

## **MECHANICAL SPECIFICATION**

### **SECTION 23 84 13.29**

### **HEATER ELEMENT STEAM HUMIDIFIERS**

#### **1 GENERAL**

##### 1.1 DESCRIPTION

- A. Provide connection-ready FlexLine Plus Pro heater steam humidifiers for fully automated and intrinsically safe production of mineral-free and pure steam in accordance with the contract documents

##### 1.2 WORK INCLUDED

- A. Install steam humidifier as shown on plans and as per manufacturer's instructions
- B. Install operating controls as shown on plans and as per manufacturer's instructions
- C. Manufacturer-specific mounting rail systems are not required

##### 1.3 SUBMITTALS

- A. Provide complete humidifier catalog data, including performance and all components provided
- B. Provide power and control wiring diagrams

##### 1.4 QUALITY ASSURANCE

- A. Provide UL or CSA listed heater element steam humidifiers

#### **2 PRODUCTS**

2.1 Self-contained steam humidifiers: Humidifiers shall produce clean, sterile steam from standard tap water, softened water, or demineralized water by means of incoloy heating elements immersed in water contained in a cleanable plastic cylinder and shall operate on any quality of water

##### A. Steam Generator

- 1. Separable corrosion resistant high grade stainless steel cylinder, cleanable without using chemicals, re-usable and with especially long service life. Throwaway cylinders are not acceptable.
- 2. Combined rinsing and scale collection system. During operation with softened or tap water the system rinses scale particles. The amount of scale deposits collected in the filter is clearly reduced. The remaining scale deposits are accumulated in the removable filter and can be removed during maintenance. The system is integrated into the unit, therefore the dimensions of the FlexLine Plus are compact even when using tap water. When using demineralized water maintenance is reduced to a minimum
- 3. Incoloy heat elements designed to shed mineral for reduced maintenance, quickly cleanable or replaceable without tools

##### B. Water Feed / Drain System

- 1. Double check valve water feed system to prevent backflow while allowing pressure feed to the steam cylinder for greatly reduced maintenance

2. Heavy-duty blow-down pump to reduce maintenance by grinding and pumping out mineral scale. Drain valves are not acceptable as they are easily jammed
3. SuperFlush cylinder rinsing system for decreased maintenance, optional pulse system HyFlush

C. Microprocessor Control

1. Highly-efficient control electronics for fastest possible steam production, optimum energy efficiency, low-maintenance operation, and comprehensive operational safety through continuous self-monitoring of the unit functions
2. Automatic system tests including self-diagnoses to check all functions and components
3. Electronic water level control with non-wearing contact-free continuous proportional water level sensing with no moving parts. Mechanical float type water level control is not acceptable due to its susceptibility to jamming
4. Selectable between sensor input with resident humidifier control (display of humidity and set point on humidifier), or control input for remote control of humidifier
5. Selectable between On/Off, modulating, or PI control
6. Highly accurate steam output control using high precision SSRs with control accuracy of  $\pm 0,5\%$  as an essential feature. Proportional controllability in the range of 5-100% of nominal output (0-100% possible)
7. SSRs and heating elements shall be individually thermally protected
8. Easy to read, 3.5" backlit graphic capacitive touchscreen display with simple menu structure for intuitive operation with clear service messages in plain text mode and as icons
9. 2 potential free remote signal relays, one of them freely programmable with 53 options
10. Selectable stand-by blow-down timer to prevent standing cylinder water according to VDI 6022
11. Selectable stand-by heating mode to keep the water warm for instant response to demand
12. Password protected field adjustment parameters to permit field adjustment of operation for difficult non-standard feed waters
13. Available EIA-485 serial interface cards with either ModBus RTU or BacNet MS/TP protocol
14. Separate inputs for voltage, current, and resistance signals
15. 0-10 Vdc analog output for simultaneous use of several devices
16. Programmable maintenance cycle timer/display
17. Optional: Relay circuit board to output 3 control commands / messages from 53 options
18. Timer controlled "dead leg" flushing to prevent stagnant water in the lines.

D. General Design

1. Steam hose adapter for quick removal and reinstallation of the cylinder without tools
2. Easily accessible connection terminals for power and control
3. Removable cover for easy access to all components

- 4. Corrosion-resistant stainless steel enclosure, powder-coated
- E. Optional features that may be specified on the plans
  - 1. Integrated HyCool drain tempering system with 140°F maximum drain temperature
- F. Steam Distribution
  - 1. For Duct Injection: Provide stainless steel steam distribution manifolds sized for the duct dimensions, and having a duct mount plate, condensate return, and steam discharge holes designed for short evaporation without spitting
  - 2. For Room Injection: Provide packaged room distribution units, consisting of a steam distribution manifold with condensate return, integral quiet cross-flow blowers, contained in a powder coated, corrosion resistant housing. Room distribution unit may be direct or remote mounted
- G. Equipment
  - 1. Humidifiers shall be FlexLine Plus Pro heater steam humidifiers as manufactured by HygroMatik GmbH ([www.HygroMatik.com](http://www.HygroMatik.com) )
- H. Acceptable Manufacturers
  - 1. HygroMatik GmbH

### **3 EXECUTION**

- 3.1 Comply fully with the manufacturer's installation instructions
- 3.2 Comply fully with all local, electrical, and applicable codes
- 3.3 Connect to untreated domestic water supply