

## SECTION 238413 - HUMIDIFIERS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes the following humidifiers:
  - 1. Steam injection.

#### 1.3 SUBMITTALS

- A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Detail fabrication and installation of humidifiers. Include piping details, plans, elevations, sections, details of components, manifolds, and attachments to other work.
- C. Field quality-control test reports.
- D. Operation and Maintenance Data: For humidifiers to include in operation and maintenance manuals.

#### 1.4 QUALITY ASSURANCE

- A. Comply with ARI 640, "Commercial and Industrial Humidifiers."

#### 1.5 COORDINATION

- A. Coordinate location and installation of humidifiers with manifolds in ducts and air-handling units or occupied space. Revise locations and elevations to suit field conditions and to ensure proper humidifier operation.

## PART 2 - PRODUCTS

### 2.1 STEAM-INJECTION HUMIDIFIERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Armstrong International, Inc.
  2. DRI-STEEM Humidifier Company.
  3. Nortec Industries Inc.
  4. Pure Humidifier Company.

Retain one of first two paragraphs and associated subparagraphs below. Retain first for duct-mounting or plenum-mounting humidifier, second if humidifier discharges directly into occupied space.

- B. Manifold: ASTM A 666, Type 304 stainless steel, steam jacketed; extending the full width of duct or plenum with mounting brackets at ends.
- C. Discharge Nozzle and Dispersion Fan:
1. Steam-jacketed discharge nozzle, aluminum blade propeller fan with finger guard, and single-speed motor interlocked to operate with humidifier.
  2. Fan Mounting: Above and behind discharge outlet on bracket integral to discharge outlet.
- D. Steam Separator: Cast iron with separate humidifier control valve.
- E. Humidifier Control Valve:
1. Actuator: Pneumatic modulating with spring return.
- F. Steam Trap: Inverted-bucket type, sized for a minimum of 3 times the maximum rated condensate flow of humidifier at 1/2-psig (3.4-kPa) inlet pressure.
- G. Accessories:
1. Aquastat mounted on steam condensate return piping to prevent cold operation of humidifier.
  2. In-line strainer.
  3. Airflow switch for preventing humidifier operation without airflow.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine ducts, air-handling units, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance.

- B. Examine roughing-in for piping systems to verify actual locations of piping connections before humidifier installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

LEED-NC Prerequisite EQ 1 requires compliance with requirements in ASHRAE 62.1-2004. ASHRAE 62.1-2004, Section 5.13 - "Humidifiers and Water-Spray Systems," sets requirements for water quality feeding humidifiers and limits obstructions downstream from humidifiers.

- A. Install humidifiers with required clearance for service and maintenance. Maintain path, downstream from humidifiers, clear of obstructions as required by ASHRAE 62.1-2004.
- B. Seal humidifier manifold duct or plenum penetrations with flange.
- C. Install humidifier manifolds in metal ducts and casings constructed according to SMACNA's "HVAC Duct Construction Standards, Metal and Flexible."
- D. Install stainless-steel drain pan under each manifold mounted in duct.
  - 1. Construct drain pans with connection for drain; insulated and complying with ASHRAE 62.1-2004.
  - 2. Connect to condensate trap and drainage piping.
  - 3. Extend drain pan upstream and downstream from manifold a minimum distance recommended by manufacturer but not less than required by ASHRAE 62.1-2004.
- E. Install drip leg upstream from steam trap a minimum of 12 inches (300 mm) tall for proper operation of trap.

### 3.3 CONNECTIONS

- A. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
  - 1. Install piping adjacent to humidifiers to allow service and maintenance.
- B. Install electrical devices and piping specialties furnished by manufacturer but not factory mounted.

### 3.4 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports.
  - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

C. Remove and replace malfunctioning units and retest as specified above.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain humidifiers. Refer to Division 01 Section "Demonstration and Training."

END OF SECTION 238413