

## **SECTION 23 84 14 – ELECTRIC STEAM GRID HUMIDIFIERS**

### **PART 1 GENERAL**

#### **1.01 SUMMARY**

- A. Perform all work required to provide and install electric steam humidifiers with steam jacketed distribution manifolds indicated by the Contract Documents with supplementary items necessary for proper installation.

#### **1.02 RELATED SECTIONS**

- A. Section 23 03 00 - Basic Mechanical Materials and Methods.
- B. Section 22 00 00 - Plumbing Piping: Connecting of water and drain services.
- C. Section 23 06 00 - Temperature Control System.

#### **1.03 REFERENCES**

- A. ARI 610 - Central System Humidifiers.
- B. ARI 630 - Selection, Installation and Servicing of Humidifiers.

#### **1.04 SUBMITTALS**

- A. Submit shop drawings and product data.
- B. Submit manufacturer's installation instructions and operating and maintenance data.
- C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with three years documented experience.
- D. Provide a two year warranty including coverage for humidifier unit except the cylinder.
- E. Provide six extra disposable humidifier cylinders for each unit.

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Nortek.
- B. Dri-Steem Humidifiers Co.
- C. DGH System, Inc.
- D. Armstrong Model AMR.
- E. Or accepted substitution.

2.02 STEAM HUMIDIFIERS:

- A. Furnish and install steam humidifiers of the sizes and capacities shown on the Drawings and listed in the equipment schedule. Humidifiers shall be of the multiple dispersion tube, steam injection, dry type wherein entrained condensate is removed from the steam by means of 304 stainless steel, centrifugal type, water/steam separators. Humidifiers shall be designed and catalogued to accomplish 100% absorption within 3' (three feet) downstream of the humidifier when the air is at 95% relative humidity.
- B. Electrode Steam Generating Type Humidifier:
1. CSA certified and UL listed.
  2. Disposable cylinder type.
  3. Electronic capacity control (20% to 100%).
  4. Proportional and integral auto-adaptive control to automatically adapt to incoming water condition.
  5. Alphanumeric LCD display which can indicate system messages, output, control signal input, capacity demand and system configuration.
  6. Keypad to configure, monitor and control humidifier with information messages on LCD display.
  7. Self-diagnostic controls on start-up and during operation shall prevent unsafe operation of the unit.
  8. Solenoid control of supply and drain water.
  9. Automatic self-help feature that can clean obstruction from the drain valve when needed.
  10. Automatic off-season shutdown that will completely drain the cylinder during prolonged off periods and restart automatically on a call for humidity.
  11. Full front access.
  12. Constant Volume Control System: The humidifier shall be controlled by a humidistat, airflow proving switch and high limit control that automatically shuts humidifier down when the humidity level in the duct increases above 80% to 85% RH. Prevents wetting of the ductwork.
  13. Variable Volume Control System: The humidifier shall be controlled by a humidistat, airflow proving switch and modulating high limit control that will automatically reduce the output capacity of the humidifier when the humidity level in the duct increases above 80% to 85% RH. Prevents wetting of ductwork when airflow is decreased.
  14. Dual cylinder units shall have dual control circuits for complete control of each cylinder and safety.
  15. Steam distributor with condensate separator.

16. Remote message indication capability to indicate normal operation, change cylinder and shutdown shall be standard.
17. Standard of acceptance NORTEC NHMC.
18. Cal-rod heater element electric humidifiers not acceptable.

## 2.03 ACCESSORIES

- A. Supply and install the following accessories in accordance with the manufacturer's recommendation.
- B. 132-9203: Duct mounted pressure differential switch, for air proving interlock.
- C. 146-9321 through 146-9330: Proportional modulating control. Allows full modulating control of humidifiers by varying signals from control systems supplied by others. Most variable DC voltage, resistance and current signals can be accommodated.
- D. 132-9505: Inline water filter for supply water.
- E. 146-9533: Fill cup extension kit for NH-005 through NH-030. Required when duct static and steam line resistance exceeds standard unit limitations.
- F. 132-8810: Steam hose 7/8 inch ID for ASD and BSD type steam distributors used with NH-005 through NH-030 units.
- G. 132-8840: Condensate return hose 3/8-inch ID. Used with all units.
- H. 146-9525 and 146-9529: Remote service indicator package provides an audible and visual indication remotely from the humidifier when any service code appears.
- I. 146-9522: Low temperature protection. Activates humidifier independent of humidistat if internal temperature falls below set point. Two required for NH-150 and NH-200.
- J. High limit stat to deactivate steam control valve when the high limit is 90 percent or higher.
- K. Provide a FCMS interface card to receive signals from FCMS for controlling the control valve of each humidifier.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install in accordance with manufacturer's written instructions.
- B. Install in accord with ARI 630.
- C. Provide galvanized steel rods to support distribution manifolds and mount in air system plenums.
- D. Connect outlet of unit to drain piping. Provide gate valve.

- E. Install cold water supply of ¼-inch type K soft copper tubing with shutoff cock and 7/8 inch drain line. Pipe drain to nearest floor drain ensuring air gap is incorporated per manufacturer's instructions.
- F. Humidifiers to operate only when airflow is proven.
- G. Mount airflow switch and tubing.
- H. Install unit in duct with at least 6'-0" of straight run downstream of humidifier for steam to be absorbed into the air stream. Provide the minimum number of dispersion tubes (manifold) to achieve the complete absorption in the short run.

3.02 COMMISSIONING

- A. Start-up by a factory trained technician.

END OF SECTION 23 84 14