SECTION 220533 – Heat Tracing – Pipe Trace

PART 1 - GENERAL

1.1 SECTIONS INCLUDES

A. Electric heating elements for Pipe Tracing. This pertains to the following electric heating cable: Self-regulating, parallel resistance, Heat-Trace cable.

B. Controls

C. Associated installation materials.

1.2 RELATED SECTIONS

A. Section 16855 “Heating Cables (Electric)”
B. Section 210533 "Heat Tracing for Fire-Suppression Piping."
C. Section 230533 "Heat Tracing for HVAC Piping."
D. Section 238323 "Radiant-Heating Electric Panels" For pre-fabricated heated panels.

1.3 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 scaled plans, sections, details, and attachments to other work.
2. Include diagrams for power, signal, and control wiring.
3. Include electrical panel schedules for load centers.

1.4 CLOSEOUT SUBMITTALS

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

1.5 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, Self-Regulating heat cables: 2-10 years from date of Substantial Completion, provided that resistance readings are taken before, during, and after installation; and sent to Manufacturer.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR ELECTRIC HEATING CABLE

A. 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.

2.2 SELF-REGULATING HEATING CABLE FOR ROOF AND GUTTER DE-ICING

A. Basis-of-Design Product: Subject to compliance with requirements, provide Wellspring Manufacturing; Self Regulating heat cable by one of the following:

1. ProLine Radiant
   12637 S. 265 W., Suite 100A, Draper, UT 84020
   Phone: 866-676-9276 / Fax: 801-948-7599
   Web: www.prolineradiant.com

2. Warmzone
   12637 S. 265 W., Suite 100, Draper, UT 84020
   Phone: 888-488-9276 / Fax: 801-948-7599
   Web: www.warmzone.com

B. Compliance: UL IEEE 515

C. Cable, Self Regulating Heating: with a homogenous self-regulating polymer heating element fed from two 16awg tined copper buss bars with an insulated tinned copper ground braid that extends through its length. Standard with a Thermoplastic UV rated covering.
   1. Optional coverings include: Fluoropolymer or No outer jacket

D. Maximum Power on Operating Temperature:
   1. RHSR-R = 149 deg F (65 deg C)
   2. RHSR-P = 230 deg F (110 deg C)
   3. RHSR-S = 248 deg F (120 deg C)

E. Capabilities and Characteristics:

1. Cable Construction: Conductive Polymer heating element fed with 16awg tinned copper buss wires.
2. Cable Width: minimum .36 inch (9.3mm) nominal. Cable both flexible and UV protected.
3. Ground Conductor: Tinned Copper.
4. Cable Outer jacket: UV Rated thermoplastic or fluoropolymer.
5. Cable Inner Insulation Jacket: Polyolefin

6. Splice: Field assembled Type determined by application.
7. Terminator: Field assembled, Type determined by application.
8. Minimum Bending Radius: 1.4 inch (36 mm).
9. Maximum Heat Output: [RHSR-12- 12W/ft. (40 W/ m)] [RHSR- 10- 10W/ft. (31 W/m)] [RHSR-8- 8 W/ft. (25 W/m)] [RHSR-5- 5 W/ft. (17 W/m)] @50 deg F (10 deg C)
10. Minimum Installation Temperature: -4 deg F (-20 deg C).
11. Minimum Spacing: May be over lapped
12. Electrical Characteristics:

    a. Volts: [100 to 120] [**200 to 277**].
    b. Phase: [**Single-phase**].
    c. Hertz: 0-60 Hz.
    d. Total Wattage by Cable Length
    e. Minimum Circuit Capacity: 15 amps.
    f. Maximum Over current Protection 40amp.

F. Accessories (Required for Specific applications)

1. Pipe Tracing
    a. Power and termination kit for Non-Hazardous locations (PLSR00-Pipe)
    b. Power and termination kit for Hazardous Locations C1D2 (PLSR-PTBO)
    c. End Seal Kit for Non-Hazardous locations (PLSR12)
    d. End Seal Kit for Hazardous locations (PLSR-JHE)
    e. Splice/Tee Kit for Non-Hazardous locations (PLSR10)
    f. Splice Kit for Hazardous locations (PLSR-JHS)
    g. Tee Kit for Hazardous locations (PLSR-JHT)
    h. Fiberglass tape for securing to pipe (PLSR03-Fiberglass)
    i. Aluminum tape to cover heating cable on PVC Pipe for efficient heat dispersion (PLSR03-Aluminum)

2.3 CONTROLS

A. Comply with requirements in Section 230900 "Instrumentation and Control for HVAC" and Section 230993 "Sequence of Operations for HVAC Controls" for control devices and sequence of operations for radiant-heating electric cables.

B. Temperature Sensor for Pipe Trace Heating:

1. System activation shall be controlled by WS controller with external temperature sensors and appropriate contactor / relay.
    a. Control device shall be CSA, ETL, UL or equivalent Approved.

PART 3 - EXECUTION

3.1 EXAMINATION

A. For all products, examine surfaces and substrates to receive electric heating cables for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Ensure surfaces in contact with electric heating cables are free of burrs and sharp protrusions.
2. Measure and verify square footages (square meters) for areas to be heated.
3. Verify available supply voltages for project.
4. Identify location of any required junction box(s). Ensure that the maximum run length distance for each product is not exceeded.
5. Ensure that environmental requirements for required controls are not violated.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Install the following types of electric heating cable for the applications described:
1. Self regulating, parallel-resistance heating element for Pipe Tracing and Heating

3.3 INSTALLATION

A. Heating Systems Installation.

1. Comply with manufacturer's product data, including product technical bulletins, installation instructions, and design drawings. Complete installation must conform to manufacturer's installation instructions, NEC Code, and any appropriate local electric codes.

3.4 CONNECTIONS

A. Ground all equipment according to NFPA 70 (NEC) Class 1 wiring.

3.5 FIELD QUALITY CONTROL

A. Testing: **Owner will engage** a qualified electrician to perform tests and inspections.

B. Manufacturer's Field Service: Engage a qualified service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections [**with the assistance of a qualified service representative**]:

1. Perform tests before, during, and after heating element installation
2. Test heating element for electrical continuity and insulation integrity before energizing.
3. Test heating element to verify rating and power input. Energize and measure voltage and current simultaneously according to instructions.

D. Radiant-heating electric elements will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports for warranty purposes, and send to manufacturer.

3.6 PROTECTION

A. Protect installed heating elements from damage during construction.

B. Remove and replace damaged heating elements according to instructions.

END OF SECTION 220533