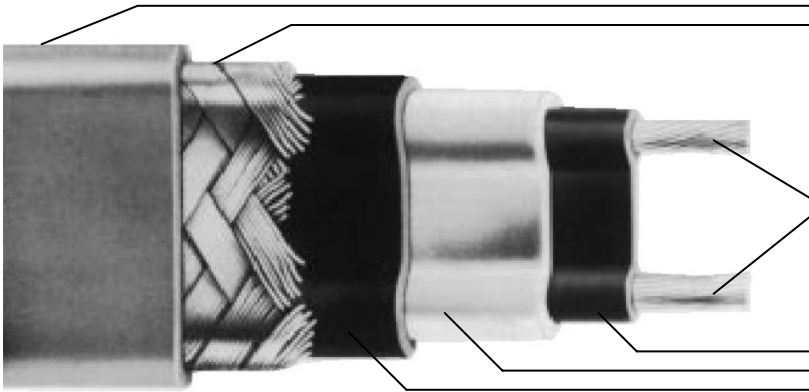


# NELSON™ TYPE LT

## SELF-REGULATING HEATER CABLE

## SPECIFICATION/APPLICATION INFORMATION



- Optional Overjacket
- Standard Metal Braid

LT3-CB	LT23-CB
LT5-CB	LT25-CB
LT8-CB	LT28-CB
LT10-CB	LT210-CB

- Stranded Plated Copper Conductors

- Self-Regulating Conductive
- Bonded Inner Thermoplastic Jacket
- Outer Thermoplastic Elastomer Jacket

### 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. An optional stainless steel braid is available for mechanical abuse situations. An optional overjacket (fluoropolymer or modified polyolefin) can be specified when the heater cable is to be installed in wet or corrosive environments.

### 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, and also limiting the maximum sheath temperature.

### Application:

Nelson's 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, tube oil, condensate return, hot water and structure anti-icing are typical applications for this product.

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. It is also used to provide a conductive ground path when cable is installed on non-conductive surfaces, such as plastic or painted pipe.

#### Options: (Delete -CB and add)

- SS** A stainless steel metal braid is available for use in dry, corrosive areas where mechanical abuse is a problem. Stainless steel metal braid is not recommended for use as a conductive ground path.
- JT** A tinned copper metal braid with a modified polyolefin overjacket is available for use when the heater cable is exposed to aqueous solutions of inorganic chemicals (phosphate, dilute acids, chlorides, bases and carbonites). It is also recommended where mechanical abuse is a problem.
- J** A tinned copper metal braid with a fluoropolymer overjacket is available for use when the heater is available for use when the heater cable is exposed to excessive moisture, organic chemicals,

- solvents, etc. in hazardous (classified) areas and ordinary areas.
- D1-** Approved for use in Class I, Division 1, Groups B, C, and D, Class II, Division 1, Groups E, F and G, Class III hazardous areas. D1 heating cable requires the use of HASK series connection kits.
- C2D1-** Approved for use in Class II, Division I, Groups E, F and G hazardous areas. C2D1 heating cable requires the use of C2D1-PLT or C2D1-ALT series connection kits. Standard Division 1 construction utilizes a tinned copper metal braid with a fluoropolymer overjacket. Ground Fault Protection Devices must be used on each heater circuit. All Division 1 designs must be reviewed by Nelson before being installed.

**Performance and Rating Data:**

Catalog Number	Service Voltage	Maximum Length	Maximum Maintenance Temperature	Maximum Intermittent Exposure	T-Rating*
LT3	120	325	150°F	185°F	T6
LT23	240	650	150°F	185°F	T6
LT5	120	270	150°F	185°F	T6
LT25	240	540	150°F	185°F	T6
LT8	120	210	150°F	185°F	T5
LT28	240	420	150°F	185°F	T5
LT10	120	180	150°F	185°F	T5
LT210	240	360	150°F	185°F	T5

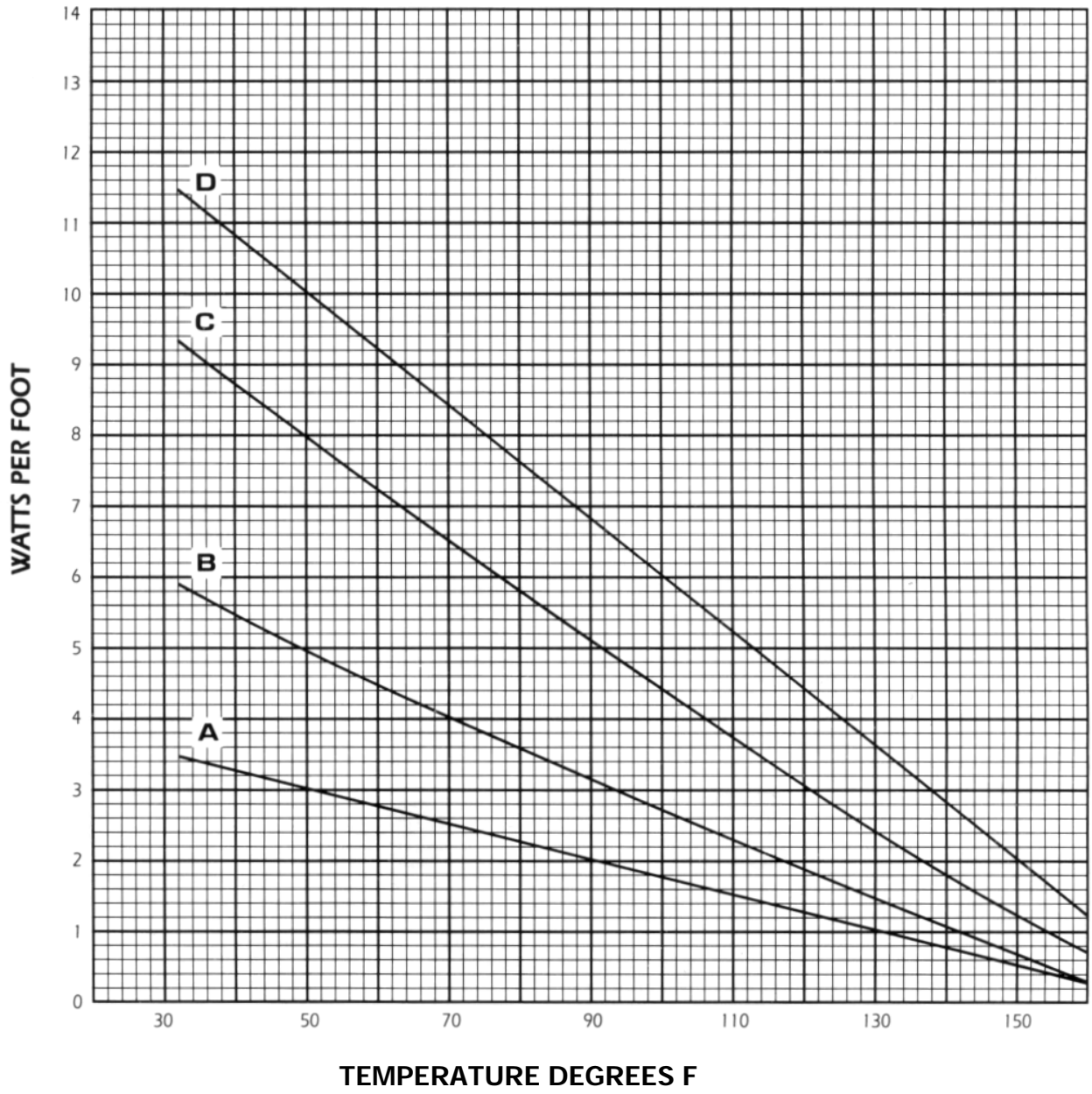
\*Electrical equipment T-rating codes define the maximum surface temperature that equipment will reach. It is used in hazardous (classified) area applications.

**Circuit Breaker Selection:**

Watts/Ft.	Start-Up Temp.	Max. Length (Feet) Vs. Circuit Breaker Size							
		120 Volt				240 Volt			
		15A	20A	30A	40A	15A	20A	30A	40A
3	50°F	325				650			
	0°F	230	305	325		460	620	650	
	-20°F	205	275	325		410	550	650	
5	50°F	225	270			460	540		
	0°F	155	205	270		310	415	540	
	-20°F	135	180	270		275	370	540	
8	50°F	145	195	210		295	390	420	
	0°F	100	130	195	210	200	265	395	420
	-20°F	90	115	175	210	175	235	350	420
10	50°F	115	150	180		230	305	360	
	0°F	85	110	155	180	165	220	325	360
	-20°F	75	100	145	180	150	195	290	360

- NOTES:
1. Circuit breakers are sized per article 427-4 of N.E.C.
  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 N.E.C. sizing factor in Article 427-4.
  4. Heater cables with CB, SS, JT & J constructions contain a metal ground shield as required by Article 427-23 of the N.E.C.
  5. Article 427-22 of the N.E.C. requires ground-fault equipment protection for each branch circuit supplying electric heating equipment. Exceptions to this requirement can be found in the 2002 N.E.C.
  6. Heater cables with D1 and C2D1 optional construction require the use of ground fault interrupter/ground leakage device with a trip setting no greater than 30mA.

**Power Output Rating:**



**A** LT3  
 LT23

**B** LT5  
 LT25

**C** LT8  
 LT28

**D** LT10  
 LT210

WATTS PER FOOT x 3.28 = WATTS PER METER  
 PIPE TEMPERATURE °F CONVERSION TO °C = 5/9 (°F - 32)

# NELSON™ TYPE LT SELF-REGULATING HEATER CABLE

# SPECIFICATION/APPLICATION INFORMATION

## Catalog Numbers:

BASIC CATALOG NUMBERS				
Voltage	Watts Per Foot			
	3	5	8	10
120 VAC	LT3	LT5	LT8	LT10
240 VAC	LT23	LT25	LT28	LT210

## Standard Feature Suffix:

-CB Tinned Copper Braid

## Optional Features Suffix:

- SS Stainless Steel Braid (Consult Factory Before Ordering)
- J Tinned Copper Braid and Fluoropolymer Overjacket
- JT Tinned Copper Braid and Modified Polyolefin Overjacket
- D1- Class I, Division I, Groups B, C and D approved
- C2D1- Class II, Division I, Groups E, F and G approved

## Voltage Adjustment:

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

Product	ADJUSTMENT MULTIPLIER						Absolute Max Length
	208 VAC		220 VAC		277 VAC		
	Power	Length	Power	Length	Power	Length	
LT23	.76	.93	.85	.96	1.27	1.07	650 ft.
LT25	.79	.93	.87	.96	1.24	1.07	540 ft.
LT28	.84	.93	.90	.96	1.19	1.08	420 ft.
LT210	.86	.93	.92	.96	1.16	1.09	360 ft.

## Approvals:

### FM

**Ordinary Locations -**  
(-CB, -SS, -J or -JT options)  
**Hazardous (Classified) Locations**  
(-CB, -J or -JT options)  
Class I; Division 2;  
Groups B, C, D Class II;  
Division 2; Group G  
Class III; Division 2  
(C2D1-option)  
Class II; Division 1;  
Groups E, F, G Class I;  
Zone 1; Group IIC



### CSA

**Ordinary Locations -**  
(-CB, -J or -JT options)  
**Hazardous (Classified) Locations**  
(-CB, -J or -JT options)  
Class I; Division 2;  
Groups B, C, D Class II;  
Division 2; Groups E, F, G  
Class III; Division 2  
(-J option)  
Class 1; Division 1,  
Groups B, C and D



### UL

**Ordinary Locations -**  
(-CB, -J or -JT options)  
**Hazardous (Classified) Locations**  
(-CB, -J or -JT options)  
Class I; Division 2;  
Groups A, B, C, D  
Class II; Division 2;  
Groups F, G  
Class I; Zone 2  
Group IIC  
(D1- option)  
Class I; Division 1;  
Groups B,C,D  
Class II; Division 1;  
Groups E, F and G  
Class III



## Accessories:

- Connection Kits for Power Connection, Tee Splice, Splices and End Seals (Nelson LT, PLT and ALT Series)
- Thermostatic Controls (Nelson TA, TH, TE and HC Series)
- Junction Boxes, Tapes and Warning Signs
- Custom Control, Monitoring and Power Panels
- Division 1 Connection Kits for Power Connection, Tee Splice, Splice and End Connection (Nelson HASK, C2D1-PLT, and C2D1-ALT Series).
- Zone 1 Connection Kits for Power Connection, Tee Splice, Splice and End Connection (Nelson Z1-PLT and Z1-ALT Series).

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](http://www.nelsonheaters.com).



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