SECTION 15775

COMPUTER ROOM AIR CONDITIONING UNITS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Packaged computer room air handling units with chilled water coils and integral controls.

1.2 RELATED WORK

A. Documents affecting work of this Specification Section include the other Sections of the contract documents, all Specification Sections in Division 1, and the following Sections:

1. Section 15990, Testing, Adjusting, Balancing of Environmental Systems.

1.3 REFERENCES

A. ARI 430 – Standard for Central Station Air Handling Units.

B. ARI 410 – Standard for Forced Circulation Air-Cooling and Air-Heating Coils.

C. NFPA 90a – Installation of Air Conditioning and Ventilation Systems.

D. UL 1995 – Heating and Cooling Equipment.

E. ANSI/AFBMA 9 – Load Ratings and Fatigue Life for Ball Bearings.

F. ANSI/UL 900 – Testing Performance of Air Filter Units.

G. AMCA 300 – Reverberant Method for Sound Testing of Fans.

H. AMCA 301 – Method for Publishing Sound Ratings for Air Moving Devices.

I. ASHRAE 68 – Laboratory Method of Testing In-Duct Sound Power Measurement Procedure for Fans.

J. ASHRAE 52-76 – Methods of Testing Air – Cleaning Devices Used in General Ventilation for Removing Particulate Matter.

1.4 SUBMITTALS

A. Submit all items in accordance with the requirements of Section 01300, “Submittals”.

B. Submit the following:

1. Specification, capacities, fan curves and performance data.
2. Control and power wiring diagrams.
3. Dimensional drawings including clearances.
4. Parts list and recommended spare parts list with prices.
5. Installation, operation and maintenance manuals.
6. Handling and lifting instructions.
7. Manufacturer’s data that indicates that the cooling capacity is tested and rated in accordance with ARI Standard 210.

8. Submit data on electrical requirements and connection point.
9. Include recommended wire and fuse sizes or MCA, sequence of operation, safety and start-up instructions.

1.5 QUALITY ASSURANCE

A. Air Handling Units: Product of manufacturer regularly engaged in production of components that issues complete catalog data on product offering.

B. ISO 9001 Certification. The air handling manufacturer shall be ISO 9001 Certified by a third party registrar, such as HSB Registration Services, that is accredited by an accreditation body such as ANSI-RAB.

C. Air Coils: Certify capacities, pressure drops and selection procedures in accordance with ARI 410-91.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 15050. Units shall ship fully assembled up to practical shipping and rigging limitations. Units not shipped fully assembled shall have tags and airflow arrows on each section to indicate location and orientation in direction of airflow. Each section shall have lifting lugs to allow for filed rigging and final placement of section.

B. Deliver units to site with fan motors, sheaves, and belts completely assembled and mounted in units. Mount motors as specified in Article 2.06 Paragraph D, and Article 2.07 Paragraph A and B.

C. Store and protect products under provisions of Section 15050.

1.7 ENVIRONMENTAL REQUIREMENTS

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

1.8 EXTRA STOCK

A. Provide one set of disposable filters.

B. Provide spare belt set.

PART 2 - PRODUCTS

2.1 COMPUTER ROOM AIR CONDITIONING UNIT

A. Manufacturer shall clearly indicate exceptions to Plan and Specifications at submittal stage.

B. Factory fabricated air-handling units of size, capacities, and configurations as scheduled on drawings.

C. The unit shall be able to withstand up to 1.5 times design static pressure, or 8-inch wc whichever is more, with no more than 0.005 inch deflection per inch of panel span.

2.2 UNIT BASE

A. Base shall be welded supporting the entire length and width of the unit.

B. Provide 12” floor stand, factory fabricated.

2.3 CASING

A. Panels shall be of double wall construction. Interior and exterior panels shall be constructed of galvanized steel. Panel insulation system shall provide a minimum R-value of (12). Insulation shall conform to NFPA 90 requirements.

B. Panels shall be fully removable to allow for a proper way to thoroughly clean panels and to access internal parts. If panels are not removable, then manufacturer shall provide access sections with doors between internal components to ensure access of the air handler.

C. Access doors shall be constructed with a double-wall of solid G90 galvanized steel interior panel. Gasket around the full perimeter of the access door to prevent air leakage. Preferred door handle shall not penetrate door casing with single-handle latch. Components shall be engineered so all maintenance can be performed from the front panel of unit.

D. External surface of unit casing shall be prepared and factory coated with a minimum 1.5 mil enamel finish or equal. Unit casing exterior with factory coating shall be able to withstand a salt spray test in accordance with ASTM B117 for a minimum of 1500 consecutive hours. Provide unit casing in manufacturer's standard color.

2.4 FANS SECTION

A. Provide supply fan section(s) with FC double width, double inlet centrifugal fan design and suitable for class of service indicated in the unit schedule. Fan shaft to be properly sized and protectively coated with lubricating oil. Fan shafts shall be solid and properly designed so that fan shaft does not pass through first critical spend as unit comes up to rated RPM. Fans shall be statically and dynamically tested as a assembly at the required RPM to meet design specifications. Key fan wheels to fan shaft to prevent slipping.

1. Provide self-aligning, grease lubricated pillow-block ball bearings selected for 250,000 hours average life per ANSI/AFBMA 9. Extend both grease lubrication fittings to drive side of unit with plastic tubes and zirt fittings rigidly attached to drive-side bearing support.

B. Mount fans on isolation bases. Internally mounted motors on same isolation base and internally isolated fans and motors with 1-inch spring isolators. Install flexible canvas ducts between fan and casings to ensure complete isolation. Flexible canvas ducts shall comply with NFPA 90A. The entire unit shall be externally isolated from supply and return ductwork and piping.

C. Fan sections shall have full height, double wall, hinged doors on drive side for inspection and maintenance of internal components. Construct doors in accordance with Article 2.03 Paragraph E.

D. Weigh fan and motor assembly at AHU manufacturer's factory for isolator selection. Statically and dynamically, balance fan section assemblies. Fan section assemblies include fan wheels, shafts, bearings, drives, belts, isolation bases, and isolators. Allow isolators to free float when performing fan balance. Measure vibration at each fan shaft bearings in horizontal, vertical and axial directions.

2.5 MOTORS AND DRVIES

A. Factory install motors on slide base to permit adjustment of belt tension. Units shall have a single point connection for electrical power supply.

B. Fan Motors shall be heavy duty, high-efficiency open drip-proof, operable at 460 Volts, 60Hz, 3-Phase.

C. V-Belt Drive shall be variable pitch rated at 1.2 times the motor nameplate.

D. Provide combination full voltage non-reversing magnetic motor starter with motor short circuit protection, disconnect switch, NEMA 1 enclosure, hand off-auto switch, green run pilot light in cover, two normally open and two normally closed field adjustable contacts and 120V secondary control transformer with dual fused primary.

2.6 REFRIGERANT COILS

A. The self-contained DX computer room AC Unit shall be furnished complete with A-frame DX coil constructed of copper tubes and aluminum fins with a maximum face velocity of 475 fpm. The

B. Each refrigerant circuit shall be distributed through the full face of the refrigerant coil. Each circuit shall be independent with hot gas mufflers, liquid line filter dryers, refrigerant sight glasses, adjustable externally equalized expansion valves, and liquid line solenoids.

2.7 COMPRESSORS

A. The compressors shall be located in a separate compartment and installed such that they can be serviced during equipment operation.

B. The compressor shall be semi-hermetic with a suction gas cooled motor, vibration isolators, thermal overloads, oil sight glass, manual reset high pressure switch, pump down low pressure switch, suction line strainer, reversible oil pumps for forced feed lubrication, and selected for a maximum operating speed of 1750 rpm.

2.8 ELECTRIC REHEAT COILS

A. The electric reheat coil shall be low watt density, fin tubular construction protected by UL thermal safety switches.

B. Reheat coil shall be configured to provide heating with the chilled water valve in full bypass.

2.9 DISCONNECT SWITCH

A. Provide non-locking disconnect, non-automatic molded case circuit breaker accessible from unit exterior with the access panel closed.

2.10 DRAIN PAN CONSTRUCTION

A. Provide insulated drain pans constructed of 300 series stainless steel. Pan insulation shall be closed cell and shall be installed to be free of voids or shall be encased by an outer, corrosion resistant covering. Drain pans shall be sloped in 2 planes; cross break interior pans and pitch toward drain connections to ensure complete condensate drainage. Units with cooling coils shall have drain pans under complete cooling coil station. Drain pan connections shall be on the side indicated on the drawings to enable proper trapping. Coat drains pans of small units not having IAQ pans with antimicrobial treatment.

2.11 FILTERS

A. Provide 2-inch flat filter sections with throwaway filters. Filters shall be removable from one side(s) of filter sections.

2.12 CONTROLS

A. Provide integral thermostat with factory mounted solid-state control panel.

B. Provide factory installed and wired controls with terminal strip mounted watertight control box, and connections for remote thermostat.

2.13 LIQUID DETECTORS

A. Provide cable style liquid detector wired to factory terminal block for alarm and shut-down.

B. Mount liquid detector on floor below unit in stand.

2.14 CONDENSTATE PUMP

A. Provide prepiped and prewired factory mounted condensate pump with discharge check valve and overflow lockout/alarm. Provide with 145gph capacity at 20ft. of head.

2.15 SMOKE DETECTOR

A. Provide factory mounted and wired smoke detector.

B. Mount detector in electrical control section and extend sensing element into the return air system.

C. The detector shall be factory wired to shutdown unit and signal alarm upon smoke detection.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit and perform initial start-up of the unit in accordance with manufacturer's instructions.

B. Make necessary adjustments to equipment, and accessories, and correct any deficiencies discovered which prevent equipment from operating as required to perform the functions required by the system design, and which prevent the equipment and accessories from performing as described in the manufacturer's catalog literature.

C. Provide one set of specified air filters per unit for use during start-up and testing.

1. After start-up and testing is completed replace air filters used during start-up and testing with a new set of air filters per this Section.
2. Provide one additional set of specified air filter for each unit to owner prior to substantial completion.

3.2 ADJUSTING AND CLEANING

A. Remove dirt, grease and other foreign materials. Repair scratches to match factory finish.

END OF SECTION