

SECTION 23 81 23

COMPUTER-ROOM AIR-CONDITIONING

PART 1 GENERAL

1.01 SUBMITTALS

- A. Product Data:
 - 1. Computer room air conditioning units.
 - 2. Air-cooled condenser package.
 - 3. Water-cooled condenser package.
 - 4. Glycol-cooled condenser package.
 - 5. Glycol pump package.
 - 6. Glycol dry cooler.
 - 7. Glycol-free cooling system.
 - 8. Control package.
 - 9. Recessed ceiling units.
- B. Shop Drawings:
 - 1. Product Data: Include certified performance curves and rated capacities; shipping, installed, and operating weights; furnished specialties; final impeller dimensions; and accessories for each type of product indicated.
- C. Operation and Maintenance Data:
 - 1. Operating and maintenance procedures.

1.02 QUALITY ASSURANCE

- A. Provide Factory-assembled, package-type computer room air conditioning units; product of manufacturer regularly engaged in production of size and type of unit specified and issuing complete catalog data on such products.
- B. Manufacturer shall be responsible for selection and operation of components furnished. Provide written certification that related components not furnished by the manufacturer have been selected in accordance with manufacturer's requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Store equipment in dry location.
- B. Retain protective covers of connections and protective coatings during storage.
- C. Protect bearings and couplings against damage from sand, grit, and other foreign matter.
- D. Comply with equipment manufacturer's written rigging instructions.

1.04 COORDINATION

- A. Coordinate size and location of concrete bases.

PART 2 PRODUCTS

2.01 FLOOR-MOUNTING UNITS 5 TONS (18 kW) AND SMALLER

- A. Acceptable Manufacturers:
 - 1. Carrier Corp.
 - 2. Compu-Aire, Inc.
 - 3. Data Aire Inc.
 - 4. Liebert Corporation

5. McQuay International
 6. Stulz Investment Corp. of America
 7. Trane Company (The); North American Commercial Group
- B. Description: Self-contained, factory assembled, prewired, and prepiped; consisting of cabinet, fan, filters, and controls; for vertical floor mounting in upflow or downflow configuration.
- C. Control System:
1. Unit-mounted panel with main fan contactor, compressor contactor, compressor start capacitor, control transformer with circuit breaker, solid-state temperature-and humidity-control modules, humidity contactor, time-delay relay, reheat contactor, and high-temperature thermostat. Provide solid-state, wall-mounting control panel with start-stop switch, adjustable humidity set point, and adjustable temperature set point. Provide auxiliary contacts for trouble alarm signal to the DDC system.
 2. Factory-wired control panel in accordance with NEC.
 3. Connect to Integrated Building Automation System. Refer to Section 25 50 00 – Intelligent Building Automation System (IBAS) for interface requirements.

2.02 CEILING-MOUNTING UNITS

- A. Acceptable Manufacturers:
1. Carrier Corp.
 2. Compu-Aire, Inc.
 3. Data Aire Inc.
 4. Liebert Corporation
 5. McQuay International
 6. Stulz Investment Corp. of America
 7. Trane Company (The); North American Commercial Group
- B. Description: Self-contained, factory assembled, prewired, and prepiped; consisting of cabinet, fan, filters, and controls; for horizontal ceiling mounting to fit 24-by-48-inch T-bar ceiling opening.
- C. Cabinet: Galvanized steel with baked-enamel finish, insulated with 1/2-inch-thick duct liner.
- D. Evaporator Fan: Forward curved, centrifugal, and directly driven by two-speed motor.
1. Motor characteristics such as NEMA designation, temperature rating, service factor, enclosure type, and efficiency are specified in Division 23 Section "Motors." If different characteristics are required, add paragraphs below to suit Project.
- E. Motors: Provide UL listed, high efficiency motors with quiet noise rating.
- F. Compressor: Hermetic, with resilient suspension system, oil strainer, and internal motor overload protection.
1. Refrigeration Circuit: Low-pressure switch, manual-reset high-pressure switch, thermal-expansion valve with external equalizer, sight glass with moisture indicator, service shutoff valves, charging valves, and charge of refrigerant.
- G. Evaporator Coil: Direct-expansion cooling coil of seamless copper tubes expanded into aluminum fins. Mount coil assembly over stainless-steel drain pan having a condensate pump unit with integral float switch, pump-motor assembly, and condensate reservoir.
- H. Water-Cooled Condenser(where applicable): Brazed-plate type with liquid-line stop valve and head-pressure-actuated, water-regulating valve.
- I. Air-Cooled Condenser(where applicable): Integral copper-tube aluminum-fin coil with propeller or centrifugal fan, direct driven.
1. Split system shall have suction- and liquid-line compatible fittings and refrigerant piping for field interconnection.

- J. Chilled-Water Coil: Seamless copper tubes expanded into aluminum fins with modulating control valve. Mount coil assembly over stainless-steel drain pan having a condensate pump unit with integral float switch, pump-motor assembly, and condensate reservoir.
- K. Electric-Resistance Heating Coil: Finned-tube electric elements with contactor, dehumidification relay, and high-temperature-limit switch.
- L. Filter: 1-inch-thick, disposable, glass-fiber media.
- M. Atomizing Humidifier: Centrifugal atomizer with stainless-steel pan, demister pad, and solenoid valve.
- N. Electrode Steam Humidifier: Self-contained, microprocessor-controlled unit with disposable, polypropylene-plastic cylinders and having field-adjustable steel electrodes and stainless-steel steam dispersion tube.
 - 1. Plumbing Components and Valve Bodies: Plastic, linked by flexible rubber hosing, with water fill with air gap and solenoid valve incorporating built-in strainer, pressure-reducing and flow-regulating orifice, and drain with integral air gap on drain.
 - 2. Control: Fully modulating to provide gradual 0 to 100 percent capacity with field-adjustable maximum capacity; with high-water probe.
 - 3. Drain Cycle: Field-adjustable drain duration and drain interval.
- O. Use only 1" pipe with 45s for condensate drains.

2.03 CONTROL SYSTEM

- A. Unit-mounted panel with main fan contactor, compressor contactor, compressor start capacitor, control transformer with circuit breaker, solid-state temperature-and humidity-control modules, humidity contactor, time-delay relay, reheat contactor, and high-temperature thermostat. Provide solid-state, wall-mounting control panel with start-stop switch, adjustable humidity set point, and adjustable temperature set point. Provide auxiliary contacts for trouble alarm signal to the DDC system.
- B. Factory-wired control panel in accordance with NEC.
- C. Connect to Intelligent Building Automation System. Refer to Section 23 50 00- Intelligent Building Automation System (IBAS) for interface requirements.

PART 3 EXECUTION

3.01 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections.
- B. Install piping adjacent to machine to allow service and maintenance.
- C. Water and Drainage Connections: Comply with applicable requirements in Division 23 Section "Domestic Water Piping." Provide adequate connections for water-cooled units, condensate drain, and humidifier flushing system.
- D. Hot-Water Heating Piping: Comply with applicable requirements in Specification Section 23 21 13 Hydronic Piping. Provide shutoff valves in inlet and outlet piping to reheat coils.
- E. Condenser-Water Piping: Comply with applicable requirements in Specification Section 23 21 13 Hydronic Piping. Provide shutoff valves in water inlet and outlet piping on water-cooled units.
- F. Refrigerant Piping: Comply with applicable requirements in Specification Section 23 23 00 Refrigerant Piping. Provide shutoff valves and piping.
- G. Electrical System Connections: Comply with applicable requirements in Division 26 Sections for power wiring, switches, and motor controls.

3.02 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections, and to assist in field testing. Report results in writing.
- B. Perform the following field tests and inspections and prepare test reports:
 - 1. Inspect for and remove shipping bolts, blocks, and tie-down straps.

2. After installing computer-room air-conditioning units and after electrical circuitry has been energized, test for compliance with requirements.
3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.03 STARTUP SERVICE

- A. Engage a factory-authorized service representative to perform startup service.
- B. Verify that computer-room air-conditioning units are installed and connected according to manufacturer's written instructions and the Contract Documents.
- C. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 26 Sections.
- D. Complete installation and startup checks according to manufacturer's written instructions.
- E. After startup service and performance test, change filters and flush humidifier.

3.04 ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Set field-adjustable switches and circuit-breaker trip ranges as indicated.
- C. Occupancy Adjustments: when requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to site outside normal occupancy hours for this purpose, without additional cost.

END OF SECTION 23 81 23