

Heatizon Systems GutterMelt

Model Specification: GutterMelt Roof and Gutter Heat Trace System

Part 1 - GENERAL

Furnish a complete UL Listed or CSA Certified system of heating cables, components, and controls, specifically for keeping water drainage paths clear and to avoid ice dams on roof eaves, gutters, and downspouts.

Part 2 - MATERIALS

- 2.1 The self-regulating cable shall consist of two (2) 16 AWG nickel-copper bus wires embedded in parallel in a self-regulating polymer core that varies its power output to respond to temperature all along its length, allowing the heating cable to be cut to length in the field. A radiation-crosslinked, modified polyolefin dielectric jacket shall cover the heating cable. To provide a ground path and to enhance the heating cable's ruggedness, the heating cable shall have a braid of tinned copper (-C), as required per section 427-23 of the NEC-1996. An ultraviolet stabilized weatherproof overjacket composed of: modified polyolefin shall cover the grounding braid. The cable shall be suited for use on wood, plastic, and asphalt building materials.
- 2.2 For energy efficiency and in order to provide heat output that is sufficient for deicing the heating cable shall have a nominal rating of 5 watts per foot but shall have a power output of 12 watts per foot in snow and ice.
- 2.3 The heating cable shall operate on line voltages of (select: 120, 208, 220, 240, or 277) volts without the use of transformers.
- 2.6 The heating cable shall be GutterMelt supplied by Heatizon Systems.
- 2.7 Power connection, end seal, and splice kit components shall be applied in the field.
- 2.8 A ground-fault device for equipment protection shall protect heating cable circuit. This requirement is in accordance with Article 426 of the NEC-1996.

Part 3 - COMPONENTS

All heating cable components shall be UL Listed and CSA Certified for use as part of the system for keeping water drainage paths clear and to avoid ice dams on roof eaves, gutters, and downspouts. Component enclosures shall be rated NEMA 4X to prevent water ingress and corrosion. In order to ensure the most reliable electrical connection and to simplify the maintenance and troubleshooting of freeze protection systems only crimp connections are acceptable.

Part 4 - SYSTEM CONTROL

Option 1: Manual Control

The system shall be controlled by a switch, either directly or through an appropriate contactor.

Option 2: Thermostatic Control - Ambient Sensing

The system shall be controlled by a 0-255°F adjustable ambient sensing thermostat. The thermostat shall be supplied with a 40°F setting from the factory. The thermostat shall be type RTAS as supplied by Heatizon.

Option 3: Snow Switch Control

The system shall be controlled by one or more M332/M326A/M326ARS or equivalent gutter-mounted temperature and/or moisture sensors.

Option 4: Control, Monitoring and Power Distribution Systems

- A) For single loop applications, a UL listed microprocessor based temperature control, monitoring and power distribution system shall be used. The controller shall accept

universal sensor inputs. The system shall be compatible with self-regulating and MI cables and shall have the following features.

- 1) NEMA 4X fiberglass enclosure
- 2) Supply voltage: (select: 120, 240 or 277 Vac single phase).
- 3) Field power connection terminal block must accept universal sensor input for one circuit.
- 4) Control must operate in 32-120°F (0-40°C) environments.
- 5) Solid state relay rated 30A at 120°F (40°C) output.
- 6) Optional RS-485 MODBUS® communications capable with interfacing with personal computers and PLC's.
- 7) Low current alarm: 0-30A in 1A increments.
- 8) Optional 5-100mA ground fault alarm trip.
- 9) Process, deviation, band, high/low and latching/non-latching (manual/automatic reset) programmable temperature alarms.
- 10) On/Off and PID control modes. PID mode must have one touch self-tuning feature such as Chromalox, 1600 series SMART button feature.
- 11) Programmable Soft-Start-Timed Output Power Limit on Start-Up.

B) For multi-loop applications, a UL listed microprocessor based temperature control, monitoring and power distribution system shall be used. The sensors shall be of the type resistance temperature detector RTD (0 – 500 C/32 – 900 F) and shall be wired to the panel. The system shall be compatible with self-regulating and MI cables and shall have the following features.

- 1) NEMA 4/12 enclosure.
- 2) Supply voltage: (select: 120, 240 or 277 Vac single phase).
- 3) The system must have a color touch screen operator interface.
- 4) Field power connection terminal block and RTD input connection terminal block for (select: 8, 12 or 24 circuits).
- 5) Select (32-120°F (0-40°C) operating environment without Cabinet Heater) (-40 – 120 F with Optional Cabinet heater).
- 6) Mechanical Two-Pole Output Relays for each circuit rated 30 Amps .
- 7) Select (Optional RS-485 MODBUS® communications for interfacing with personal computers and PLC's).
- 8) The system must be capable of checking cable continuity without use of a monitor wire.
- 9) Ground fault alarm must be adjustable between (25 – 500 mA).
- 10) The system must have selectable capability for ground fault alarm only or ground fault and trip.
- 11) The system must have Non-Latching, High/low programmable temperature alarms.
- 12) The system must have Open Sensor Alarm with Programmable Open Sensor Output Setting (0 – 100%).
- 13) The System must have capability to graphically display circuit currents.
- 14) The system must have load managing start-up capability.
- 15) The system must have programmable self-test capability from 0 to 720 hours with full system alarm capability including ground fault, high/low temp and continuity
- 16) On/Off Control with adjustable Deadband (1 – 10)
- 17) The system must be field programmable for °F or °C.
- 18) The system must have capability for global programming of all setpoints and alarms.
- 19) The system must have capability for graphic displays of Loop Status, Alarm conditions, Process Temperature, Setpoints, and Currents.
- 20) The system must have one set of dry alarm contacts.
- 21) The system must have selectable Hand/Off/Auto control modes.
- 22) The system must have a control Loop Enable/Disable Feature.
- 23) All features including temperature control, contactors, and power distribution must be contained in one enclosure.
- 24) The system must be modular in-design, such that individual components can be replaced in the field if necessary.
- 25) The system must be cUL approved.

- C) Control, Monitoring and Power Distribution Systems shall be IntelliTrace HTLS /HTAS as supplied by Heatizon Systems.

Part 5 - ELECTRICAL

Contactor

Where the heat tracing circuit current exceeds thermostat or switch rating, Contactor type CONT as supplied by Heatizon Systems shall be used. Contactor enclosure type NEMA 4 shall be used.

Ground Fault Circuit Breaker

Per NEC-1996 Article 426, the system shall be protected by a 30-mA trip, ground fault circuit breaker.

Part 6 - EXECUTION

- 6.1 The heating cable shall be laid in gutters; shall be suspended in downspouts either as a loop or a single length and held in place by a downspout hanger; and shall be attached to the roof using the roof clip.
- 6.2 The heating cable shall be protected from damage and installed according to manufacturer's instructions.
- 6.3 After installation subject heating cable to testing using a 2500-Vdc meggar, minimum insulation resistance shall be 10 megohms or greater.