SECTION 22 05 33
HEAT TRACING FOR BELOW GREASE WASTE PIPING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes a UL/ULC Listed Heat Tracing Systems for below grade Grease Waste Piping
B. Self-Regulating Heating Cable
C. Connection Kits for joining heating cable sections
D. Electronic Heat Trace Controller
E. Heating Cable Installation Accessories

1.2 RELATED SECTIONS

A. Section 22 07 19 – Plumbing Piping Insulation
B. Section 22 08 00 – Commissioning of Plumbing Systems
C. Section 22 09 00 – Instrumentation & Control for Plumbing Systems
D. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables
E. Section 26 05 26 – Grounding and Bonding for Electrical Systems

1.3 REFERENCES

A. IEEE 515.1-2012: Standard for testing, design, installation and maintenance of electrical resistance trace heating for commercial applications.
B. CSA C22.2 NO. 130-03-2008 Requirements for Electrical Resistance Heating Cables and Heating Device Sets.
C. National Electric Code (NEC): NFPA70

1.4 ACTION SUBMITTALS

A. Product Data: For UL/ULC Listed Heat Tracing Systems for Plumbing Piping including the following:

1. Manufacturer's Data Sheets for Heat Cable, Components, Controller & Installation Accessories.
2. Installation Instructions for Heat Tracing Systems for Plumbing Piping
3. Electrical Wiring Diagram for Controller, Sensors & Interface to BMS

1.5 CLOSEOUT SUBMITTALS

A. Operation & Maintenance Manuals for Heat Tracing Systems for Plumbing Piping

1.6 QUALITY ASSURANCE

A. Manufacturers Qualifications
    1. Minimum of 10 years of experience in design, engineering, manufacturer and support of Heat Tracing Systems.
    2. Manufacturer shall be ISO-9001:2008 Registered
B. Installer Qualifications
    1. System installer shall have a complete understanding of product from manufacturer prior to installation of Heat Tracing Systems for Plumbing Piping System.
    2. Electrical Connections shall be performed by a licensed electrician.

SECTION 22 05 33
HEAT TRACING FOR BELOW GREASE WASTE PIPING

1.7 DELIVERY, STORAGE AND HANDLING

A. Store products in manufacturer's unopened packaging and dry location with a temperature range of 0°F (-18°C) to 100°F (38°C) until ready for installation.

B. Protect Heating Cable from exposure to moisture, water & mechanical damage until ready for installation.

Specifier: Retain one or both of the paragraphs below based upon Project requirements

1.8 WARRANTY

A. Provide manufacturer's standard warranty form which manufacturer warrants against defect in material and workmanship under normal use and regular service and maintenance for a period of one year from the date of shipment of the products by Chromalox.:

1. Heating Cable & Components: One Year
2. Controls & Sensors: One Year

A. Provide manufacturer's extended warranty of ten (10) years from the date of installation on heating cable and components by completing warranty registration card within the timeline indicated on the extended warranty.

(1) Install heating cable system per manufacturer's instructions on their Installation & Operation Manual
(2) Maintain & complete the installation & maintenance log.
(3) Submit complete testing log data to owner

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Basis of Design Manufacturer: Subject to compliance with requirements, provide a Heat Tracing Systems for Plumbing Piping by Chromalox, Pittsburgh, PA, 800-443-2640, www.chromalox.com .

Specifier: Retain one of the two paragraphs below based upon Project requirements

1. Submit comparable products of one of the following for approval by Engineer:

a. [Specifier: insert name of manufacturer of comparable product.]

b. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.

1. Provide specified product: Owner will not consider substitution request.

B. MATERIALS

1. Heating Cables

(a) Basis of design shall be Chromalox SRF Self-Regulating, Heating Cable specifically designed for the intended application, tested and approved to CSA 22.2 No 130-03 and IEEE 515.1 requirements.
(b) The self-regulating, heating cable shall consist of two (2) 16 AWG nickel-copper bus wires embedded in a radiation cross-linked, continuous, self-regulating polymer core.
(c) The self-regulating, heating cable shall have a fluoropolymer, dielectric jacket cover.
(d) The self-regulating, heating cable shall have a tinned-copper ground braid.
(e) The heating cable shall be UL, FM or CSA Listed.
(f) The manufacturer shall provide design heat loss information on all piping and select a self-regulating, heating cable from the table below to prevent freezing of the pipe:

SECTION 22 05 33
HEAT TRACING FOR BELOW GREASE WASTE PIPING

Heater Output @ 50°F	Voltage	Maximum Exposure Temperature
3 Watts / Lineal Ft	120 & 208-277	185°F
5 Watts / Lineal Ft	120 & 208-277	185°F
8 Watts / Lineal Ft	120 & 208-277	185°F
10 Watts / Lineal Ft	120 & 208-277	185°F

2) Connection Kits
   a) Heating Cable Connection Kits shall be Chromalox SnapFit or similar for exposed piping and not require installing contractor to cut into heating cable core and expose the bus wires.
   b) Chromalox SnapFit connection kits shall be NEMA 4X rated to prevent water ingress and corrosion.
   c) Chromalox SnapFit Connection Kits shall be UV stabilized for installation outdoors.
   d) Heating Cable Connection Kits shall be Chromalox HS Kits for buried piping and compatible with standard electrical mechanical tubing and junction boxes. All J-box connections with heating cable shall be sealed with fire stopping material to prevent over heating of the connection inside of the junction box.
   e) Manufacturer to provide connection kits for power, splice, tee and end seal.
   f) All Splices, Tees & End Seals shall be installed above the insulation per NEC.
   g) All Connections kits shall be UL, CSA or FM Listed.

3) Heating Cable Accessories
   (a) Heating cable shall be attached to plumbing piping with Chromalox FT-3 glass fiber, glass tape. Use of metal zip ties is prohibited for the attachment of the heating cable to the plumbing piping.
   (b) Contractor shall provide Chromalox CL-1 Heating Tracing Labels every 10', opposite sides of pipe to identify plumbing piping with heat tracing cable installed on it.
   (c) All PVC Sanitary Piping shall have a 2"W aluminum tape placed over the heating cable along its entire length to facilitate heating of the plastic pipe.
4) Controller
   (a) Basis of design is Chromalox IntelliTrace ITC controller for (1 or 2) circuits.
   (b) Unit shall operate at 100-277 VAC and rated @ 40A per circuit
   (c) Unit shall include a 10" High Resolution TFT Display with ability to show set point temperature, line temperature and current draw of each circuit simultaneously.
   (d) Unit shall include ON/OFF, PID or Manual SSR power control with a selectable Soft Start capability. Electro-mechanical relays shall not be permitted.
   (e) Unit shall include two temperature sensors inputs per circuit.
   (f) Unit shall include 2 x common alarm outputs (1 x AC, 1 x DC), Alarms for Low/High Temperature & Current, GFEP (Ground Fault Equipment Protection) & Sensor Failure.
   (g) ModBus RTU/RS485 Communications capability.

(h) Unit shall include multiple levels of password security.

Specifier: Retain one of the (h) list below based upon Project requirements. Standard product configuration is for a FRP enclosure. Optional 304 stainless steel, NEMA 4x enclosure.

(i) Unit shall be supplied with a FRP, NEMA 4X Enclosure with wall mounting bracket.

(h) Unit shall be supplied in a type 304, stainless steel, NEMA 4X enclosure with wall mounting bracket.

Specifier: If connection to BACnet network is required – please include item J below.

(j) Unit shall include BACnet protocol converter for connecting all IntelliTrace ITC controllers to BACnet network. Protocol Converter shall be Chromalox model MBC contained in a NEMA4 Enclosure with separate power supply.

5) Temperature Sensors – One (1) required

(a) Provide one Chromalox RBF-HT-10 ohm, three wire, ambient sensing, temperature sensor with copper sheathed probe with vented guard. Unit shall include ½" NPT fitting for mounting into condulet fitting by others.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Installer to field verify all plumbing piping sizes & lengths as shown on drawings.

B. Installer to verify that power is available, in proper location and ready for use.

C. Installer to verify that all plumbing piping has been properly prepared for heating cable installation. Notify General Contractor or Construction Manager of unsatisfactory conditions exist prior to Plumbing Pipe Freeze Protection System.

3.2 INSTALLATION

A. The plumbing pipe freeze protection installation shall conform to all local building codes including but limited to NFPA70, IEEE 515.1 Commercial Heat Tracing Applications.

B. The installer shall comply with the Chromalox's Plumbing Pipe Freeze Protection System installation, operation & maintenance instructions.

C. The installer shall layout heating cable per approved shop drawings.

D. Grounding of the Plumbing Pipe Freeze Protection System shall be in accordance with section 26 05 26 "Grounding & Bonding for Electrical Systems"

E. Connections of all electrical wiring shall be in accordance with section 26 05 19 "Low-Voltage Electrical Systems"

3.3 FIELD QUALITY CONTROL

A. Start-Up and testing of the Plumbing Pipe Freeze Protection System shall be performed by factory technician or factory representative per the owner's requirements.

B. Field Testing & Inspections

1. The system shall be commissioned in accordance to the Chromalox Installation, Operation & Maintenance Manual.

2. The heating cable circuit integrity shall be tested using a 2500 Vdc megohmmeter at the following intervals below. Minimum acceptable insulation resistance shall be 1000 megohms or greater.
    a. Before installing the heating cable
    b. After heating cable has been installed onto the roof or gutter
    c. After installing connection kits
    d. Prior to initial start-up (commissioning)
    f. As part of the regular system maintenance
3. The technician shall verify that the IntelliTrace ITAS Controller parameters are set properly for the Plumbing Pipe Freeze Protection System requirements.
4. The technician shall verify that the temperature sensors are correctly connected to the controller.
5. The installer shall submit test results to owner after commissioning.

3.4. ADJUSTING AND CLEANING

A. Keep ambient temperature sensors clean of dirt and debris

3.5 MAINTENANCE

A. Comply with Manufacturers recommendations IOM Manual Plumbing Pipe Freeze Protection System.

END OF SECTION