

SECTION 23 84 00
HUMIDITY CONTROL EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Humidifier[s] as indicated on drawing[s] and as indicated on schedule[s].
- B. Complete and operable humidification system [which meets applicable building codes].
- C. Equipment start-up and project inspection by qualified factory trained representative.

1.2 QUALITY ASSURANCE:

- A. ISO 9001-2000.
- B. ANSI/NFPA 70 - National Electrical Code.
- C. ARI 640, "Standard for Commercial and Industrial Humidifiers.

1.3 RELATED SECTIONS:

- A. 23 05 11 Common Work Results for HVAC
- B. 23 21 13 Piping Installation
- C. 23 09 23 Control System

1.4 SUBMITTALS:

- A. Submit product data under provisions of Section 01 33 23. Include product description, model, dimensions, component sizes, rough-in requirements, service sizes, and finishes. Include rated capacities, operating weights, furnished specialties, and accessories.
- B. Submit manufacturer's installation instructions.
- C. Submit operation and maintenance data.
- D. Submit coordination drawings. Detail fabrication and installation of humidifiers. Include piping details, plans, elevations, sections, details of components, and dispersion tubes. Detail humidifiers and adjacent equipment. Show support locations, type of support, weight on each support, and required clearances.
- E. Submit wiring diagrams including power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.
- F. Submit minimum water quality requirements and water pressure requirements.

1.5 SCHEDULES:

- A. Refer to information contained in schedule shown on the drawings.
- B. Humidifiers to be of type, capacity, and arrangement as listed in the schedule.
- C. Include accessories listed in schedule and those accessories required for type of unit.

PART 2 - PRODUCTS

2.1 ELECTRODE STEAM HUMIDIFICATION SYSTEM

- 2.1.1. Electrode humidifier generating mineral-free, sterile steam from a potable water supply Packaged unit, wall mounted, atmospheric steam generation using an electrode steam cylinder[s]. Resistive element technology and boiler steam (pressure steam) technology not acceptable.

2.1.2 Unit to be complete with:

- A. Touchscreen controller with standard building automation and Online connectivity:
 - 1. Intuitive touchscreen control with color graphic user interface.
 - 2. Standard building automation communication protocols BACnet IP, BACnet MSTP and Modbus. Additional hardware required for building automation communication not acceptable.
 - 3. Standard Nortec Online connectivity for remote monitoring and factory diagnostic.
 - 4. Embedded web interface for easy configuration and remote monitoring from any computer with a web browser over a local area network (LAN) connection.
 - 5. USB interface for new software/feature upload and download of operational information.
 - 6. Single or dual channel analog signal acceptance, supporting both demand and transducer control. Ability to control setpoint from humidifier control when using transducer controls.
- B. Standard remote monitoring with Online Capability
 - 1. Integrated hardware and software allows for remote end-user and factory diagnostic of humidifier via the internet.
 - 2. Humidifier parameter data and performance trending data can be exported remotely using the internet.
 - 3. Humidifier will be accessed via the internet by registering humidifier to the manufacturer. Controls contractor to provide internet access to humidifier through Ethernet cable with RJ-45

connection.

- C. Plumbing door interlock safety switch to allow power interruption when installing or servicing the humidifier.
- D. Packaged system with electrode cylinder technology:
 - 1. Cylinder optimized for humidifier capacity and supply voltage. Cylinder must have welded seam to ensure watertight and have high water sensor to prevent overfilling.
 - 2. Durable powder coated steel cabinet with zero side clearance requirement for minimal footprint.
 - 3. Insulating air gap between plumbing and electrical compartment for increased electronic reliability.
 - 4. Standard internal drain water tempering to ensure maximum 140° F [60° C] drain water. External drain water cooler not acceptable.
 - 5. Integral fill cup with minimum 1-inch [25 mm] air gap to prevent back siphoning.
 - 6. Full cylinder indication and pre-notification of automatic shutdown at end of cylinder life.
 - 7. Automatic pulse feature to clean any obstruction from the drain solenoid valve if required.
 - 8. Automatic off-season shut-down after 3 days of "no call" will completely drain the cylinder and automatically restart on call for humidity. Adjustable on/off and time sequence. Provides extended cylinder life, while ensuring stagnant water does not remain in the system.
 - 9. Plumbing door interlock safety switch to allow power interruption when installing or servicing the humidifier.
- E. Auto-Adaptive Control water management:
 - 1. Advanced water management utilizing the patented Proportional plus Integral Auto-Adaptive Control system for optimal energy efficiency, water usage and cylinder life.
 - 2. 98% thermal efficiency from startup until end of cylinder life.
 - 3. Drains automatically optimized to water conditions to maximize cylinder and reduce water usage.
 - 4. Modulating output between 20% and 100% of rated capacity.

2.1.3 Optional Accessories

- A. Refer to 'Option schedule'

2.2 SHORT ABSORPTION STEAM DISTRIBUTOR

2.2.1 Steam Distribution -Short Absorption Manifold complete with:

- A. Steam dispersion panel consisting of a (one) horizontal stainless steel header supplying steam to a bank of vertical tubes, spaced closely as necessary to meet absorption distance requirements, and to reduce condensation loss. Refer to schedule for project specifics.
- B. Single horizontal stainless steel header to provide steam to vertical distributor tubes and to reduce condensation losses. Dual header systems creating unnecessary heat loss, or systems needing to be installed on a partition or requiring blank off plates are not acceptable.
- C. Headers shall be welded stainless steel construction.
 - 1. Header design is primarily round tube to minimize pressure drop. Square headers are not acceptable. (Full size SAM-e only).
 - 2. Slim rectangular profile header design to minimize pressure drop. (Mini SAM-e only).
 - 3. Steam inlet and condensate return located on same side of header to allow single point entry and floor mounting. Condensate return shall be located at lowest point of header.
- D. Vertical stainless steel distribution tube to promote condensation evacuation. Horizontal distributor tubes are not accepted.
- E. Tubes shall be primarily stainless steel construction.
 - 1. Distribution tubes shall include provisions for a top bracket. Factory supplied top bracket shall be provided to ensure adequate support of tubes in duct.
 - 2. Stainless steel nozzle inserts ensure condensate free steam is discharged from the center of the distribution tubes. Tubes without nozzle inserts are not acceptable.
 - 3. Stainless steel nozzles shall be made from similar material as the tubes to ensure similar expansion and contraction coefficients. Tubes with nozzles made from dissimilar metals or polymers are not acceptable.
 - 4. Stainless steel nozzle inserts shall have metered orifices, sized to provide even distribution of the discharged steam, spaced for optimum steam absorption.
- F. Steam Inlet
- G. Steam inlet configuration selection based on pressurized or atmospheric

steam applications. Refer to schedule[s] for project specifics.

- A. For pressurized steam, inlet is determined by the size of the selected steam valve. (Steam valve selected from LIVESTEAM engineering manual or H.E.L.P. software).
- B. For atmospheric steam, inlet is determined by the selected humidifier.

H. Optional Insulation

I. Tubes and headers include insulation for increased energy efficiency. Uninsulated tubes and headers not acceptable.

- 1. Tube and header insulation constructed from stainless steel shielding for increased energy efficiency and reduced airstream heat gain. Stainless steel shields to be isolated from distributor using plenum rated synthetic foam strips. Insulation to provide air-gap to minimize conduction and convection, as well provide reflective surface to minimize radiating heat transfer. Tubes and/or headers insulated with ceramic or foam wrap type insulations not acceptable.

Part 3 - EXECUTION

3.1 INSTALLATION:

- A. Install humidifiers per manufacturers' instructions.
- B. Install with required clearance for service and maintenance.

3.2 ACCESSORIES:

- A. Install accessories in accordance with manufacturer's recommendations.

3.3 COMMISSIONING:

- A. Start-up of humidifier to be by factory trained technician.

END OF SECTION