

SECTION 15XXX
HUMIDIFIERS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. NORTEC Short Absorption Manifold (Humidifier Steam Dispersion Panel) - SAM-e Humidifier[s], and mini Short Absorption Manifold (Humidifier Steam Dispersion Panel) – mini SAM-e 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. Manufacturer: For each product specified, provide components by same manufacturer throughout.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authority having jurisdiction, and marked for intended use.
- C. Comply with ARI 640, “Standard for Commercial and Industrial Humidifiers.”
- D. Products shall be supported with a warranty that ensures the product will be free from defects in materials and workmanship for a period of two years after shipment.
- E. Commissioning of a system or systems specified in this section is part of the construction process. Documentation and testing of these systems, as well as training of the Owner’s operation and maintenance personnel, is required in cooperation with the Commissioning Authority. Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure. Refer to Project Closeout, Section 01700, for substantial completion details. Refer to Section 01810, Commissioning, for detailed commissioning requirements.
- F. Products specified below are to be manufactured in an ISO 9001-2000 certified facility.

1.3 SUBMITTALS

- A. Submit product data under provisions of Section 15010. 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.

1.4 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.5 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.6 COORDINATION

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

XXXXX OR XXXXX

- B. Coordinate location and installation of humidifier in the space it serves with the electrical, mechanical, and plumbing contractors.

PART 2 - PRODUCTS

2.1 SHORT ABSORPTION MANIFOLD

- A. Short Absorption Manifold designed for atmospheric steam humidifiers or pressurized steam from a boiler, to directly inject the steam into ducted air for humidification.
 1. Absorption distance characteristic shall prevent water accumulation on any induct surfaces beyond ___in (___mm) downstream of the steam dispersion panel. (Refer to distance calculated in H.E.L.P. Software).
 2. Steam dispersion panel consisting of a (one) horizontal stainless steel header supplying steam to a bank of closely spaced 3" (7.6 cm) OR 6" (15.2 cm) OR 9" (22.9 cm) OR 12" (30.5 cm) vertical tubes (3" (7.6 cm) OR 6" (15.2 cm) for mini SAM-e), as necessary to meet absorption distance requirements, and to reduce condensation losses.
 3. Single horizontal stainless steel header to provide steam to vertical distributor tubes and to reduce condensation losses. Dual header systems creating unnecessary condensation, or systems needing to be installed on a partition or requiring blank off plates are not acceptable.
 4. Header design is primarily round tube to minimize pressure drop. Square headers are not acceptable. (Full-size SAM-e only).
 5. Slim profile rectangular profile header design minimizes pressure drop. (Mini SAM-e only).
 6. Steam inlet and condensate return located on the same side and at the bottom of the header to allow single point entry and floor mounting.
 7. Headers are 304 stainless steel construction.
 8. Vertical stainless steel distribution tubes to promote condensate evacuation. Horizontal distributor tubes are not accepted.
 9. Distribution tubes shall include threaded standoffs for trouble free attachment to factory-supplied support bracket.
 10. All tubes are available in either 409 or 304 stainless steel construction.
 11. Stainless steel nozzle inserts ensure condensate free steam is discharged from the center of the distribution tubes. Systems without nozzle inserts, or other than stainless steel, are not acceptable.
 12. Stainless steel nozzle inserts shall have metered orifices, sized to provide even distribution of the discharged steam, spaced for optimum steam absorption.
 13. Tubes and headers shall accommodate factory installation or field retrofit of optional insulation for increased energy efficiency.

- B. Options
 - 1. Tube and header insulation constructed from 304 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. (Patent Pending). Uninsulated headers, or simple foam insulation not accepted.
 - 2. Adjustable mounting frame available for quick and easy installation. (Does not apply for mini SAM-e).
- C. Standard of acceptance: Nortec SAM-e.

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

- A. Install humidifiers and steam dispersion panels per manufacturers' instructions.
- B. Seal humidifier dispersion-tube duct penetrations with flange.
- C. Install with required clearance for service and maintenance.

3.3 TESTING

- A. System verification testing is part of the commissioning process. Verification testing shall be performed by the Contractor and witnessed and documented by the Commissioning Authority. Refer to section 01810, Commissioning, for system verification tests and commissioning requirements.

XXXXX OR XXXXX

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections. Report results in writing.
 - 1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - 2. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove malfunctioning units, replace with new units, and retest.
 - 3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 TRAINING

- A. Training of the Owner's operation and maintenance personnel is required in cooperation with the Commissioning Authority. Provide competent, factory-authorized personnel to provide instruction to

operation and maintenance personnel concerning the location, operation, and troubleshooting of the installed systems. The instruction shall be scheduled in coordination with the Commissioning Authority after submission and approval of formal training plans. Refer to System Demonstrations, section 01670, for contractor training requirements. Refer to section 01810, Commissioning, for further contractor training requirements.

XXXXX OR XXXXX

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain humidifiers.
1. Train Owner's maintenance personnel on procedures and schedules for starting and stopping, troubleshooting, servicing, and maintaining equipment and schedules.
 2. Review data in maintenance manuals. Refer to Division 1 Section "Contract Closeout."
 3. Review data in maintenance manuals. Refer to Division 1 Section "Operation and Maintenance Data."
 4. Schedule training with Owner, through Architect, with at least seven days advance notice.

END OF SECTION