

PART 1 GENERAL

1.1 Section Includes Evaporative Media Humidification Systems

1.2 RELATED SECTIONS

- A. Section 08310 - Access Doors and Panels.
- B. Section 15052 - Common Work Results for HVAC.
- C. Section 15700 - Heating, Ventilating, and Air Conditioning Equipment.
- D. Division 16 – Electrical.

1.3 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.
- B. ARI 640 - Commercial and Industrial Humidifiers.
- C. UL 900 - Test Performance of Air Filter Units.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.

- B. Product Data: Including but not limited to product descriptions, models, dimensions, component sizes, rough-in requirements, service sizes, and finishes. Include rated capacities, operating weights, furnished specialties, and accessories.
 - 1. Manufacturer's installation instructions.
 - 2. Operation and maintenance data.
 - 3. Minimum water quality requirements and water pressure requirements.

- C. Shop Drawings: For each type of humidification system specified.
 - 1. Details of fabrication, installation of humidifiers.
 - 2. Piping details, plans, elevations, sections, details of components, and dispersion tubes.
 - 3. Detail of humidifiers and adjacent equipment showing support locations, type of support, weight on each support, and required clearances.
 - 4. Wiring diagrams including power, signal, and control wiring. Differentiate between manufacturer-installed and field-installed wiring.

- D. Test Results.

1.5 QUALITY ASSURANCE

- A. Manufacturer:
 - 1. Products manufactured in an ISO 9001 certified facility.
 - 2. For each product specified, provide components by single 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. Humidifiers: In compliance with ARI 640 - Standard for Commercial and Industrial Humidifiers.

1.6 COMMISSIONING

- A. Commissioning of system or systems specified herein is required. Provide personnel and equipment to facilitate commissioning process.
- B. 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.
- C. Project Closeout is dependent on successful completion of all commissioning procedures, documentation, and issue closure.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials in their original sealed containers bearing manufacturer's name and identification of product.
- B. Do not store products in location with conditions outside manufacturer's absolute limits.
- C. Materials delivered to the site shall be examined for concealed damage or defects in shipping. Defects shall be noted and reported to the Owner's Representative in writing.

1.8 PROJECT CONDITIONS

- A. Coordinate location and installation of humidifiers in ducts and air-handling units in the space it serves with the electrical, mechanical, and plumbing contractors. Revise locations and elevations to suit field conditions and to ensure proper humidifier operation.

1.9 WARRANTY

- A. Manufacturer's Standard Warranty: Two year warranty covers defects in materials and workmanship, commences on date of shipment.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: NORTEC; 826 Proctor Ave. P. O. Box 698; Ogdensburg, NY 13669. Toll Free: 866-NORTEC-1. Email: nortec@waltermeier.com. Web: www.humidity.com.
- B. Substitutions: Not permitted.

2.2 EVAPORATIVE MEDIA HUMIDIFICATION SYSTEMS

- A. Series: MH Series humidifiers as manufactured by NORTEC.
- B. General:
 - 1. Packaged evaporative media humidifier providing humidification and air-cooling using the principle of surface evaporation over a wetted media. Designed for installation in air-handling systems or ductwork. Air downstream of humidifier is free of aerosols, cooler, and more humid.
 - 2. Humidifier accepts potable, softened, reverse osmosis and de-ionized water.
 - 3. Humidifier designed around V-Profile humidification boxes, which use impregnated polyester as humidifying medium. Fire protection shall be in accordance with UL 900 Class 1 in the USA, and ULC-S111-07 Class 2 in Canada.
 - 4. Electronic controller, which monitors the operation of the system, controls output levels and initiates self-cleaning flushing cycles to ensure hygiene and prolong media life span.
 - 5. Humidifier powered by 120 volts single phase power supply with power consumption ranging from 0.20-0.71 kW.
 - 6. Recirculation system to capture and reuse excess water. Improved water conservation through either performing drains based on operating time and water added or optionally by monitoring conductivity to maintain a programmable maximum mineral concentration.
 - 7. Duct shall contain only metalwork and media boxes. Pumps, valves, controls, and other mechanical components shall be provided in a separate module for installation external to duct.
 - 8. Control panel includes Modbus interface for integration into building automation system. BACnet, LonWorks, N2 protocols available as options.
- C. Evaporative Media:
 - 1. Media: Made of durable V-shaped polyester material, absolutely free of fiberglass, packaged in stainless steel casing.
 - 2. Compliance: The material shall have a flame retardant coating and fire protection in compliance with UL 900 Class 1 in the USA, and ULC-S111-07 Class 2 in Canada.
 - 3. Replacement: Lift out stainless steel media casings are hooked into the humidifier frame. No tools required for media removal.
 - 4. Rate of Evaporation: Dependent on the air volume, air temperature, cross sectional area of the humidifier and the media depth.
 - 5. Depth: Dictates the maximum efficiency of up to 85 percent (8 inch, 203 mm media) or 95 percent (12 inch, 305 mm media).
- D. Mist Eliminator:

1. Patented integral mist eliminator prevents water droplets in cases where the face velocity across the media exceeds 750 ft/s (3.8 m/s).
2. Allows face velocities operation up to 1080 fpm (5.5 m/s).
3. Material Compliance: Meets UL 900 Class 2 requirements.

E. Management System:

1. Unit includes electronic control cabinet with NRTL-c approval to include electrical fuses, main switch.
2. Microprocessor control using a proportional-integral method for interpreting analog signals from a humidistat and or building control systems.
3. The controller determines which stages should be activated to meet humidification loads.
4. The controller activates self-maintenance cycles. This includes controlled flushing of the water tank in conjunction with filling cycles, and scheduled drain cycles to maintain cleanliness of the water tank.
5. The controller will manage programmable self-wash cycles. This cycle reduces scaling on the media and ensures clean hygienic operation. In addition, the controller flushes water lines after a period of inactivity.
6. Control panel complete with on/off switch, auto drain switch, and LED's for fault, maintenance, and operational indication.

F. Control panel with backlit LCD Display to have the following functionality:

1. Service indicator and LED power on.
2. Easy scroll through keypad with back-lit graphic display.
3. Display of relative humidity and setpoint.
4. Display of operating hours.
5. Capacity output.
6. Real-time date and time.
7. Error history indication.
8. Clean mode and media drying.
9. Limited capacity adjustment.
10. Inlet flush, drain time and drying cycles.
11. Adjustable maintenance intervals.
12. Remote relay testing.
13. Modbus standard host protocol.
14. Terminal block installed for easy field connection of low voltage 24VAC control cable from prewired hydraulic unit with 30 feet (10 m) of cabling included.

G. Humidity Control Methods:

1. Humidistat/thermostat or BMS control.
2. Accepts standard modulating control signals.
3. On/Off 24 VAC safety loop for On/Off control, air proving, and/or high limit.

H. Hydraulic Assembly:

1. Packaged Hydraulic Assembly: Shall be installed external to airstream and include all components required for recirculation of excess water including; pump, staging valves, reservoir, sensors, and drainage system.
2. Air Cooled Electric Sealed Motor Pump: Powered by a 120 Volts 1 phase 60 Hz connection.
3. Staging Valves: Provide up to 3 staging valves serving up to six banks of evaporative media.
4. 24 VAC Pressure Regulated Water Inlet Valve: 1/2 inch NPT connection shall operate between 30-145 psi operating pressure.
5. Level Control Float: Provides feedback to control electronics when water tank is full or when tank needs to be refilled.
6. UV Water Treatment: UV lamp continually sterilizes water flowing to evaporative media with UV-C radiation.
7. Drain Connection: 2.0 inch (5.08 cm) ID.
8. Overflow Protection: In case of a level control or fill valve failure allows water to flow directly to drain.

I. Aerosol Breakdown and Hygiene Control:

1. Management System capable of real-time flushing, washing and drying cycles via the Management System control panel. In the event of no call for humidity, humidifier shall drain the tank and remain empty until demand is present.
2. Multi-sided gradient in base pan ensures complete water tank draining, drying.
3. Humidifier Operation: Aerosol-free operation guaranteed by hygroscopic properties of humidifier media.

J. Optional Features/Accessories:

1. Conductivity Monitoring Sensor: Maintains water quality at programmed level which maximizes life of evaporative media.
2. In-Line Water filter with 5 micron filter.
3. On/Off digital duct high limit humidistat.
4. Air proving switch.
5. 10V Digital Duct Humidistat package.
6. 0 - 10V Digital Wall Humidistat
7. 2-10V Dig Wall Humidity Sensor.
8. 2-10V Duct Humidity Sensor.
9. System: Links XPS as manufactured by NORTEC.
 - a. Description: Remote building management system capability using BACnet MSTP, BACnet/IP, LonWorks LonTalk, or Johnson N2 networks for monitoring and controlling.
 - b. Variable definitions, addresses, and values.
 - c. Monitor up to eight humidifiers (1 master, 7 slaves) with single interface.
 - d. External Interface File (XIF) for LonWorks integration.
 - e. Protocol Implementation Conformance Statement (PICS) for BACnet integration.
 - f. BACnet Interoperability Building Blocks (BIBBS) for BACnet Services.

K. Model: NORTEC MHTC ReFlow Evaporative Humidifiers/Coolers.

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. If preparation is the responsibility of another installer, notify Architect of deviations from manufacturer's recommended installation tolerances and conditions.
- D. Do not proceed with installation until substrates have been properly prepared and deviations are corrected.
- E. Commencement of installation constitutes acceptance of conditions.

3.2 INSTALLATION

- A. Install components plumb and level, in accordance with approved shop drawings, product installation details and manufacturer's recommendations.
 - 1. Install humidifiers and steam dispersion panels per manufacturers' instructions.
 - 2. Seal humidifier dispersion-tube duct penetrations with flange.
 - 3. Install with required clearance for service and maintenance.

3.3 TESTING AND ADJUSTING

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including piping and electrical connections.
- B. Test Results: Reported in writing to Architect.
 - 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. 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.

3. Schedule training with Owner, through Architect, with at least seven days advance notice.

3.5 PROTECTION AND CLEANING

- A. Protect humidification system components from damage until date of substantial completion.
- B. Repair or replace damaged components that cannot be repaired.
- C. Remove temporary protective coverings, excess materials.

END OF SECTION