

DIVISION 23 8313 Radiant Electric Heating Cables

LOW VOLTAGE DE-ICING / SNOW MELTING SYSTEM UNDER NON-CONDUCTIVE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Includes But Not Limited To:
 - 1. Furnish and install low voltage de-icing / snow melting system with screen heating element under non-conductive roofing as described in Contract Documents.
- B. Related Sections:
 - 1. Section 073100 - Shingles and Shake: Installation coordination with roofing material and details
 - 2. Section 073200 - Roof Tiles: Installation coordination with roofing material and details.
 - 3. Section 074100 - Roof Panels: Installation coordination with roofing material and details.
 - 4. Section 075000 – Membrane Roofing: Installation coordination with gutter material and details.
 - 5. Section 076000 – Flashing and Sheet Metal: Installation coordination with gutter material and details.
 - 6. Section 077000 – Roof and Wall Specialties and Accessories: Installation coordination with gutter material and details.
 - 7. Section 260600 – Schedules for Electrical: Materials and installation of wiring and electrical power source.

1.2 SYSTEM DESCRIPTION

- A. The system shall consist of all equipment and materials for a complete roof de-icing system to be installed.
- B. The area covered and heat density (measured by Watts or BTU equivalent) per linear foot of heating element or square foot of area for each Heatizon System product are determined by the spacing between adjacent runs of heating element, the total length of heating element, and the size of the transformer. See manufacturer's installation instructions for more detailed information.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and written installation instructions for low-voltage electric screen heating element systems.
- B. Shop Drawings: At Architect's request, submit drawings showing layout of system Control Box, activation device, grounding connections, and heating elements required to provide complete operating system. Include the following:
 - 1. Locations for activation devices.
 - 2. Location of low-voltage heating element step-down transformer and control box.
 - 3. Cold-lead cable runs from transformer to heating element connection points.
 - 4. Heating element layout and spacing.
 - 5. Cold-lead jumpers between non-adjacent areas.

6. Connections between cold-lead and heating element.
 7. Low-voltage wiring between control box and activation device.
 8. Low-voltage wiring between sensor(s) and activation device(s).
 9. Differentiate between:
 - a. Control wiring.
 - b. Heating element.
 - c. Cold-lead.
 - d. Branch-circuit wiring.
 10. Differentiate between zones of heating element.
- C. Operation and Maintenance Data: Submit manufacturer's written maintenance and operation instructions for system.
- D. Warranty: Submit copy of system manufacturer's standard warranty for system.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
1. Firm regularly engaged in manufacturing of low-voltage electric screen heating elements, of type, sizes and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. Installer Qualifications:
1. Licensed Contractor with a minimum of two years successful certified experience installing projects utilizing electric screen heating element systems equal to systems specified in this section.
- C. Regulatory Requirements:
1. Comply with applicable local electrical code requirements of local authorities having jurisdiction.
 2. Provide products that are listed, recognized, and labeled by Nationally Recognized Testing Laboratory (NRTL) that include but are not limited to:
 - a. ETL subsidiary of Intertek Testing Laboratories,
 - b. Canadian Standards Association (CSA), and
 - c. Underwriters Laboratories (UL).
 1. Conform with requirements of "Safety for Electric Radiant Heating Panels and Heating Panel Sets" (UL - 1693, 1st Edition, dated December 11, 1996).
 2. Conform with requirements of "Outline of investigation for Roof and Gutter De-icing Cable Units," (UL - 1588 Issue 4, dated May 24, 2002), and "IEEE Recommended Practice for Electrical Impedance, Inductive and Skin Effect Heating of Pipelines and Vessels" (IEEE 844-2000).
 3. Conform to requirements of "Dry-Type General Purpose and Power Transformers" (UL - 1561).
 4. Conform to "Requirements for Electrical Resistance Heating Cables and Heating Device Sets" (CSA - 22.2, No 130-03, dated January, 2008)

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle in accordance with manufacturer's written instructions. Store the materials in dry indoor location off the ground.

- B. Remove damaged materials from job site and replace with new at no additional cost to Owner.

1.6 WARRANTY

- A. Provide Manufacturer's Standard Warranty with following requirements:
 - 1. Control Box Components - One year
 - 2. Power Transformer - Five years
 - 3. Heating Element - 25 years

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Heatizon Systems, 4137 South 500 West, Murray, Utah 84123 (888) 239-1232
www.heatizon.com.

2.2 DISTRIBUTOR

- A. COMFORT RADIANT HEATING, LLC, 9 Morris Lane, Clifton Park, New York, 12065
(888)448-0555 www.comfortradiant.com

2.3 COMPONENTS

- A. Low-voltage Screen Heating Element Heating element shall be bright bronze woven metal fabric screen: ZMesh®
 - 1. Rated for operating at variable output of 0 to 12 watts per linear foot.
 - 2. Maximum Operating Voltage: 0.1262 volts per linear foot of heating element.
 - 3. Maximum Secondary Voltage: Not to exceed 32.0 volts.
 - 4. Heating Element Operating Temperature: Not to exceed 90 degrees C.
 - 5. Screen element thickness not to exceed 0.020".
 - 6. Heatizon Systems ZMesh® number E102.
 - 7. Width: 9 inches or 12 inches.
 - 8. Rated for installation on wood or concrete-based sub-roof.
 - 9. Heating Element shall allow for penetrations by screws, nails and staples as long as they do not contact any other metallic objects.

- B. Low-voltage Electric Heating Element Transformer:
 - 1. Properly sized so heating element operation is less than 96 amps.
 - 2. Multi tapped on primary side to allow for operation of supply of 120, 208, 240, and/or 277 volts.
 - 3. Multi tapped on secondary side to allow proper operation when operating range of heating elements lengths.
 - 4. Heatizon Systems Options:
 - a. S050 (0.5kVA)
 - b. S101 (1kVA)
 - c. S102 (2kVA)
 - d. S103 (3kVA)
 - e. S202 (2x 2kVA) (single primary with dual secondaries)
 - f. S203 (2x3kVA) (single primary with dual secondaries)

- C. Control Box:
 - 1. Provide unit that:
 - a. Soft starts transformer.
 - b. Monitors overall system for proper and safe operation.
 - c. Interfaces with activation device.

- d. Shuts system off in event of fault.
 - e. Provides protection for over-current, undercurrent and high temperature transformer (CBX6T and CBX23T models have a 24VAC power supply for Activation Device).
2. Provide means of faults and fault status.
 3. Fitted with power service disconnect rated for system operating range.
 4. Heatizon Systems Control Box: SLC500, CBX6, CBX6T, CBX23, and CBX23T (CBX6T and CBX23T models have a 24VAC power supply for Activation Device).
- D. Activation Device:
1. Provide unit with a dry contact rated for 1 amp and 250 volts AC.
 2. Provide one of the following:
 - a. Aerial Mounted Temperature - Moisture Sensor: Model M326, M326A24, M326ARS24 requiring 24V or M326A or M326ARS requiring 120V.
 - b. 12 hour Mechanical Timer: Model M325D.
 - c. 24 hour Programmable Timer: Model M323.
 - d. Electronic Temperature contact: Model M336.
 - e. Remote Temperature Controller: Model M322.
 - f. Gutter Snow Switch: Model M335.
 - g. Selector Box: Model M329 for activation and operation of up to 12 control units.
 3. System Accessories:
 - a. Transition Plate: Model E217
 - b. Gutter Controller: Model 332 (turns gutter/downspout on whenever roof system is on).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine roof deck for proper installation, cleanliness, or condition that may hinder successful installation of low-voltage electric snow melt system.
1. Notify Contractor in writing of items needing correction.
 2. Do not install snow melt system until faulty conditions are corrected.

3.2 INSTALLATION

- A. Interface with Other Work: Coordinate installation of low voltage cable heat melt system with appropriate sections in Division 07 for roofing material and appropriate sections of Division 26 Electrical.
- B. Install snow melt system, including Heating Element, Transformer, Control Box, and Activation Device, in accordance with Manufacturer's written instructions and approved Shop Drawings.
- C. Install optional moisture barrier on roof deck where screen heating element will be installed. Install moisture barrier over all of screen heating element to enclose element in a water-tight barrier.
- D. Attach manufacturer's supplied red octagonal warning sign (STOP! DANGER!) spaced equally on De-Icing / Snow Melt System on roof.

3.3 FIELD QUALITY CONTROL

- A. Testing as directed by System Manufacturer:
1. Prior to covering, visually inspect the heating element and cold leads for cuts, shorts, and other damage; repair as necessary.
 2. Check for continuity to any conductive material, including but not limited to metal;

- eliminate as necessary.
3. Conduct After-Installation Element Tests per manufacturers installation instructions. Test system in presence of Architect, Contractor, and Owner's Representative, to be certain system functions in accordance with design intent.
- B. Verify that all heating element is completely covered.

3.4 DEMONSTRATION

- A. Provide adequate demonstration and training to Owner in operation and maintenance of system.

END OF SECTION