

# Type LT Self-Regulating Heater Cable

For use in Ordinary (Unclassified) and Hazardous (Classified) Locations

**UL:**  
-CB, -JT or -J options:  
Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class I,  
Zone 1, AEx e II

**UL:**  
D1- option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G;  
Class III

**CSA:**  
-CB, -JT or -J options:  
Class I, Division 2,  
Groups B, C, D; Class  
II, Division 2, Groups E,  
F, G; Class III, Class I,  
Zone 2, Group IIB+H2

**CSA:**  
-J option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G; Class  
I, Zone 1, Group IIB,  
Zone 1, Ex e II T6 (T5)

**FM:**  
-CB, -JT or -J options:  
Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class III

**FM:**  
-J option: Class I, Zone  
1 AEx e II; Group IIC

## Operating Principle

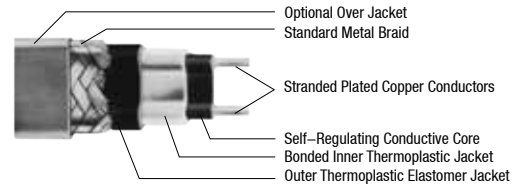
- The parallel bus wires apply voltage along the entire length of the heater cable.
- The conductive core provides an infinite number of parallel conductive paths permitting the cable to be cut to any length in the field with no dead or cold zones developing.
- The heater cable derives its self regulating 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, and also limiting the maximum sheath temperature.

## 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 over jacket is then extruded over the inner jacket.
- A stranded tinned copper metal braid is supplied on all heaters.
- An optional over jacket (fluoropolymer or modified polyolefin) can be specified when the heater cable is to be installed in wet or corrosive environments.
- The base product is supplied with a tinned copper metal braid that may be used in both general applications and in dry, non corrosive hazardous (classified) areas.

## Application

- Nelson Type LT self regulating heater cable is ideal for use in maintaining fluid flow under low ambient conditions.
- Freeze protection and low watt density process temperature systems such as product pipelines, fire protection, process water, dust suppression systems, lube oil, condensate return, domestic hot water ① and structure anti-icing are typical applications for this product.



## Accessories

- Nelson AX Series Connection Kits for Power, Splice, Tee Splice, Powered Splices and End Terminations
- Nelson HASK Series Division 1 Connection Kits for Power, Splice, Tee Splice and End Terminations
- Nelson EX Series Zone 1 Connection Kits for Power, Splice, Tee Splice and End Terminations
- Nelson TA, TH, TE and HC Series Thermostats and Contactors
- Junction Boxes, Tapes and Warning Signs
- Custom Control, Monitoring and Power Panels

## Certifications and Compliances

- UL Standard: 50 Ed. 12
- UL Listed: E53501, E49805
- CSA Standard: C22.2 No. 130-16, C22.2 No. 94-R2011, C22.2 No. 213-16
- CSA Certified: LR42103, LR42104
- FM Standard: FM3616: 2011
- FM Approved: JI 1B7A1.AX, JI 3B3A6.AX
- Other Standards: IEEE 515-2011, IEEE 515.1-2012, ANSI/ISA 12.12.01-2015

① LT-A, B, C, D self-regulating cable approved for domestic hot water maintenance applications.

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Groups F, G; Class I,  
Zone 1, AEx e II

**UL:**  
D1- option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G;  
Class III

**CSA:**  
-CB, -JT or -J options:  
Class I, Division 2,  
Groups B, C, D; Class  
II, Division 2, Groups E,  
F, G; Class III, Class I,  
Zone 2, Group IIB+H2

**CSA:**  
-J option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G; Class  
I, Zone 1, Group IIB,  
Zone 1, Ex e II T6 (T5)

**FM:**  
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Class I, Division 2,  
Groups A, B, C, D;  
Class II, Division 2,  
Groups F, G; Class III

**FM:**  
-J option: Class I, Zone  
1 AEx e II; Group IIC

## Performance Rating

Service Voltage	Maximum Maintenance Temperature °C (°F)	Maximum Intermittent Exposure °C (°F)	Watts/m (Watts/ft)	T-Rating ①
120	65 (150)	85 (185)	10 (3)	T6
240				
120	65 (150)	85 (185)	16 (5)	T6
240				
120	65 (150)	85 (185)	26 (8)	T5
240				
120	65 (150)	85 (185)	33 (10)	T5
240				

## Circuit Breaker Selection

Watts/m (Watts/ft)	Start-Up Temp. °C (°F)	Maximum Length in Meters (Feet) Vs. Circuit Breaker Size								
		120 Vac				240 Vac				
		15A	20A	30A	40A	15A	20A	30A	40A	50A
10 (3)	10 (50)	100 (320)	115 (370)	115 (370)	115 (370)	190 (630)	225 (740)	225 (740)	225 (740)	225 (740)
	-18 (0)	65 (220)	90 (290)	115 (370)	115 (370)	140 (465)	175 (580)	225 (740)	225 (740)	225 (740)
	-29 (-20)	60 (195)	80 (260)	115 (370)	115 (370)	115 (385)	155 (515)	225 (740)	225 (740)	225 (740)
16 (5)	10 (50)	65 (220)	85 (280)	85 (280)	85 (280)	135 (445)	170 (560)	170 (560)	170 (560)	170 (560)
	-18 (0)	45 (150)	60 (200)	85 (280)	85 (280)	90 (300)	120 (400)	170 (560)	170 (560)	170 (560)
	-29 (-20)	40 (135)	55 (175)	80 (265)	85 (280)	80 (265)	105 (350)	160 (525)	170 (560)	170 (560)
26 (8)	10 (50)	45 (150)	65 (205)	70 (225)	70 (225)	90 (300)	120 (400)	135 (450)	135 (450)	135 (450)
	-18 (0)	30 (105)	45 (140)	65 (215)	70 (225)	65 (210)	85 (285)	130 (425)	135 (450)	135 (450)
	-29 (-20)	30 (95)	40 (125)	60 (190)	70 (225)	60 (190)	80 (255)	115 (380)	135 (450)	135 (450)
33 (10)	10 (50)	40 (125)	50 (165)	60 (200)	60 (200)	75 (250)	100 (335)	120 (400)	120 (400)	120 (400)
	-18 (0)	25 (90)	40 (125)	55 (185)	60 (200)	55 (185)	75 (245)	110 (365)	120 (400)	120 (400)
	-29 (-20)	25 (85)	35 (110)	50 (165)	60 (200)	50 (165)	65 (220)	100 (330)	120 (400)	120 (400)

① Electrical equipment T rating codes define the maximum surface temperature that equipment will reach. It is used in hazardous (classified) area applications. Notes

1. Circuit breakers are sized per national electrical codes.
2. When using 240 volt product at 208, 220 or 277 volts, use the circuit adjustment factors shown in the Voltage Adjustment Table.
3. When using 2 or more heater cables of different wattage 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 125% sizing factor.
4. National electrical codes require ground-fault equipment protection for each branch circuit supplying electric heating equipment. Exceptions to this requirement can be found in the NFPA 70, National Electrical Code.
5. Heater cables with D1 optional construction require the use of ground fault interrupter/ground leakage device with a trip setting no greater than 30mA.

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**UL:**  
 D1- option: Class I,  
 Division 1, Groups B,  
 C, D; Class II, Division  
 1, Groups E, F, G;  
 Class III

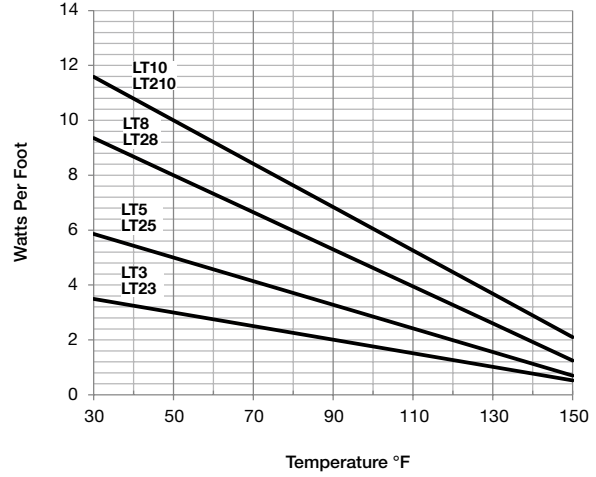
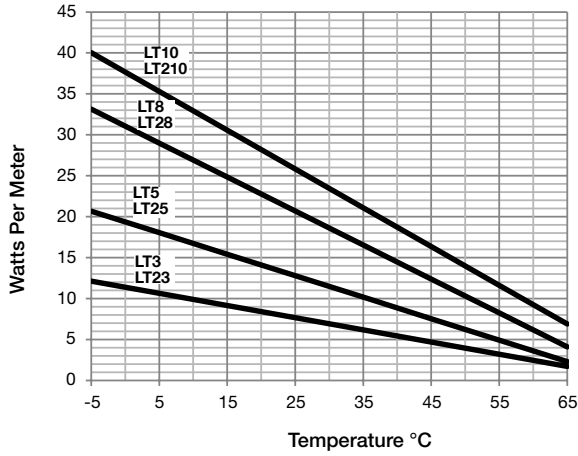
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 II, Division 2, Groups E,  
 F, G; Class III, Class I,  
 Zone 2, Group IIB+H2

**CSA:**  
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 Division 1, Groups B,  
 C, D; Class II, Division  
 1, Groups E, F, G; Class  
 I, Zone 1, Group IIB,  
 Zone 1, Ex e II T6 (T5)

**FM:**  
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 Class I, Division 2,  
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**FM:**  
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## Power Output Rating



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Class II, Division 2,  
Groups F, G; Class I,  
Zone 1, AEx e II

**UL:**  
D1- option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G;  
Class III

**CSA:**  
-CB, -JT or -J options:  
Class I, Division 2,  
Groups B, C, D; Class  
II, Division 2, Groups E,  
F, G; Class III, Class I,  
Zone 2, Group IIB+H2

**CSA:**  
-J option: Class I,  
Division 1, Groups B,  
C, D; Class II, Division  
1, Groups E, F, G; Class  
I, Zone 1, Group IIB,  
Zone 1, Ex e II T6 (T5)

**FM:**  
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Selection Table

Service Voltage	Maximum Segment Length Meters (Feet)	Description	Catalog Number
120	115 (370)	Tinned Copper Braid	LT3-CB
		Tinned Copper Braid and Fluoropolymer	LT3-J
		Tinned Copper Braid and Modified Polyolefin	LT3-JT
		Class I, Division 1, Groups B, C and D	D1-LT3
240	225 (740)	Tinned Copper Braid	LT23-CB
		Tinned Copper Braid and Fluoropolymer	LT23-J
		Tinned Copper Braid and Modified Polyolefin	LT23-JT
		Class I, Division 1, Groups B, C and D	D1-LT23
120	85 (280)	Tinned Copper Braid	LT5-CB
		Tinned Copper Braid and Fluoropolymer	LT5-J
		Tinned Copper Braid and Modified Polyolefin	LT5-JT
		Class I, Division 1, Groups B, C and D	D1-LT5
240	170 (560)	Tinned Copper Braid	LT25-CB
		Tinned Copper Braid and Fluoropolymer	LT25-J
		Tinned Copper Braid and Modified Polyolefin	LT25-JT
		Class I, Division 1, Groups B, C and D	D1-LT25
120	70 (225)	Tinned Copper Braid	LT8-CB
		Tinned Copper Braid and Fluoropolymer	LT8-J
		Tinned Copper Braid and Modified Polyolefin	LT8-JT
		Class I, Division 1, Groups B, C and D	D1-LT8
240	135 (450)	Tinned Copper Braid	LT28-CB
		Tinned Copper Braid and Fluoropolymer	LT28-J
		Tinned Copper Braid and Modified Polyolefin	LT28-JT
		Class I, Division 1, Groups B, C and D	D1-LT28
120	60 (200)	Tinned Copper Braid	LT10-CB
		Tinned Copper Braid and Fluoropolymer	LT10-J
		Tinned Copper Braid and Modified Polyolefin	LT10-JT
		Class I, Division 1, Groups B, C and D	D1-LT10
240	120 (400)	Tinned Copper Braid	LT210-CB
		Tinned Copper Braid and Fluoropolymer	LT210-J
		Tinned Copper Braid and Modified Polyolefin	LT210-JT
		Class I, Division 1, Groups B, C and D	D1-LT210

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**UL:** D1- option: Class I, Division 1, Groups B, C, D; Class II, Division 1, Groups E, F, G; Class III  
**CSA:** -CB, -JT or -J options: Class I, Division 2, Groups B, C, D; Class II, Division 2, Groups E, F, G; Class III, Class I, Zone 2, Group IIB+H2  
**CSA:** -J option: Class I, Division 1, Groups B, C, D; Class II, Division 1, Groups E, F, G; Class I, Zone 1, Group IIB, Zone 1, Ex e II T6 (T5)  
**FM:** -CB, -JT or -J options: Class I, Division 2, Groups A, B, C, D; Class II, Division 2, Groups F, G; Class III  
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## Voltage Adjustment ①

Absolute Max Length Meters (Feet)	Adjustment Multiplier						Product
	208 Vac		220 Vac		277 Vac		
	Power	Length	Power	Length	Power	Length	
225 (740)	0.76	0.93	0.85	0.96	1.27	1.07	LT23
170 (560)	0.79	0.93	0.87	0.96	1.24	1.07	LT25
135 (450)	0.84	0.93	0.90	0.96	1.19	1.08	LT28
120 (400)	0.86	0.93	0.92	0.96	1.16	1.09	LT210

① Use of self-regulating heater products at other than rated voltages require minor adjustments in power and maximum circuit lengths..