency Drives: When required, provide Variable Frequency Drives (VFD's) on fan motors. Fans shall be set to operate at 60 Hz maximum speed. See Section 26 29 23 - Variable Frequency Controllers for requirements.

PART 2 - PRODUCTS

2.1 PREFERRED MANUFACTURERS

- A. All equipment and components shall be new, and the manufacturer's current model.
- B. Acceptable Manufacturers:
 1. Custom Units: Cambridgeport, Haakon, Ventrol, York, Carrier.
 2. Factory Packaged Units: Carrier, McQuay, Munters, Trane, York

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install per Manufacturer's requirements, shop drawings and Contract documents.
- B. Insulate coil headers located outside airflow.
- C. Provide flexible connection to separate unit from connecting ductwork.
- D. Installation of water coils:
 1. Make all connections from supply lines to coils with unions or flanges to facilitate coil removal.
 2. Connect water supply to leaving airside of coil (counter flow arrangement).
 3. Locate water supply at bottom of supply header and return water connection at top.
 4. Install water coils to allow draining and install drain connection at low points.

- E. Test the operation of all unit safety and control devices.
- F. Clearly label and identify all piping supply, return and drain connections as specified in Division 1 specification “MEPS Identification/Labeling” (01 70 10)

END OF SECTION