

SECTION 40 41 13

HEAT TRACE

PART 1 -- GENERAL

1.1 DESCRIPTION

- A. Scope: Provide all labor, material, tools, equipment and incidentals required to furnish, install, and place into satisfactory operation heat tracing systems, complete with appurtenances as shown, specified, and as required.
- B. Related Sections:
 - 1. Section 40 05 05 - Exposed Piping Installation.
 - 2. Section 22 07 19 - Plumbing Piping Insulation.
 - 3. Section 40 42 00 - Insulation of Process Piping and Equipment

1.2 QUALITY ASSURANCE

- A. All equipment specified in this Section shall be furnished by a single supplier.
- B. Reference Standards:
 - 1. American National Standards Institute, Inc. (ANSI).
 - 2. Institute of Electrical and Electronic Engineers (IEEE).
 - 3. National Electrical Supplier's Association (NEMA).
 - 4. National Electrical Code (NEC).
 - 5. Underwriters Laboratories, Inc. (UL).
 - 6. Factor Mutual Research Corporation (FM).
 - 7. American Society of Heating, Refrigeration, Air Conditioning Association (ASHRAE).

1.3 SUBMITTALS

- A. Shop Drawings and Product Data: Comply with the requirements of Section 01 33 00 – Submittal Procedures and provide the following:
 - 1. Supplier's literature, illustrations, specifications and engineering data including dimensions, materials, size, weight, performance data including efficiencies.
 - 2. Electric and control wiring diagrams.
 - 3. Layout drawings showing locations of power taps and thermostats.
 - 4. Sizing calculations for each run of heat trace. Calculations shall show:
 - a. Ambient temperature and wind loss used.
 - b. Temperature maintained in material.
 - c. Running and startup current values.
- B. Reports:
 - 1. Submit all test reports to Engineer within 10 days of testing completion.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Suppliers:
 - 1. Chemelex Auto-Trace Self-Regulating by Raychem Corporation.
 - 2. Approved equivalent.

- B. Service Conditions
 - 1. Process Water Piping
 - a. Pipe heat tracing system shall be provided for the piping as specified or shown on the Drawings and shall be capable of preventing freezing of the pipes or objects protected throughout the ambient temperature range of minus 6F to plus 45F.
 - 2. Design the heat tracing system with the assumption that the carried water in the piping is not moving.
 - 3. Tepid Water Piping for Emergency Shower Eyewash:
 - a. Provide Pipe heat tracing system as specified or shown on the Drawings. The heat tracing system shall be able to maintain 85°F temperature.
 - b. Provide adjustable control Thermostat equal to Thermon E4X-25325.
 - 4. Power supply shall be 120 volts.

- C. Pipe Heat Tracing Materials
 - 1. Type: Self-regulating, designed so that it can be cut to any length without significantly changing the heater output per unit length.
 - 2. The heater output shall vary in response to temperature changes along the pipe.
 - 3. Constant wattage heaters shall not be used.
 - 4. Heater cable shall be rated for 225F, 240 volt AC (for use on 120VAC system). Cable make-up shall include a five component system consisting of stranded copper bus wire, self-regulating semi-conductive core, fluoropolymer jacket, tinned copper shield and fluoropolymer outer jacket.
 - 5. The outer jacket of fluoropolymer shall be provided of suitable thickness and corrosion resistant properties to prevent corrosion from the surrounding environment.
 - 6. The heating system shall also include all necessary components for proper installation of each circuit as required. Components shall include the following:
 - a. Power connection kit with junction box for connecting each heater to the power circuit.
 - b. Fibrous glass tape to fix heater to pipe every 2 feet.
 - c. Cable end seal kit for termination of cable.
 - d. Peel-off self-sticking black on yellow labels "Electric Traced". Labels shall be provided for each ten feet of pipe.
 - 7. Provide a heat-tracking control panel at each location shown on the Drawings. The control panel shall be a compact, full-featured, microprocessor-based, single-point heat-tracing control system. It shall provide control and monitoring of electrical heat-tracing circuits for both freeze protection and temperature maintenance, and with alarms, ground-fault and voltage protection.
 - a. The panel shall be a NEMA 4X with 480 VAC power feed.

- b. Temperature measurement shall be via a 3-wire 100-ohm platinum RTD(s) connected directly to the unit.
- c. Basis of design shall be Raychem 910 series

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Inspect all items immediately upon delivery to site for damage.
- B. Each reel of heater shall be tested prior to installation to determine that the heater has not been damaged in shipment. Provide test results to Engineer.
- C. Heat tracing shall be tested after installation but before insulation is applied. Provide test results to Engineer.
- D. Heat tracing shall be tested after insulation is applied. Provide test results to Engineer.
- E. Install items in complete conformance with the shop drawings and supplier's installation instructions and leave in proper working condition.
- F. Provide all required mounting and control accessories, including all bolts, nuts, ties, junction boxes and adhesives.
- G. Install heating elements directly against metal pipe before insulation is installed. Install in accordance with supplier's instructions.

++ END OF SECTION ++