SECTION 23 65 33
DIRECT DRIVE FLUID COOLER

PART 1 - GENERAL

1.1 DESCRIPTION

Packaged, air-cooled fluid cooler package, including refrigerants and controls.

1.2 RELATED WORK

A. Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION: General mechanical requirements and items, which are common to more than one item.

B. Section 23 25 00, HVAC WATER TREATMENT: Requirements for condenser water treatment.

C. Section 23 21 13, HYDRONIC PIPING: Requirements for water piping and fittings.

1.3 QUALITY ASSURANCE

A. Refer to Article, QUALITY ASSURANCE, in specification Section 23 05 11, COMMON WORK RESULTS FOR HVAC AND STEAM GENERATION.

B. Design Criteria:

1. Equipment manufacturer must specialize in the manufacture of the products specified and have five years experience with the equipment.

1.4 SUBMITTALS

A. Submit in accordance with specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include rated capacities, pressure drop, fan performance and rating curves, dimensions, weights, mounting details, front view, side view, equipment and device arrangement.
3. Include electrical rating, detail wiring for power, signals and controls.
4. Sound curves and characteristics of sound attenuators if required to meet the noise criteria.

1.5 APPLICABLE PUBLICATIONS

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. American National Standard Institute (ANSI):

A10.18-96.....Construction and Demolition Operations - Temporary Floor Holes, Wall Openings, Stairways and Other Unprotected Edges

C. American Society for Testing Materials (ASTM):

A385-05.....Standard Practice for Providing High-Quality Zinc Coatings (Hot-Dip)

B117-03.....Standard Practice for Operating Salt Spray (Fog) Apparatus

B209-06.....Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

E84-06.....Standard Test Method for Surface Burning Characteristics of Building Materials

D. National Electrical Manufacturers Association (NEMA):

MG 1-06.....Motors and Generators (ANSI)

250-03.....Enclosures for Electrical Equipment (1000 Volts Maximum)

E. National Fire Protection Association (NFPA):

70-05.....National Electrical Code

PART 2 - PRODUCTS

2.1 DIRECT DRIVE FLUID COOLER:

A. Coil:

1. The coil shall be constructed of seamless copper tubes on a staggered tube pattern. Tubes shall be mechanically expanded into continuous, corrugated, rippled aluminum plate type fins for permanent metal-to-metal contact. The fins shall have full depth fin collars completely covering the copper tube.
2. Heavy wall copper headers shall have dimpled stub tubes from the coil and a beaded hole for the large connection tube, both items to assure good brazing surface and joint strength.
3. Headers shall be field piped to prevent excessive vibration.
4. Coils shall be factory leak tested, dehydrated and connection ends spun closed. Unit shall be shipped under pressure with a dry air or nitrogen holding charge.

B. Cabinet:

1. The cabinet shall be beige, pre-painted G90 galvanized steel. Motors shall be supported by 11-gauge galvanized steel rail fastened to the coil center and end supports. Each fan section shall be in an individual compartment, separated from other fan

sections by cabinetry. All legs and lifting brackets shall be 11-gauge galvanized steel.

C. Motors:
   1. Motors shall be dual voltage, 208-230-460/3/60 1140 rpm, open drip-proof motors with internal overloads.

D. Fans and Fan Guards:
   1. Fans shall have heavy gauge aluminum blades with painted steel spider. Fan guards shall be PVC coated steel.

E. Electrical:
   1. Unit shall have weatherproof electric control panel with factory mounted door interrupt switch. Control voltage shall be 120 volts with individual contactors and fuse protection for each motor.

F. Temperature Control:
   1. Provide a means of controlling fans to maintain fluid temperatures. This shall be automatic in operation without daily or seasonal adjustment. Controls shall be mounted and wired in the unit electric panel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fluid cooler plumb, level and anchored on structure provided. Coordinate steel structure with fluid cooler mounting requirements.

B. Install vibration controls according to manufacturer’s recommendations.

C. Install anchor bolts to elevations required for proper attachment to supported equipment

D. Maintain manufacturer’s recommended clearances for service and maintenance.

E. Piping:
   1. Install piping, including flanges or union adjacent to fluid cooler to allow for service and maintenance.
   2. Install flexible pipe connectors at connections to fluid cooler mounted on vibration isolators.
   3. Install shutoff/balancing valves at fluid cooler inlet connections.
   4. Install piping adjacent to fluid cooler to allow service and maintenance.
   5. Provide drain piping with valve at fluid cooler drain connections and at low points in piping.

F. Electrical Wiring: Install electrical devices, components and accessories furnished loose by manufacturer, including remote flow switches and variable frequency drives.

3.2 STARTUP AND TESTING

A. Provide the services of a factory-authorized and qualified representative to perform start up service.
B. Clean entire unit.
C. Inspect field-assembled components and equipment installation, including piping and electrical connections.
D. Verify that accessories are properly installed.
E. Obtain and review performance curves and tables.
F. Perform startup checks, according to manufacturer's written instructions, and as noted below:
   1. Check clearances for airflow and tower servicing.
   2. Check for vibration isolation and structural support.
   3. Verify fan rotation for correct direction and for vibration or binding and correct problems.
   4. Lubricate rotating parts and bearings.
   6. Operate equipment controls and safeties.
G. Start fluid cooler and verify operation.
H. Prepare and submit a written report of startup and inspection service to the Resident Engineer.
I. Replace defective and malfunctioning units.

3.3 TRAINING

Furnish the services of a competent, factory-trained engineer or technician for a 2-hour period for instructing VA personnel in operation and maintenance of the equipment, including review of the operation and maintenance manual, on a date requested by the Resident Engineer.

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