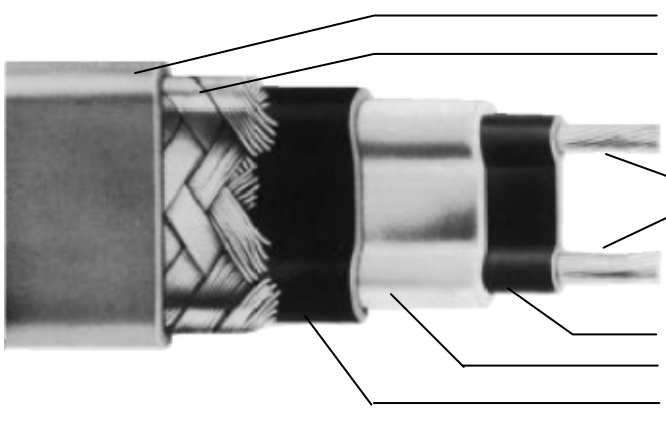
NELSON™ DOMESTIC HOT WATER
TEMPERATURE MAINTENANCE SYSTEM

SPECIFICATION/APPLICATION INFORMATION



Description:

Nelson Type LT self-regulating heater cable is a parallel circuit electric heater strip. An irradiation cross-linked conductive polymer core material is extruded over the multi-stranded, tin-plated, 16-gauge copper bus wires. The conductive core material increases or decreases its heat output in response to temperature changes. Two jackets provide extra dielectric strength, moisture resistance, and protection from impact and abrasion damage. The inner thermoplastic jacket is extruded over and bonded to the core material. A thermoplastic elastomer outer jacket is then extruded over the inner jacket. A stranded tinned copper metal braid is supplied on all heaters. A color-coded modified polyolefin overjacket is supplied for positive identification during installation.

Principle of Operation:

The 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.

Application:

Nelson's Type LT domestic hot water heating cable is an energy-efficient and economical alternative to common recirculation systems. The heating cable is used to maintain water temperature in the supply piping system, reducing or eliminating the delay in obtaining hot water at each fixture. This cable system eliminates the need for return piping, pumps, check valves and pressure balancing valves found in recirculating systems. In addition, maintenance requirements are greatly reduced through the elimination of all devices with moving parts connected to the recirculating portion of the hot water supply system. The standard product offering has been designed to maintain nominal domestic water temperatures of 105ºF, 115ºF, 125ºF and 140ºF. These representative hot water temperatures are in accordance with the 1999 ASHRAE Applications Handbook, Service Water Heating. The heating cables are UL Listed and CSA Certified for domestic hot water temperature maintenance and meet all requirements of IEEE Standard 515.1, Recommended Practice for the Testing, Design, Installation, and Maintenance of Electrical Resistance Heat Tracing for Commercial Applications.

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Performance and Rating Data:

Catalog Number	Service Voltage	Maximum Segment Length	Nominal Maintenance Temperature	Ambient Temperature Range	Color Code
LT-A	208	810	105°F	74-79°F	Blue
LT-B	208	770	115°F	70-78°F	Green
LT-C	208	720	125°F	70-78°F	Yellow
LT-D	208	715	140°F	70-78°F	Red
LT-C1	120	330	125°F	70-78°F	Purple

NOTE: If the specified installation does not comply with published application values, please consult your authorized factory representative. Product is designed for applications on copper supply piping with standard fiberglass insulation of the thickness noted in the Product Selection Tables. Contact your Nelson representative if using other types of insulation.

Circuit Breaker Selection:

Cable Type	Start-Up Temp.	Service Voltage	Max. Length (Feet) Vs. Circuit Breaker Size			
			15A	20A	30A	40A
LT-A	50º F	208	810	1080	1620	2160
LT-B	50º F	208	515	685	1030	1370
LT-C	50º F	208	340	450	680	905
LT-D	50º F	208	285	380	570	760
LT-C1	50º F	120	230	305	460	610

NOTES:
1. Maximum segment length is the maximum continuous heater run with minimal voltage drop. For breaker loading, multiple heater segments can be installed in parallel providing no individual length is longer than the maximum segment length.
2. Circuit breakers are sized per North American electrical codes.
3. When using 2 or more heater cables of different ratings in parallel on a single circuit breaker, use the 15A column amperage of 15 amps, divide it by the maximum footage to arrive at an amps/foot figure for each cable. You can then calculate circuit breaker sizes for these combination loads. These amps/foot factors include the sizing factors required by North American electrical codes.
4. North American electrical codes require ground-fault equipment protection for each branch circuit supplying electric pipe heating equipment.

EGS Electrical Group NELSON HEAT TRACE

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Product Selection Tables:

105° F. HOT WATER SYSTEM LT-A @ 208V

Insulation Thickness*	Copper Pipe Diameter – Inches										
	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
0.5”											
1.0”											
1.5”											
2.0”											

115° F. HOT WATER SYSTEM LT-B @ 208V

Insulation Thickness*	Copper Pipe Diameter – Inches										
	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
0.5”											
1.0”											
1.5”											
2.0”											

125° F. HOT WATER SYSTEM LT-C @ 208V

Insulation Thickness*	Copper Pipe Diameter – Inches										
	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
0.5”											
1.0”											
1.5”											
2.0”											

140° F. HOT WATER SYSTEM LT-D @ 208V

Insulation Thickness*	Copper Pipe Diameter – Inches										
	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
0.5”											
1.0”											
1.5”											
2.0”											

125° F. HOT WATER SYSTEM LT-C1 @ 120V

Insulation Thickness*	Copper Pipe Diameter – Inches										
	½	¾	1	1-¼	1-½	2	2-½	3	4	5	6
0.5”											
1.0”											
1.5”											
2.0”											

* Fiberglass Insulation

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Catalog Numbers:

CATALOG NUMBERS				
	Nominal Temperature			
Voltage	105ºF	115ºF	125ºF	140ºF
208 VAC	LT-A	LT-B	LT-C	LT-D
120 VAC			LT-C1	

The Nelson Domestic Hot Water Temperature Maintenance System has been designed to provide nominal pipe temperatures under specific conditions. Due to variations in sealing techniques, operating environment, installation methods, etc., exact temperatures cannot be assured without thermostatic control. This is recommended in applications where critical temperature tolerances are required.

Approvals:	CSA	UL
	Ordinary Locations – Type LT series cables and accessories are approved for water temperature maintenance applications.	**Ordinary Locations –** Type LT series cables and accessories are specifically approved for hot water temperature maintenance applications.

Accessories:

- Connection Kits for Power Connection, Tee Splice, Splices and End Seals (Nelson PLT Series)
- Thermostatic Controls (Nelson TH and HC Series)
- Junction Boxes, Tapes and Warning Signs
- Custom Control, Monitoring and Power Panels

Nelson Heat Tracing Systems products are supplied with a limited warranty. Complete Terms and Conditions may be found on Nelson's website at www.nelsonheaters.com.

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