Nelson™ Heat Trace Systems
Pipe freeze protection and low-temperature maintenance systems for commercial applications

Keep fluids flowing at consistent temperatures even in freezing conditions.
Sometimes insulating your pipes is not enough.

In many parts of the country, frigid temperatures can result in water freezing and pipes bursting, or liquid setting and plugging the pipe. Insulating the pipes is not always enough to protect them from loosing heat in these conditions. Loss of heat within the pipe can lead to costly repairs or facility shutdowns.

What if you could install a solution that allows you to operate it without the worry of overheating the pipes and their contents. A system designed for your facility’s requirements?

“Having a system that provides a steady temperature is critical to our business. Having one that provides simple, reliable operation, means less time has to be spent monitoring the cables for hot-spots in the pipe.”
- Worker at an automotive company.

“The advantages of a self-regulating heater cable installed in the facility are vast. But knowing that we don’t need antifreeze in the system removes the possibility of chemical leaks. That makes the facility safer for all of us.”
- Engineer at a building management company.
Keep your pipes a consistent temperature.

Nelson pipe freeze protection and low-temperature maintenance systems by Emerson are the ideal solutions to ensure frigid temperatures don’t slow you down. Self-regulating heater cable combined with the right connection kits, thermostats, cable controllers and monitors ensure that the pipes they are installed on and the equipment they are connected to remain operational — no matter the surrounding temperatures. By replacing the lost heat, the pipe and fluids inside of them can be kept at a constant temperature, eliminating any heat loss while preventing freezing.

Operating Principle of Self-Regulating Heater Cables

Parallel bus wires apply voltage along the entire length of the heater cable. The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing. The heater cable derives its self-regulating characteristic from the inherent properties of the conductive core material. As the core material temperature increases, the number of conductive paths in the core material decrease, automatically decreasing the heat output. As the temperature decreases, the number of conductive paths increase, causing the heat output to increase. This occurs at every point along the length of the cable, adjusting the power output to the varying conditions along the pipe. The self-regulating effect allows the cable to be overlapped without creating hot spots or burnout. As the cable self-regulates its heat output, it provides for the efficient use of electric power, producing heat only when and where it is needed, and also limiting the maximum sheath temperature.
Self-Regulating Heater Cable
Ideal for Harsh and Rugged Commercial Applications.

Nelson Heat Trace heater cable is designed to replace heat lost through the thermal insulation from equipment in the system. Our self-regulating heater cable will adjust its own output in response to pipe temperature and is available in a variety of temperature and power ratings.

### Nelson Type CLT
- Designed for use in Ordinary (Unclassified) Locations
- Ideal for use in maintaining fluid flow under low ambient conditions and for freeze protection and low watt density process temperature systems. Typical applications include pipelines, fire protection, process water, hot water and structure anti-icing.

### Nelson Type LT
- Designed for use in Ordinary (Unclassified) and Hazardous (Classified) Locations
- Ideal for use in maintaining fluid flow under low ambient conditions. Typical applications include freeze protection and low watt density process temperature systems such as product pipelines, fire protection, process water, lube oil and condensate return.

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<td>10 W/ft (33 W/m)</td>
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Connection Kits for Self-Regulating Heater Cable
Ideal for Harsh and Rugged Commercial Applications.

Nelson Heat Trace connection kits are approved for use in ordinary (unclassified) and Division 2 hazardous areas when used with Nelson Heat Trace field-fabricated heating cables.

Nelson PLT-BC
- Non-metallic connection kit suitable for connecting up to two heating cables to customer supplied power wiring.
- Kit Contents:
  - 1 Universal Base, Box Adapter, Sealing Gasket, O-Ring and Locknut
  - 1 Junction Box with Sealing Gasket and Cover
  - 1 Sealing Grommet
  - 1 Power Termination and Cable End Seal with Adhesive Sealant
  - 1 3-Point Floating Terminal Block
  - 1 Ground Connection Splice
  - 2 Stainless Steel Pipe Clamps

Nelson PLT-BS
- Non-metallic connection kit designed for connecting two heating cables in an in-line splice configuration.
- Kit Contents:
  - 1 Universal Base, Box Adapter, Sealing Gasket, O-Ring and Locknut
  - 1 Junction Box with Sealing Gasket and Cover
  - 1 Universal Sealing Grommet
  - 2 Power Terminations with Adhesive Sealant
  - 1 3-Point Floating Terminal Block
  - 1 Ground Connection Splice
  - 2 Stainless Steel Pipe Clamps

Nelson PLT-BY
- Non-metallic connection kit designed for connecting three heating cables in a tee splice configuration.
- Kit Contents:
  - 1 Universal Base, Box Adapter, Sealing Gasket, O-Ring and Locknut
  - 1 Junction Box with Sealing Gasket and Cover
  - 1 Watertight Connection Fitting and Hi-Temp Flexible Tubing
  - 1 Sealing Grommet
  - 3 Power Terminations and 2 Cable End Seals with Adhesive Sealant
  - 1 3-Point Floating Terminal Block
  - 1 Ground Connection Splice
  - 2 Stainless Steel Pipe Clamps

Nelson PLT-L
- Non-metallic connection kit designed as end-of-circuit indicating light assemblies utilizing low temperature LED lamps. They are suitable for 120/208/240/277 Vac operation.
- Kit Contents:
  - 1 Universal Base, Box Adapter, Sealing Gasket and Locknut
  - 1 Junction box with Sealing Gasket and Cover
  - 1 Pilot Light Assembly (Specify Voltage)
  - 1 Sealing Grommet (Specify Cable Construction)
  - 1 Power Termination with Adhesive Sealant
  - 1 Ground Connection Splice
  - 2 Stainless Steel Pipe Clamps (specify pipe size)
Self-Regulating Heater Cable Thermostats
Ideal for Harsh and Rugged Commercial Applications.

Nelson Heat Trace thermostats are approved for use in ordinary (unclassified) and Division 2 hazardous areas when used with Nelson Heat Trace field-fabricated heating cables.

**Nelson TA4X140**
- For ambient temperature control in ordinary (unclassified) or corrosive locations.
- NEMA Type 4X, IP66, die cast aluminum enclosure with single pole, double throw switch
  - Temperature Range: -9°C to +60°C (+15°F to +140°F)
  - Exposure: -40°C to +71°C (-40 to +160°F)
  - Capillary:
    - Length: N/A
    - Material: Stainless Steel
    - Maximum Bulb Temperature: +71°C (+160°F)
  - Electrical Data: 22 amp resistance 480 Vac
  - Calibration Accuracy: +1.1°C (+2°F)

**Nelson TH4X325**
- For controlling heat tracing systems in ordinary (unclassified) or corrosive locations.
- NEMA Type 4X, IP66, die cast aluminum enclosure with single pole, double throw switch
  - Temperature Range: -4°C to +163°C (+25°F to +325°F)
  - Exposure: -40°C to +71°C (-40 to +160°F)
  - Capillary:
    - Length: 3 m (10 ft)
    - Material: Stainless Steel
    - Maximum Bulb Temperature: +215°C (+420°F)
  - Electrical Data: 22 amp resistance 480 Vac
  - Calibration Accuracy: +1.6°C (+3°F)

**Nelson TF4X40**
- For use with Nelson Type CLT and LT heater cable.
- For controlling heat tracing systems in ordinary (unclassified) or corrosive locations.
- NEMA Type 4X, IP66, molded fiberglass enclosure with single pole, single throw switch
  - Temperature Range:
    - Fixed Range: 4.4°C (40°F)
  - Exposure: -40°C to 71°C (-40°F to +160°F)
  - Capillary Length: 0.9 m (3 ft)
  - Material: Tin Plated Copper
  - Maximum Bulb Temperature: +71°C (+160°F)
  - Electrical Data: 22 amp resistance 480 Vac
  - Calibration Accuracy: +2.2°C (+4°F)
Self-Regulating Heater Cable Controllers and Monitors
Ideal for Harsh and Rugged Commercial Applications.

Nelson Heat Trace micro-processor based, digital, general purpose controllers are designed for use in ordinary (unclassified) locations to provide temperature control of an individual heater segment with sensor monitoring, remote alarm contacts, and ground fault leakage detection.

**Nelson CM-GP**
- This micro-processor based digital electronic controller has been specifically designed for wall mounted electric heat tracing applications. It provides temperature control of an individual heater segment with sensor monitoring, remote alarm contacts, and ground fault leakage detection.
  - NEMA 4X Fiberglass reinforced, carbon impregnated, UV resistant polymer enclosure is designed for wall mounted applications.
  - System is provided with dual pole heater switching and is environmental hardened for use in various plant locations and can be installed in ordinary locations.
  - Provided with a common alarm contacts for remote monitoring of the control system.

**Nelson CM-1**
- This microprocessor based heater cable monitoring system continually monitors the supply voltage and current flow to each heating device. It can be used with both series and parallel styles of electric heat tracing cables. With the addition of continuity monitoring devices (referred to as “CMD”), this system monitors both bus wires in parallel styles of heating cable. When used in conjunction with ground fault branch breakers, the CM-1 serves as an automatic alarm system for any ground fault condition.
  - Mounted in a NEMA 4 or 4X enclosure that can be wall or rack mounted in close proximity to the breaker panel feeding the heat tracing system.
  - Available in configurations up to 48 circuits and is environmentally hardened for use in various plant locations.
  - Standard versions can be installed in Division 2 hazardous locations without any special considerations.
  - Individual CM-1 systems throughout a facility can be connected to a central PC running RS-485 host communications software.
  - Alarm status and alarm acknowledgment can be accessed from the central location.
Heating cable solutions for temperature-related problems

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