

SECTION 22 05 33

HEAT TRACING FOR PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes plumbing piping heat tracing for freeze prevention and domestic hot-water-temperature maintenance with the following electric heating cables:

- 1. Self-regulating, parallel resistance.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include rated capacities, operating characteristics, and furnished specialties and accessories.
- 2. Schedule heating capacity, length of cable, spacing, and electrical power requirement for each electric heating cable required.

- B. Shop Drawings: For electric heating cable.

- 1. Include plans, elevations, sections, and attachment details.
- 2. Include diagrams for power, signal, and control wiring.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Sample Warranty: For special warranty.

1.05 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For electric heating cables to include in operation and maintenance manuals.

1.06 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace electric heating cable that fails in materials or workmanship within specified warranty period.

- 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 SELF-REGULATING, PARALLEL-RESISTANCE HEATING CABLES

- A. Basis-of-Design Product:** Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Chromalox.
 - 2. Nelson Heat Trace; a division of EGS Electrical Group LLC.
 - 3. Raychem; a brand of Tyco Thermal Controls LLC.
 - 4. Thermon Americas Inc.
- B. Comply with IEEE 515.1.**
- C. Heating Element:** Pair of parallel No. 16 or No. 18 AWG, tinned, stranded copper bus wires embedded in crosslinked conductive polymer core, which varies heat output in response to temperature along its length. Terminate with waterproof, factory-assembled, nonheating leads with connectors at one end, and seal the opposite end watertight. Cable shall be capable of crossing over itself once without overheating.
- D. Electrical Insulating Jacket:** Flame-retardant polyolefin.
- E. Maximum Operating Temperature (Power On):** 150 deg F.
- F. Maximum Exposure Temperature (Power Off):** 185 deg F.
- G. Electrical Components, Devices, and Accessories:** Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.02 CONTROLS

- A. Pipe-Mounted Thermostats for Freeze Protection:**
 - 1. Remote bulb unit with adjustable temperature range from 30 to 50 deg F.
 - 2. Snap action; open-on-rise, single-pole switch with minimum current rating adequate for connected cable.
 - 3. Remote bulb on capillary, resistance temperature device, or thermistor for directly sensing pipe-wall temperature.
 - 4. Corrosion-resistant, waterproof control enclosure.

2.03 ACCESSORIES

- A. Cable Installation Accessories:** Fiberglass tape, heat-conductive putty, cable ties, silicone end seals and splice kits, and installation clips all furnished by manufacturer, or as recommended in writing by manufacturer.
- B. Warning Tape:** Continuously printed "Electrical Tracing"; vinyl, at least 3 mils thick, and with pressure-sensitive, permanent, waterproof, self-adhesive back.
 - 1. Width for Markers on Pipes with OD, Including Insulation, Less Than 6 Inches: 3/4 inch minimum.
 - 2. Width for Markers on Pipes with OD, Including Insulation, 6 Inches or Larger: 1-1/2 inches minimum.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine surfaces and substrates to receive electric heating cables for compliance with requirements for installation tolerances and other conditions affecting performance.**
 - 1. Ensure surfaces and pipes in contact with electric heating cables are free of burrs and sharp protrusions.**
- B. Proceed with installation only after unsatisfactory conditions have been corrected.**

3.02 APPLICATIONS

- A. Install the following types of electric heating cable for the applications described:**
 - 1. Freeze Protection for Piping: Self-regulating, parallel-resistance heating cable.**

3.03 INSTALLATION

- A. Electric Heating-Cable Installation for Freeze Protection for Piping:**
 - 1. Install electric heating cables after piping has been tested and before insulation is installed.**
 - 2. Install electric heating cables according to IEEE 515.1.**
 - 3. Install insulation over piping with electric cables according to Section 220719 "Plumbing Piping Insulation."**
 - 4. Install warning tape on piping insulation where piping is equipped with electric heating cables.**
- B. Set field-adjustable switches and circuit-breaker trip ranges.**

3.04 CONNECTIONS

- A. Ground equipment according to Section 260526 "Grounding and Bonding for Electrical Systems."**
- B. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."**

3.05 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.**
- B. Perform the following tests and inspections with the assistance of a factory-authorized service representative:**
 - 1. Perform tests after cable installation but before application of coverings such as insulation, wall or ceiling construction, or concrete.**
 - 2. Test cables for electrical continuity and insulation integrity before energizing.**
 - 3. Test cables to verify rating and power input. Energize and measure voltage and current simultaneously.**

- C. Repeat tests for continuity, insulation resistance, and input power after applying thermal insulation on pipe-mounted cables.
- D. Cables will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports.

3.06 PROTECTION

- A. Protect installed heating cables, including nonheating leads, from damage during construction.
- B. Remove and replace damaged heat-tracing cables.

END OF SECTION
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